

Network Camera

Online help

SMT-2221PV,SMT-3231PV,SMT-2731PV,
SMT-3221PV,SMT-2721PV,SMT-1031PV,
SMT-1031PVW

Monitoring

You can check the live screen to view what is being captured by the camera and control screen capture, and other features. When you click the  button on the screen, the live screen will appear.

You can move to the live screen, playback screen or setup screen by clicking the buttons at the top.

-  (Live): Check the live screen to view what is being captured by the camera and control a variety of camera features.
-  (Playback): Search and playback a recorded image from an SD card (or microSD card) or NAS.
-  (Setup): Change the camera settings.

The following information can be found in the upper right corner of the web viewer.

- **Model name:** Displays the camera model name. Clicking the model name opens detailed version information.
- **Account name:** Displays the name of the account that accessed the camera, such as 'admin' or 'user 1'. To log out from the web viewer, click the account name and then click **[Logout]**.
- **Apps:** Opens a list of all applications installed on the camera. Click **[Go App]** button to access the settings screen for a specific application. (May not be displayed depending on account permissions.)
- **Help:** Opens the Online Help in a new window, providing detailed information about the features of the camera web viewer. Click **[Protocol]** to view the list of SUNAPI APIs requested on the current page. The most recently requested API appears at the top, and the API address can be copied using the copy button next to each item. The list is cleared upon leaving the page. The filter function is available to display only APIs matching a specific SUNAPI action.
- **Theme switch:** You can set the theme color of the camera web page. Choose and apply the preferred theme (White or Black) according to your preference or the ambient brightness.

Note

- If you click the icon  at the top right of the live page, you can see the connected IP address and the authentication status. If successfully authenticated, the icon will be colored in green. If failed to be authenticated, it will be colored in red. If authentication is irrelevant due to the use of HTTP connection, dash (-) will be displayed.
- When playing a video on the live page, ghosting might occur under one of the following cases:
 - When the resolution changed after changing the profile
 - When the data transfer is delayed due to network delay after changing the profile
 - When the size or location of the web browser window changed

Icons

The icons at the bottom of the live screen provide the following functions (Some functions may not work with certain browsers or codecs.):

Icon	Description of function
 BestShot	BestShot is the extracted image of the most confident object among the objects (Person, Face, Vehicle, License plate) detected by the camera. The image format of BestShot is JPEG, and its image

Icon	Description of function
	contains only part of the region where the objects are shown. BestShot for individual object can be checked from the BestShot panel in the live page. In addition, the detailed properties of each object are displayed as icons. For example, a Person object has properties such as gender, color of tops and bottoms, wearing of a bag. The type of object to be displayed in the BestShot panel can be selected from [Setup]>[Analytics]>[Object detection]>[BestShot] .
 Video setup	You can check or change the profile applied to the current live screen. You can also change the display settings of the live screen.
 PTZ	You can control the Pan/Tilt/Zoom motions of the camera. PTZ operates only if the Video profile applied to the current live screen supports digital PTZ. To change to a digital PTZ control profile, select [Digital PTZ profile] from [Setup]>[Basic]>[Video profile]>[Video profile]>[Profile type] .
 Status	Check the connection information for each profile and for connected users at the same time. It is also possible to display streaming information on the video screen.
 Overlay	The type of objects to be displayed on screen when the camera detects objects can be selected. The objects detected by an AI camera are displayed only when the analytics algorithm of the AI camera is working. For AI algorithm to work, one of the following functions must be enabled: Object detection, IVA, People counting, Queue management, or Heatmap.
 Privacy area	The Privacy area setting window will appear. Specific functions related to privacy mask areas can be

Icon	Description of function
	controlled, including setting the use of the privacy mask area feature or designating a privacy mask area. For more information on privacy mask areas, refer to [Setup]>[Video & Audio]>[Video setup] .
 Full screen	View the live screen in full screen. To return to the size of the previous web browser, click the  icon in full screen mode or press the [Esc] key on the keyboard.
Size option	The size changes to the next size each time you click it.  (Fit): Fit the camera image to the size of the web browser.  (Original Size): View the camera image at its actual resolution.  (Aspect Ratio): View the live screen in the web browser by zooming in or out, while maintaining the aspect ratio of the camera image.
 Capture	Capture and save the live screen as a PNG image file. A captured image file is saved in the default recording path of each browser.
 Record	You can record and save the live screen to a PC. Click the Record icon to start recording; click the icon again to stop recording. Recorded files are saved in .avi format and can be saved in the default path of the browser or a file path can be set in the 'Save as' window. To protect your video files with password, select ZIP from the list of the video recording file format and enter a password. You need to enter the password to play back downloaded videos. The password setup function for recorded videos is not available in some camera models.
 Pixel count	On the live screen, you can see the number of horizontal/vertical pixels

Icon	Description of function
	in the area selected with the mouse. Click the Pixel count icon and click and drag the desired area with the mouse. The selected area will be displayed and the number of pixels in the image will be displayed. When you click the Pixel count icon again, the Pixel count function ends.
 Alarm output	When you click a desired alarm output number, the alarm will be outputted as previously set. The alarm can be set from the [Setup]>[Event]>[Alarm output] page. The number of alarm outputs varies depending on the camera.

To capture image

- In the scene to capture, click the capture icon().
- When the captured image is saved, a notification message will pop up. The capture image is saved to the path specified in each browser.

To record video

- Click the Record icon().
- To end the manual recording, click the Record icon()

The manual recording can be saved as an .avi file in your PC. Specify the path and save the video.

To protect video recordings with password

- You can select ZIP as the recording format and click the “REC” icon to set the password.

Your video recordings will be saved as .zip in your PC. You need to enter the password to play back the videos. (The password setup function for recorded videos is not available in some camera models.)

To switch to full screen

- Select the Full screen icon()
- To exit the full screen mode, click the Full screen icon()

To count the number of pixels

- Click the Pixel count icon().
- Set the area by dragging the mouse on the image. The number of horizontal/vertical pixels of the area will be displayed on the screen.

Video setup

Profile

The name and detailed information of the Video profile applied to the current live screen will be displayed. When you press the **[Profile]** drop-down icon, a

Video profile list that can be used from the current web viewer will appear; when you select the desired Video profile, it will be applied to the live screen immediately. You can check the resolution, codec, frame rate and target bitrate of the selected Video profile.

Display

Set the contrast, brightness, sharpness, etc. of the live screen; when you enter the setting, it will be applied to the live screen immediately. Click the  button if you want to reset all the display settings. (The **[Display]** function is not supported on some camera models.)

PTZ

You can control Pan/Tilt/Zoom operation of the camera or move to a preset PTZ position and control group motion.

Note

- The PTZ function is available only when **[Digital PTZ Profile]** is selected in **[Setup] > [Basic] > [Video profile] > [Profile type]**.
- Expand the camera image by clicking the  icon on the PTZ control screen and then you can adjust the camera views by clicking and dragging the  icon.
- In the center of the video screen, **[+]** and eight direction indicators will be displayed. When the mouse is dragged from the **[+]** sign in a given direction, it will move in that direction. Moreover, if you click the direction indicator, the pan and tilt will move in the selected direction.

Preset

When you select a desired preset from the preset list and click the **[Go]** button, it will move to the desired preset location.

To set a preset position, click the  icon on the PTZ control screen, adjust the camera view position, and then click the **[Set]** button. Set the preset name and number in the **[Name]** and **[Number]** fields and click the **[Apply]** button.

Clicking the **[Home]** button moves the camera view to the home position. The home position can be set in the **[Setup]>[PTZ]>[Digital PTZ]>[Preset]** tab.

Group

Select a desired group number from the group list and click the **[Start]** button to activate the group operation. To stop the group operation, click the **[Stop]** button. The group list can be added or modified in the **[Setup]>[PTZ]>[Digital PTZ]>[Group]** tab.

Status

Profile access

Check the connection status of all currently-set profiles or check the status of currently-connected users.

Current users

You can check the applied profile for each user, bitrate (kbps), network connection status and IP address of all users currently connected to the camera.

Stream info

Display video information (resolution, video codec, frame rate, bitrate) and audio information (audio codec, sampling rate) in real time on the live video.

Playback

You can import and playback a recorded image from an SD card (or microSD card) or NAS.

When you click the  button on the screen, the playback screen will appear. A time bar will appear at the bottom of the playback screen and an image recorded according to the set schedule or by an event is displayed on the time bar. When you click [**Refresh**], the recorded image information in the time bar is updated to the latest.

You can search for a recorded image by event type or date, and capture or save it to a PC. Also, if the time on the camera system has been adjusted and thus resulted in overlapping time, the video recorded during that overlapping hour can be searched. If there are overlapping sections, the [**Overlapped section**] option will appear next to the [**All**] button.

You can move to the live screen, playback screen or setup screen by clicking the buttons at the top.

-  (Monitoring): Check the live image being captured by the camera and control various camera functions.
-  (Playback): Search and playback a recorded image from an SD card (or microSD card) or NAS.
-  (Setup): Change the camera settings.

Note

- A video needs to be recorded first on the [**Live**] page before being able to play it.
- Connecting to the web viewer via Chrome, the record playback screen feature can be securely used.

Playback icons

The icons at the bottom of the playback screen provide the following functions:

Icon	Description of function
 Playback/Pause	Playback or pause an image.
 Speed	Play the video at 2x speed.

Playback a recorded image through event search

You can search for a recorded image by event type.

To search by event and play back

1. Click the Show button on the Playback screen. If there is any video taken on the day of searching, it will be displayed on the time bar.
2. To search by event type, click the [**All**] button at the top of the time bar and select an event you want.
3. Click the [**Apply**] button to display the searched events on the time bar.
4. Click the Playback button.
5. To stop the playback, click the Pause button.

Playback a recorded image through time search

Search for a recorded image by selecting a date and time on the calendar. When you click the **[Today]** button on the time bar, only images recorded today will be searched.

To search by time and play back

1. Click a date on the time bar, select the date you want on the calendar, and set the start and end time.
 - When you select **[All day]**, the start and end time will be set automatically from 00:00:00 to 23:59:59.
2. Click the **[Apply]** button.
3. Click the Playback button. The video of the selected time will play back.
 - If the video is already playing, the recorded time of the current video is displayed.
 - Move the button along the time bar to play back the video of the desired time.

Recorded video save

Recorded videos can be saved to files.

To save a video

1. Click the **[Export]** button.
2. In **[Time]**, set the Start time and End time for the video to save.
3. From **[Type]**, select the file type you want.
 - AVI: Saves in .avi.
 - ZIP: Saves in .zip. You can set a password for your files. You need to enter this password to unzip those files in order to play videos. (The password setup function for recorded videos is not available in some camera models.)
4. Click the **[OK]** button.

Video profile

The user can add or delete a video profile, and change the profile properties. Set the video profile, frame rate and codec as 'Video profile' in advance and later change the video profile to stream or play back an image. When you finish the setting, click **[Apply]** at the bottom of the page.

Video profile connection policy

After profile properties have been changed, you can set whether to output an image with the previous profile or with the changed profile.

When **[Keep connection when Profile properties are changed]** is selected, the image is outputted according to the previous profile properties even if the profile properties have been changed; when the web viewer is reconnected, the image is outputted with the changed profile. Border lines will appear on the edge of the live view of the [Live] screen until you connect to the web viewer again after changing the profile properties. **[Keep connection when Profile properties are changed]** is not selected, the image is outputted with the changed profile immediately when the profile properties are changed.

Video profile

Users can select a video profile according to the service environment and circumstances of product use. In addition to the profiles provided by default, users can add a new profile or delete an existing one. You can set the codec, profile type, resolution, frame rate, and other settings for each profile.

Profile list

The profile list is provided by default; all profiles added by the user are also displayed.

Copy the RTSP URL for each profile from the **[RTSP URL]** column.

Adding a video profile

1. Click **[Add]**. A new item will be added to the profile list.
2. Enter the name of profile in the **[Name]** field. The entered name will appear in the profile list.
3. Set the profile items, including **[Codec]**, **[Profile type]** and **[Resolution]**.
4. Click **[Apply]** at the bottom of the page.
5. When the confirm window appears, click **[OK]**. The new profile will be added.

Changing a video profile property

1. Select the profile which you wish to change from the profile list.
2. Change the relative settings, including **[Codec]**, **[Profile type]** and **[Resolution]**.
3. Click **[Apply]** at the bottom of the page.
4. When the confirm window appears, click **[OK]**. The settings of the selected profile will change.

Deleting a video profile

1. Select the profile which you wish to delete from the profile list.
2. Click **[Delete]**.
3. When the confirm window appears, click **[OK]**. The selected profile will be deleted.

Name

The name of the profile selected from the profile list will be displayed. You can enter a new profile name if creating a new profile.

Codec

Select the codec which you wish to apply to the profile. The profile properties may vary according to the selected codec type.

Profile type

Select a profile type to apply. The selected profile type will be displayed in the **[Type]** column of the profile list. The setup items may vary according to the selected codec type.

- **Default profile:** This is the default profile applied for streaming a live camera image. 'Default' is displayed in **[Type]** in the profile list.
- **Email/FTP profile:** A video profile that is used when sending a capture image of the event to email and FTP servers. [Event] will be displayed in the **[Type]** column.
- **Edge recording profile:** This profile is applied for recording an image on an SD card or NAS. 'Record' is displayed in **[Type]** in the profile list.
- **Frame Lock profile:** This is a profile applied to guarantee a certain level of video frame rate. 'FrameLock' is displayed in **[Type]** in the profile list. This 'Frame Lock profile' option appears only when **[Codec]** is set to **[H.264]** or **[H.265]**.
- **DPM profile:** A profile used exclusively for Dynamic privacy masking. In the table in [Video profile], "DPM profile" is displayed as "DPM" under **[Type]**. The [DPM profile] option can be selected only when the WiseAI app installed on the camera is running. Additionally, if the DPM feature is disabled in the WiseAI app's [Dynamic privacy masking] menu, masking will not be applied even if [DPM profile] is selected.
On some camera models, enabling [DPM profile] may limit the OSD functionality.

Profile properties

Set the details for the current video profile.

Resolution

Set the resolution of the camera image.

Note

- In order to stream a high-resolution image smoothly, it is recommended to connect to the web viewer using Google Chrome.

Frame rate

Set the number of frames per second.

The range of frame rates available varies according to the frame rate value selected from **[Video & Audio]>[Camera setup]>[Sensor]**.

Maximum bitrate

Set the maximum bitrate of the image when **[Bitrate control]** is **[VBR]**.

Target bitrate

Fix the amount of image data to be sent if **[Bitrate control]** is **[CBR]**.

Advanced

If either **[H.264]** or **[H.265]** is set for **[Codec]** of the profile, all advanced setup items will be displayed. If **[MJPEG]** is selected for **[Codec]** of the profile, only the **[Encoding priority]** item will be displayed.

Bitrate control

Set how to adjust the amount of image data.

- **CBR:** Constant Bitrate is for sending full-frame data of a constant size. When CBR is selected, the size of data to be sent is set by setting the target bitrate. CBR has a constant data size, making it is easy to predict the data size for the whole system, enabling the system to be operated stably.
- **VBR:** Variable Bitrate is for sending an image within the maximum bitrate without fixing the data size of the frame. VBR can use storage space capacity or bandwidth efficiently while maintaining the quality, but if an image suddenly becomes more complex, it may cause a strain on the network.

Note

- When the Bitrate control is set to 'CBR (fixed bitrate)' and the priority on image quality mode is selected, the actually transferred frame rate may be different from the set frame rate in order to guarantee the best image quality under the set bitrate in consideration of the complexity on screen.

Video compression

You can set the video compression ratio.

The **[Compression]** option of **[Profile properties]** sets the priority of encoding when **[Bitrate control]** is set to **[CBR]**. The **[Video compression]** option sets the priority of encoding, which affects the amount of data transmission and video quality based on the video compression rate for VBR action.

The higher the value of **[Video compression]**, the better the video compression rate. As the video compression rate increases, the amount of video data transmission decreases, but the video quality might be degraded as a result. If the video compression rate is lowered by setting a low value to **[Video compression]**, the video quality improves, but the amount of video transmission could increase.

[Video compression] is activated if either **[H.264]** or **[H.265]** is selected for **[Codec]** of the profile, and **[VBR]** is set for **[Bitrate control]**.

Encoding priority

Set the priority between frame rate and image quality if the amount of image data exceeds the target bitrate. (Supported options may vary depending on camera specifications.)

If either **[H.264]** or **[H.265]** is selected for **[Codec]** of the profile, the user can select between **[Frame rate]** and **[Compression]**. If **[Frame rate]** is set as the high priority, the maximum frame rate is secured, but the image quality may be lowered. On the other hand, when **[Compression]** is set as the high priority, the image quality is secured, but some frames may be omitted, so that the image may be disconnected or seem unnatural. If either **[H.264]** or **[H.265]** is selected for **[Codec]** of the profile, **[Encoding priority]** is activated only when **[CBR]** is set for **[Bitrate control]**.

If **[Codec]** of the profile is **[MJPEG]**, you can select between **[Frame rate]** and **[Bitrate]**.

GOV length

GOV (Group of Video) is a group of image frames for H.264/H.265 video compression; it means the group of frames from one I-frame to the next I-frame. GOV contains both I-frame and P-frame. I-frame is the frame which becomes the basis of compression (also called the key frame); it has data for one complete image. P-frame has information of the changed area only, based on the front frame. For this reason, the number of I-frames is fewer as the GOV length is longer, making the image size small, while the number of I-frames is more as the GOV length becomes shorter, making for a larger image size. The maximum value of the GOV length varies according to the **[Frame rate]** in **[Profile properties]**.

Profile

This menu becomes active only when the codec of the profile is H.264. The profile can be considered as a bundle of various compression technologies. The profiles supported in the Hanwha Vision cameras include **[Baseline]**, **[Main]** and **[High]**. The compression performance becomes higher and the quality becomes better as you move from Baseline to High, but a lot of system resources are used for compressing and decompressing and may create a strain on the playback equipment. (Supported options may vary depending on camera specifications.)

Entropy coding

Set the type to reduce compression loss.

Two entropy coding types, CAVLC (Context Adaptive Variable Length Coding) and CABAC (Context Adaptive Binary Arithmetic Coding), are provided.

(Supported options may vary depending on camera specifications.) However, only CAVLC coding type is available for the Baseline profile.

- **CABAC:** The CABAC data processing procedure is more complicated than CAVLC, so that it uses more system resources, but it has an excellent compression rate.
- **CAVLC:** The data processing procedure for CAVLC is simpler than CABAC, so that it uses fewer system resources, but the compression rate is relatively low.

Smart codec

Set whether or not to use smart codec. Smart codec is a unique technology of Hanwha Vision that reduces the compression rate for an area of interest to the user (to output in high quality), while it increases the compression rate for other areas, (to output in normal quality), thereby reducing the data size of the image as a whole. Smart codec is activated only when **[Bitrate control]** is **[CBR]**. The area for smart codec can be set from **[Video & Audio]>[Smart codec]**.

Dynamic GOV

To apply the Dynamic GOV function to the current profile, select **[Enable]**. Dynamic GOV is the function whereby the GOV length is changed automatically according to the image situation. In a video where little or no motion is detected, GOV operates based on the value set for **[Dynamic GOV]** by user, decreasing the bitrate of the whole video. Once motion is detected, I-frame is displayed immediately. Then, until the motion is not detected anymore, GOV operates based on the value set for **[GOV length]**.

- Enter the maximum GOV length to apply when there is no motion in the image. The range of input value is displayed next to **[GOV length]**. The input value in **[GOV length]** becomes the minimum value, while the maximum value is 480; it varies according to the **[Frame rate]** in **[Profile properties]**.

Note

- When the WiseStream function is used, if the dynamic GOV and dynamic FPS functions are used, the WiseStream performance is optimized. The WiseStream can be set in the **[Video & Audio] > [WiseStream]** menu.

Dynamic FPS

Select **[Enable]** to apply the Dynamic FPS function to the profile currently being set.

Dynamic FPS is a function that automatically changes FPS settings, from the minimum FPS setting to frame rate setting depending on the screen situation. In a nearly motionless video, FPS will function using the minimum FPS setting, which in turn reduces the overall screen bitrate. When a motion is detected, FPS will use an increased FPS value.

Minimum FPS

Enter the minimum FPS value to be applied when Dynamic FPS is enabled. The **[Minimum FPS]** option cannot be configured if the FPS value is set as 1.

Note

- When the WiseStream function is used, if the dynamic GOV and dynamic FPS functions are used, the WiseStream performance is optimized. The WiseStream can be set in the **[Video & Audio] > [WiseStream]** menu.
- Dynamic FPS is enabled only when **[Codec]** is set to **[H.264]** or **[H.265]** and **[Bitrate control]** is set to **[VBR]**.

Multicast

Multicast is the method used to send data in one instance from the camera to multiple pieces of equipment. Set whether or not to use RTSP (Real Time Streaming Protocol) on the current profile and enter the detailed information.

Multicast (RTSP)

To send an image by using RTSP, select [**Enable**].

IP address

Enter an IPv4 address that can be connected from the IPv4 network. The range of multicast IP address is anywhere between 224.0.0.0 and 239.255.255.254. However, 255 cannot be used at the end.

Port

Set the port that controls sending of the image. The range of multicast RTSP ports is from 1024 to 65534, and only even numbers are allowed. (The 3702 port however, cannot be used.)

TTL

You can set the TTL of the RTSP packet. A value between 0 and 255 can be entered for the TTL value.

User

You can manage the user accounts connecting to the camera. You can change the administrator password and guest settings, authentication setup and setting of current users. When you finish the setting, click **[Apply]** at the bottom of the page.

Change administrator info

You can change the administrator account ID and password. To reinforce security, create a password by combining random English uppercase and lowercase letters, numbers and special characters.

ID

View or change the administrator ID that is currently used.

Note

- Administrator ID must contain only alphanumeric characters with a maximum length of 8 characters.
- The default guest ID “guest” or the default user ID “user1”, “user2”...“user10” cannot be used as the administrator ID.

Current password

Enter the current password. To prevent the password from being changed by someone else, the administrator password can be changed only after entering the previous password.

New password

Enter a new password.

Confirm new password

This is the confirmation procedure to prevent incorrect input of a new password. Enter the new password again.

Note

- It is recommended to change the password every three months.
- The password restrictions are as follows:
 - After the factory reset, both the admin and user passwords will reset, and you need to create them again.
 - When you access the camera web viewer for the first time, or access it after the initialization, you will be moved to the password setting menu.
 - To use the web viewer menu, you need to set the new password in the password change menu and log in to the web viewer again with the changed password.
 - When changing the admin password, if the current password is not matched, then you cannot set the new password.
 - After changing the password, if there is a camera connected to a client, such as CMS or NVR, then you need to register the changed password before use. If you

maintain the same connection, the client will use the previous password for authentication, so the account can be locked.

- When logging in to the web viewer, if you entered incorrect password more than five times, it will be locked for 30 seconds and you won't be able to access the web viewer.
- If connection is made from various places with the same ID, or the password is changed while a number of Internet browsers are open, the Internet browsers may malfunction. It is recommended that a password be changed only from one location or only through one Internet browser.

Guest settings

When you select **[Allow guest access]**, a guest can connect to a web viewer screen. When you connect with a guest account, you can see only the live screen on the web viewer. Guest ID and password are 'guest/guest' and these cannot be changed.

Authentication setup

When you select **[Allow RTSP connection without authentication]**, you can access the camera video using RTSP (Real Time Streaming Protocol) without the login authentication.

Current users

You can set the connection information for user accounts other than the administrator, and set use permissions including audio in, audio out, alarm output and profile.

When a registered user logs in, only the functions set for that user are enabled. 10 current user accounts are set by default; you can add or delete an account. Up to 10 current IP user accounts can be used.

Note

- If you want to select the configured user that can use ONVIF, the use of the function may be restricted depending on the permission level set.

Use

Select the check box to enable the selected user account.

Name

Enter the ID

Password

Enter the password. The password setting rule is same as the administrator password setting rule.

Admin privilege

Authorize the selected users with admin privileges. Normal users can use only functions that their administrator allowed, but administrators can access and set any functions they want. However, even if admin privileges are given to users, they cannot change their admin ID or password.

Profile setup

Grant access to the selected user to control the detailed settings for video profiles.

Video setup

Grant access to the selected user to control detailed settings related to a video output.

Camera setup

Grant access to the selected user to control detailed settings related to camera video.

Alarm output

Grant access to the alarm output to the selected user. The users with alarm output access can transmit alarms.

Profile access

Set the type of video profiles the selected user can choose on live mode. If set to **[Default]**, the user can only check videos through the default profile. If set to **[All]**, the user can check videos through all profiles.

Playback

Grants the selected user the right to search and play the recorded video. When a user with playback permission accesses the web viewer, the  (playback) icon is activated at the top.

Open platform

Grant the selected user permission to access the app installed on the camera and check the detailed information of the app. The installed app information can be checked in the **[Open platform]** menu.

Inputting a current user

1. Select the row of the current user account you wish to use. The current user account is changed to a status where input is available.
2. Select the check box in the **[Use]** column.
3. Enter the ID and password in the **[Name]** and **[Password]** columns.
4. Select a function to allow in the **[Audio in]**, **[Audio out]** and **[Alarm output]** columns respectively, and select the type of profile to allow in the **[Profile]** column. (Some cameras do not support setup of **[Audio in]**, **[Audio out]**, and **[Alarm output]**.)

5. When the input of the current user account is completed, click **[Apply]** at the bottom of the page.
6. When the confirm window appears, click **[OK]**.

 Note

- If the number of current user accounts is less than 10, you can add a current user account by clicking **[Add]**.

Modifying a current user

1. Select the row of the current user account you wish to modify.
2. Change the function settings and click **[Apply]** at the bottom of the page.
3. In the confirmation dialog, click **[OK]**. Then the information of the user will be changed.

Deleting a current user

1. Select the row of the current user account you wish to delete and click **[Delete]**.
 2. Click **[Apply]** at the bottom of the page.
 3. In the confirmation dialog, click **[OK]**. Then the information of the selected current user will be deleted.
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Date & Time

You can check the current system time of the camera, change the time setting according to the local time zone, or set the system time through synchronization with the PC time or NTP server.

Current system time The current system time of the camera is displayed. The previously set system time is displayed.

Time zone The camera time is set based on standard time (GMT).

Time zone

The user can select the time zone.

Daylight saving time

When an area where daylight saving time is used is selected, the **[Daylight saving time]** menu will be displayed. The start and end time for daylight saving time in the selected time zone are displayed. When **[Enable]** is selected for **[Daylight saving time]**, a time which is one hour ahead of the standard time of the relevant zone is displayed.

Note

- Only when **[Daylight saving time]** is set to **[Enable]** will the time appearing on the timeline of the **[Playback]** screen be displayed according to daylight saving time.
- If the clock function of the PC is set to automatically apply daylight saving time, the daylight saving time option is automatically selected in the camera web viewer, and cannot be changed by the user.

System time setup The user can set the camera time manually or by synchronizing it with an NTP server.

Manual

The user can enter the current time manually for the camera or synchronize it with the time of the PC with which it is currently being used.

- Set the system time by entering the time in **[Y - M - D]** and **[h: m: s]**.
- When **[Synchronize with PC viewer]** is selected, the time of the PC viewer is synchronized with the system time. When **[Synchronize with PC viewer]** is selected, the same time zone should be separately set for both the PC and the camera.

Synchronize with NTP server

The NTP (Network Time Protocol) server time is synchronized with the system time. 5 NTP server addresses are entered by default. You can change an NTP server address by clicking the address input field.

IP & Port

Enter IP address and port. You can set IPv4 and IPv6 on the **[IP address]** tab. You can set the port for each protocol on the **[Port]** tab. When you finish the setting, click the **[Apply]** button at the bottom of the page. When you click the **[Apply]** button, you will need to reconnect to the web viewer.

IPv4 setup

You can check or change the IP type, MAC address, IP address, subnet mask, gateway, and DNS information used for the network communication using the IPv4 type.

IP type

Select the IP connection type. If a fixed IP address is used, set **[Manual]** and enter the information. If a dynamic IP is used, set **[DHCP]** and enter the DNS address only.

- **Manual:** Enter and set the IP address, subnet mask, gateway, DNS1 and DNS2 directly.
- **DHCP:** Set DNS1 and DNS2.

MAC address

The MAC address of the camera is displayed.

IP address

The current IPv4 address is displayed. You can change the IP address by setting **[Manual]** for **[IP type]**.

Subnet mask

The subnet mask of the current IP address is displayed. You can change the subnet mask by setting **[Manual]** for **[IP type]**.

Gateway

The gateway of the current IP address is displayed. You can change the gateway by setting **[Manual]** for **[IP type]**.

DNS setting by DHCP

This is displayed when **[DHCP]** is set for **[IP type]**. If you select **[Use]**, the DNS address is automatically assigned.

DNS1/DNS2

The address of the DNS (Domain Name Service) server is displayed.

Host name

Host name is the name to retrieve the host name which is used in ONVIF GetHostname command. The first character must be alphabetic and only alphabetic characters, numbers, hyphen(-), and the '.' symbol can be entered. Hyphen(-) and the '.' symbol cannot be at the beginning or end of the host name. Up to 63 characters can be entered. Name of the camera is input as default; does not need to be set as it is not a required value.

Note

- If you choose **[Change host name]** option under **[Network]>[HTTPS]>[Secure connection system]>[HTTPS (Use a secure connection)]**, the host name will be changed to the common name set in the certificate.

MTU

Set the maximum transmission unit (MTU) at which data can be transferred from the network interface. The MTU value can be set from 1280 octets to 1500 octets. If the value is set too low, the video playback may be delayed. Therefore, the MTU value should be set according to the user's network environment.

ICMP (Timestamp)

Select **[Enable]** to use the Internet Control Message Protocol (ICMP) timestamp request message. You can use the timestamp to calculate the round-trip time or time difference between the two systems. The ICMP (Timestamp) option is enabled by default.

IPv6 setup

IPv6 is a next-generation Internet address system with data processing speed, concurrent data processing capacity and Internet address system which are more expanded than IPv4. To use IPv6, select **[Enable]**. You can set the IP type, IP address, Prefix and gateway. When you select a camera model from the IP installer, you can select either IPv4 or IPv6 address and connect by entering the appropriate address directly in the web browser.

IP type

Select the IP connection type. The default value is **[Default]**. If DHCP is not detected, the value will automatically be changed to the previous setting.

- **DHCP:** The IPv6 address assigned through DHCP is displayed.
- **Manual:** The user can enter an IPv6 address of choice.
- **Default:** The current IPv6 address is displayed.

Note

- After changing the setting, click the **[Apply]** button to close the web browser window. After a moment, access the changed IP address again.

IP address

Enter the IPv6 address.

Prefix

This value sets the IP range. If **[IP type]** is **[Default]**, **[Prefix]** value is 64. If it is **[Manual]**, you can change the **[Prefix]** value.

Gateway

Gateway is displayed when **[Manual]** is set for **[IP type]**. The user enters the gateway address directly.

Port

A port is the location used for sending and receiving data. Click **[Port]** tab, set the relevant items, and then click the **[Apply]** button at the bottom of the page. It is recommended to use HTTPS and RTSP to reinforce image security.

Note

- When setting the port number, you cannot use 3702, 49152 or any number between 0 and 1023.

HTTP

The HTTP port is used for connecting to the camera using a web browser. The default value is 80 (TCP). The available range is between 1024 and 65535. When the HTTP port is changed, the web browser window will be closed. Enter the new HTTP port at the end of the IP address to reconnect. If the HTTP port is 80, the port number can be omitted. (e.g.: Camera IP address: 192.168.1.100, HTTP port In case of 8080 -> http://192.168.1.100:8080)

HTTPS

HTTPS has increased security over HTTP. This can be used when HTTPS mode is set in SSL, and the default value is 443 (TCP). The available range is between 1024 and 65535.

RTSP

This is the port for sending an image in RTSP (Real Time Streaming Protocol); the default value is 554. The available range is between 1024 and 65535.

Time out

To use the time out, select the **[Time out]** checkbox. If there is no response for a certain period of time when connection is made in RTSP, reset the port connection.

Digital PTZ

You can set the camera views to move after digital zoom is executed, rather than having the camera view change by physically moving the camera up and down (tilt) or left and right (pan). You can set a preset or change the camera views by setting a group of presets. When you complete the setting, click the **[Apply]** button at the bottom of the page.

Note

- **[Digital PTZ profile]** should be selected from **[Video profile]>[Profile type]** in order to set digital PTZ.

Adjusting the PTZ

Exclusive PTZ control

If you select **[Exclusive PTZ control]**, PTZ is restricted from being controlled by multiple users at the same time.

If there are continuous motion commands from a user, the users other than the current PTZ controlling user is restricted. If there are no additional commands for 10 seconds, the limited control permission is lifted. In this context, a single user refers to an individual IP address that has access to the cameras.

You can adjust the pan, tilt, and zoom actions of the camera.

Adjusting the PTZ

- When you drag the icon  with the mouse, the camera moves to the pan and tilt.
- Select an image magnification by clicking the icon  to zoom the screen in or clicking the icon  to zoom the screen out from the zoom bar.

You can also adjust PTZ on the camera video screen. Hover mouse over the  icon and click the indicator to fine-tune the camera's pan/tilt position, or click the  icon and drag the mouse to quickly adjust the camera pan/tilt position. If mouse is scrolled up, the video will be zoomed in. If mouse is scrolled down, the video will be zoomed out.

Preset

Preset means the setting of the camera views. 128 presets can be set.

Setting a preset

1. Expand the camera image by clicking the icon  on the PTZ control screen, and then
 - adjust the camera views by clicking and dragging the icon .
 - select an image magnification by adjusting the zoom bar, or click the icon  to zoom the screen in or click the icon  to zoom the screen out.
2. Select a preset number from **[Number]**.
3. Enter the relevant preset name in **[Name]**.
4. Click the **[Add]** button.

Moving to a preset

1. Select a preset number from **[Number]**.

2. When you click the **[Go]** button, the camera views will move to the set location.

Deleting a preset

1. Select the preset number you wish to delete from **[Number]**.
2. When you click the **[Remove]** button, the preset will be deleted.

Group

You can group a number of presets and access presets placed in a group sequentially.

Setting a group

1. Select a group number from **[Group no.]**.
2. Click the **[Add]** button in **[Preset list]**. When the preset list is displayed, select a number from **[Preset no.]** and enter the length of time (in seconds) to stay in the relevant preset in **[Dwell time]**.
3. Enter two or more preset numbers by repeating step No. 2.
4. If you want to remove a specific preset among presets assigned to a group, select the preset to be removed from the **[Preset list]** and click the **[Delete]** button.
5. When you complete the setting, click the **[Apply]** button at the bottom of the page.

Running a group

1. Select a group you wish to run from **[Group no.]**.
2. When you click the **[Start]** button, the presets for the relevant group will change according to the dwell time.
3. When you click the **[Stop]** button, the presets running as a group will stop.

Deleting a group

1. Select a group you wish to delete from **[Group no.]**.
2. When you click the **[Remove]** button, the group will be deleted.

Video setup

You can set a privacy area in the camera's image or flip it in reverse directions (vertically or horizontally). In addition, you can display an analog image or change the video output type. (Depending on the camera model, privacy area, video screen flip/mirror function, or video output function might not be supported.)

Privacy area

To prevent a possibility of privacy invasion in the camera's image, you can set a privacy area. To use the privacy area function, click **[Enable privacy area]**. To deactivate a privacy area, deselect **[Enable privacy area]**, then you can check the full camera's image without anything hidden due to privacy. The set privacy areas are not deleted, and they can be checked in the privacy area list.

Note

- When you select **[Enable privacy area]**, the LDC function is disabled. You can check the LDC function in **[Video & Audio]>[Camera setup]>[Special]**.

Setting a privacy area (PTZ camera)

1. Select **[Enable privacy area]** and click **[OK]** in the confirmation dialog.
2. Click on 4 corners with the mouse on the camera video screen.
3. In the **[Privacy area]** window, set the following:
 - Drag the icon  to place the desired video screen on a privacy area by adjusting the camera pan/tilt.
 - Enter the name of the privacy area in **[Name]**, select the color to cover the image in **[Color]**.
 - Select whether to enable **[Zoom threshold]**. The function ensures that a privacy area is used only if the image is magnified to higher than a zoom ratio set in **[Set zoom threshold]**. In other words, if the image is reduced below the zoom ratio, the privacy area is deleted from the image.
4. In the **[Privacy area]** window, click **[OK]**.
5. In step 3, if you select **[On]** in **[Zoom threshold]**, the **[Set zoom threshold]** window will appear. After setting the desired zoom ration, click **[OK]**.
6. A new privacy area is added to the list of privacy areas. The privacy area to which zoom threshold is applied will be marked as '[Zoom]' in the list of privacy areas. The color set in the camera's image screen is used to display the privacy area.

Setting a privacy area (zoom camera)

1. Select **[Enable privacy area]** and click **[OK]** in the confirmation dialog.
2. Drag with the mouse on the camera video screen to set the privacy area.
3. In the **[Privacy area]** window, set the following:
 - Enter the name of the privacy area in **[Name]**, select the color to cover the image in **[Color]**.
 - Select whether to enable **[Zoom threshold]**. The function ensures that a privacy area is used only if the image is magnified to higher than a zoom ratio set in **[Set zoom threshold]**. In other words, if the image is reduced below the zoom ratio, the privacy area is deleted from the image.
4. In the **[Privacy area]** window, click **[OK]**.
5. In step 3, if you selected **[On]** for the **[Zoom threshold]** option, then the **[Set zoom threshold]** window will appear. After setting the desired zoom ration, click **[OK]**.
6. A new privacy area is added to the list of privacy areas. The privacy area to which zoom threshold is applied will be marked as '[Zoom]' in the list of privacy areas. The color set in the camera's image screen is used to display the privacy area.

Setting a privacy area (except for a zoom or PTZ camera)

1. Select **[Enable privacy area]** and click **[OK]** in the confirmation dialog.
2. Drag the mouse on the camera video screen to set the privacy area.
3. In the **[Privacy area]** window, set the following:
 - Enter the name of the privacy area in **[Name]**, select the color to cover the image in **[Color]**.
4. In the **[Privacy area]** window, click **[OK]**.
5. A new privacy area is added to the list of privacy areas. The color set in the camera's image screen is used to display a privacy area.

Note

- When entering the name of a privacy area, you can enter only English letters, numbers, dash (-), and period (.).

Changing a privacy area

- You can change the size of a privacy area by moving a corner of the privacy area.
- To create a polygon (N-gon), first select and create a quadrilateral. When a **[+]** sign appears, click it to add another point. You can add up to 4 additional points to create a polygon of your choice.
- To delete a vertex, hover over the vertex you want to delete. Then the **[-]** sign appears on the point. Clicking the **[-]** sign deletes the vertex.
- To move a privacy area, click and drag the relevant area with the mouse.

Deleting a privacy area

1. Select a privacy area to delete from the list of privacy areas. The selected area is displayed on the camera's image screen.
2. Click **[Delete]** to delete the selected area.

Changing the order of privacy areas

You can change the order where each privacy area is saved.

1. Click **[Order]**.
2. In the **[Order]** dialog box, select a privacy mask area to change its order, and then select an option you would like.
 - Click **[Top]** to move to the very first order.
 - Click **[Up]** to move to the previous order.
 - Click **[Down]** to move to the next order.
 - Click **[Bottom]** to move to the last order.
3. Click **[OK]** in the **[Order]** dialog.

Video rotation

If the screen is displayed upside down after installing the camera, you can correct this using the flip mode and mirror mode functions.

The **[Hallway view]** feature provides a long vertical view of the screen, which allows you to operate the surveillance area more efficiently in a corridor or alley.

Note

- If you change the video rotation setting, the video will be flipped in four directions or changed. To help you analyzing the changed video and accumulate the statistics, change the analysis and statistics setting. The settings can be changed in the **[Analytics]** and **[Statistics]** menus. (Some camera models do not support **[Analytics]** or **[Statistics]**.)

Flip

Select **[On]** to flip the camera image upside down.

Mirror

Select **[On]** to mirror the camera image.

Hallway view

By rotating the camera image in an environment where a general camera cannot properly monitor the narrow aisles or hallways, you can magnify the vertical monitoring areas. You can rotate it 90 deg (Clockwise) or 270 deg (Clockwise) or set it to 0 deg to return to the original image.

Note

- In order to set the hallway view, you should set the installed camera to 0 degree, or rotate to 90 degrees clockwise or 270 degrees clockwise, and select the same angle in **[Hallway view]**.
 - When you set **[Hallway view]**, the web browser will close automatically, which requires you to reconnect to the web viewer.
-

Camera setup

You can change the camera settings to capture the best image in the environment where the camera is installed. Image presets suitable for various environments are provided by default; you can also specify camera settings directly. You can check on the camera preview screen how the camera image is displayed according to the settings. When you complete the setting, click **[Apply]** at the bottom of the page. If the time-out time (240 seconds) has passed without clicking **[Apply]** after changing the setting, the previous setting will be restored.

Comparison view

You can see the videos of before and after changing camera video setting values all at once in the **[Before]** and **[After]** panels.

Sensor mode

Set how many frames per second the CMOS sensor of the camera will capture.

Note

- Changing the sensor mode will reset the whole camera setting. (Depending on camera specifications, settings may not be reset.)
- Sensor mode value cannot be set differently for each image preset. Frame rate applies identical to all image presets.
- The maximum value of **[Basic]>[Video profile]>[Frame rate]** varies according to the number of frames set for the sensor mode.
- The [50 fps] or [60 fps] options under sensor mode can be selected only when **[Backlight]** mode is set to **[Off]**. (Available sensor mode options may vary depending on the camera specifications.)
- If **[Backlight]** is set to [WDR] under **[Image preset mode] > [User preset]**, the **[Sensor mode]** cannot be set to [50 fps] or [60 fps] in that user preset. (Available sensor mode options may vary depending on the camera specifications.)

Image preset mode

Various image presets are provided for specific purposes. Select an image preset that best suits your camera environment. (Supported options may vary depending on camera specifications.)

- **User-defined preset 1:** Used for displaying the image as you set.
- **User-defined preset 2:** Used for displaying the image as you set.
- **Outdoor daytime:** Used to display a clear and smooth video taken outdoor in daytime.
- **Outdoor night time:** Used to reduce the level of noises for video taken outdoor at night with low brightness and lighten up dark areas.
- **Indoor backlight:** Used to display a video where indoor and outdoor are both identifiable with indoor backlight.
- **Indoor bright scenes:** Used to provide clear picture quality and reduce flickering in an illuminated indoor environment.
- **Number plates:** Used to improve the ability to identify the license plate of a car in daytime and at night.
- **Vivid video:** Used to improve color and clarity.

Note

- After selecting an image preset mode, change the detailed settings of camera image, such as white balance and night/day modes, and click **[Apply]** to save the changed value as the image preset value. To reset it to default, click **[Reset]**.
- When **[User preset]** is selected and **[Backlight]** is set to **[WDR]**, **[Sensor mode]** cannot be set to [50 fps] or [60 fps]. (Available sensor mode options may vary depending on the camera specifications.)
- If **[Sensor mode]** is set to [50 fps] or [60 fps], setting **[Backlight]** to **[WDR]** in **[User preset]** disables the corresponding preset. (Available sensor mode options may vary depending on the camera specifications.)

SSDR

SSDR is a function that improves the visibility of dark areas by increasing the brightness of dark areas in environments where there is significant contrast between dark and bright areas.

SSDR

To use SSDR, select **[Enable]**.

Level

Adjust the level of dynamic range. As the level goes higher, a dark area becomes brighter.

D-Range

Select the amplitude area of the dynamic range.

- **Narrow:** The camera's default mode which prioritizes image quality.
- **Wide:** A mode that improves discrimination. It darkens the bright area to visualize the saturated area clearly and brightens the dark area to improve discrimination. Setting the mode as **[Wide]** improves discrimination on videos with similar brightness levels, but may decrease their expressiveness.

White balance

You can make corrections to show the color white correctly and other colors normally, in any lighting environment.

Mode

Select the white balance mode according to the environment where the camera is being used. (Supported options may vary depending on camera specifications.)

- **Manual:** You can adjust red gain and blue gain manually. If more red color is shown, lower the red gain, and if more blue color is shown, lower the blue gain. If more green color is shown, raise both the red and the blue values.
- **ATW:** Corrects the camera color automatically.
- **NarrowATW:** Auto-corrects camera color in 2800 K ~ 9000 K environment. **[ATW]**The color temperature range is narrower than Mode.
- **Outdoor:** The colors of the camera are corrected to be optimized for an outdoor environment.

- **Indoor:** Correction is made to optimize colors for an indoor environment.
- **AWC:** Screen correction is made to optimize the colors for the current lighting environment. When you aim the camera at white paper and click **[Set]**, the red gain and blue gain will be adjusted and applied to the image. The white balance value continues to be applied to the currently displayed video. If the environment changes, this should be adjusted again.
- **MERCURY:** Screen correction is made to optimize the colors for the mercury lighting environment.
- **SODIUM:** Screen correction is made to optimize the colors for the sodium lighting environment.

Red gain

Adjust the red gain. If the red gain is high, more red color is shown on the screen. If too much red is shown, lower the red gain.

Blue gain

Adjust the blue gain. If the blue gain is high, more blue color is shown on the screen. If too much blue is shown, lower the blue gain.

Note

- In any of the following cases, white balance may not operate normally. In such case, adjust the white balance through the **[AWC]** mode.
 - If the surrounding environment exceeds the color temperature correction range, such as a clear sky or sunset
 - If the surrounding environment is dark
 - If the camera faces directly toward a fluorescent light or if there is a significant illumination change.

Backlight

BLC

The BLC (Back Light Compensation) mode selects and corrects a specific area on a dark image captured against the light, to show an object in a selected area more clearly.

BLC level

Move the slide bar to adjust the BLC level. The higher the level, the brighter the set area.

WDR

The WDR (Wide Dynamic Range) mode shows both a dark area and a bright area clearly in a backlight environment. This method captures once with a fast shutter to show a bright area clearly and again with a slow shutter to show a dark area clearly, using the dual shutters of the camera, and then combines only the parts shown clearly from the two images into one image. If the WDR mode is used, noise may occur between the bright area and the dark area.



WDR mode off



WDR mode on

WDR level

Adjusts the intensity of backlight correction.

i Note

- When WDR mode is selected, the shutter value will be reset. The screen will become bright and then become dark.
- When WDR mode is used, the frame rate is reduced by half.
- It is recommended to use the WDR mode when a camera is installed indoor and there is very strong backlight.
- If the WDR mode is used, noise may occur between the bright area and the dark area.
- If the WDR mode is used, noise may occur in the motion detection area.
- Please turn off the WDR mode because, depending on the lighting condition in WDR mode, the following problems could occur:
 - When there are unnatural color changes and/or unnatural symptoms on the screen.
 - When there is noise on the bright part of the screen.
- The WDR performance may vary depending on the size of bright areas on the screen, so adjust the installation angle properly for the best WDR performance.
- If you set the WDR level too high, the screen may exhibit unnatural symptoms.

Exposure

Change the exposure according to the environment of the camera. If the background is darker than the subject, the subject will be shown normally only when the exposure is decreased. Conversely, if the background is brighter than the subject, the subject will be shown normally only when the exposure is increased.

Brightness

The brightness of the screen can be adjusted. The higher the number, the brighter the screen.

Minimum shutter

The shutter can set the sensor exposure automatically according to the environment; the electronic shutter operates at a range of between minimum shutter and maximum shutter. Minimum shutter means the minimum value of the possible range for exposure time and sets a long exposure time.

If the selected minimum shutter value is smaller than the fps value of [**Sensor**] mode, the frame rate can be reduced in the dark.

Maximum shutter

Maximum shutter means the maximum value of the possible range for exposure time and sets a short exposure time.

Anti flicker

Prevents screen flickering that occurs due to inconsistency in the lighting in the capturing environment.

Anti flicker shutter speed

Set the shutter speed to prevent flickering. The available values for the anti flicker shutter speed vary depending on the settings configured in the [Sensor mode] and [Anti flicker].

SSNR

Remove noise from the image. (Supported options may vary depending on camera specifications.)

- **On/Off:** Sets whether or not to use the SSNR function. When **[On]** is selected, the SSNR level can be adjusted.
- **WiseNR:** When a moving object is in the image, the noise reduction level is adjusted automatically to improve object discrimination.
- **WiseNR II :** When there is a movement of a person or vehicle in the image, it will automatically adjust the noise reduction level to reduce the tailing effect of moving objects to improve distinction.

SSNR 2D level

SSNR 2D reduces noise on the image using adjacent pixels in one frame. Set the SSNR 2D level. The level can be set when **[On]** or **[WiseNR]** is selected for **[SSNR]**.

Noise will be reduced when you raise the level, but the picture may become less clear.

SSNR 3D level

SSNR 3D reduces noise on the image using the pixels of various frames. Set the SSNR 3D level. The level can be set when **[On]** or **[WiseNR]** is selected for **[SSNR]**.

The higher the level, the less the noises, but then the video might lag.

AGC

AGC (Auto Gain Control) adjusts the brightness by controlling the sensitivity of image gain when capturing an object in dim light.

- **Low - High:** Setting to **[High]** increases the gain in dark environments, making the screen brighter.

 The screen exposure can be saturated depending on the max/min range of shutter settings.

- It may take a while until the effect is applied or canceled after setting the WiseNR mode (SSNR 2D and SSNR 3D).
- The level of noise might go up despite the improved video detection ability after setting the WiseNR mode (SSNR 2D and SSNR 3D).
- In the bright environment with less noises, the effect of WiseNR (SSNR 2D and SSNR 3D) can be little.
- Since the motion detection function is used internally when the WiseNR (SSNR 2D and SSNR 3D) is enabled to detect motion in video, it is detected according to the operational condition of motion detection event. For the detailed motion detection settings, go to **[Analysis] > [Motion Detection]**.
- As the usage of AGC increases, the SSNR 3D value for SSNR also increases, which could lead to stuttering in the video.
- AGC action increases screen noise.

Day/Night

Change the image to color or b/w according to the camera's environment.

When the dwell time is set, the image can be changed to color or b/w according to preference.

When switching to Day/Night, a motion detection event or image analysis event cannot be detected.

Mode

Selects the mode which changes the camera to color or b/w. (Supported options may vary depending on camera specifications.)

- **Color:** Outputs an image in color.
- **B/W:** Outputs an image in b/w.
- **Auto:** Switch to color mode during the daytime and b/w at night or in low light.

However, if **[AGC]** under **[Exposure]** is set to **[Off]**, **[Day/Night]** cannot be set to **[Auto]**.

- **External:** When an alarm input terminal is linked with external equipment, color and b/w can be controlled.
- **Schedule:** Day/Night is changed to the schedule set from **[Activation time (Color)]**.

Note

- The **[External]** can be set when there is more than one alarm inputs. Select **[Event]>[Alarm I/O]** to set the alarm I/O.

Dwell time

Changes to color or b/w when **[Auto]** is selected for Day/Night and the brightness condition is maintained for the set dwell time.

Duration

Sets the time interval when switching to color or b/w occurs.

When **[Customize]** is selected, you can manually set the ambient brightness level that determines the Day/Night mode switching threshold within a range of 0-100. The left slider with the Sun icon sets the threshold for switching from b/w to color, while the right slider with the Moon icon sets the threshold for switching from color to b/w. Entering a lower value in the left input field causes

the image to switch to color in brighter conditions, while entering a higher value in the right input field causes the image to switch to b/w in darker conditions. The sliders are only active when [Day/Night mode] is set to [Auto]. If the [Level(Max gain)] value under [Exposure] > [AGC] is set below 30 dB, or if [AGC] is set to [Off] or [Manual], the sliders will be disabled and [Day/Night mode] will automatically switch to [Color].

Alarm input

Set the image to color or b/w according to the opening and closing status of the alarm sensor.

Activation time (Color)

Sets the schedule for operation in color mode. When [**Everyday**] is selected and the time is set, color mode is activated at the relevant time every day, and b/w mode is activated at all other times. If you wish to not have color mode set for the same time every day, you can deselect [**Everyday**] and set the activation time to Mon., Tue., Wed., Thu., Fri., Sat. or Sun., respectively.

Note

- When switching between night and day modes, the motion detection event will not take place. In other words, even if you 'Enable' the motion detection event, it will not detect when switching between night and day modes occurs. You can enable or disable the motion detection event in [**Analytics**] > [**Motion Detection**].

Special

You can adjust an image for sharpness, contrast, color level, etc.

Sharpness

Adjust the overall sharpness of the image.

Sharpness level

Adjust the overall sharpness of the image. You can set the sharpness level by setting [**On**] for [**Sharpness**].

The higher the sharpness level is, the stronger and clearer the video sharpness is.

Gamma

Adjust the contrast of the image. This means the gap between the brightest part and the darkest part in an image; a higher gamma value means a clearer display of the difference in brightness.

Color level

Adjust the intensity of color in the image.

Chromatic aberration correction

You can enable or disable the [**Chromatic aberration correction**] feature. Chromatic aberration is a phenomenon where colors are separated due to differences in refractive index based on the wavelength of light through the lens, which can result in unexpected colors, such as purple, appearing along the edges of objects. If this phenomenon occurs in the lens, it can be improved through chromatic aberration correction.

Note

- Depending on the focus distance of the object being captured, the effect of chromatic aberration correction may not be noticeable in environments where chromatic aberration doesn't occur.
- When an object has thin borders in primary colors, its color may seem washed out or faded due to chromatic aberration.
- The higher the chromatic aberration correction level, the more noticeable the phenomenon of color removal may be.
- Colors may be excessively removed depending on the distribution or size of the color components. Therefore, it is not recommended to use the chromatic aberration correction function in environments with many thin borders of primary colors outdoors, such as lawns.

Correction level

You can adjust the chromatic aberration correction level. A higher value applies more correction.

This option is enabled only when you select [**Chromatic aberration correction**] > [**On**].

LDC

LDC (Lens Distortion Correction) corrects image distortion at the edge of a wide angle lens. (Supported options may vary depending on camera specifications.)

- **Off**: LDC (image distortion correction) function is not used.
- **Manual**: Adjusts the distortion correction level manually.
- **Auto**: Adjusts the image distortion automatically.
- **Fill mode (Manual)**: Corrects the video using the Fill mode. The correction values can be manually adjusted in [LDC level].
- **Fill mode (Auto)**: Corrects the video using the Fill mode. The correction values are automatically set. Since Fill mode maintains the screen's top and bottom angular fields of view, the left and right end of the video could be cropped.
- **Stretch mode (Manual)**: Corrects the video using the Stretch mode. The correction values can be manually adjusted in [LDC level].
- **Stretch mode (Auto)**: Corrects the video using the Stretch mode. The correction values are automatically set. Since Stretch mode maintains the screen's top/bottom/left/right angular fields of view, none of the areas in the original video recording is lost, but the aspect ratio of the video is not maintained.

LDC Level

Adjusts the distortion correction level. It is enabled by setting [**LDC**] to [**Manual**], [**Fill mode (Manual)**], or [**Stretch mode (Manual)**]. The higher the level value, the flatter the curved corners. The lower the level value, the less the changes to the curved corners.

OSD

Display the camera title or the date and time, and set the location, size, color and transparency of the characters.

Camera title

Sets whether or not to display the camera title. When **[Enable]** is selected, the **[Add]**/**[Delete]** buttons will be activated.

When you click the **[Add]** button, a field where a camera title can be entered will be added to the list.

The initial position of the camera title is the top-left corner of the video screen.

Moving the orange cursor to the desired position changes the location of the camera title on the video screen. (For some cameras, clicking **[Add]** adds a camera title field for entering a title and X,Y coordinate fields for positioning.)

To preview how the camera title is displayed on the screen after entering it, enter the camera title and click **[Preview]**.

Up to 5 camera titles can be added.

To delete a camera title, select the title to delete and click **[Delete]**.

Date & Time

To display the date and time on the screen, select **[Enable]**. To display the days of the week, select the check box under **[Weekday overlay]**. Select the date format in **[Format]** and set its location on the preview video screen. (For some cameras, you can set the coordinates where the date and time are displayed in the **[X]** column and **[Y]** column.)

Size

Adjust the size of OSD.

Color

Set the color of OSD.

Transparency

Set the transparency of OSD.

Overlay image

You can display the image you want on the screen. Use the **[Upload image]** menu to upload images.

Upload image

[...]button can be clicked to search files in bitmap format. Click **[Upload]** to upload image files. To delete image files applied to the screen, click **[Remove]**. Image file should be 16 bits (RGB565 not supported), 24 bits, or 32 bits bitmap file. Image size can be up to 300 x 300 px and file size should be no more than 400 KB.

For certain cameras, the image specifications may vary. The image file should be an 8-bit bitmap (RGB565 is not supported). The image size can be up to 288 x

288 pixels (width must be a multiple of 32, and height must be a multiple of 4), and the file size should not exceed 400 KB.

i Note

- In case of the item with a location that can be adjusted (camera title, date & time, overlay image, and system info), if it overlaps with other fixed OSD items, the screen may fail to display it properly. (Some cameras do not support **[Overlay image]** or **[System info]** option.)

Activation time

The camera always operates at a specific preset time. Set and use a desired image preset at the desired time.

Off

The camera operates at the time selected in the image preset.

Only scheduled time

You can execute a desired image preset at a specific time. Select an image preset and set the start and end time. Set the image preset for each hour according to the usage of the camera.

The date from Sunday to Saturday, based on the current camera time, is displayed on the time table shown when **[Only scheduled time]** is selected. You can set the time by clicking or dragging on the time table with the mouse. The set activation time is executed repeatedly on the relevant weekday and time. You can change the time view unit by clicking **[1 min]**, **[30 min]** or **[1 h]**. When you click **[Reset]**, all set event activation times will be deleted. To confirm or change the camera time, refer to **[Basic]>[Date & Time]**.

Smart codec

Smart codec is a technology that reduces the size of image data by setting an area desired by the user as an area of specific quality, while managing other areas at normal quality.

Manual ROI area

The user can set the area on the camera image screen. When you click and drag on the screen with the mouse, a square-shaped area will be created. 5 areas can be set, but overlapping is not allowed. When you click the **[Clear]** button, all set areas will be deleted.

Note

- **[Bitrate control]** should be selected as the **[CBR]** mode when using the smart codec. In **[VBR]** mode, smart codec functions are not supported.
- A smart codec can be set for each video profile. If you set **[CBR]** for **[Bitrate control]** in **[Basic]>[Video profile]** and set [Disable] in **[Smart codec]** then the smart codec function will not operate in the profile.

Smart codec setup

Quality

Select the quality level of an area set by the user. You can check an area in set quality level. The adjusted quality level of an area is always higher than normal quality.

WiseStream

WiseStream basically analyzes the complexity of video and effectively reduces the size of data while maintaining the video resolution.

[WiseStream] mode operates based on motion detection, which means it raises the compression ratio to reduce the size of the video data and save bandwidth if there is not much movement in the camera video. If a visible movement occurs, it returns to normal setting not to lose any video data. [AI-based WiseStream] mode operates based on AI object detection area, which means it raises the compression ratio to reduce the size of the video data and save bandwidth if the size of the object-detected area is small. If the size of the object-detected area increases, it returns to normal setting.

Mode

WiseStream mode can be selected.

- **WiseStream:** Operates based on motion detection. Its bit rate is saved by maintaining the quality of the movement detection areas and reducing the quality of the other areas. The benefit of bitrate reduction is great in environments of low video complexity with negligible or no motions while it is little in environments of high video complexity with many motions.
- **AI-based WiseStream:** Operates based on AI object detection area, which means the smaller the object detection area, the lower the bitrate, and the greater the object detection area, the higher the bitrate.

Note

- To use [AI-based WiseStream] mode, ensure the WiseAI application is installed and activated.
- [WiseStream] and [AI-based WiseStream] cannot be set for each profile but the whole camera.
- [WiseStream] and [AI-based WiseStream] work only when [Codec] is set to [H.264] or [H.265] or when [Bitrate control] is set to [VBR]. [Codec] and [Bitrate control] can be set in [Basic]>[Video profile] page.
- If screen change (e.g. a dramatic movement right in front of the camera) occurs while in the [WiseStream] mode, image quality deterioration (e.g. block noise) could be worse than video to which WiseStream is not applied.
- Any area with no object being detected in the [AI-based WiseStream] mode is affected by relatively worse image quality deterioration (e.g. block noise).

WiseStream/AI-based WiseStream

The video quality of [WiseStream] or [AI-based WiseStream] can be set based on the option selected in [Mode].

Quality

If you do not want to use the WiseStream function, select [Off]. Select [Low], [Medium], or [High] for the degree of bitrate reduction to apply with WiseStream.

PVM setup

You can configure the Public View Monitor (PVM) settings.
After completing the PVM settings, click **[Apply]** at the bottom of the page.

Monitor setup

You can control the power of the PVM or set the monitor's screen mode.

Remote control

By default, the PVM can be remotely controlled with a remote control. If you do not want to use the remote control of the PVM, uncheck **[Enable]**.

Monitor power

You can turn on and off the monitor. Click **[On]** to turn on the monitor; click **[Off]** to turn off the monitor.

Screen mode

You can set the screen mode.

- **Single:** Displays an image (output) only from the monitor's built-in camera. If the slide show feature is activated, the set slide-show image is displayed.
 - **PIP:** Separates the screen into two parts. An image from one source device is displayed on the main screen at the same time an image from the other source device is displayed on the sub screen. You can use the PIP (Picture-in-picture) feature only when another device is connected to the HDMI input on the monitor. You can configure detailed settings for both main and sub screens in the PIP mode.
 - **Main screen:** Choose which source device will be used for the main screen. Select **[Camera]** to display the image from the built-in camera; select **[HDMI input]** to display an image from an HDMI-connected device. An image from non-selected device will be displayed on the sub screen.
 - **Sub screen position:** Choose where to put the sub screen over the main screen. Choose the position among **[Top left]**, **[Top right]**, **[Bottom left]**, and **[Bottom right]**.
 - **Sub screen size:** Choose the size of the sub screen among **[Small]**, **[Middle]**, and **[Large]**.
 - **PBP:** Separates the screen in half displaying images from two different source devices simultaneously on the left and right sides of the screen. You can use the PBP (Picture-by-picture) feature only when another device is connected to the HDMI input on the monitor.
 - **HDMI screen position:** Choose between **[Left]** and **[Right]** the position of the image from an HDMI-connected device. If you select **[Left]**, an image from the built-in camera is displayed on the right.
-

Slide show

You can play a slide show on the PVM. Select **[Enable]** to play a slide show. When a motion detection event occurs, live video appears on the monitor screen. Go to **[Analytics]>[Motion detection]** to configure settings for motion detection events.

Notes

- Image files can be uploaded only in JPG, PNG, or BMP format.
- Images will be saved only as 1920 × 1080 pixels.
- You can type only English letters, numbers, or periods in the file name. A blank space cannot be used.
- While a file is being uploaded, the web viewer's webpage screen is switched to the loading screen. And the upload speed varies depending on the file.
- If you close the web viewer or go to another menu page while a file is being uploaded, the file may not be successfully uploaded.

Image dwell time

Set the image switching interval while the slide show runs. For example, if you select **[5 seconds]**, an image changes to the next image every 5 seconds.

Live streaming time

When a motion event occurs, live video (not slide show) will be streamed on the monitor screen. Set the time for how long live video will be played. For example, if you select **[10 seconds]**, the live video will be streamed on the monitor screen for 10 seconds when a motion event occurs.

Image file

You can upload up to 10 image files to be used for slide show.

Uploading image files

1. Under **[Image file]**, click **[...]** to choose a file.
2. When the selected file is displayed in the box, click **[Upload]**.

Deleting image files

- To delete a file, select the file under **[Image list]** and click **[Delete]**.
- To delete all the uploaded files at once, click **[Delete all]** under **[Image file]**.
Deleting all images will disable the slideshow feature.

Image list

The files uploaded in **[Image file]** are displayed in a list.

Banner

You can display a banner on the PVM monitor screen. When you upload a banner image and select **[Enable]**, the banner appears on the screen.

You can upload an image, respectively, for Banner 1 and Banner 2 and move the banner by dragging it up or down.

If an overlay image and a banner image overlap on the screen, the banner image will be positioned above the overlay image. To set overlay images, go to

[Camera setup]>[OSD]>[Overlay image].

Note

- Image files can be uploaded only in JPG, PNG, or BMP format.
- The recommended size for banner images is 1920x162. However, if the video rotation mode is **[Hallway view]**, the ideal image size is 1080x288. To set **[Hallway view]**, go to **[Video setup]>[Video rotation]**.
- After uploading banner images and changing the video rotation mode to **[Hallway view]**, all images will be deleted and the saved image locations will reset.
- If you upload an image that goes beyond the recommended size or that has a long vertical dimension (e.g., 1920x800 pixels), the image quality may be degraded.
- You can type only English letters, numbers, or periods in the file name. A blank space cannot be used.
- While a file is being uploaded, the web viewer's webpage screen is switched to the loading screen. And the upload speed varies depending on the file.
- If you close the web viewer or go to another menu page while a file is being uploaded, the file may not be successfully uploaded.

Image file

You can upload up to 2 banner images.

Uploading banner image files

1. Click [...] under **[Image file]** and select a file you want to upload.
2. When the name of the file you selected appears in the box, click **[Upload]**.

Deleting banner image files

- To delete a single file, choose it from the **[Image list]** and click **[Delete]**.
- To delete all files, click **[Delete all]**.

Image list

The list shows a list of image files you uploaded in **[Image file]**.

Common

You can configure the detailed Public View Monitor (PVM) settings.

Person detection area color

When the **[Person detection]** feature is activated, you can set the border color of the person detection area displayed on the PVM monitor screen. If no color is set, the person detection area will not be displayed even when a person is detected.

Face detection area color

When the **[Face detection]** feature is activated, you can set the border color of the face detection area displayed on the PVM monitor screen. If no color is set, the face detection area will not be displayed even when a face is detected.

Notes

- The person and face detection area display feature works only when the Object detection feature is enabled. To enable Object detection, go to **[Analytics]>[Object detection]** and select **[Enable object detection]**.

Monitor power schedule

You can set the monitor to turn on only during the scheduled time. Then the monitor is turned on only during the scheduled time and is turned off during the non-scheduled time.

If you select **[Only scheduled time]**, a weekly timetable appears based on the current date of the camera system. You can change the time unit by clicking **[1 min]**, **[30 min]**, or **[1 h]**.

You can manipulate time blocks by resizing them or moving them to different days or times.

Resizing time blocks

- Click the bottom edge or top edge of a time block and move up or down with the mouse to drag the time block to a new size.

Moving time blocks

- Click a time block and drag it higher or lower in the current day.
- Click a time block and move it side to side to move to another day.

Deleting time blocks

- Click a time block you want to delete and then the block disappears.
- To delete all the time blocks, click **[Reset]**.

Notes

- If you manually turn off the monitor during the time when it is set to power on, the monitor will remain powered off until the time when it is set to turn on.
- Go to **[Basic]>[Data & Time]** to check or change the camera system time.

DDNS

If you use DDNS (Dynamic Domain Name Service), you can set the IP address of the camera to be changed to a general host name which can be easily remembered by the user. If the IP address of the camera is 198.160.0.100, you can connect to the camera by entering a host name such as <http://ddns.hanwha-security.com/camera1> instead of the IP address. It is convenient since the user can connect to the camera with the DDNS address even if the IP address of the camera is changed.

The exclusive Wisenet DDNS for Hanwha Vision or public DDNS can be used for DDNS. Enter the desired DDNS information and click the **[Apply]** button at the bottom of the page. If the connection to the selected DDNS is made, 'Successful' message will be displayed, and if the connection is not made, 'Failed' message will be displayed.

Note

- To use the DDNS service, the setup of port forwarding for the DDNS and the router need to be done together.
- For the port forwarding setup method for the router, see the instruction manual shipped together with the product.
- When UPnP discovery function is enabled, DDNS cannot be used. UPnP discovery will be activated when the **[UPnP discovery]** option is set to **[Enable]** on **[Network]>[Auto IP configure]**.

DDNS

Off

Select if you wish not to use DDNS.

Wisenet DDNS

Select when you use DDNS server provided by Hanwha Vision. To use Wisenet DDNS, sign up for the membership at the Wisenet DDNS homepage (<http://ddns.hanwha-security.com>) and register the product at **[My DDNS]>[Register Product]**.

- **Server:** Enter DDNS server name which you intend to use.
- **Product ID:** Enter ID of the product registered on Wisenet DDNS server. If **[Quick connect]** is selected when a router which supports the UPnP (Universal plug and play) function is used, it supports automatic opening of the port in case of connection from the outside.

Note

- If the router does not support the UPnP function or to use DDNS server without using **[Quick connect]**, set manual for the port forwarding of the router. For the port forwarding setup method for the router, refer to the instruction manual included in the product.

Public DDNS

Select it when you use DDNS server provided by a public website. Use it after signing up for the service at the relevant website.

- **Server:** Select public DDNS server which you intend to use.
- **Host name:** Enter a host name registered on DDNS server.
- **Username:** Enter the user name for DDNS server.
- **Password:** Enter the password for DDNS server.

IP filtering

You can prepare an IP address list to allow or reject the connection for a specific IP. IP addresses are managed separately between IPv4 and IPv6. When you complete the setting, click the **[Apply]** button at the bottom of the page.

Filtering type

[Deny registered IP] and **[Allow registered IP]** filtering conditions apply to all registered IP addresses.

- **Deny registered IP:** Denies access for a registered IP.
- **Allow registered IP:** Allows access for a registered IP

Note

- When an access-authorized IP is registered, the IP currently connected to the camera should also be registered. Especially, when **[Enable]** is selected for **[Basic]>[IP & Port]>[IPv6 setup]**, all IPv4 and IPv6 addresses of the IP addresses currently connected should be added.
- A currently-connected IP address cannot be registered as **[Deny registered IP]**.

IPv4

This is the address list for IPv4 types; an IP address can be added or deleted. Up to 10 IP addresses can be entered.

Adding an IPv4 address

1. Click the **[Add]** button. A field where an IPv4 address can be entered will be created.
2. Enter the IP and Prefix information. The filtering range for the entered information will be displayed. Prefix can set the IP range, and a value from 1 to 32 can be set in IPv4.
3. Filtering for the relevant range is possible only after the **[Use]** box is checked.
4. Clicking the **[Apply]** button at the bottom of the page will save all information added to the list.

Deleting an IPv4 address

1. Select an IPv4 address you wish to delete.
2. Click the **[Delete]** button.
3. Click the **[OK]** button on the delete confirm window. The IPv4 address will be deleted.

IPv6

This is the address list for IPv6 types; an IP address can be added or deleted. Up to 10 IP addresses can be entered.

Adding an IPv6 address

1. Click the **[Add]** button. A field where an IPv6 address can be entered will be created.

2. Enter the IP and Prefix information. The filtering range for the entered information will be displayed. Prefix can set the IP range, and a value from 1 to 128 can be set in IPv6.
3. Filtering for the relevant range is possible only after the **[Use]** box is checked.
4. Clicking the **[Apply]** button at the bottom of the page will save all information added to the list.

Deleting an IPv6 address

1. Select an IPv6 address you wish to delete.
 2. Click the **[Delete]** button.
 3. Click the **[OK]** button on the delete confirm window. The IPv6 address will be deleted.
-

HTTPS

You can select a secure connection system or install a public certificate.

Secure connection system

Select an appropriate secure connection system in consideration of the security level. HTTPS (Hypertext Transfer Protocol over Secure Socket Layer) sends and receives data through the process of encoding/decoding users' page requests over SSL sub layer under hypertext transport agreement layer. Therefore, this mode is safer than HTTP mode in terms of security.

HTTP (Do not use a secure connection)

Select this to send data without HTTP encryption.

HTTPS (Use a secure connection)

Select this to connect in HTTPS secure connection mode.

Certificates

A list of registered certificates is displayed. Select the certificate to use for HTTPS connection.

Certificates can be registered in **[Network]>[Certificate management]**, and only certificates with non-encrypted key files are displayed on the list.

Change host name

Selecting **[Change host name]** option changes the camera's host name to the common name in the certificate. Some security check tools may see that the product's security is vulnerable if the camera's host name is different from the common name set in the certificate.

You can view the host name under **[Basic]>[IP & Port]>[IP address]>[IPv4 setup]>[Host name]**.

[Change host name] can be set only when **[Device certificate]** is selected in **[Certificates]**.

Mutual authentication

To proceed with mutual authentication for enhanced security, select **[Mutual authentication]**.

As you proceed with mutual authentication, you can choose an option for allowing access.

- **[Allow all connections]**: All access attempts that tried mutual authentication are allowed for connection regardless of the success/failure of mutual authentication. This means that even without mutual authentication, camera access is granted.

- **[Allow only mutually authenticated connections]**: Camera access is granted upon the success of mutual authentication only.
- **[Allow only mutually authenticated connections (including Device ID authentication)]**: Access is allowed only when the client's device ID information is verified and certified to verify integrity of mutual authentication.

[Mutual authentication] can be set only when **[Device certificate]** is selected in **[Certificates]**.

TLS settings

Sets Cipher mode or TLS version to use for encrypted communication.

Cipher mode

Provides cipher suites by combining various algorithms to use for TLS-encrypted communications, such as key exchange, authentication, and encryption.

- **Secure cipher suites only**: Uses only cipher suites with a high level of security.
- **All compatible cipher suites**: Uses cipher suites for backward compatibility although less secure. **[All compatible cipher suites]** includes both secure and not secure cipher suites.

Version

Selects the TLS protocol version to use for encrypted communication.

CORS policy

CORS (Cross-Origin Resource Sharing) allows web pages to access resources from different origins. By selecting **[Same origin only]** and clicking **[OK]**, the server will only allow requests coming from the same origin and block requests from different origins. If you select **[Same origin only]**, you need to restart the web service, causing the web page to refresh in the process.

If you select **[Same origin only]** under **[CORS policy]**, the camera may not be compatible with some VMSeS.

802.1x

You can select whether or not to use the 802.1x protocol when connecting to a network, and install the certificates. When you complete the setting, click the **[Apply]** button at the bottom of the page.

IEEE 802.1x setup

IEEE 802.1x

To use IEEE 802.1x protocol for connecting to the network, select **[Enable]**. IEEE 802.1x is a part of the network protocol group called IEEE 802.1 and is the IEEE standard regarding port-based Network Access Control (PNAC). IEEE 802.1x is mainly used for reinforcing security in a wireless LAN (Wi-Fi) environment.

EAP Type

EAP (Extensible Authentication Protocol) is a protocol that allows easier extension using the authentication method defined by wireless network and Point-to-Point Protocol. It is recommended to be used only in an environment where EAP-TLS, PEAPv0/MSCHAPv2 cannot be used since LEAP is an insecure authentication method.

- **EAP-TLS:** EAP-TLS (Transport Layer Security) carries out mutual authentication that requires a client certificate with the server; a dynamic WEP key is used for security after connection is made.
- **LEAP:** LEAP (Lightweight Extensible Authentication Protocol) does not require certificates and uses only a dynamic WEP key, so a strong password should be used.
- **PEAPv0/MSCHAPv2:** PEAP/MSCHAPv2 (Protected Extensible Authentication Protocol/Microsoft Challenge Handshake Authentication Protocol) authentication performs authentication based on the ID and password of user through an EAP-TLS session generated from the server-side authentication only.

EAPOL version

Select **[1]** or **[2]** for the version of the **[EAPOL]** (EAP over LANs) used in the network switch.

ID

Enter your client certificate ID for **[EAP-TLS]** and enter your user ID for **[LEAP]** and **[PEAPv0/MSCHAPv2]**.

Password

Enter your client private key for **[EAP-TLS]** and enter your user password for **[LEAP]** and **[PEAPv0/MSCHAPv2]**. This is not necessary if an unencrypted key is used in **[EAP-TLS]**.

 Note

- If the connected network equipment does not support 802.1x, it may not operate properly even if **[Enable]** is set for 802.1x.

Certificates

CA certificates

Select the CA certificate you want from the certificate list.

The CA certificate displayed is the one registered in **[Network]>[Certificate management]>[CA certificate]**.

Client certificate

Select the client certificate you want from the certificate list. The client certificate is a certificate created/applied and used by users.

The client certificate displayed is the one registered in **[Network]>[Certificate management]>[Client certificate]**.

QoS

QoS (Quality of Service) is the function that sets the priority of data transmission and secures the data transmission quality according to set priorities when overload (simultaneous traffic increase, network failure, etc.) occurs on the network. A QoS IP address can be entered in IPv4 or IPv6. When you finish the setting, click the **[Apply]** button at the bottom of the page.

IPv4

A QoS IP address can be added or deleted in IPv4. The default values are 32 for Prefix and 63 for DSCP.

- **Prefix:** This value can set the IP range, and a value from 1 to 32 can be set in IPv4.
- **DSCP:** The QoS priority is DSCP (Differentiated Services Code Point). A value of 0 to 63 can be set for the DSCP value; as the value gets closer to 0, the priority becomes lower.

Adding an IPv4 address

1. Click the **[Add]** button. A field where an IPv4 address can be entered will be created.
2. Enter the IP, Prefix and DSCP information.
3. QoS can be applied to the relevant IPv4 address only after the **[Use]** check box is selected.
4. Clicking the **[Apply]** button at the bottom of the page will save all information added to the list.

Deleting an IPv4 address

1. Select an IPv4 address you wish to delete.
2. Click the **[Delete]** button.
3. Click the **[OK]** button on the delete confirm window. The IPv4 address will be deleted.

IPv6

A QoS IP address can be added or deleted in IPv6. The default values are 128 for Prefix and 63 for DSCP.

- **Prefix:** This value can set the IP range; a value from 1 to 128 can be set in IPv6.
- **DSCP:** The priority for QoS is DSCP (Differentiated Services Code Point). A value of 0 to 63 can be set for the DSCP value; as the value gets closer to 0, the priority becomes lower.

Adding an IPv6 address

1. Click the **[Add]** button. A field where an IPv6 address can be entered will be created.
2. Enter the IP, Prefix and DSCP information.
3. QoS can be applied to the relevant IPv6 address only after the **[Use]** check box is selected.
4. Clicking the **[Apply]** button at the bottom of the page will save all information added to the list.

Deleting an IPv6 address

1. Select an IPv6 address you wish to delete.
 2. Click the **[Delete]** button.
 3. Click the **[OK]** button on the delete confirm window. The IPv6 address will be deleted.
-

SNMP

SNMP (Simple Network Management Protocol) is a network management protocol which can collect information from the equipment on the network, and manage the network. When you finish the setting, click the **[Apply]** button at the bottom of the page.

SNMP v1/v2c

SNMP v1 protocol is not encrypted and has almost no security function. It also tends to use excessive bandwidth, so if there is much equipment, it may be difficult to manage the network. An algorithm has been added to SNMP v2c protocol for data and authentication security, allowing for more efficient bandwidth than with SNMP v1.

SNMP v1/v2c

To use SNMP v1/v2c, select **[Enable]**.

Read community

Enter the read-only community name to access SNMP information.

Write community

Enter the write-only community name to access SNMP information.

SNMP v3

SNMP v3 authentication has stronger security than v1 and v2c; transmission without data transformation is possible. The packet is also encrypted to block unauthorized users from accessing data.

SNMP v3

To use SNMP v3, select **[Enable]**.

Password

Set the user password for SNMP v3. Passwords must be between 8 and 16 characters. The default password is weak, so changing it to a new password is highly recommended immediately after installing the product. Users are responsible for security and other issues due to continued use of the default password.

Note

- To use SNMP v3, the 'Secure connection system' needs to be set to '[HTTPS]' mode. Go to **[Network] > [HTTPS] > [Secure connection system]** and then select **[HTTPS]**

(Secure connection mode using a unique certificate)] or [HTTPS (Secure connection mode using the public certificate)].

- To use SNMP v3, the 'Secure connection system' needs to be set to '[HTTPS]' mode. Go to [Network] > [HTTPS] > [Secure connection system] and then select [HTTPS (Use a secure connection)].
- Failure to use SNMP v3 may result in security issues.

SNMP traps

The SNMP traps is a function that delivers specific events in the equipment on the network to the management system.

SNMP traps

To use SNMP traps, select [**Enable**].

Community

Enter the name of the trap community that receives the message.

IP address

Enter the IP address of the user sending the message.

- **Authentication failure notification:** Set whether or not to deliver an event to the management system when community information is incorrect.
 - **Network connection notification:** Set whether or not to deliver an event to the management system when the disconnected network is reconnected.
-

Auto IP configure

You can set the camera IP automatically. You can assign an IP address that can connect to an additional camera on the same local network or set the camera IP to check for a camera connected to the network on Windows or Mac OS. When you finish the setting, click the **[Apply]** button at the bottom of the page.

Link-Local IPv4 address

You can assign an additional IP that can connect to a camera from the same local network.

Auto configure

To use auto configuration of a Link-local IPv4 address, select **[Enable]**.

- **IP address:** The assigned IP address is displayed.
 - **Subnet mask:** The subnet mask of the assigned IP address is displayed.
-

UPnP discovery

You can search for a camera automatically from clients and OS that support the UPnP (Universal Plug and Play) protocol.

UPnP discovery

To use UPnP discovery, select **[Enable]**.

- **Friendly name:** The camera name is displayed. The friendly name is displayed in order of WISENET - model name - MAC address.
-

Bonjour

You can search for a camera automatically from clients and OS that support the Bonjour protocol. Connected cameras are displayed on the Bonjour bookmark of the Safari web browser on Mac OS, which supports Bonjour by default.

Bonjour

To use Bonjour, select **[Enable]**.

- **Friendly name:** The camera name is displayed. The friendly name is displayed in order of WISENET - model name - MAC address.
-

Certificate management

You can add or delete certificates. You can manage CA certificate and client certificate separately. CA certificate is signed by the Certificate Authority (CA), and client certificate is created, applied, and used by person.

Client certificate

You can install or delete a user certificate. If you have a certificate file and key file, you can register the certificate. You can also create a certificate file by filling out the certificate information.

Our device certificate is provided by default, which cannot be deleted. Clicking the button ⓘ shows the certificate information.

Adding a client certificate

1. Click **[Add]**.
2. If you have a Client certificate file, select **[Client]** from the **[Type]** options in the **[Add certificate]** dialog, and perform the following:
 - **Name for the certificate:** Enter the certificate name. You can enter up to 31 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only _-[]). A blank space cannot be used.
 - **Certificate file:** Click [...] and select the certificate file.
 - **Key file:** Click [...] and select the auth key file.
3. If you want to create a certificate manually, select **[Self-Signed]** from the **[Type]** options in the **[Add certificate]** dialog, and perform the following: A certificate can also be created simply by filling out the required fields marked with an asterisk (*).
 - **Name for the certificate:** Enter the certificate name. You can enter up to 31 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only _-[]). A blank space cannot be used.
 - **Common name (CN):** Enter the common name of the certificate. You can enter up to 63 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only * _-[].). A blank space also can be used.
 - **SAN:** Enter the certificate subject alternative name (SAN) information. You can enter up to 198 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only * _-[].). A blank space cannot be used.
 - **Valid thru:** Select the expiry date of the certificate.
 - **Country (C):** Enter the country information. Only two alphabet letters are allowed.
 - **State/Province (ST):** Enter the state or province information. You can enter up to 63 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only _-[]). A blank space also can be used.
 - **Organization (O):** Enter the organization information. You can enter up to 63 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only _-[]). A blank space also can be used.
 - **City/locality (L):** Enter the locality information. You can enter up to 63 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only _-[]). A blank space also can be used.
 - **Organizational unit (OU):** Enter the information on the organization unit. You can enter up to 63 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only _-[]). A blank space also can be used.
 - **E-mail:** Enter the e-mail address. You can enter up to 63 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (only ~!@ _-[].,?). A blank space cannot be used.
4. In the **[Add certificate]** dialog, click **[OK]** to save the entered information in the list.

Deleting a client certificate

1. Select the client certificate to delete.
2. Click **[Delete]**.

CA certificate

You can install or delete a CA certificate. CA certificate is issued by the Certificate Authority (CA).

Our root CA certificate is provided by default, which cannot be deleted. Clicking the button ⓘ shows the certificate information.

Adding a CA certificate

1. Click **[Add]**.
2. In the **[Add CA certificate]** dialog:
 - **Name for the certificate:** Enter the certificate name.
 - **Certificate file:** Click [...] and select the certificate file.
3. In the **[Add CA certificate]** dialog, click **[OK]** to save the entered information in the list.

Deleting a CA certificate

1. Select the CA certificate to delete.
 2. Click **[Delete]**.
-

Event rule

You can create rules that make the camera perform a particular action when a specific event occurs.

Event rule

You can register detailed event rules of when the camera will perform a specific action when a specific event occurs. Also, you configure conditions for activating the event rules.

Adding event rules

After clicking the **[Add]** Button, configure the event rules in the setup window.

1. In **[Rule name]**, enter the desired name of event rules. Up to 15 characters can be entered.
2. After selecting **[Add]** in the **[Event trigger]** panel, select both the channel number where the event occurs and the trigger type to create the event.
3. Click **[Invert]** if you want the event trigger to be triggered when the event ends rather than when it occurs. For example, if you select **[Invert]** in **[Motion detection]**, the event trigger will operate as soon as the camera ends detecting motion after detecting motion. A list of sub-rules will appear for a specific trigger depending on your settings. After selecting a sub-rule, you can choose an **[Invert]** option.
4. In **[Duration]**, set up the minimum time for the event to occur before performing the action. For example, if the **[runtime]** is set to **[60]**, an event operation will be executed in case all the event triggers occur within 60 seconds.
5. In the **[Event action settings]** panel, select the desired event action to perform when an event occurs. (The supported event actions vary depending on the camera specification.)
 - **E-mail:** To capture the video screen and send it via e-mail when an event occurs, select **[Enable]**. Detailed e-mail settings can be configured in **[Event]>[FTP/E-mail]**.
 - **FTP:** To capture the video screen and send it via the FTP server when an event occurs, select **[Enable]**. Detailed FTP settings can be configured in **[Event]>[FTP/E-mail]**.
 - **Record:** To record the video when an event occurs, select **[Enable]**. Detailed record settings can be configured in **[Event]>[Storage]**.
 - **Handover:** The handover function is for moving the camera to the preset position of the PTZ when an event occurs. When the PTZ number is selected, the camera will move to the PTZ location in case an event occurs. When **[Off]** is selected, the handover function will not work, even when an event occurs. Detailed PTZ camera reception settings can be configured in **[Event]>[Handover]**.
 - **Alarm output:** To output an alarm when an event occurs, select the output time. If **[Always]** is selected, the alarm will continue to be output until it is stopped by the user. To disable the alarm when an event occurs, select **[Off]**. Detailed alarm output settings can be configured in **[Event]>[Alarm I/O]**.
 - **Monitor alarm:** Set how the PVM (Public View Monitor) runs when an event occurs. If you do not want any alarms to go off even when an event occurs, select **[Off]**. Select **[LED flashing]** to flash LED lights mounted on the PVM; select **[Beep]** to emit a beep sound; and select **[Beep & LED flashing]** to emit a beep sound and flash LED lights simultaneously.
 - **MQTT:** When an event occurs, it publishes a notification message to the MQTT client. If you want to add or edit the MQTT message to be published, go to the **[Event]>[MQTT]>[Publication/subscription]>[Publication]** tab.
6. Configure the schedule of event action from **[Activation time]**. In other words, an event action is performed only at the set time when an event occurs. It is possible to select a preset option so that an event action is performed either all the time or only during weekdays/weekends. Moreover, it is possible to configure a new event action

schedule after clicking the calendar-shaped icon.

The camera's system time can be checked in **[Basic]>[Date & Time]**.

7. Click **[OK]**.

Added event rules will be displayed. You can check if the event rules and their details are valid or invalid. For example, if "motion detection" is registered as an event trigger condition while the "motion detection" function of the camera is disabled, it is displayed as "invalid."

To change the event rules, double-click the rule you want from the list of event rules. When the event rules window opens, you can change the details.

To disable the event rules, select **[Off]** from the list of the event rules.

Deleting an event rule

- Select a event rule on the list and then click the **[Delete]** button.

Note

- Selecting **[Network disconnection]** in the event trigger options limits the options of event triggers and event actions that can be combined.

Handover

Handover moves the receiver camera to the PTZ preset position when an event occurs. You can set the camera and the preset position to use for the handover.

Receiver

You can add or delete PTZ cameras for receiving. Up to 32 receiver cameras can be registered.

Displays the information of cameras registered as the receiver camera.

Adding a receiver camera

1. Click **[Add]**.
2. In the **[Add Camera]** dialog, enter the PTZ camera information to receive the handover.
 - **No.:** Set the receiver camera number.
 - **IP type:** Select the IP address type between IPv4 and IPv6.
 - **Type:** Select the mode of communication among HTTP, HTTPS, and TCP.
 - **IP address:** Enter the IP address of the receiver camera.
 - When you select **[IPv4]** in **[IP type]**, enter it in the format of four numbers separated by dots, ranging from 0 to 255. (However, addresses between 223.255.255.255 and 255.255.255.255 cannot be set, and addresses ending in 255 cannot be set.)
 - When you select **[IPv6]** in **[IP type]**, enter an address in the format of eight 16-bit, 4-digit hexadecimal numbers separated by a colon (:), ranging from 0 to ff (hexadecimal). Consecutive zeros can be abbreviated as a double colon (::). (The :: can only be used once in the address).
 - **Port:** Enter the port number of the receiver camera.
 - **User:** Enter the access ID to access the receiver camera. This can be set only when **[HTTP]** or **[HTTPS]** is selected for **[Type]**.
 - **Password:** Enter the password to access the receiver camera. This can be set only when **[HTTP]** or **[HTTPS]** is selected for **[Type]**.
 - **Action:** Select what action the receiving camera will perform when an event occurs. Select **[Preset]** to move the camera view to the preset position, or **[Custom]** to display the query string. This can be set only when **[HTTP]** or **[HTTPS]** is selected for **[Type]**.
 - **Preset no.:** Enter the preset position number to which the receiver camera will move. The preset number should be set in advance in the PTZ camera for reception. In the handover menu, enter the preset PTZ number. This can be set only when **[HTTP]** or **[HTTPS]** is selected for **[Type]** and **[Preset]** is selected for **[Action]**.
 - **Query string:** Enter the query string of the URL. This can be set only when **[HTTP]** or **[HTTPS]** is selected for **[Type]** and **[Custom]** is selected for **[Action]**. You must enter at least 1 character and can enter up to 255 characters.
 - **TCP message:** Enter the message to send to the TCP recipient. This can be set only when **[TCP]** is selected for **[Type]**. You must enter at least 1 character and can enter up to 255 characters.
 - **Info:** Displays URL complete with the entered information.
 - **Verification of server certificate:** Selecting **[Enable]** will verify the integrity and authenticity of the certificate sent from the server. A specific CA certificate to use for certificate verification can be selected in **[CA certificates]**. This appears only when **[HTTPS]** is selected in **[Type]**.
 - **CA certificates:** Select a desired certificate from the list of CA certificates installed on the camera. TLS/SSL connection is available only when selecting the CA certificate used to sign the certificate sent from the server. The indicated CA certificate is the one registered in **[Network]>[Certificate management]>[CA certificate]**. This can be set only when **[HTTPS]** is selected in **[Type]**.

3. Click **[OK]**.

Modifying a receiver camera

1. In the receiving camera list, select the checkbox next to the camera you want to modify to select it.
2. Click the **[Modify]** button.
3. When the **[Add Camera]** dialog box appears, modify the options and then click **[OK]**.

Deleting a receiver camera

1. Click a checkbox in the list of receiver cameras, and select the camera you want to delete.
2. Click **[Delete]**, and in the confirmation dialog, click **[OK]**.

Note

- If the type is set to **[HTTP]**, the receiver camera will receive both HTTP and HTTPS. If the type is set to **[HTTPS]**, the receiver camera will only receive HTTPS.
- You cannot set the same preset number, query string, TCP message, etc. for the same IP address.

FTP / E-mail

When an event is created while the camera is capturing an image, the captured image can be sent to an FTP server or by e-mail. Also, video files can be sent to an FTP server. Enter the appropriate FTP server and e-mail configuration information to be used.

When you enter FTP server or e-mail server information and click the **[Apply]** button at the bottom of the page, an FTP server connection test or an e-mail test will be carried out. If an incorrect FTP server address or e-mail server address is entered, a message saying 'Failed' will be displayed. If the test is successfully done, the message saying 'Successful' will be displayed

FTP configuration

Protocol

Select a communication protocol used for the transfer of image files when an event occurs. You can choose between the File Transfer Protocol (FTP) and the Secure File Transfer Protocol (SFTP) that is more secure than FTP.

Login type

The login-type option appears when you select **[SFTP]** in **[Protocol]**. You can choose between **[Password]** and **[Key file]** for authentication to access the server. Select **[Password]** to authenticate with your ID and password; select **[Key file]** to authenticate with a key file.

Server address

Enter the IP address for the FTP server where an event creation image will be sent. You can enter from 1 to 64 characters.

ID

Enter the ID for the FTP server login account. Special characters such as `#%&+=\:<>"` are not allowed, and you can enter from 1 to 30 characters.

Password

Enter the password for the FTP server login account. Special characters such as `#%&+=\:<>"` are not allowed, and you can enter from 1 to 30 characters.

Private key file

The private-key-file option appears when you select **[SFTP]** in **[Protocol]** and then select **[Key file]** in **[Login type]**.

Click **[Import]** to import a private key file to use for authentication to access the server. In the **[Import private key file]** dialog box, type a name in the **[Key name]** box and click **[...]** to choose a key file to import. If the key file is encrypted, select **[Enable]** in the **[Key passphrase]** area and then type the Key passphrase in the box to decrypt the file. If you close the **[Import private key**

file] dialog box, the key name that you typed in the **[Key name]** box appears in the **[Private key file]** box.

You can delete the registered private key file by clicking **[Delete]**.

Upload directory

Enter the directory of the FTP server where an event creation image will be recorded. You can enter up to 60 characters using alphabets, numbers, and/or special characters (/~`!@#\$%^&()_-=+{}[];',.).

Port

Enter the port value of the FTP server. The default port value of the FTP server is 21, which can be changed according to the FTP server settings. The port can be changed within a range of 1 to 65535.

Passive mode

Select **[Enable]** when connection in passive mode is necessary due to firewall or FTP server configuration.

File type

Select the file type to be sent to the FTP server when an event occurs.

If **[Image]** is selected, the camera will send the captured image to FTP when an event occurs. At this point, the image file is sent with the information set in [E-mail/FTP profile]. Detailed settings for [E-mail/FTP profile] can be viewed in [Basic]>[Video profile].

If **[Video clip]** is selected, when an event occurs, the video is sent for the set duration determined by **[Pre event duration]** and **[Post event duration]** based on the time of the event occurrence. For example, if [Pre event duration] is set to [1 sec] and [Post event duration] is set to [10 sec], the video of which range includes 1 second before the event and 10 seconds after the event is sent to the FTP server based on the time of the event occurrence. So, if an event occurs at 12:30:10 PM, the video from 12:30:09 PM to 12:30:20 PM will be sent to the FTP server.

File name

You can preset the file name format that will be used for the file transmitted via FTP when an event occurs.

Select **[IP address]** to include the IP address in the file name. If you select **[YY]**, **[MM]**, **[DD]**, **[hh]**, **[mm]**, and **[ss]**, respectively, the file name will include the date of event occurrence, including the year, month, day, hour, minute, and second information. Also, if you select **[Rule index]**, the event rule number will be included in the file name. The channel name is automatically inserted right before the file name extension.

Select **[Enable]** to generate the file name using the format you set when files are transferred via FTP.

Enter the e-mail SMTP server address for sending an event creation image by e-mail. You can enter from 1 to 64 characters.

Verification of server certificate

Selecting **[Enable]** will verify the integrity and authenticity of the certificate sent from the email server. A specific CA certificate to use for certificate verification can be selected in **[CA certificates]**.

CA certificates

Install the CA certificate to use for email server authentication from the list of CA certificates installed on the camera. To establish a TLS/SSL connection, you must select the CA certificate that was used to sign the certificate sent by the server.

Authentication

Select whether or not to authenticate with an ID and password each time an e-mail is sent.

TLS

Set whether or not to use TLS. Select **[Enable]** if using an e-mail server that requires security.

ID

Enter the ID for the login account connected to the e-mail SMTP server. Special characters such as # % & + = \ : < > " ' are not allowed, and you can enter from 1 to 32 characters.

Password

Enter the password for the login account connected to the e-mail SMTP server. Special characters such as # % & + = \ : < > " ' are not allowed, and you can enter from 1 to 32 characters.

Port

Enter the port value of the e-mail SMTP server. The default port value of the e-mail server is 25; the port value when using TLS is 465.

Recipient

Enter the email address of the e-mail recipient. You can enter from 1 to 64 characters.

Sender

Enter the email address of the e-mail sender. If the address of the sender is not correct, the intended recipient may not receive the e-mail. You can enter from 1 to 64 characters.

Subject

Enter the subject of the e-mail to be sent when an event is created. Special character \ is not allowed, and you can enter from 1 to 60 characters.

Message

Enter the body information for the e-mail to be sent when an event is created. When an event is created, the captured image will be sent as an e-mail attachment. Special character \ is not allowed, and you can enter from 1 to 255 characters.

Storage

You can select a device to capture a camera image and set the recording conditions. When you complete the setting, click **[Apply]** at the bottom of the page.

Storage action setup Selecting a recording device and selecting **[On]** allows you to change the setting for the relevant device.

When **[On]** is set for an SD card and NAS at the same time, NAS is processed by priority.

- **SD Card:** You can set whether or not to use an SD card. When an SD card is recognized, the free space, total capacity and status are displayed. To format the SD card, click **[Format]**.
- **NAS:** You can set whether to use NAS (Network Attached Storage). When a connection to NAS is established, the free space, total capacity and status are displayed. To format the default folder on NAS, click **[Format]**.

Note

The **[Status]** column shows the status of the recording device.

- **None:** There is no recording device, or the recording feature is inactive.
- **Ready:** Waiting to record
- **Recording:** Able to record
- **Formatting:** The recording device is being formatted
- **Full:** The recording device does not have enough free space
- **Error:** A problem occurred, and further recording is not possible.
- **No profile available:** The selected edge recording profile is inactive (The edge recording profile can be selected at **[Basic] > [Video profile]**)
- **Profile error:** An error occurred in the selected edge recording profile (The edge recording profile can be selected in **[Basic] > [Video profile]**)
- **Password error:** The SD card password does not match the camera's set SD card password (The SD card password can be changed in **[Encryption]**)

Overwrite

Sets whether or not to use the overwrite function of an SD card or NAS. When the device capacity has been reached, new data will be recorded over the oldest data. When the device capacity has been reached, a message saying 'Full' is displayed in **[Status]** in the device list.

Auto delete

Sets whether or not to use the auto delete function. The most recent data for the set number of days is kept and the rest will be deleted. The number of auto delete days can be set from 1 to 180. The **[Auto delete]** function is activated only when **[Enable]** is set for **[Overwrite]**.

Note

- When 'Error' is displayed in **[Status]** in the device list, check whether the recording device is connected properly, whether the file system of the recording device is damaged or not, and whether the recording device is physically damaged. If the 'Error' message persists after checking the recording device, format or replace the device.
- Recording may not be possible due to temporary network disconnection when NAS is used, so it is recommended to use an SD card also.
- When resolution, bit rate and frame rate are set at high, the amount of image data also increases. If the amount of data increases, a frame skip may occur even if set to full frame. If frame skipping occurs, then at least one image is saved per second.
- Before removing the (Micro) SD card, first switch to **[Off]**. If you remove it on your own or power up the camera with a unstable source of electricity without switching to **[Off]**, it can damage the (Micro) SD card.
- If you use the (Micro) SD memory card below the recommended speed, it can cause frame skipping. If you use the (Micro) SD memory card with too large capacity, it can slow down the format speed.
- If you use NAS, auto deletion is supported only when the NAS capacity is above the recommended specifications.
- Deleted data cannot be restored.

SD File System

This menu is displayed only when **[SD Card]** is selected in the **[Device]** column of **[Storage action setup]**, allowing you to select the file system on the SD card. SD cards support VFAT and EXT4 file systems, so select the file system according to the SD card of the camera you are using. If the file system of the SD card is EXT4, Windows OS can recognize it only when a separate application is installed.

Type

Select either VFAT or EXT4 for the file system of the SD card. When the setting is changed, all existing data will be formatted. Be sure to back up data before changing the setting.

Note

- High Endurance SD Cards are recommended. For detailed information, refer to the Hanwha Vision website.
- It can take up to 10 minutes to format the (Micro) SD card with the EXT4 file system.

Encryption

SD card encryption allows you to save video data in your encrypted SD card (or microSD card). This keeps your SD card safe and secured even when you lost it. The SD card encryption option appears when you select **[SD]** for **[Device]** under the **[Storage action setup]** column.

Note

- If you change the SD card setting to encrypt or decrypt it, all of its data will be deleted and the SD card will be formatted.

SD card encryption

Selecting **[Enable]** encrypts the SD card while deselecting **[Enable]** decrypts it.

Encrypting SD card

1. Select **[Enable]** under **[Encryption]**.
2. Enter your **[New password]** in the text box, and enter the same password again in the **[Confirm new password]**.
3. Click **[Apply]** at the bottom of the page.
4. If SD card encryption is working properly, the 'Encrypted' message will appear.

Decrypting SD card

1. Deselect **[Enable]** under **[Encryption]**.
2. Click **[Apply]** at the bottom of the page. If SD card encryption is disabled, so the SD card data is not encrypted, 'Unencrypted' message will appear.

Changing password

You can change the password for SD card encryption.

If the password of the encrypted SD card and the password you entered do not match, 'Password error' message will appear in the **[Status]** column of **[Storage action setup]**.

1. Click **[Change password]**.
2. Enter the current password in the **[Current password]** text box.
3. Enter the new password in the **[New password]** and **[Confirm new password]** text boxes.
4. Click **[Apply]** at the bottom of the page.

NAS connection setup This menu is displayed only when **[NAS]** is selected in the **[Device]** column of **[Storage action setup]** and NAS access information is entered. Enter the NAS information and click **[Test]** to check the connection. If the connection is made, a 'Successful' message appears; otherwise, a 'Failed' message is displayed.

Server address

Enter the NAS IP address or domain name.

You can enter up to 63 characters, including English uppercase (A-Z) and lowercase (a-z), numbers (0-9), and special characters (only _). However, the first and last characters must be English letters or numbers.

ID

Enter the ID for the account registered on NAS.

You can enter up to 31 characters, including English uppercase (A-Z) and lowercase (a-z), numbers (0-9), and special characters (only _-).

Password

Enter the password for the account registered on NAS.

You can enter up to 31 characters, including English uppercase (A-Z) and lowercase (a-z), numbers (0-9), and special characters (only ~!@^*_-[]./?).

Default folder

Designate the default folder where NAS will record image data.

You can enter up to 31 characters, including English uppercase (A-Z) and lowercase (a-z), numbers (0-9), and special characters (only/_-). For example, you can use a special character (/) as a directory separator like "Directory1/Directory2".

Note

- If a failure message is displayed when you test after entering NAS information, check the following items:
 - Check if the IP address, ID, password, and default NAS folder are entered correctly.
 - Check if the IP address type of NAS and the IP address type of the camera are identical. (e.g.: The default value of NAS and the camera is 255.255.255.0. If the IP address is 192.168.20.32, the NAS IP address should be between 192.168.20.1 and 192.168.20.255.)
 - For the NAS default folder, only one folder should be used in one camera, with no duplication.
 - Check if the device is recommended NAS equipment. Refer to 'Recommended NAS specifications' in the user's manual.
- If **[Overwrite]** in the storage setup for NAS is not used and the free space for NAS is less than 20%, images will be recorded on the SD card.
- If an SD card which was used in another camera is inserted while data is being recorded on NAS, images may not be recorded.
- If the NAS setup is changed while data is being recorded on NAS, the change will not apply immediately.
- If NAS equipment is removed or the network connection is terminated while data is being recorded on NAS, the NAS recording action may be terminated.
- When resolution, bitrate and frame rate are set at high, the amount of image data also increases. If the amount of data increases, a frame skipping may occur even if set to full frame rate. If frame skipping occurs, then at least one image is saved per second.
- Check if you are trying to access as another user without formatting the default folder that is saved or used already.

Record

Record setup

Edge recording profile

The name of the video profile which will be used for recording is displayed. The profile set as 'Edge recording profile' from **[Basic]>[Video profile] > [Profile type]** is displayed.

Continuous recording

Sets for normal recording with no event; Video is saved with a fixed frame rate at all times in an ordinary situation without an event.

- **None:** No camera image is recorded.
- **I-Frame:** Records I-Frame only for continuous recording.
- **Full frame:** Records full frame for continuous recording.

Event recording

Sets the recording type when an event occurs.

- **I-Frame:** Records only I-Frame when an event occurs.
- **Full frame:** Records full frame when an event occurs.

Pre event duration

Sets the image recording time before an event occurs. An image can be recorded at 1 second, 3 seconds and 5 seconds prior to the occurrence of an event.

Post event duration

Sets the image recording time span after an event. An image can be recorded for 5 seconds, 10 seconds, 30 seconds, 60 seconds or 120 seconds after the occurrence of an event.

Record file type

Sets the file format for recording an image. When the file recording format is changed, the existing data will be erased.

- **STW**: This is the unique file type for Hanwha Vision.
 - **AVI**: This is an AVI file.
-

Continuous recording schedule You can set the time to record an image on the recording device.

Always

Always records an image on the recording device.

Only scheduled time

Records an image only at the scheduled time. The date from Sunday to Saturday, based on the current camera time, is displayed on the time table shown when **[Only scheduled time]** is selected. You can set the time for recording by clicking or dragging on the time table with the mouse. The set time is executed repeatedly on the relevant weekday and time.

You can change the time view unit by clicking **[1 min]**, **[30 min]** or **[1 h]**. When you click **[Reset]**, all set event activation times will be deleted. To confirm or change the camera time, refer to **[Basic]>[Date & Time]**.

Alarm I/O

The I/O port of a camera can be set either as an input or output port as desired.

After selecting it to be either an input or output port, you can set the details of each Alarm I/O.

Note

If you use all alarm ports as output, the **[External]** mode of **[Day/Night]** will be disabled. If it is already set to **[External]**, it will be changed to the **[Auto]** mode. You can select **[Video & Audio]>[Camera setup]>[Day/Night]** to check the External mode of Day/Night.

Alarm I/O

After selecting a port number, decide whether to use the port as an input or output port.

If **[Input]** is selected, **[Input device setup]** can be set. If **[Output]** is selected, **[Alarm output]** can be set.

The number of supported alarm inputs/outputs may differ by camera.

Input device setup

Sets whether or not to use an alarm input device and the type to activate an alarm event when an alarm input is given.

Input device setup

To use an alarm input device, select **[Enable]**.

Type

Select the alarm input type.

- **N.O. (Normal Open)**: The alarm input sensor is open by default; when it is closed, an alarm input event is created.
- **N.C. (Normal Close)**: The alarm input sensor is closed by default and when it is open, an alarm input event is created.

Alarm output

Sets how to control an alarm when an alarm is outputted by the user or when an event is created.

When changing the type of alarm output, the Alarm output button on the Live page and the type of alarm output in the Event setup are changed.

Type

Selects the alarm output type.

- **N.O. (Normal Open)**: The alarm output sensor is open by default and when it is closed, an alarm is outputted.
- **N.C. (Normal Close)**: The alarm output sensor is closed by default and when it is open, an alarm is outputted.

Mode

Sets the control type when an alarm is outputted.

- **Pulse:** An alarm is outputted for the time set in **[Duration]** and the alarm turns off automatically.
- **Active/Inactive:** When you press the alarm output button on the monitoring screen, an alarm will turn on; when you press the button again, the alarm will turn off.

Duration

Sets the alarm output time when **[Pulse]** is selected in **[Mode]**.

Time schedule

A time schedule event is a function for generating events at set intervals. When you complete the setting, click the **[Apply]** button at the bottom of the page.

Event setup schedule To use the event setup schedule, select **[Enable]**.

Transfer interval This sets the event occurrence interval. Click the drop-down menu and select a number and a unit.

 Note

- The transfer interval should be set lower than the operation interval in the event action settings.

Device alarm

You can set alarms to go off when the network is physically disconnected.

 Note

You can change the option settings on the **[Device alarm]** page only when you are logged in as an administrator.

Network disconnection

To trigger an alarm when the network is disconnected, select **[Enable]**.

MQTT

MQTT (Message Queueing Telemetry Transport) is a messaging protocol based on Publication/Subscription. As it is designed to transmit lightweight messages, it is ideal for connecting remote devices that require a small code space or minimal network bandwidth. Communicating through the MQTT protocol enables the camera to easily send and receive data to and from multiple devices. For example, if a camera's client sends a notification of a camera event, multiple clients subscribing to that notification can receive it through a broker. Also, the camera's client can receive notifications from several clients and control the camera's motion. For example, you can receive a notification from another client and start recording with the camera, or you can send a notification back to another client that you received the notification.

MQTT

Enable MQTT

Select **[Enable MQTT]** to connect to the set broker.

Status

Shows the connection status to the broker. Click the refresh button to update the connection status to the broker.

Client setup

Set MQTT client information. Enter the MQTT broker information where the camera's client will be connected.

An MQTT broker brokers messages on the topic received from the publisher when a client sends a declaration to the broker that it will subscribe to the messages of a specific topic.

Address

Enter the broker's domain and IP address. **[Address]** and **[Port]** are required entries and are marked with an asterisk (*).

Port

Enter the port number to connect to the broker. **[Address]** and **[Port]** are required entries and are marked with an asterisk (*).

Username

Enter the client ID.

Password

Enter the client password.

Transport protocol

Choose between TCP, TLS, WebSocket, and WebSocketSecure.

Basepath

If using WebSocket and WebSocketSecure, you can set the basepath as well as the broker address and port. In this case, the URL of the final broker will be Address:port/basepath.

ALPN

Enter the ALPN supported by the broker.

Verification of server certificate

If connecting via TLS or WebSocketSecure, select **[Enable]** to verify a server certificate.

Client certificate

Selects the one you want from the list of certificates installed on the camera. To add a client certificate, go to **[Network]>[Certificate management]>[Client certificate]**.

CA certificates

Selects the one you want from the list of certificates installed on the camera. To add a CA certificate, go to **[Network]>[Certificate management]>[CA certificates]**.

Custom client ID

To use a client ID defined by the user when connecting to a broker, select **[Enable]** and enter the desired ID in the **[Client ID]** field. If there is no input entered in the **[Client ID]** field, it will be connected using a random ID.

Keep Alive interval

Enter the time in seconds. Checks if the broker is connected every set interval time.

If you set both **[Keep Alive interval]** and **[Connection timeout]** together, make sure to set the **[Connection timeout]** value higher than the **[Keep Alive interval]** value.

Connection timeout

Enter the time in seconds. If there is no response from the broker for the set period of time, it will be disconnected from the broker.

If you set both **[Keep Alive interval]** and **[Connection timeout]** together, make sure to set the **[Connection timeout]** value higher than the **[Keep Alive interval]** value.

Auto reconnect

If you select **[Enable]**, it will automatically try to connect every minute if the previously connected broker is disconnected.

Clean session

If **[Enable]** is selected, all information (e.g., client ID or messages designated to be retained) previously retained is to be deleted from the client and broker when connecting them. If **[Enable]** is not selected, the information remaining in the previous session is to be retained. For example, if there is a topic you subscribed to in the previous session, the client can receive messages on that topic even if you do not subscribe to it again.

Default topic prefix

Enter the default topic prefix. When setting the default topic prefix, the final topic is created by combining the default topic prefix and message topic. When additionally publishing MQTT, you can set whether to use the default topic prefix. For more information, refer to **[Event]>[MQTT]>[Publication/Subscription]>[Publication]>[Adding MQTT publications]**.

Connection message

This is the message a client sends to a broker when the connection is complete. Select an item to be used as a connection message. You can add messages in the **[Event]>[MQTT]>[Publication/Subscription]>[Publication]** tab.

LWT message

The LWT (Last Will and Testament) message is a message in which the broker declares in advance that it will send a message designated to a certain topic when the connection between the client and the broker is abnormally disconnected. Select an item to be used as the LWT message. You can add messages in the **[Event]>[MQTT]>[Publication/Subscription]>[Publication]** tab.

Publication/Subscription

MQTT (Message Queueing Telemetry Transport) is based on a publication and subscription protocol. When a publisher sends a topic and message to a broker, the broker sends a topic to the subscriber and the subscriber is subscribed to the message of the topic. Any client can be a publisher or a subscriber as it is not specified.

On the **[Publication/Subscription]** page, you can add and edit publication and subscription message items so that a MQTT client can publish and subscribe to messages on certain topics using the MQTT protocol.

Publication

Sets the MQTT topic and messages to be published. The topic and message are delivered to the client that is subscribing to a topic published.

Adding MQTT publications

1. Click the **[Add]** button.
 2. Follow the steps below in the **[Add MQTT publication]** dialog box.
 - **Name:** Enter the name of the message to publish.
 - **Default topic prefix:** Select the checkbox to include the default topic prefix set when sending a message. In this case, the message is sent with the default topic prefix along with the topic. For example, if "camera" is set as the default topic prefix, and "connection" is set as the topic to publish, the message will be sent with "camera/connection" as the content. You can set the default topic prefixes in **[Event]>[MQTT]>[Client setup]>[Default topic prefix]**.
 - **Topic:** Enter the topic to publish.
 - **QoS:** Select the desired level for the MQTT publication.
 - 0: Clients only send a topics and messages, and clients and brokers will not proceed with any additional steps to check with the items sent from each other or to respond to them. In other words, the topic and message are sent, but the result is not guaranteed.
 - 1: A client will repeatedly send the same topic and message until a broker confirms receipt.
 - 2: It is ensured that a broker receives the same topic and message only once through the handshake between the client and the broker.
 - **Retain:** Select **[Enable]** to let a broker save the published message to send to a new subscriber that is subscribed to the topic later on.
 - **Payload:** Enter the message content to be published.
 3. Click **[OK]**.
- To edit the set MQTT publication information, select the desired item, and click **[Modify]**.

Deleting MQTT publication messages

1. Select an item to delete from the MQTT publication list.
2. Click the **[Delete]** button.

Subscription

Sets the MQTT topic and messages to subscribe.

Adding MQTT subscriptions

1. Click the **[Add]** button.

2. Follow the steps below in the **[Add MQTT subscription]** dialog box.

- **Name:** Enter the name of the message to subscribe to.
- **Topic:** Enter the topic to subscribe to.
- **Type:** Select the subscription method of the topic and a message.

The MQTT topic can be organized in a hierarchy by separating it with slashes (/), such as "event/objectdetection/person."

Also, wild cards can be used. Use a # to subscribe to all topics of lower levels. For example, you can subscribe to all lower-level topics such as A/B/a, A/B/a/D, A/B/b, and A/B/b/D by entering A/B/#.

Use a + to comprehensively subscribe to topics of a certain level. For example, you can comprehensively subscribe to topics such as A/B/a/D, A/B/b/D, and A/B/c/D by entering A/B/+D.

- **Stateless:** An event occurs whenever a message is received from a topic that is subscribed to and the event occurrence status will be released immediately. If the subscribing message is received several times, an event will occur upon each receipt.

For example, if you set an "on" message to subscribe in the "home/light" topic in order to trigger an event that turns on the light, the light will be turned on and then soon turned off by receiving the "on" message. If the same message is received several times, the light will be turned on and off whenever the message is received.

- **Stateful:** When a message is received from a topic that has been subscribed to, an event will occur, and the event occurrence status will be maintained afterward. The status will be disabled if a message different from the subscribing message is received. Therefore, if subscribing messages are received continually, a new event will not occur even if you receive messages several times.

For example, if you set an "on" message to subscribe in the "home/light" topic to trigger an event that turns on the light, the light will be turned on and the turned-on status will be maintained when you receive the "on" message. If it receives messages aside from "on," the light will be turned off. Afterward, the light will be turned on again if an "on" message is received.

- **QoS:** Select the desired level for the MQTT subscription.
 - 0: When a client sends a topic, the client and broker do not proceed with further steps to confirm its receipt.
 - 1: Send the same topic several times until the client who sent a topic receives the confirmation of its receipt.
 - 2: It is ensured that a broker receives the same topic only once through the handshake between the client and the broker.
- **Payload:** Enter the message content to subscribe to.

3. Click **[OK]**.

- To edit the set MQTT subscription information, select the desired item, and click **[Modify]**.

Deleting MQTT subscriptions

1. Select an item to delete from the MQTT subscription list.
2. Click the **[Delete]** button.

Motion detection

A motion detection event can be created when a motion detection area and the exclude area are set and a motion is detected from inside the area set by the user.

Motion detection

Enable motion detection

To use the motion detection event, select **[Enable motion detection]**.

Note

- The motion detection area and the exclude area are set and used according to the size range of the motion.
- In any of the following cases, the performance of the motion detection event may deteriorate and a malfunction may occur:
 - If an object is similar in brightness or color to the background on the screen
 - If a small motion occurs near the edge of the screen
 - If an overall change on the screen occurs continuously at random due to factors such as scene changes and sudden illumination changes
 - If a moving object comes too close to the camera
 - When one object hides another object
 - When the motion of an object is too fast
 - When reflection, blurring or shading occur due to strong light such as direct sunlight, high illumination or headlights from a vehicle
 - In cases of severe snow, rain or wind, or sunset or sunrise.

Include area

The area designated by the user is set as the motion detection area.

Setting an area

When you select 4 corners of an image with the mouse, it is set as the motion detection area and the color of the number buttons in **[Area]** changes.
Up to 8 areas can be set and the level, sensitivity, and minimum duration can be set separately for each motion detection area.

Changing an area

You can change the size of a motion detection area by moving a corner of the motion detection area. To move a motion detection area, click and drag the relevant area with the mouse.

To create a polygon (N-gon), first select and create a quadrilateral. When a **[+]** sign appears, click it to add another point. You can add up to 4 additional points to create a polygon of your choice.

To delete a vertex, hover over the vertex you want to delete. Then the **[-]** sign appears on the point. Clicking the **[-]** sign deletes the vertex.

Deleting an area

To delete a motion detection area, click **[x]** at the relevant area on the screen and click the **[OK]** button on the delete confirm window.

Area

When a motion detection area is added, the color of the number buttons in **[Area]** will change. When you click the number button, the relevant motion detection area will appear from the preview screen.

Level of detection

This sets the standard level of motion detection. You can set the level for each motion detection area in **[Area]**, and when a motion is larger than the set level, a motion detection event will be created.

Also, as a motion in each area is detected, a motion graph will appear, and when a motion event is created, the color of the graph will change.

Sensitivity

This sets the motion detection sensitivity for each area. Set a lower sensitivity for an environment where the background and an object are clearly distinguishable and a higher sensitivity for an environment where the background and an object are not clearly distinguishable.

Minimum duration (s)

Minimum duration (s): Sets the minimum amount of time to trigger an event after detection. When the movement lasts longer than the set period of time, the event is triggered.

Object

Select the object type to trigger the motion detection event.

For example, if **[Person]** is selected, the motion detection event occurs only when people are detected in the motion detection area.

■ Note

- If an object is selected, the camera detects only the selected objects. If no object is selected, the camera detects any movements. For example, if no option is selected in **[Object]**, the motion detection event occurs when the camera detects the moving object that satisfies the motion detection event rule conditions.

Exclude area

The area designated by the user is set as the exclude area.

Setting an exclude area

When you select 4 corners of an image with the mouse, it is set as the exclude area, and the color of the number buttons in **[Area]** changes. Up to 8 exclude areas can be set.

Changing an exclude area

You can change the size of an exclude area by moving a corner of the exclude area. To move an exclude area, click and drag the relevant area with the mouse.

To create a polygon (N-gon), first select and create a quadrilateral. When a **[+]** sign appears, click it to add another point. You can add up to 4 additional points to create a polygon of your choice.

To delete a vertex, hover over the vertex you want to delete. Then the **[-]** sign appears on the point. Clicking the **[-]** sign deletes the vertex.

Deleting an exclude area

To delete an exclude area, click [x] at the relevant area on the screen and click the [OK] button on the delete confirm window.

Area

When an exclude area is added, the color of number buttons in [Area] will change. When you click the number button, the relevant exclude area will appear from the preview screen.

Sets the min and max sizes of an object to detect.

Size

Click the bottom right corner and drag the mouse to change the size. Changing the size also changes the [Minimum] and [Maximum] values under [Size].

Note

- If the ROI and Exclude areas are identical or overlap each other, the Exclude area has priority over the other.
- Any movement smaller than the specified minimum size or larger than the specified maximum size will not be detected. please determine the best values for the minimum/maximum detection sizes that are appropriate for the installation environment in order to avoid any false detection arising out of small and/or large noises. Remember that the same movement in the same spot does not always result in the same detection size. Therefore, it is recommended to allow small/big enough rooms for your minimum/maximum size limits in consideration of the deviation in detected sizes.

Common

Tampering detection

A tampering detection event can be created when the screen is blocked or the camera position is changed.

Tampering detection Enable tampering detection

To use the tampering detection event, select [**Enable tampering detection**].

Level of detection

This sets the standard level of tampering detection. A tampering detection event is created when a tampering of the set level is detected.

Also, when a tampering is detected, a graph showing the level of tampering will appear, and when a tampering detection event is created, the color of the graph will change.

Sensitivity

Higher sensitivity results in a more sensitive response of the detection level graph.

Minimum duration (s)

This sets the minimum time to detect a tampering and create an event. A tampering detection event is created only when tampering persists for the minimum duration.

Except dark images

To exclude a sudden decrease in brightness on the screen, as such in the case of a sudden extinction of lights or blocking of lights, from the tampering detection event, select [**Enable**].

Note

- The detection performance may deteriorate on a uniform background, or in a night-time, low-light environment.
- If the camera shakes too much or if there is sudden change in light, the tampering detection may not function properly.
- It may take up to 5 seconds for a tampering detection event to be created after a tampering occurs.
- When a camera tampering is detected, the function will restart after stabilizing for approximately 5 seconds, and any tampering will not be detected during the stabilization process.
- When an incorrect event is repeatedly being created, errors can be minimized by gradually lowering the level.
- If you set the level of detection too low, then it is possible to trigger an alarm out of quite small changes on the screen, but it can also lead to false detection cause by objects in motion or change in brightness.

Defocus detection

A defocus detection event can be created when defocus of the camera lens is detected.

Defocus detection

Enable defocus detection

To use the defocus detection event, select [**Enable defocus detection**].

Level of detection

This sets the standard level of defocus detection. A defocus detection event is created when defocus beyond the set level is detected.

When defocus is detected, a graph showing the level of defocus will appear, and when a defocus event is created, the graph color will change.

Sensitivity

The higher the sensitivity, the higher the level graph is for the same image.

Minimum duration (s)

This sets the minimum length of time of defocus for an event to be created. A defocus detection event is created only when a defocus condition persists for the minimum duration.

Note

- In order to receive an alarm indicating defocus detection after it has occurred previously, the status must return to the stable status at least once. Instances of returning to the stable status are as follows.
 - When [**Enable defocus detection**] is deselected
 - When an object in the image moves to a defocus position so that it can be distinguishable
- In any of the following cases, the defocus detection performance may deteriorate, or a malfunction may occur.
 - Monitoring an environment with a monotonous background, at night time, and/or in a low light environment
 - Sudden illumination change (e.g. an indoor light is turned off)
 - Blocked lens or appearance of a large object which covers the most of the screen
 - The object of focus is changed due a change of the camera position

Object detection

An object detection event can be triggered when the camera detects an object set by the user. The camera can detect four types of objects: Person, Vehicle, Face, and License plate.

Object detection

Enable object detection

To enable object detection events, select **[Enable object detection]**.
When **[Enable object detection]** is selected, an object detection event occurs when the object selected from **[Object detection]** stays on screen for a longer time than the time set in **[Minimum duration]**.

Object

Sets the type of objects for the camera to detect and the minimum duration for an event to occur.

Object

Select one of the object types for the camera to detect.

Minimum duration (s)

Sets the minimum duration for an event to occur after the camera detected an object. The event occurs only when the detected object moves for a longer time than the set time.

Exclude area

Sets the area from which the objects selected from **[Object detection]** are to be excluded.

Setting an exclude area

Either select 4 vertexes using the mouse or draw a quadrilateral by dragging the mouse from the Preview screen to set the excluded area. Up to 8 areas can be excluded.

Changing an exclude area

An exclude area can be reshaped by moving its vertexes.
To draw a polygon, select one of the lines of an existing quadrilateral and click the + sign to add a new vertex. Up to 4 vertexes can be added to an existing quadrilateral.
To move an exclude area, use the mouse to select and drag it.

Deleting an exclude area

To delete an exclude area, right-click on an exclude area to be deleted and click the **[OK]** button in the Confirm delete window.

Area

As exclude areas are added, the color of the number buttons in **[Area]** changes accordingly. To select an exclude area from the preview screen, click the

corresponding number button.

i Note

- The value configured on the **[Exclude area]** tab of **[Object detection]** is linked to the **[IVA]>[Exclude area]** value. In other words, if an exclude area is designated on the **[Exclude area]** tab of **[Object detection]**, an identical exclude area is also created in **[IVA]>[Exclude area]**.

Common

Sets the sensitivity, minimum size, and maximum size for the camera to detect objects.

This is a setting you can apply to raise the detection accuracy and minimize the occurrence of false detection depending on your environment.

Sensitivity

Sets the sensitivity of detecting objects. Decrease the sensitivity in an environment where background and objects are clearly distinguished, and increase the sensitivity in a dark environment where background and objects are hard to be distinguished.

Size

Sets the minimum and maximum size of the objects to be detected. Click the vortex at the bottom right and drag it to resize it. When an object is resized, the values for **[Minimum]** and **[Maximum]** in **[Size]** change as well.

Exclude area

The AI camera transfers the analytics data of each object to the programs that are linked to the camera so that they can utilize the data. The data of objects detected in excluded area are not transferred by default. Select **[Enable object data from the excluded area]** to transfer the data.

For the detailed object information transferred by the camera, refer to the "AI Camera Metadata Specification" document.

i Note

- The value configured on the **[Common]** tab of **[Object detection]** is linked to the **[IVA]>[Common]** value. In other words, if the value on the **[Common setup]** tab of **[Object detection]** changes, the **[IVA]>[Common setup]** value is also changed.
- The camera doesn't detect objects that are smaller than the minimum size or larger than the maximum size. To avoid false detection caused by noises large and small, set the optimal minimum/maximum detection size appropriate for the installation environment. However, the minimum/maximum detection size needs to have some room for toleration because even the same motion detected in the same area could vary in size.

BestShot

BestShot is an image created by the most confident object among the all objects (Person, Face, Vehicle, License plate) detected by AI camera. The image is in JPEG format and contains only a portion of the area where the target objects are detected.

BestShot image data can be transferred to the programs linked to the camera for them to utilize.

BestShot & Attributes

Select the type of object to be captured for BestShot.

The selected object's BestShot can be viewed from the BestShot panel located at the left side of the Live page in the web viewer. At the bottom of the BestShot image is detailed property information displayed in icon. For a 'Vehicle' object for instance, its type (Sedan, Bus, Truck, Motorcycle, Train, Bicycle) information is displayed at the bottom of the BestShot image in the Live page.

IVA

An IVA event can be created when the rule for video analytics is set and a motion which satisfies the event rule condition is detected.

IVA (Intelligent Video Analytics)

Enable IVA

To use the IVA event, select **[Enable IVA]**.

Virtual line

Detects passing objects based on the virtual line and its direction configured by the user.

Setting a virtual line

When you click the start point and the end point of the line at each desired position on the camera image screen, the virtual line will be set and the color of the number button in **[Line]** will change.

You can change the direction from A to B, B to A or both directions by clicking the arrow in the middle of the virtual line, or you can select a desired direction from **[Direction]** in **[Categories]**. Up to 8 virtual lines can be set.

Changing a virtual line

You can change the size of the virtual line by moving a corner of the set virtual line. You can change the position of the virtual line by clicking and dragging the virtual line with the mouse. Also, when the + sign appears after selecting the virtual line, you can click the + symbol to add additional points and move the points to create various shapes of virtual lines.

Deleting a virtual line

Click the number button of the virtual line to be deleted, and then click the **[Delete]** button.

Line

When a virtual line is added, the color of the number buttons in **[Line]** will change. When you disable a virtual line by clicking the number buttons, the relevant virtual line will be displayed on the preview screen.

Name

View or change the name of the virtual line selected in **[Line]**.

Object

Note

- If you select a certain object in the **[Object]** option, the camera detects only the selected object and an IVA event occurs when the object meets the IVA event rules. However, if you do not select any other options in the **[Object]** option, the camera detects all moving objects and an IVA event occurs when an object meets the IVA event rules.

Virtual area

Categories

- **Crossing:** To create an event when an object which passes the set virtual line is detected, select the checkbox.
- **Direction:** This sets the direction for an object to pass the virtual line.

The user sets the virtual area and applies the image rule of intrusion, enter/exit, appear (disappear) and loitering in the relevant area to detect the motion of an object.

Setting a virtual area

On the preview screen, use your mouse to select 4 corners or drag to draw a quadrilateral shape which will then be your ROI area.
Up to 8 virtual areas can be set and an image analysis rule can be set for each area.

Changing a virtual area

You can change the size of the virtual area by moving a corner of the set virtual area.
To create a polygon (N-gon), first select and create a quadrilateral. When a + sign appears, click it to add another point. You can add up to 4 additional points to create a polygon of your choice.
To move the set virtual area, click and drag the relevant area with the mouse. When a corner is created after clicking a line, you can set a polygonal virtual area by moving the corner.

Deleting a virtual area

To delete a virtual area, click the X icon next to its number label on the preview screen.

Area

When a virtual area is added, the color of the number buttons in **[Area]** will change. When you disable a virtual area by clicking the number buttons, the relevant virtual area will be displayed on the preview screen.

Name

View or change the name of the virtual area selected in **[Area]**.

Object

Note

- If you select a certain object in the **[Object]** option, the camera detects only the selected object and an IVA event occurs when the object meets the IVA event rules. However, if you do not select any other options in the **[Object]** option, the camera detects all moving objects and an IVA event occurs when an object meets the IVA event rules.

Categories

You can set the rule to apply for each virtual area.

- **Intrusion:** The event triggers when the camera detects the object selected from [Object] within the designated area.
 - **Minimum duration (s):** Sets the minimum amount of time to trigger an event after detection. When the movement lasts longer than the set period of time, the event is triggered.
- **Enter:** When an object enters the area set by the user, an event will be created.
- **Exit:** When a moving object exits the area set by the user, an event will be created.
- **Appear (Disappear):** When an object which does not exist inside the area designated by the user appears inside the area without passing the area line and remains for a certain period of time, or if an object which exists inside the area disappears, an event will be created.

Unlike the other options, the [Appear (Disappear)] option detects not only the object type selected in [Object] but also all the other types of moving objects.

- **Minimum duration (s):** This sets the minimum timeframe for an object to be detected as appearing (disappearing). When an object which exists in the detection area for the set time disappears, it is detected as disappearing, and when an object which does not exist appears for the set amount of time, it is detected as appearing.
- **Loitering:** The event triggers when the camera detects the object selected from [Object] loiters within the designated virtual area.
 - **Minimum duration (s):** This sets the minimum amount of time for the camera to detect a loitering object and trigger the event. Any object that loiters longer than the set minimum duration triggers the event.

Note

- When loitering detection is used together with other IVA event detection, the performance may deteriorate to a certain degree in comparison with separate use of loitering detection.
- In the cases below, the loitering detection function may not work as the camera considers the object disappeared.
 - When a loitering object overlaps with another object
 - When an object that was loitering stops in a place for some time
 - When the environment is complex and there is a moving object in proximity to the loitering object

Exclude area

This sets the exclude area where motion will not be detected when the analytics rule is applied to the virtual line and the virtual area.

Setting an exclude area

On the preview screen, use your mouse to select 4 corners or drag to draw a quadrilateral shape which will then be your Exclude area. Up to 8 exclude areas can be set.

Changing an exclude area

You can change the size of an exclude area by moving a corner of the set exclude area. To create a polygon (N-gon), first select and create a quadrilateral. When a + sign appears, click it to add another point. You can add up to 4 additional points to create a

polygon of your choice.

You can move the position of an exclude area by selecting and dragging the exclude area with the mouse.

Deleting an exclude area

To delete an exclude area, click the X icon next to the area's number label on the preview screen.

Common

Area

When an Exclude area is added, the color of the number buttons in **[Area]** will change one by one. If you click the number buttons to deactivate them, then the Exclude area will be selected on the preview screen.

This sets the sensitivity and the minimum and maximum size of an object to be detected that will be applied to both the virtual line and the virtual area.

This is a setting you can apply to raise the detection accuracy and minimize the occurrence of false detection depending on your environment.

Sensitivity

This sets the motion detection sensitivity for the virtual line and the virtual area. Set a lower sensitivity for an environment where the background and an object are clearly distinguishable and a higher sensitivity for an environment where the background and an object are not clearly distinguishable.

Size

This sets the minimum and maximum size of an object to be detected that will be applied to both the virtual line and the virtual area. You can change the size by clicking and dragging a corner with the mouse. When the size is changed, **[Minimum]** and **[Maximum]** in **[Size]** also change.

Exclude area

The AI camera transfers the analytics data of each object to the programs that are linked to the camera so that they can utilize the data. The data of objects detected in excluded area are not transferred. Select **[Enable object data from the excluded area]** to transfer the data.

For the detailed Object information transferred by the camera, refer to the "AI Camera Metadata Specification" document.

Note

- If the detection area and the exclude area are identical or overlap, the exclude area has priority.
- Any movement smaller than the specified minimum size or larger than the specified maximum size will not be detected. please determine the best values for the minimum/maximum detection sizes that are appropriate for the installation environment in order to avoid any false detection arising out of small and/or large noises. Remember that the same movement in the same spot does not always result in the same detection size. Therefore, it is recommended to allow small/big enough rooms for your minimum/maximum size limits in consideration of the deviation in detected sizes.

DPM (Dynamic privacy masking)

The dynamic privacy masking feature allows you to protect the privacy of the objects set in the video.

DPM

Enable DPM

To enable the dynamic privacy masking feature, select **[Enable dynamic privacy masking]** and set a profile type to [DPM profile]. To set a profile type, go to **[Basic] > [Video profile] > [Profile type]**.

Object

Select the object to which dynamic privacy masking will be applied. The selected object will be mosaicked based on their metadata coordinates.

Note

- The **[DPM]** feature operates only on video streaming from a DPM profile. To set a profile to [DPM profile], select **[Basic] > [Video profile] > [Profile type] > [DPM profile]**.

Search

People counting counts the number of people who pass a virtual line through the camera image analysis. You can search and confirm statistical data for the number of people counted by condition and time in people counting 'Search'.

Note

- In order to use the search function in people counting, you need to select **[Enable people counting]** from **[Statistics]>[People counting]>[Setup]**, and set the people counting rule.

Search

Statistics for the number of people entered by the people counting rule or count type are shown.

The rule line set from **[Statistics]>[People counting]>[Setup]** is shown on the screen. Also, the data for the number of people counted according to each count method (IN or OUT) by rule is shown in a table. The number in the table is the total number of people counted from 00:00 to the current time today. **[Rule name]** in the table is set from **[Statistics]>[People counting]>[Setup]**. **[IN]** shows the number of people who moved in the direction of the arrow in the rule line, and **[OUT]** shows the number of people who moved in the opposite direction.

Today

The number of people counted from 00:00 to 24:00 is shown in a graph by hour. There are 4 options in the combination of rule name and count type (IN and OUT) as 'rule name-IN' and 'rule name-OUT'. When an option is selected, the relevant graph will be shown in Cyan. If you place the mouse on top of the graph, a balloon showing the number of people at the selected time will appear.

Weekly

The trend for the number of people by date for the last 7 days, based on today, is shown in a graph.

There are 4 options in the combination of rule name and count type (IN and OUT) as 'rule name-IN' and 'rule name-OUT'. When an option is selected, the relevant graph will be shown in Cyan. If you place the mouse on top of the graph, a balloon showing the information regarding the number of people on the selected date in an exact numerical value will appear.

Search

Date

When you select **[Recent]**, you can search by one recent day, week or month based on the current time.

When you select **[Period]**, you can specify a period by day, month or year and search. Select the calendar icon to change the date.

Rule

Select the rule condition to search. Select the rule condition by combining the rule (Rule 01 and Rule 02) and the count method (IN and OUT) of the relevant rule. For example, if you select the check box where 'Rule 01' and 'IN' meet, the number of people who passed in the arrow direction in the rule line specified in 'Rule 01' is searched. If you select the check box where 'Rule 02' and 'OUT' meet, the number of people who passed in the opposite direction of the arrow in the rule line specified in 'Rule 02' is searched.

The rule can be set in **[Statistics]>[People counting]>[Setup]**.

Search people counting data

1. Select the date you wish to search from **[Date]** in **[Search]**.
2. Select a rule you wish to search and the counting method of each rule in **[Rule]**. For example, if you wish to search for the number of people who moved in the direction specified in 'Rule 01', select the check box where 'Rule 01' and 'IN' meet.
3. Click the **[Search]** button. The search results will be displayed in **[Results]**.

Results

If you search people counting data, the results will be shown in a graph and a table.

If you search 'one recent day', data by hour from 00:00 to 24:00 today will be shown. If you search 'one recent week', data by date from the 7 days immediately previous to today will be shown. If you search 'one recent month', data by date for the 30 days immediately previous to today will be shown. If you select 'Period' and designate a specific day, month and year, data by hour from 00:00 to 24:00 for the designated date and data by date for the designated month and year will be shown.

People counting data is shown separately as 'Rule name-IN' and 'Rule name-OUT' as the combination of the rule name and count method (IN and OUT). If you select the option from a graph, only the relevant graph will be shown in Cyan. Also, if you place the mouse on top of a graph, a balloon showing the data at the selected time in an exact numerical value will appear.

Note

- Searched data refreshes every 15 minutes. The search results may differ from the real time results shown on the [\[Setting\]](#) page.

Download

When you click the **[Download]** button after searching, you can download the search results. The search results can be downloaded in .txt file formats, and the downloaded file will be saved in the browser's default save path. Up to 64 characters, including letters and numbers, can be entered for the file name.

Setup

People counting counts the number of people who pass a virtual line through the camera image analysis. The conditions for counting the number of people and detailed items for improving the accuracy of people counting are set from 'Setup' in people counting. When you complete the setting, click the **[Apply]** button at the bottom of the page.

Setup

Enable people counting

To use the people counting function, select **[Enable people counting]**.

Configuration

Set the counting rule for counting the number of people. Up to 2 people counting rules can be set.

Setting the counting rule

To set a counting rule, select the check box in **[Rule]** and enter the rule name in the **[Name]** field. Up to 15 characters, including letters and numbers, can be entered for the rule name. The entered name is shown in **[Statistics]>[People counting]>[Search]**.

Setting the count type

The types for counting the number of people in people counting are IN count and OUT count.

When you select the check box in **[Rule]**, the rule line will appear in the image. IN count applies to people who move in the direction of the arrow on the line and OUT count applies to people who move in the opposite direction. Clicking the arrow on the rule line changes its direction.



Setting the rule line

The people counting function counts the number of people who pass the rule line. To change the position of the rule line, click the rule line shown in the image and drag it using the mouse. You can adjust the length of the line by dragging a corner located at either end of the rule line.

If you select and activate the rule, the real time count is displayed at the bottom of the video. Real time counting resets at every 00:00.

Activating and deactivating the people counting rule

To enable the counting rule, select the check box of the desired rule from **[Rule]**.

To disable the counting rule, deselect the check box of the desired rule from **[Rule]**. The people counting rule setting remains intact, so if you select the check box again, the original rule function will be re-activated.

Exclude area

Set to not count the number of people who enter an area specified by the user.

Setting an exclude area

When you select the 4 corners of an image with the mouse, the area is set as the exclude area, and the color of the number buttons in **[Area]** changes. Up to 4 exclude areas can be set.

Changing an exclude area

You can adjust the size of an exclude area by clicking and moving a corner or a line of the exclude area. To move an exclude area, click and drag the relevant area with the mouse.

Deleting an exclude area

To delete an exclude area, click the right mouse button at the relevant area on the screen and click the **[OK]** button on the delete confirm window.

Calibration

Area

When you click a number button in **[Area]**, the relevant area will be selected in the image. The edge of the selected area will appear with a thick white line.

Set the camera or the human height to count in order to improve the accuracy of people counting. You can only select and apply either the camera height or the human height. (Some cameras do not support [Camera height] setting.)

Size

Specify the height of people to count. You can adjust the height by dragging the corner at the bottom right of the box displayed on the image screen.

Note

- The value set on **[People counting] > [Calibration]** applies equally to **[People counting]** and **[Heatmap]** functions.
- Calibration is required for improving the accuracy of people counting. Inaccurate calibration information can have negative impact on the accuracy of people counting.

Real-time people counting data

The sum of the number of people counted in real time according to the set rule and the count type of each rule will be shown in a table.

Report

Enable

To receive people counting data periodically through e-mail and FTP, select **[Enable]**.

Detailed settings for FTP and e-mail can be done from **[Event]>[FTP/E-mail]**.

Schedule

To receive people counting data at the same time every day, select **[Daily]** and choose a time.

To receive people counting data on the same weekday and time every week, select **[Weekly]** and select a weekday and a time.

File name

Enter the file name for sending people counting data through an FTP server or e-mail and select the file format. Up to 64 characters, including letters and numbers, can be entered for the file name.

Event activation time You can set People Counting to work always or set it to work at a scheduled time only. When it is activated, People Counting data at that time is collected.

Always

People Counting always works.

Only scheduled time

People Counting is activated at the scheduled time only. If you select **[Only scheduled time]**, the timetable will display the dates from Sunday to Saturday based on the current camera time. You can set the action time of People Counting by clicking or dragging the mouse in the timetable. The set schedule works repeatedly on the set day and time.

You can change the time viewing unit by clicking the **[1 min]**, **[30 min]**, or **[1 h]** button. Clicking the **[Reset]** button deletes all set schedules. To check or change the camera time, see **[Basic]>[Date & Time]**.

Delete all data To delete all people counting data, click **[Delete all data]**.

Note

- In the following cases, it is recommended that you reset the rule to match the changed video screen and click **[Delete all data]** to delete the old data used for the people counting search.
 - If you have changed the settings in **[Video & Audio] > [Video Setup] > [Video Rotation]**
 - If you change the settings in **[Video & Audio] > [Camera Setup] > [Special] > [DIS]**

Note

The people counting function aims at supplying statistical data but not data with real time accuracy, and it may include moving objects or animals in the total measured number of units.

In any of the following cases, errors in the measured data are likely to increase:

If installed in a space with no sufficient visions

Night time or low brightness (Figure 1)

In an environment with a sudden change in light, or in case of exposure to strong light, such as direct sunlight, sunset, sunrise, direct lighting, etc. (Figure 2)

If there is consistent movement at the fixed location such as near the door (Figure 3)

If many people move in a group

If moving object is close to the set rule,

If the rule is set at the outer edge of image for a fisheye camera (Figure 4)

A camera to operate people counting requires that the lens to be installed on the ground in a direct drop. (Figure 5)

In you set the object size to a value greater than the actual size in calibration, the measurement results can yield a less number of people than actual; on the contrary, if you set it to a smaller number, then it can yield a greater number of people than actual.

Figure 1

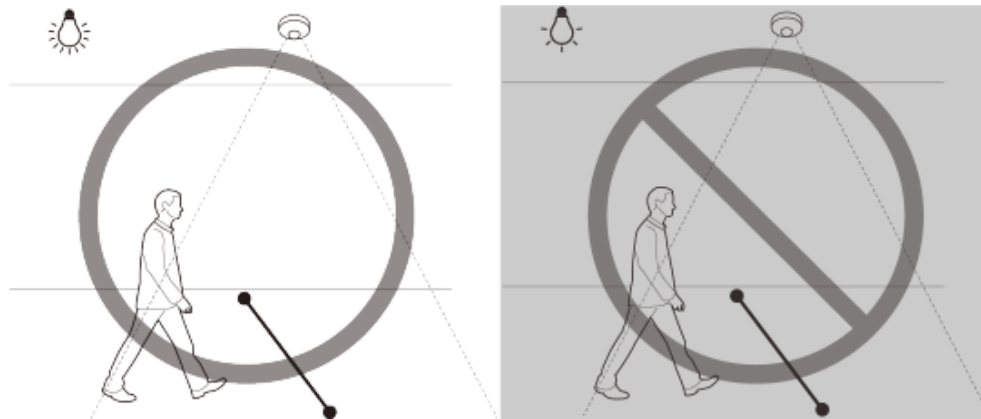


Figure 2

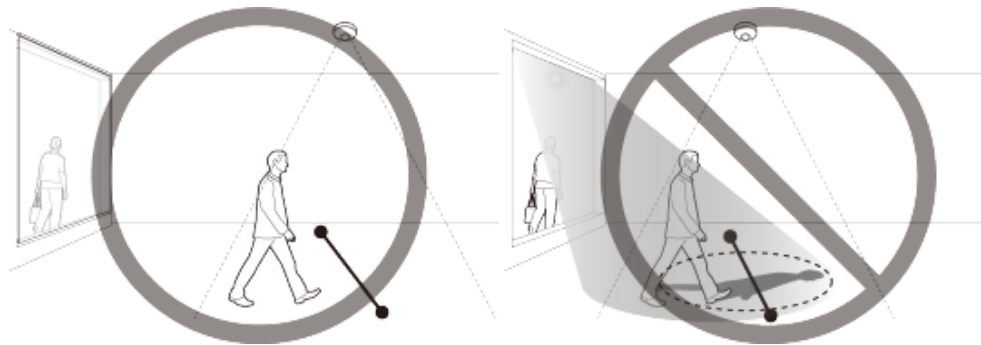
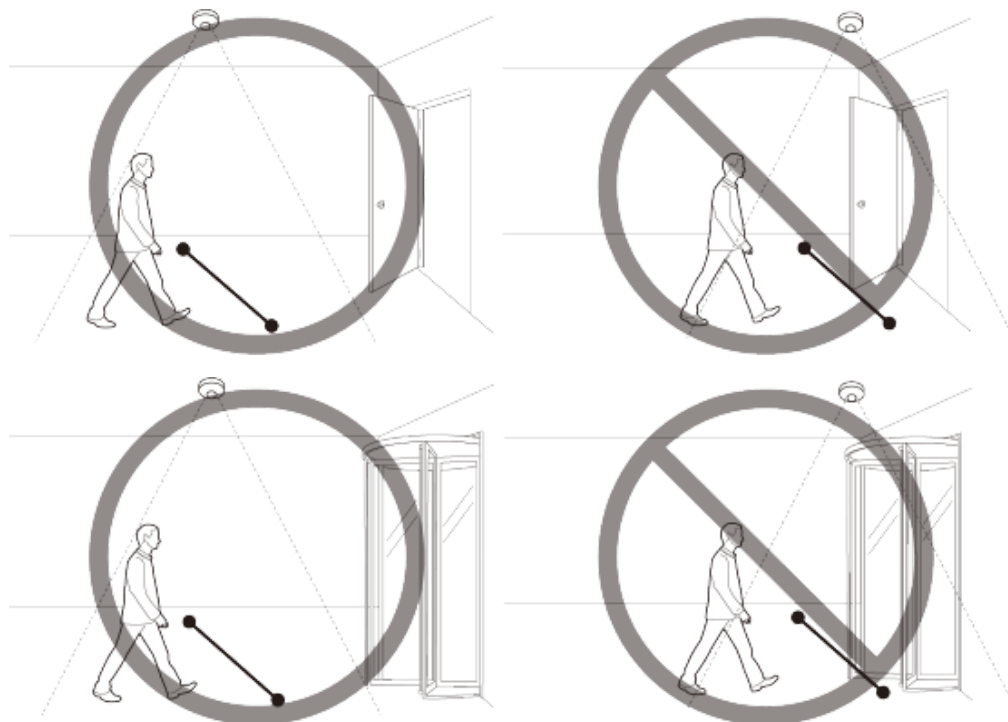


Figure 3



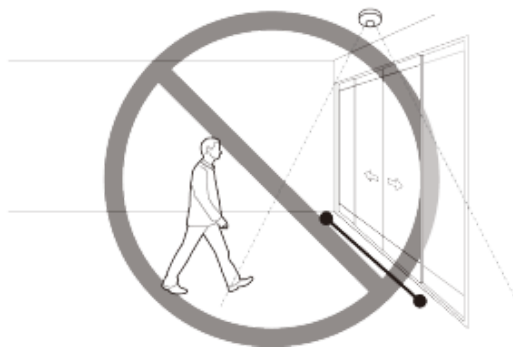
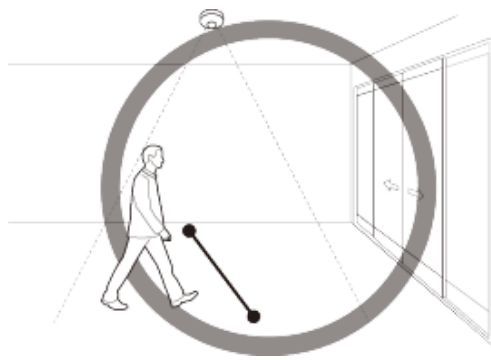


Figure 4

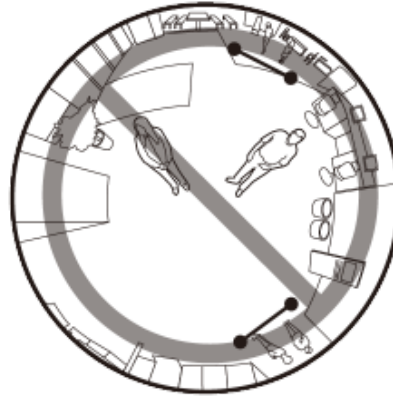
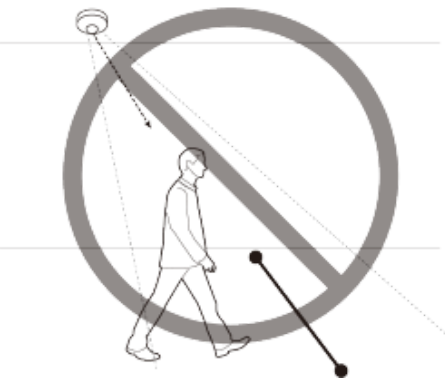
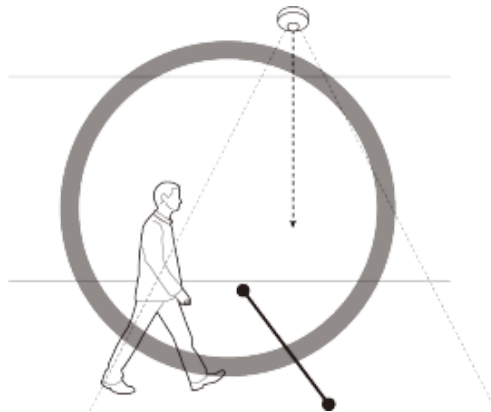


Figure 5



Search

Queue management is a function used to monitor the average number of people staying in a specified area and the total time of stay through an analysis of camera images. The number of queuing people and statistical data of queuing time can be searched and viewed from the 'Search' page of Queue management.

Note

- In order to use the search function in queue management, you must select **[Enable queue management]** from **[Statistics]>[Queue management]>[Setup]** and set the queue management area.

Search

The queue rule set from **[Statistics]>[Queue management]>[Setup]** is displayed on the screen.

Occupancy

Real-time analysis data for each queue rule is shown.

Today

Average number of people

The number of people counted in each queue rule from 00:00 to 24:00 is shown in a graph displayed by hour.

When you select the name of a queue rule located at top right side of the graph, only the relevant graph will be shown in cyan. If you place the mouse on top of the graph, a balloon showing the number of people at the selected time will appear.

Total time (min)

The total queuing time is analyzed by the queue rules and the detection levels (high and middle), and it is shown in the graph.

The level of detection is specified in **[Level of detection]** on the **[Setup]** page, and the level of queuing is classified into 'High' and 'Medium', according to the number of people in the queue.

For example, 'Queue 1- High' indicates the total time during which there is a large number of queuing people in 'Queue 1' as the 'High' level of detection, and 'Queue 1- Medium' indicates the total time during which there is a large number of queuing people in 'Queue 1' as the 'Medium' level of detection.

Weekly

The trend for the average number of people by queue and date for the last 7 days, based on today, is shown in a graph.

If you place the mouse on top of the graph, a balloon showing the information regarding the number of people on the selected date will be displayed in an exact numerical value.

Search

Date

When you select [Recent], you can search by one day, week, or month from the current time.

When you select [Period], you can specify a period by day, month, or year and search accordingly. Select the calendar icon to change the date.

Rule

Select the conditions for the search. The queue rule and the analysis conditions (average number of people, high or medium for the level of detection) can be selected in combination. For example, when you select the checkbox where 'Queue 1' and 'Average' meet, the average number of people in the 'Queue 1' Queue is searched. When you select the checkbox where 'Queue 1' and 'High' meet, the total time for the number of people corresponding to 'High' for the level of detection queuing in 'Queue 1' is searched. You can also select both 'Average' and 'High' that meet with 'Queue 1' for searching.

The rule can be set in **[Statistics]>[Queue management]>[Setup]**.

Search queue data

1. Select the date you wish to search in **[Date]** of **[Search]**.
2. Select the queue you wish to search and the analysis option in **[Rule]**. For example, if you wish to search the average number of people queuing in 'Queue 1' and the total time for the number of people corresponding to 'High' for the level of detection queuing in 'Queue 1', select the checkbox where 'Queue 1' and 'Average' meet and the checkbox where 'Queue 1' and 'High' meet.
3. Click the **[Search]** button. The search results will be displayed in **[Results]**.

Results

If you search queue data, the results will be shown in a graph and table.

If you search 'one recent day', data by hour from 00:00 to 24:00 on the current day will be shown. If you search 'one recent week', data by date from the 7 days immediately prior to the current day will be shown. If you search 'one recent month', data by date for the 30 days immediately prior to the current day will be shown.

If you select 'Period' and designate a specific day, month, and year, data by hour from 00:00 to 24:00 for the designated date and data by date for the designated month and year will be shown.

Queue data is displayed separately into 'Queue name-Average', 'Queue name-High', and 'Queue name-Medium' in the combination of the queue name and the analysis method (average number of people, high level of queuing, medium level of queuing). If you select an option from a graph, only the relevant graph will be shown in Cyan. In addition, if you place the mouse on top of a graph, a balloon showing the data at the selected time in an exact numerical value will appear.

Note

- Searched data refreshes every 15 minutes. The search results may differ from the real time results shown on the [\[Setup\]](#) page.

Download

When you click the **[Download]** button after searching, you can download the search results. The search results can be downloaded in .txt file formats, and the downloaded file will be saved in the browser's default save path. Up to 64 characters, including alphabetic characters and numbers, can be entered for the file name.

Setup

Queue management is a function used to monitor the average number of people staying in a specified area and the total time of stay through an analysis of camera images. Set the queue rule you wish to analyze and the detailed items for improving the analysis accuracy in the 'Setup' page of queue management. When you complete the setting, click the **[Apply]** button at the bottom of the page.

Setup

Enable queue management

To use the queue management function, select **[Enable queue management]**.

Rule

Set the queue rule for which you wish to analyze the number of queuing people or the queuing time. Up to 3 queue rules can be set.

Set queue management rule

To set the queue management rule,

1. Put a check mark in the checkbox in front of the **[No.]** column.
2. When the queue management rule is displayed on the image screen, adjust the size and shape of the queue management area by dragging the corner of the area with the mouse.
3. Enter the name of area in the **[Name]** field. Up to 15 characters, including alphabetic characters and numbers, can be entered for the rule name. The entered rule name is shown in **[Statistics]>[Queue management]>[Search]**.

Activate and deactivate the queue management analysis for each rule

- To activate the queue management analysis, select the check box in front of the relevant **[No.]** column.
- To deactivate the queue management analysis, deselect the check box in front of the relevant **[No.]** column. The queue management analysis setting for each rule remains intact, meaning if you select the check box again, the queue management analysis function will be activated in the same setting.

Queue events

Set the conditions to create a queue event.

A different queue event can be set for each queue set in **[Rule]**.

Level of detection

The level of detection (queue level) displays the number of people staying in the set rule. An alarm is generated if the current level is higher than the target level of detection.

The level of detection is classified into 'High' and 'Medium', according to the number of people in a given queue rule. When **[Maximum]** and **[High]** are set for the number of people, the 'Medium' value will be set automatically.

'High' for the level of detection refers to the status in which the number of people exceeding the 'High' value and less than the 'Maximum' value is detected. 'Medium' for the level of detection refers to the status in which the number of people exceeding the 'Medium' value and less than the 'High' value is detected.

For example, if 20 is set for the **[Maximum]** value and 18 is set for the **[High]** value, 9 will automatically be set for the 'Medium' value. If the number of people

queuing in the relevant queue area is over 18 and less than 20, the level of detection will be 'High'. If the number of people queuing in the relevant queue area is over 9 and less than 18, the level of detection will be 'Medium'.

Minimum duration (s)

You can set a minimum waiting time for a queue event to occur by detection level.

If you select [**High**] and set a time, a queue event will occur if the number of people, corresponding to 'High' in the [Level of detection], waits in the area for longer than the time set in the [Minimum duration].

If you select [**Medium**] and set a time, a queue event will occur if the number of people, corresponding to 'Medium' in the [Level of detection], waits in the area for longer than the time set in the [Minimum duration].

For example, in [**Level of detection**], if 'Medium' is '2', 'High' is '4', 'Maximum' is '8' people, and the value of [High] and [Medium] in the [**Minimum duration**] is set to '10 seconds' and '5 seconds' each, the queue event will occur if 4~7 people stay in the area for more than 10 seconds since the 'High' wait condition is met. In addition, if 2~3 people stay in the area for more than 5 seconds, the queue event will occur by meeting the 'Medium' wait condition.

Report

Enable

To receive queue data periodically through e-mail and FTP, select [**Enable**]. Detailed settings for FTP and e-mail can be done from [**Event**]>[FTP/E-mail].

Schedule

To receive queue data at the same time every day, select [**Daily**] and choose a time.

To receive queue data on the same weekday and time every week, select [**Weekly**] and select a weekday and a time.

File name

Enter the file name for sending queue data through an FTP server or e-mail and select the file format. Up to 64 characters, including alphabetic characters and numbers, can be entered for the file name.

Event action settings

FTP

To save an image on an FTP server when a queue management event is created, select [**Enable**]. Detailed settings for FTP can be done from [**Event**]>[FTP/E-mail].

E-mail

To send an image by e-mail when a queue management event is created, select [**Enable**]. Detailed settings for e-mail can be done from [**Event**]>[FTP/E-mail].

Alarm output

It is possible to set the alarm output number for a specific alarm when a queue management event is created. After selecting an alarm output number, select **[Off]** if you do not wish to use the alarm. If you wish to use the alarm, select the output time. You can also set the alarm to sound continuously until turned off by the user by selecting **[Always]**.

Depending on the alarm output setup, **[Alarm output]** options may look different. If there is no alarm output, **[Alarm output]** options are not displayed. If there is more than one alarm output, they are displayed as **[Alarm output 1]**, **[Alarm output 2]**, and so on.

Select **[Event]>[Alarm output]** to set the alarm output.

Delete all data

To delete all queue analysis data, click **[Delete all data]**.

i Note

- In the following cases, it is recommended that you reset the rules to match the changed video screen and click **[Delete all data]** to delete the old data used for the queue management search.
 - If you have changed the settings in **[Video & Audio] > [Video setup] > [Video rotation]**

i Note

The queue management function aims at supplying statistical data, not data with real time accuracy, and it may include moving objects or animals as the total number of measured units.

If you use the queue function in an environment with short waiting time, it can generate a lot of events.

In any of the following cases, errors in the measured data are likely to increase:

If installed in a space with no sufficient visions

Night time or low brightness (Figure 1)

In an environment with a sudden change in light, or in case of exposure to strong light, such as direct sunlight, sunset, sunrise, direct lighting, etc. (Figure 2)

If there is consistent movement at the fixed location such as near the door (Figure 3)

If many people move in a group

If moving object is close to the set rule,

If the rule is set at the outer edge of image for a fisheye camera (Figure 4)

A camera to operate queue management requires that the lens to be installed on the ground in a direct drop. (Figure 5)

Figure 1

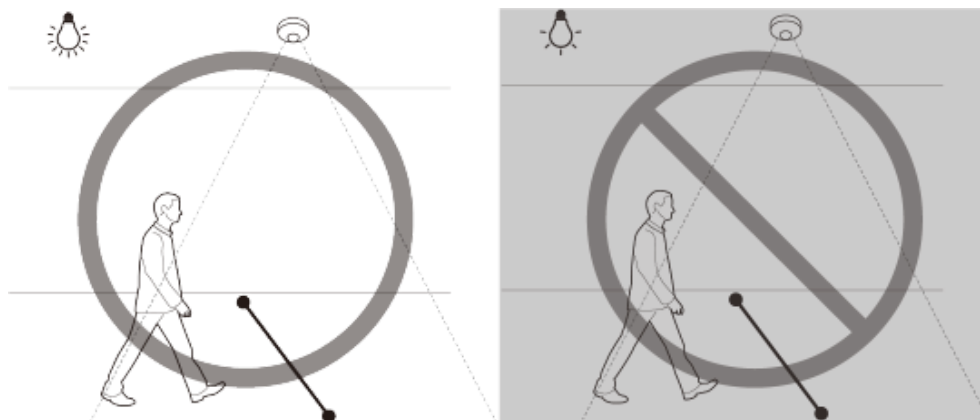


Figure 2

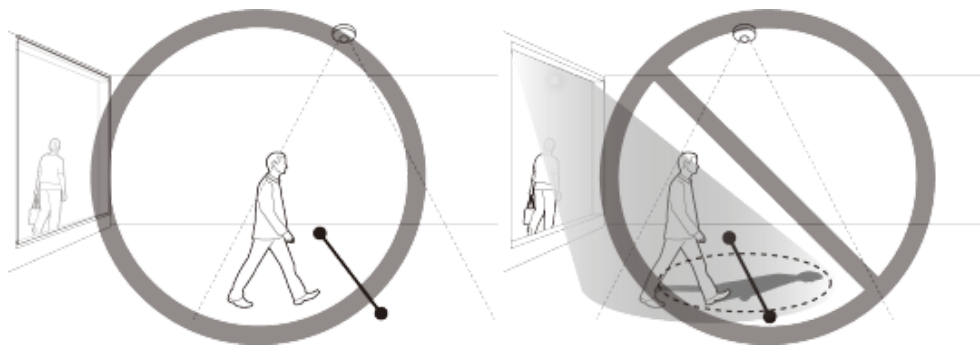


Figure 3

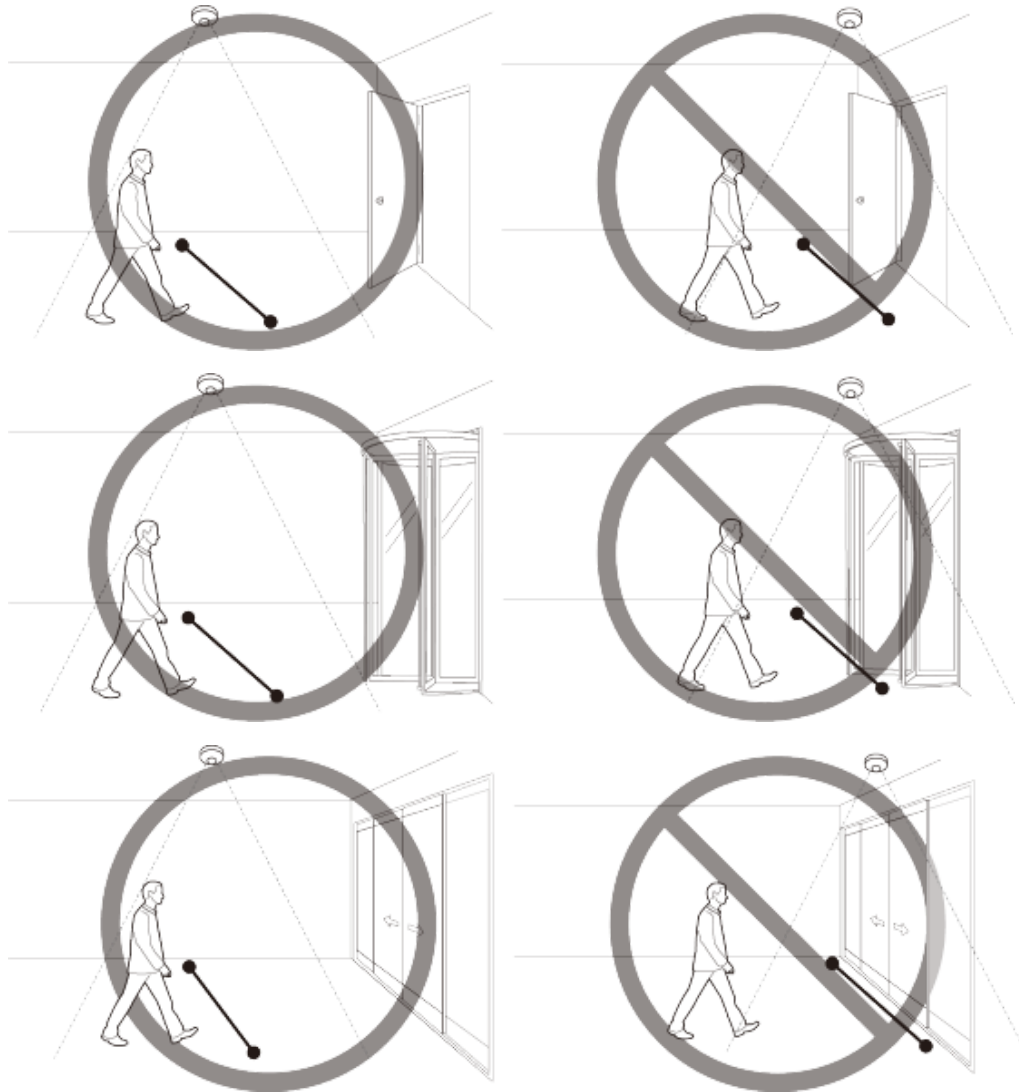


Figure 4

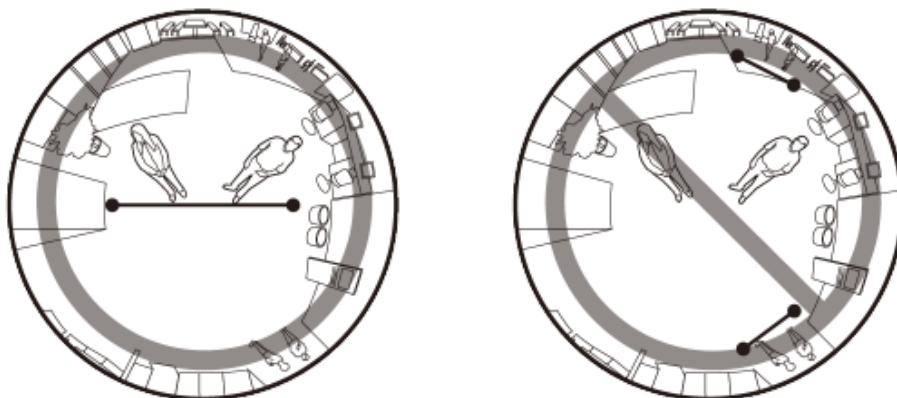
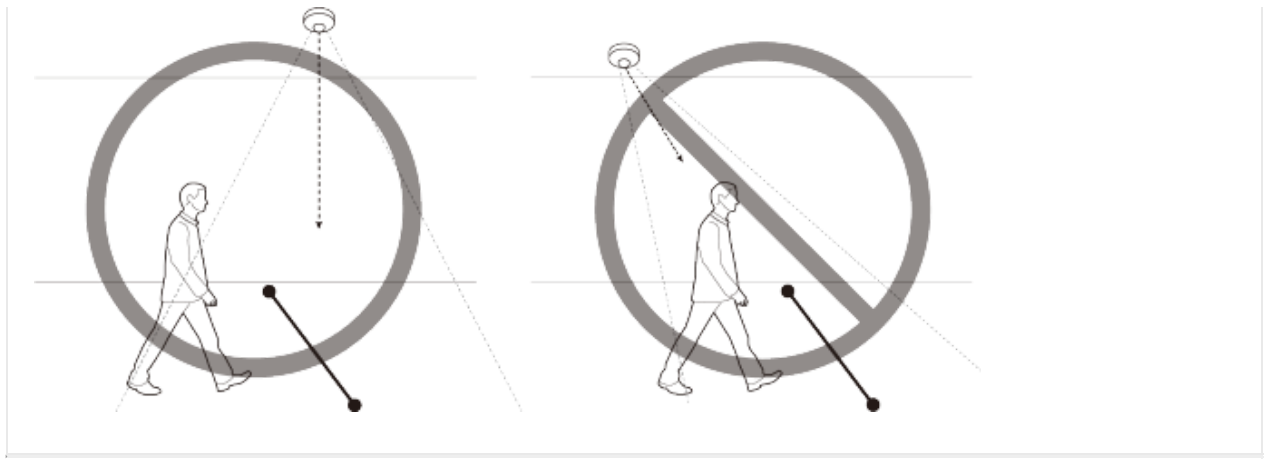


Figure 5



Search

The heatmap shows in color the movement of the moving objects and the frequency of their stay over time. You can search heatmap data and confirm results from 'heatmap search'.

Note

- In order to use the heatmap search function, you need to activate it by selecting **[Enable heatmap]** from **[Statistics]>[Heatmap]>[Setup]**.

Heatmap

Heatmap information based on the frequency of motions in the current image will appear on the screen. For the frequency of motion by color to be shown on the screen, refer to the color in [Index].

Index

The Index color bar indicates the frequency of motions. If the frequency of motions is low, it is displayed in blue, and in red if the frequency of motions is high.

Search

You can set the date and search reference value.

Date

When you select **[Recent]**, you can search by recent day, week or month. When you select **[Period]**, you can specify a daily, monthly, or yearly period for searching.

The heatmap search results will be displayed on the screen immediately.

Reference

Selecting **[Auto]** normalizes the color of the heatmap based on the maximum frequency of movement within the search section.

The user may set the reference values for normalization by selecting **[Manual]**.

Searching heatmap and viewing results

1. Select the date you wish to search from **[Date]** in **[Search]**.
2. Click the **[Search]** button.
3. The search results will be displayed in **[Results]**.

Results

If you have searched heatmap data, the results will be displayed. Heatmap information for the period you have searched, with the image at the time of searching as the background, will be displayed.

Note

- Searched data refreshes every 15 minutes. The search results may differ from the real time results shown on the [\[Setup\]](#) page.

Download

When you click the **[Download]** button after searching, you can download the search results as an image file. The search results can be downloaded in .png format; the downloaded file will be saved in the browser's default save path. Up to 64 characters, including letters and numbers, can be entered for the file name.

Setup

Heatmap shows the frequency of motion on the screen in color. In 'heatmap setup', you can set the color of the background image and an area to be excluded when heatmap data is collected. When you complete the setting, click the **[Apply]** button at the bottom of the page.

Note

- The camera or human height set in **[Statistics]>[People counting]>[Setup]** > **[Calibration]** applies equally to the heatmap functions.
- The heatmap function aims at supplying statistical data, not data with real time accuracy, and it may include moving objects or animals in the total measured number of units.
- In any of the following cases, errors in the measured data are likely to increase:
 - If installed in a space with no sufficient visions
 - Night time or low brightness
 - In an environment with a sudden change in light, or in case of exposure to strong light, such as direct sunlight, sunset, sunrise, direct lighting, etc.
 - If there is consistent movement at the fixed location such as near the door
 - If many people move in a group

Setup

Enable heatmap

To use the heatmap function, select **[Enable heatmap]**.

Configuration

Set the color of the heatmap background image.

Background color

Select the color of the background image that shows heatmap data. When **[Color]** is selected, the background image will be displayed in color, and when **[B/W]** is selected, the background image will be displayed in black and white.

Exclude area

Motion in an area designated by the user will not be collected as heatmap data.

Setting an exclude area

When you select the 4 corners of an image with the mouse, the area is set as the exclude area, and the color of the number buttons in **[Area]** changes. Up to 4 exclude areas can be set.

Changing an exclude area

You can change the size of an exclude area by clicking a corner or a line of the exclude area and moving it. To move an exclude area, click and drag the relevant area with the mouse.

Deleting an exclude area

To delete an exclude area, click the right mouse button at the relevant area on the screen and click the **[OK]** button on the delete confirm window.

Area

When you click a number button in **[Area]**, the relevant area will be selected in the image. The edge of the selected area will appear with a thick white line.

Report

Enable

To receive heatmap data periodically through e-mail and FTP, select **[Enable]**. Detailed settings for FTP and e-mail can be done from **[Event]**>**[FTP/E-mail]**.

Schedule

To receive heatmap data at the same time every day, select **[Daily]** and choose a time.

To receive heatmap data on the same weekday and time every week, select **[Weekly]** and select a weekday and a time.

File name

Enter the file name for sending heatmap data through an FTP server or e-mail and select the file format. Up to 64 characters, including letters and numbers, can be entered for the file name.

Delete all data

To delete all heatmap statistics data, click **[Delete all data]**.

Note

- In the following cases, it is recommended that you reset the rule to match the changed video screen and click **[Delete all data]** to delete the old data used for searching the heat map.
 - If you have changed the settings in **[Video & Audio]** > **[Video setup]** > **[Video rotation]**
 - If you change the settings in **[Video & Audio]** > **[Camera setup]** > **[Special]** > **[DIS]**
-

Data server setup

When a Retail Insight server is registered, camera's data (People counting, Queue management, and Heatmap data) is transferred to the registered server. On the **[Data server setup]** page, Retail Insight server information can be entered and registered. Click the **[Apply]** button below after entering the necessary information.

Data server setup

Enable data server

To transfer camera's data to the Retail Insight server, select **[Enable data server]**.

Login

Server information can be entered to register the Retail Insight server.

IP

Enter the IP address of the Retail Insight server.

Note

- Next to the **[IP]** field, a message indicating the status of connection to the server is displayed.
 - Connecting: Displayed when attempting to connect to the Retail Insight server. When the **[Apply]** button at the bottom of the page or **[Enable data server]** is selected, connection to the server is attempted.
 - Success: Displayed when connected to the Retail Insight server.
 - Failed: Displayed when failed to connect to the Retail Insight server. If this message persists, make sure that the Retail Insight server information on the **[Data server setup]** page is correct.

Port

Enter the port value of the Retail Insight server.

The port value can be 80 or anywhere between 1024 to 65535.

ID

Enter the ID of the account for logging in to the Retail Insight server.

ID can contain up to 8 letters, but does not allow special characters: # % & + = \ :
< > ' "

Password

Enter the password of the account for logging in to the Retail Insight server.

Password can be 8 to 20 letters, but does not allow special characters: # % & + = \ :
< > ' "

Store name

Enter your store name.
The store name is used by the Retail Insight server to distinguish your camera.

Product information

Check the model name and serial number of the product and set the device name, location, description and language.

Product information

Model

The model name of the product you are currently using is displayed. Changes cannot be made to the model name.

Serial number

The serial number of the product you are currently using is displayed. Changes cannot be made to the serial number.

Device name

Enter the device name of the product you are currently using. If you have installed a number of cameras, a different device name for each camera is recommended.

Enter up to 8 characters long, including uppercase (A-Z), lowercase (a-z), numbers, or special characters (excluding #'"&+:<>=%*).

Location

Enter the installation location of the product you are currently using. If you have installed a number of cameras, a different location name is recommended to distinguish between them.

Enter up to 32 characters long, including uppercase (A-Z), lowercase (a-z), numbers, special characters (only ~`!@\$^()_-|{}[];.,/?).

GPS coordinates

Select to enter the camera's **[GPS coordinates]**.

Longitude

You can enter or view the longitude value. Up to 6-digit decimal numbers can be typed within the range of -180 to 180.

Latitude

You can enter or view the latitude value. Up to 6-digit decimal numbers can be typed within the range of -90 to 90.

Description

Enter the description of the product you are currently using. You can enter other necessary information, including the installation date and location where the screen is showing.

Enter up to 32 characters long, including uppercase (A-Z), lowercase (a-z), numbers, special characters (only ~`!@\$^()_[]{};./?).

Memo

Enter the description of the product you are currently using. Enter other necessary information that were not entered on the description section.

Enter up to 32 characters long, including uppercase (A-Z), lowercase (a-z), numbers, special characters (only ~`!@\$^()_[]{};./?).

Language

Select the language of the product you are currently using. When you select a language and click Apply, all UI will be changed to the relevant language.

Open source license

We provide open source licenses used by this product. Click the **[View]** button to see the information of the open source licenses used by this product and full license texts.

Upgrade / Restart

You can upgrade the software of the product you are currently using, perform a factory default, back up or restore the configuration, or restart.

Upgrade/Downgrade Software can be upgraded as new firmware versions are released. You can also downgrade to a previous version.

Software

The software version of the product you are using is displayed. Changes cannot be made to the software version.

You can view the software details, including the ISP version applied to the software and SUNAPI version, by clicking the **[Info]** button.

Software upgrade

You can upgrade the software of the product you are using. To upgrade the software, click the **[...]** button. Select an upgrade file and click the **[Open]** button. When you click the **[Upgrade]** button, upgrading will begin. When upgrading has ended, the camera will reboot and the connection will be terminated automatically. You will need to reconnect to the web viewer.

Note

- Upgrade can take up to 10 minutes. Do not terminate the program while upgrading is in progress. Doing so may result in the program failing to upgrade properly.
- For the web viewer to work properly, you need to delete all the browser caches before connecting again after the software upgrade.
- You can download the latest software version from Hanwha Vision's website: <http://www.hanwhavision.com>

Factory default

Resets the system configuration to what it was at the time of product purchase. When you click the **[Reset]** button and then click the **[OK]** button in the confirm window, the factory default reset will be carried out. (Logs won't be reset though.)

If you wish to reset the system configuration (except for the network configuration and installed open platform configuration) to factory default, select **[Except network parameter & open platform]**. When a factory default is carried out, the connection with the camera will be terminated. When you reconnect to the web viewer for the first time, you will need to enter the password again.

Configuration backup & restore

You can backup and save the current camera setup or restore a desired configuration. You can create a number of backup files for desired configurations, or restore and use a desired configuration according to the purpose or environment when using the product.

Backup

When you click the [**Backup**] button, a backup file of 'model name Config.bin' will be created.

Restore

When you click the [**Restore**] button, a window where you can select a backup file to restore will appear. When you select a backup file and press the [**Open**] button, the configuration will be restored based on the relevant backup file.

Note

- When you restore the configuration, the connection with the camera will be terminated automatically and you will need to reconnect to the web viewer.
- If you use an imported backup file for a different model than the product you are currently using, the product may malfunction. Do not use a backup file for a different model or change the configuration manually.

Restart

Restart the camera system. Click the [**Restart**] button, and when the confirm window appears, click the [**OK**] button. The camera will restart and the web viewer window will close. You will need to reconnect to the web viewer.

Log

You can check camera-related logs. You can check information including camera access, system changes and events which have occurred, and backup log information for each log type.

Note

Logs can be checked in order of most recent log first.

Up to 1,000 logs can be saved. By selecting [**View 10 lines**], [**View 15 lines**], or [**View 20 lines**], you can set how many logs will be displayed on one page.

When the number of logs that are saved exceeds 1,000, a new log is saved after deleting the oldest log.

Access log

You can check login and logout information for each access account.

Log type

You can check accounts which have accessed the camera, login and logout date, and time information. When you select All, you can check login and logout, date & time, and detailed information for all access IDs.

Export

You can back up the selected log type as a text file. To back up the access log, click [**Export**]. The log file information is displayed as camera model name_log type_backup date, and time.

System log

You can check date & time and detailed information for system changes.

Log type

This allows you to check camera system setup change information, along with the date and time. When you select All, you can check date & time and detailed information for all system changes.

Export

You can backup the selected log type as a text file. To backup the system log, click [**Export**]. The log file information is displayed as camera model name_log type_backup date, and time.

Event log

You can check the date & time and detailed information for an event which has occurred in the system.

Log type

You can check occurrence date & time and detailed information for a selected event. When you select All, you can check the date & time and detailed information for all events occurring in the system.

Export

You can backup the selected log type as a text file. To backup the event log, click **[Export]**. The log file information is displayed as camera model name_log type_backup date, and time.

Open platform

When you install an additional application on the camera, you can use the functions of the installed application in addition to existing functions.

Note

You can check all the applications installed on the camera by clicking **[Apps]** at the right top of the web viewer. To customize application settings, click **[Go App]** in the Apps dialog box.

Open platform

You can check the information of applications installed on the camera.

Installing applications

1. Click the [...] button, select an application and then click **[Open]**.
2. Click **[Install]**. When installation of the application is complete, a message saying 'Installed' is displayed and information about the installed application is displayed in the list.

No.

A number is assigned in the installation order of application.

Application name

The application name, installed date and version are displayed.

- **Uninstall:** Deletes an installed application.
- **Go App:** Navigates to the screen provided by each application.

Status

Displays the running status of an application.

When an application is running, 'Running' is displayed, and when an application is stopped, 'Stopped' is displayed.

- **Start:** Executes the installed application.
- **Stop:** Stops a running application.
- **Health:** The resource usage rate, thread count and running time of currently-running applications are displayed. This is activated only when at least one application is running.

Setup

Set the execution priority and whether the application runs automatically. After completing the settings, click **[Apply]**.

- **Default app:** Select **[Enable]** to set as the default app. The default app's **[Priority]** is automatically set to **[High]**, and if you change the app running priority to **[Low]** or **[Medium]**, the app will no longer be the default app. If you do not select the **[Except network parameter & open platform]** option

when resetting the camera system to factory defaults, other installed apps will be deleted, but not the default app.

- **Priority:** Set the priority among applications that are running. If the total resource usage of the camera (including the camera's main task and applications) increases, the running applications are forcibly terminated in the order of "Low" priority.
- **Auto start:** Select [**Enable**] in [**Auto start**] to automatically run the application when the camera is turned on and the main task is executed.

Application manager

Displays the resource usage rate of applications running in the camera.

- **Application name:** Displays the application name.
- **Memory usage (%):** Displays the memory usage rate of each application.
- **CPU usage (%):** Displays the CPU usage rate of each application.
- **Thread count:** Displays the number of threads created by each application.
- **Duration:** Displays the total running time of each application.
- **Action:** Displays the action status of each application. To stop the application, click [**Kill App**].
- **Total usage:** Displays the total resource usage rate (including the main task of the camera and applications) currently used in the camera.
- **Total:** Displays the total number of applications currently running.

Note

- For questions regarding the installation and usage of applications, contact the developers' website of Hanwha Vision (<http://step.hanwha-security.com>).

