

Network Camera

User's Guide

Before operating the unit, please read this manual thoroughly and retain it for future reference.

Software Version 1.0

SNC-WL862

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Features

- Four 5M pixel CMOS image sensors. High resolution of total 20M pixel.
- Four different areas can be viewed simultaneously using four independent image sensors. The full area range of 360 degree is covered.
- Monitoring at a maximum frame rate of 30 fps (2688 x 1920) per sensor.
- Three video compression technologies (video codec) of H.265/H.264/JPEG are used.
- Selectable operating modes from among 3 codecs.
- Optimize efficiency in the network bandwidth using the Smart Stream management.
- Easy focus adjustment using the Easy Focus function at the time of installation.
- Turning on/off the built-in IR cut filter enables switching between the day mode and night mode.
- For indoor/outdoor use (compatible with IP66, IK10).
- The built-in microphone, the connector for an external microphone, and the connector for audio output, enable the transmission and reception of audio signals.
- Motion detection and camera tampering detection functions.
- The storage function enables the recording of video and audio from the alarm detection result and the streaming them using the same protocol as live video/audio.
- Superimposing the day/time on image.
- PoE (Power over Ethernet) compliant.

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How to Use This User's Guide

This User's Guide explains how to operate the Network Camera from a computer. The User's Guide is designed to be read on the computer display. This section gives tips on making the most of the User's Guide. Read it before you operate the camera.

Jumping to a related page

When you read the User's Guide on the computer display, you can click on a sentence to jump to a related page. You can easily search the related pages.

Software display examples

Note that the displays shown in the User's Guide are explanatory examples. Some displays may be different from the ones that appear in actual use.

Printing the User's Guide

Depending on your system, certain displays or illustrations in the User's Guide, when printed out, may differ from those that appear on your screen.

Installation Manual

The Installation Manual describes the names and functions of parts and controls of the Network Camera, connection examples, and how to set up the camera. Be sure to read the Installation Manual beforehand.

System Requirements

The following computer environment is necessary for the computer to display images and the controls of the camera.
(July 2019)

OS

Windows 8.1 Pro
Windows 10 Pro

Web Browser

Windows Internet Explorer Ver. 10, Ver. 11

Notes

- In case of Windows 10, turn the tablet mode off.
- In case of Windows 8.1, use the Internet Explorer desktop user interface (desktop UI) edition.
- Use the 32 bit version of Internet Explorer.

Accessing the Camera Using the Web Browser

After the IP address has been assigned to the camera, check that you can actually access the camera using the web browser installed on your computer.

- 1 Start the web browser on the computer and enter the IP address of the camera in the URL address bar.



- 2 Enter the user ID and password.

The authentication dialog appears. When you enter the user name and password for Administrator in the dialog, the viewer window is displayed.

The factory setting of the user name for the Administrator is set to **admin**. Set the new password in the appeared dialog at the first access to the camera.

Display sample



When the camera connected for the first time, the dialog about the installation of the plug-in appears. Click **Yes** to install the ActiveX plug-in.

Notes

- If the dialog is displayed to notify that the execution of ActiveX control is prohibited in security settings, then enable the ActiveX control of the browser.
- When you install ActiveX Control, you should login to the computer as Administrator.
- Currently the camera uses the 32 bit version of ActiveX plug-in. It is unable to use the 64 bit version of Internet Explorer browser.
- In the following situation, the on-screen Java control may be malfunctioned.
 - When the PC is connected to the different cameras whose IP addresses are the same

– When the PC is connected to the same model cameras whose firmware versions are different This problem can be solved by removing the browser Cookie.

- If the Compatibility View settings of Internet Explorer is enabled, the problem may be occurred in displaying setting menu or UI. In this case, disable the Compatibility View settings.
- If **Automatic configuration** is enabled in the Local Area Network (LAN) settings of Internet Explorer, the image may not be displayed. In that case, disable **Automatic configuration** and set the proxy server manually. For setting the proxy server, consult your network administrator.

Tip

The software is optimized for Internet Explorer using **medium** font. If it cannot be viewed correctly, redisplay it using **Reload**.

To display the viewer correctly

To operate the viewer correctly, set the security level of Internet Explorer to **Medium** or lower, as follows:

- 1 Select **Tools** from the menu bar for Internet Explorer, then select **Internet Options** and click the **Security** tab.
- 2 Click the **Internet** icon (when using this unit via the Internet), or **Local intranet** icon (when using this unit via a local network).
- 3 Set the slider to **Medium** or lower. (If the slider is not displayed, click **Default Level**.)

When using antivirus software, etc., on the computer

- When you use antivirus software, security software, personal firewall or pop-up blocker on your computer, the camera performance may be reduced. For example, the frame rate for displaying the image may be lower.

Using RTSP players

Streaming image can be viewed using the video players that support RTSP streaming.

The following is the step to view the stream using VLC media player.

- 1 Launch the RTSP player.
- 2 When Media > Open Network Stream is selected, URL dialog box will pop up.
- 3 The address format is `rtsp://<ip address>:<rtsp port>/<RTSP streaming access name>`.

Set the RTSP port to default 554. For more information, refer to "RTSP streaming" (page 26).

Example:

```
rtsp://192.168.0.100:554/live1s1.sdp
```

- 4 The live video will be displayed in your player.

Precautions for Preventing Access to the Camera by an Unintended Third Party

The camera may be accessed by an unintended third party on the network, depending on the usage environment. Changing the user name and password of the camera administrator from the default settings is highly recommended for security reasons. If the camera is accessed by an unintended third party, there may be an undesired effect, such as operations or settings to block monitoring, etc.

The camera can be fraudulently accessed in a network environment where a device is connected or connectable to the network without the administrator's permission, or a PC or other network device connected to the network can be used without any permission. Connect to these environments at your own risk. To prevent unauthorized access to the camera, set it according to the following steps.

Do not use the browser to access other websites while you set or after setting the camera. You will remain logged in to the camera as long as the browser is open, so to prevent an unintended third party's use or execution of malicious programs, close the browser after you finish setting the camera.

How to set up

- 1 Set the network address of the camera using SNC toolbox.

For details about how to use SNC toolbox, refer to the application guide.

After this step, do not use SNC toolbox to change the network settings of the camera. Use SNC toolbox to search for the camera only.

- 2 Start the web browser, select the **Enable HTTPS** checkbox in "Security > HTTPS" of camera configuration to enable HTTPS (SSL).

For details, refer to "Security Menu" (page 29) in the Configuration menu.

- 3 Restart the web browser and access the camera again.

- 4 Set the user name and password of the administrator of the camera. For details, refer to "Security Menu" (page 29) in the Configuration menu.

- 5 Select the **Enable Cross-Site Request Forgery (CSRF) protection** checkbox in "Security > Others".

For details, refer to "Security Menu" (page 29) in the Configuration menu.

- 6 Deselect **Enable FTP server** checkbox in "Network > FTP".

Note

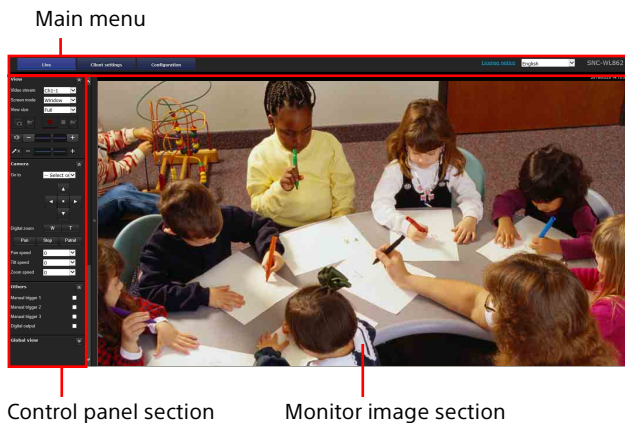
If you use the FTP still image sending function, the SSL function will be disabled, and communication content will not be coded. Do not use the FTP still image sending function if the camera is at risk of unauthorized access.

Hereafter, use the camera using the HTTPS (SSL) connection.

Operating the Camera

Configuration of the Live Viewer

This section explains the functions of the parts and controls of the live viewer. For the detailed explanation on each part or control, see the specified pages.



Monitor image section

Displays the live image of the camera. Select the digital zoom factor from X1 to X12 using the mouse wheel.

Video title,
H.265/H.264 protocol options



Video title

The video title can be set in “Video settings” (page 17).

H.265/H.264 protocol options

Displays H.265/H.264 protocol options that are set in **Client settings**. For details, refer to “Client settings” (page 12).

Zoom factor

Displays the digital zoom factor.

Title & time

The motion video title can be set in “Video settings” (page 17). The title will be followed by the current time.

Time

Displays the current time.

Main menu

Live

Displays the live view window.

Client settings

Click this button to access the client settings page. For details, refer to “Client settings” (page 12).

Configuration

Click this button to access the camera configuration page. The Configuration are allowed only if you logged in as Administrator. For details, refer to “Camera configuration” (page 13).


License notice

Displays the license notice etc.

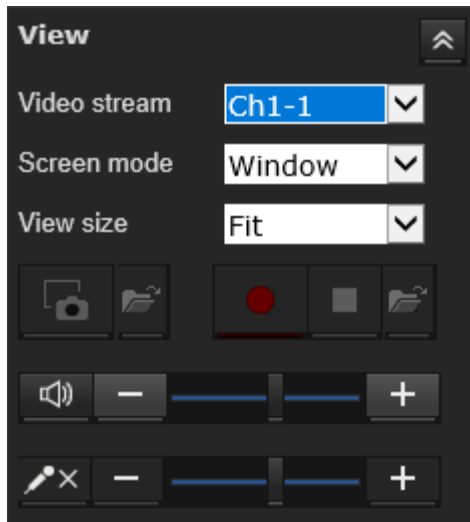
Language

Set the language from the pull-down list.

Control panel section

Click  to hide the detail setting menu or click it again to show the menu.

View panel



You can change the video stream, screen mode and view size. Also, still images and movies can be saved (movie saving can also be stopped), and audio output levels can be adjusted.

View

Select the video stream displayed in the live view. This camera supports multiple streams. It can be selected from the combination of the channel and the video stream.

For details on multiple streams, refer to "Media > Video" (page 21) in the Configuration screen.

Video stream

Displays the channel number and the stream number of the selected video stream. When you select **QuadMode**, 4 channels are simultaneously displayed on the quad screen.

Note

When the quad screen is displayed, you cannot operate the menus other than **Video stream** on the control panel.

Screen mode


Switches between the window display and full-screen display. To switch from the Full screen display to Window display, press **Esc** on the keyboard.

View size

Select the view size to be displayed.
x1/4: displays a quarter size of the image.

x1/2: displays a half size of the image.
x1: displays the image according to the frame size selected in "Frame size" (page 22) of the video menu.
Full: Image is displayed according to the view size.
Fit: Image is displayed according to the view size with fixed aspect ratio.


Capture

Click to capture a still image shot from the recorded video and to store it in the computer. Click  to open the destination folder.

Note

If the protection mode of the security property in the Internet Option dialog of the Windows Control Panel is enabled, still image cannot be captured.

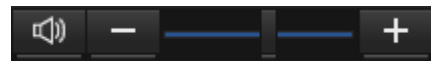
Run/ Stop Save Video

Runs and stops Save Video. Click  to open the destination folder.




Notes

- If the protection mode of the security property in the Internet Option dialog of the Windows Control Panel is enabled, video cannot be saved.
- You should record videos for 5 seconds or more. Videos less than 5 seconds may not be played back.

Volume



Use the +/- buttons to adjust the PC's audio output volume which is input from the camera's microphone.

When you click , the icon changes to  and the output from the speaker stops. To output sound from the speaker, click  again.




Note

When **JPEG** is selected in the setting of the video codec, the microphone input cannot be used.

Mic volume

Use the +/- buttons to adjust the microphone input volume from the PC.



When you click , the icon changes to  and the microphone input stops. To receive input from the microphone, click  again.

Note

When **Half-duplex** is selected in **Client settings** > **Two way audio**, either the microphone or speaker, but not both, is enabled.

Camera control panel



The camera supports digital pan/tilt/zoom (e-PTZ) controls. The camera can be panned/tilted, moved to the home position and zoomed in this panel. For details, refer to "PTZ settings" (page 34).

Go to

Select a preset position from the pull-down list. The camera will move to the position according to the preset settings.

Pan/Tilt control

Click the arrow button of the direction in which you want to move the camera. To return to the home position, click **■**.

Zoom control

Click **W** to zoom out. Click **T** to zoom in.

Pan: When the camera is in zoom mode, the camera pans horizontally according to the maximum angle automatically.

Stop: Stops Pan and Patrol.

Patrol: Commands the camera to consecutively display views of the preset positions according to the preset settings.

Note

The split-screen images that are not selected are also switched in the patrol mode.

Pan speed

Set the pan speed. -5 is the slowest and 5 is the fastest.

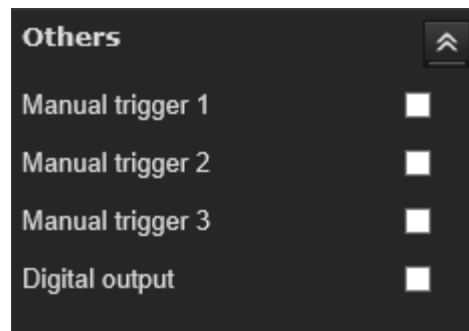
Tilt speed

Set the tilt speed. -5 is the slowest and 5 is the fastest.

Zoom speed

Set the movement of zooming in or out when **W** or **T** is clicked. -5 is the smallest and 5 is the largest.

Others panel



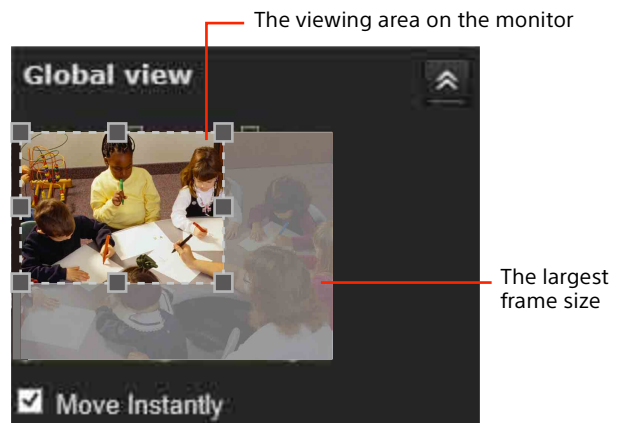
Manual triggers

When the manual trigger is set to the event trigger in the Event settings, you can enable the trigger by selecting the checkbox.

Digital output

Manually turn on/off the Digital output (DO).

Global view



Global view window is displayed. The Global view window contains a full view image (the largest frame size of the captured video) and a floating frame (the viewing region of the current video stream). The floating frame allows users to control the e-PTZ function (Electronic Pan/Tilt/Zoom). For

more information about e-PTZ operation, refer to “PTZ settings” (page 34). For more information about how to set up the viewing region of the current video stream, refer to “Media > Video” (page 21).

Note

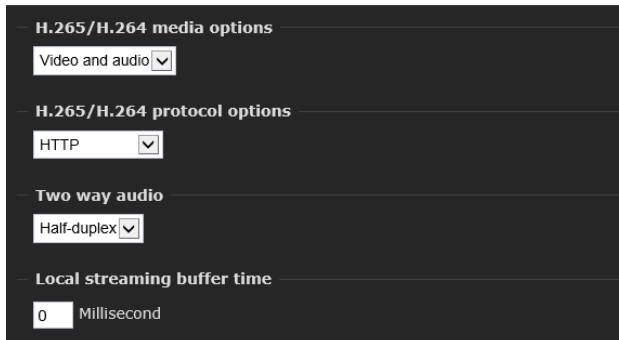
The PTZ buttons on the panel are not operational unless you are showing only a portion of the full image. If the live view window is displaying the full view, the PTZ buttons are not functional.

Move Instantly

If you click some location in the Global view window under the condition that **Move Instantly** option is selected, the viewing region is moved to the clicked location instantly.

Client settings

This section explains how to select the stream transfer mode and the saving options on the local computer. When the settings are completed, click **Save** at the lower part of the page to enable the settings.



The screenshot shows a settings panel with the following sections:

- H.265/H.264 media options:** A dropdown menu set to "Video and audio".
- H.265/H.264 protocol options:** A dropdown menu set to "HTTP".
- Two way audio:** A dropdown menu set to "Half-duplex".
- Local streaming buffer time:** A numeric input field set to "0" with the unit "Millisecond" next to it.

H.265/H.264 media options

Select the video data, audio data, or the both to stream. This option becomes active when the video mode is set to H.265 or H.264.

H.265/H.264 protocol options

The communication method of the video/audio data can be switched.

Note

The function may not operate correctly if you use personal firewall software or antivirus software on your computer. In that case, disable the software or select the TCP mode.

H.265/H.264 streaming has four transfer modes depending on the network environment.

UDP Unicast: When **UDP Unicast** is selected, RTP (Real-time Transport Protocol) is adopted for video/audio communications. RTP is the protocol for real-time video/audio streaming. However video/audio may not be played back properly because of the loss of the network packets depending on the network traffic. In such case, select **TCP**.

UDP Multicast: This protocol allows multicast-enabled routers to forward network packets to all clients requesting streaming media. This helps to reduce the network transmission load of the Network Camera while serving multiple clients at the same time. However, in case that the router that does support multicast or firewall is installed between the camera and the computer, video/audio may not be played back properly. In such a case, select **TCP** or **UDP Unicast**. When this protocol is used, check **Always multicast** in "streaming protocols > RTSP".

TCP: The TCP communication is adopted for video/audio communications. When **TCP** is selected, the video/audio is transmitted via the port number specified in "RTSP port" (page 26) of "Network > Streaming protocols"

This protocol guarantees the complete delivery of streaming data and thus provides better video quality. The downside of this protocol is that its real-time effect is not as good as that of the UDP protocol.

HTTP: When **HTTP** is selected, HTTP communication is adopted for video/audio communications. HTTP is the protocol usually used for reading web pages. In an environment capable of reading web pages, you can watch or listen to video/audio by selecting the HTTP port.

Notes

- When connecting via a proxy server, neither **UDP Unicast** nor **UDP Multicast** can be selected.
- The multicast streaming should be enabled to use **UDP Multicast** function. For details, refer to "RTSP streaming" (page 26).
- Select **HTTP** to use the SSL function.
- When the image codec is set to **JPEG**, **HTTP** is selected for the connection.

Two way audio

Half-duplex

Audio is transmitted from one direction at a time.

Full-duplex

Audio is transmitted in both directions simultaneously.

Local streaming buffer time

In the case of encountering unsteady bandwidth, live streaming may lag and video streaming may not be very smoothly.

If you enable this option, the live streaming will be stored temporarily on your PC's cache memory for a few milliseconds before being played on the live viewing window. This will help you see the streaming more smoothly. If you enter 3,000 Millisecond, the streaming will delay for 3 seconds.

Camera configuration

This section explains how to set the functions of the camera by the Administrator. For details about monitoring the camera image, see "Operating the Camera" (page 8). This section explains the basic operations and each option of the Configuration menu.

Note on the display of menu options

Only currently available options are clearly displayed in the Configuration menu. Grayed out options cannot be selected.

Basic Operations of the Configuration menu

You can use the Configuration menu to set all functions of the camera in detail to suit the user's needs. Click **Configuration** in the viewer to display the Configuration menu.

How to set up the Configuration menu

- 1 Input the user name of the administrator and password, and then log in.

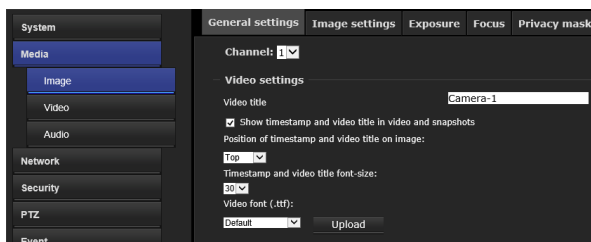
The view window is displayed. For details, refer to "Accessing the Camera Using the Web Browser" (page 5).

- 2 Click **Configuration** on the main menu.

- 3 Click the main menu name (example: System) on the left side of the Configuration menu.

The submenus of the clicked main menu appear. Click again to collapse the submenus.

Example: **Media** menu



- 4 Click the submenu name.

The clicked menu appears.

- 5 Select the tab above the menu, and then set each setting option in the tab.

Example: For details of the menu tabs and setting options of the **General settings** tab of **Media** menu, refer to page 17.

- 6 After setting, click **Save**.

The settings you have made become active.

Move to other page without clicking **Save** to cancel the set values and return to the previous settings.

Common buttons in every menu

The following common buttons are displayed in menus as necessary.

Save

Click this button to activate the settings. Refresh the view without clicking **Save** or move to other page to cancel the set values and return to the previous settings.

General notes on menus

- After changing a setting on a menu, wait at least 30 seconds before turning off the power of the camera. If the power is turned off immediately, the new setting may not be stored correctly.
- If the camera settings are changed while watching the live viewer, some settings cannot be stored. To reflect the change on the opening live viewer, click **Refresh** on the web browser.

Configuration of the Configuration menu

System

Displays the System menu. ("System Menu" (page 14))

Media

Displays the menu for setting the camera image and audio. ("Media menu" (page 17))

Network

Displays the menu for setting the network connection. ("Network menu" (page 24))

Security

Displays the menu for specifying the login user and which computer(s) can connect to the camera. ("Security Menu" (page 29))

PTZ

Displays the PTZ control menu. ("PTZ Menu" (page 34))

Event

Displays the menu for setting events. ("Event Menu" (page 35))

Applications

Displays the menu for setting all built-in detection functions. ("Applications Menu" (page 40))

Recording

Displays the setting menu for recording. ("Recording menu" (page 43))

Storage

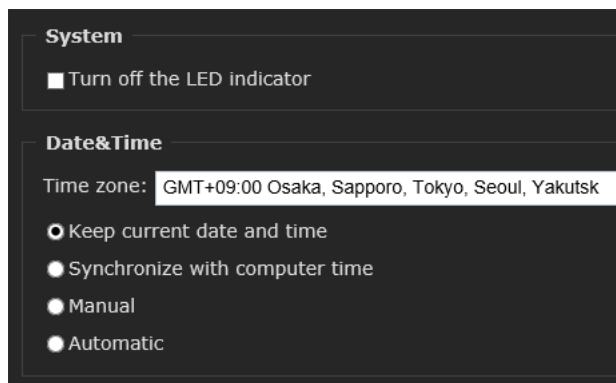
Displays the menu for setting SD card and network storage, and for browsing recording data. ("Storage menu" (page 45))

System Menu

When you click **System** in the Configuration menu, the submenus of the System menu expand. Use this menu to perform the principal settings of the camera.

System > General settings

Configure the general settings for the Camera.



System

Turn off the LED indicator

You can turn off the LED indicator by selecting this option if you do not want others to notice the camera is in operation.

Date&Time

Time zone:

Select an appropriate time zone from the list. For details when uploading daylight saving time rules, refer to "Import/Export files" (page 16) in "System > Maintenance".

Keep current date and time: Select if you want to save the current date and time.

Synchronize with computer time: Select if you want to synchronize the camera's date and time with the computer.

Manual: Select if you want to set the camera's date and time manually. Select the year, month, date, hour, minutes and seconds from each drop-down list.

Automatic: Select if you want to synchronize the date and time of the camera with the time server called NTP (Network Time Protocol) Server. If you select **Automatic**, set NTP server.

NTP server: Assign the IP address or domain name of the NTP server. Leaving the text box blank connects the Network Camera to the default time servers.

Updating interval: Select to update the time using the NTP server on an hourly, daily, weekly, or monthly basis.

Note

Time slip can readily occur in low or high temperature environments. In this case, select **Automatic**.

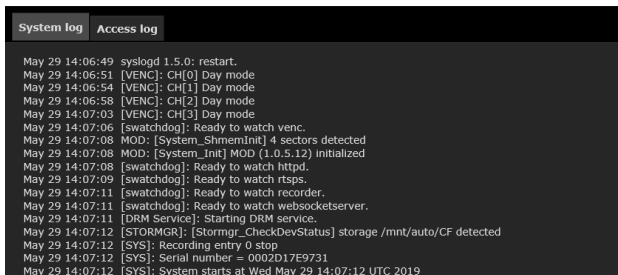
Save

Click **Save** to activate the settings when you complete the settings of this page.

System > Logs

The system log and access log are displayed.

System log

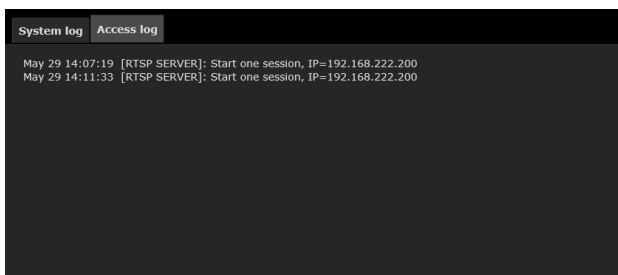


```
System log | Access log
May 29 14:06:49 syslogd 1.5.0: restart.
May 29 14:06:51 [VENC]: CH[0] Day mode
May 29 14:06:54 [VENC]: CH[1] Day mode
May 29 14:06:58 [VENC]: CH[2] Day mode
May 29 14:07:03 [VENC]: CH[3] Day mode
May 29 14:07:06 [swatchdog]: Ready to watch venc.
May 29 14:07:08 MOD: [System_ShmemInit] 4 sectors detected
May 29 14:07:08 MOD: [System_Init] MOD (1.0.5.12) initialized
May 29 14:07:08 [swatchdog]: Ready to watch httpd.
May 29 14:07:09 [swatchdog]: Ready to watch rtsps.
May 29 14:07:11 [swatchdog]: Ready to watch recorder.
May 29 14:07:11 [swatchdog]: Ready to watch websocketsserver.
May 29 14:07:11 [DRM Service]: Starting DRM service.
May 29 14:07:12 [STORMGR]: [Stormgr_CheckDevStatus] storage /mnt/auto/CF detected
May 29 14:07:12 [SYS]: Recording entry 0 stop
May 29 14:07:12 [SYS]: Serial number = 0002D17E9731
May 29 14:07:12 [SYS]: System starts at Wed May 29 14:07:12 UTC 2019
```

This tab displays the system log in a chronological order. The useful information is also saved when a problem occurs. The system log is stored in the Camera's buffer area and will be overwritten when reaching a certain limit.

Click **Reload** to load the latest information.

Access log



```
System log | Access log
May 29 14:07:19 [RTSP SERVER]: Start one session, IP=192.168.222.200
May 29 14:11:33 [RTSP SERVER]: Start one session, IP=192.168.222.200
```

Access log displays access history such as the access time and IP address of all viewers (including operators and administrators) in a chronological order. The access log is stored in the Camera's buffer area and will be overwritten when reaching a certain limit.

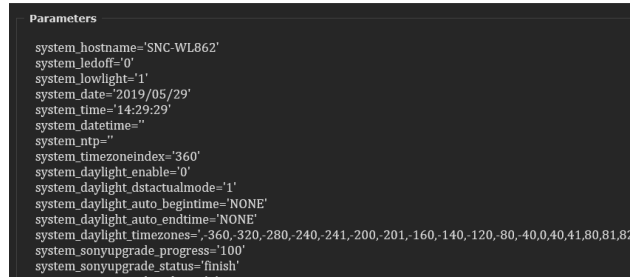
Click **Reload** to load the latest information.

System > Parameters

The **Parameters** page lists the entire system's parameters.

Tip

The parameters may not be displayed depending on the browser environment. Click **Reload** for that case.

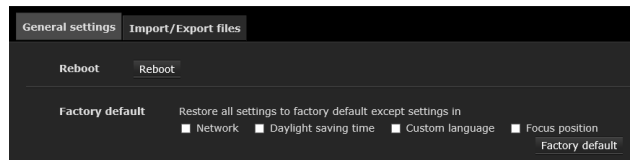


```
Parameters
system_hostname='SNC-WL862'
system_ledoff='0'
system_lowlight='1'
system_date='2019/05/29'
system_time='14:29:29'
system_datetime=''
system_ntp=''
system_timezoneindex='360'
system_daylight_enable='0'
system_daylight_dstactualmode='1'
system_daylight_auto_beginntime='NONE'
system_daylight_auto_endtime='NONE'
system_daylight_timezones='-360,320,280,240,241,200,201,160,140,120,-80,-40,0,40,80,81,82'
system_sonyupgrade_progress='100'
system_sonyupgrade_status='finish'
```

System > Maintenance

General settings

Reboot



```
General settings | Import/Export files
Reboot | Reboot
Factory default | Restore all settings to factory default, except settings in
[ ] Network [ ] Daylight saving time [ ] Custom language [ ] Focus position
Factory default
```

This feature allows you to reboot the system forcibly. It takes about two minutes to complete. After rebooting the system, the focus will be adjusted. Please wait for it to complete. If the connection fails after rebooting, manually enter the IP address of the camera in the address field to resume the connection.

Factory default

This feature allows you to restore the camera to factory default settings. The following option is available.

- Network:** Select to retain the network settings.
- Daylight saving time:** Select to retain the Daylight saving time settings.
- Custom language:** Select to retain the Custom language settings.
- Focus position:** Select to retain the lens focus position.

If none of the options is selected, all settings will be restored to factory default. Click **Factory default**, and the camera reboots automatically. Do not turn off the camera until the camera has restarted.

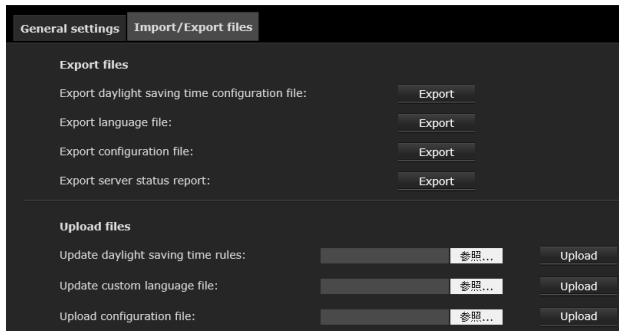
Tip

The camera can also be reset to the factory settings by pressing and holding the reset button (for 5 seconds or more) on the camera.

Note

When the camera is restarted or reset to the factory settings, the alarm is output for about 40 seconds.

Import/Export files



Export files

This feature allows you to save daylight saving time configuration, custom language file, configuration file, and server status report.

Export daylight saving time configuration file

Save the Daylight Saving Time rule in a file. Click **Export** to export the daylight saving time rule.

Export language file

Save the language strings in a file. Click **Export** to export the language strings.

Export configuration file

Click **Export** to export all parameters for the device and user-defined scripts.

Export server status report

Click **Export** to export the current server status report, such as time, logs, parameters, process status, memory status, file system status, network status and so on.

Upload files

Update daylight saving time rules

Click **Browse...**, specify the daylight saving time rule file and click **Upload**.

Editing daylight saving time rules

Open the file with the text editor and locate your time zone; set the start and end time of DST. When completed, save the file.

In the example below, DST begins each year at 2:00 a.m. on the second Sunday in March and

ends at 2:00 a.m. on the first Sunday in November.

```
<TimeZone id="-240" name="(GMT-06:00) Central Time (US and Canada)">
  <StartTime>
    <Shift>60</Shift>
    <Month>3</Month>
    <Day></Day>
    <WeekinMonth>Second</WeekinMonth>
    <DayofWeek>Sunday</DayofWeek>
    <Hour>2</Hour>
  </StartTime>
  <EndTime>
    <Shift>-60</Shift>
    <Month>11</Month>
    <Day></Day>
    <WeekinMonth>First</WeekinMonth>
    <DayofWeek>Sunday</DayofWeek>
    <Hour>2</Hour>
  </EndTime>
</TimeZone>
<TimeZone id="-241" name="(GMT-06:00) Mexico City">
  <StartTime>
```

Update custom language file

Click **Browse...** and specify your own custom language file and click **Upload**.

Upload configuration file

Click **Browse...** to update a configuration file. The model and firmware version of the camera should be the same as the configuration file. If you have set up a fixed IP or other special settings for your camera, it is not recommended to update a configuration file.

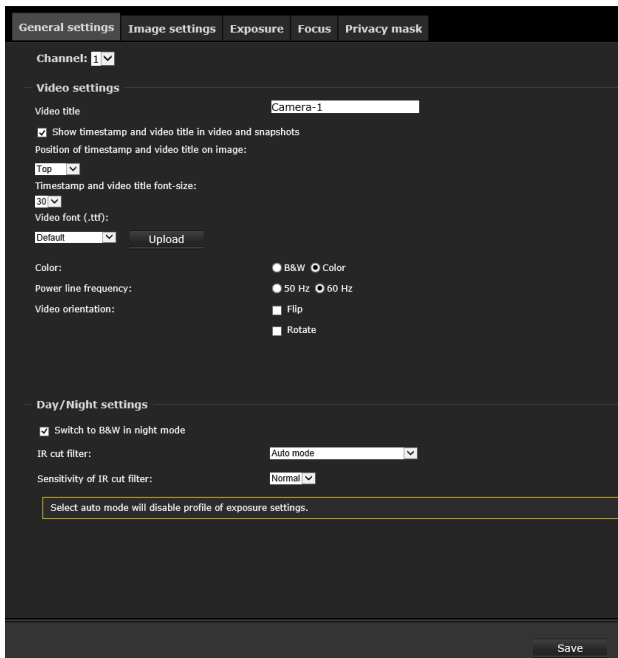
Media menu

When you click **Media** in the Configuration menu, the submenus of the Media menu expand. Use this menu to perform the camera function settings. The Media menu consists of **Image**, **Video** and **Audio**.

Media > Image

Channel: Select a Channel (one of the 4 sensors) before making configurations. These 4 sensors can be individually configured.

General settings



Video settings

Video title

Enter a name that will be displayed on the title bar of the live video.

Show timestamp and video title in video and snapshots

If selected, the time stamp and the video title are displayed in the live view.

Position of timestamp and video title on image

Select to display the time stamp and the video title on the top or at the bottom of the live view.

Timestamp and video title font-size

Select the font size for the time stamp and the video title.

Video font (.ttf)

Select True Type fonts for time stamps and video titles displayed in the live view. Also, select lower-case characters for the file name you specify.

Color

Select to display color or black/white video streams.

Power line frequency

Set the power line frequency consistent with local utility settings to eliminate image flickering associated with fluorescent lights.

Video orientation

Flip: reflect the display of the live view.

Rotate: The rotation here indicates clockwise rotation of the live view to 90 degrees or 270 degrees.

Rotation can be applied with flip and physical lens rotation settings to adapt to different mounting locations.

Day/Night settings

Switch to B&W in night mode

Select this to enable the camera to automatically switch to Black/White during night mode by removing the built-in IR cut filter.

IR cut filter

Select the day/night mode. This function has the following modes.

Auto mode: Normally works in day mode; switches automatically to night mode in a dark place. If you set Auto mode, set the sensitivity for the camera to automatically switch to night mode.

Day mode: Works in day mode at all times.

Night mode: Works in night mode at all times.

Synchronize with digital input: Works in night mode while digital input (sensor input) is active.

Schedule mode: The camera switches between day mode and night mode based on a specified schedule. Enter the start and end time for the day mode.

Sensitivity of IR cut filter

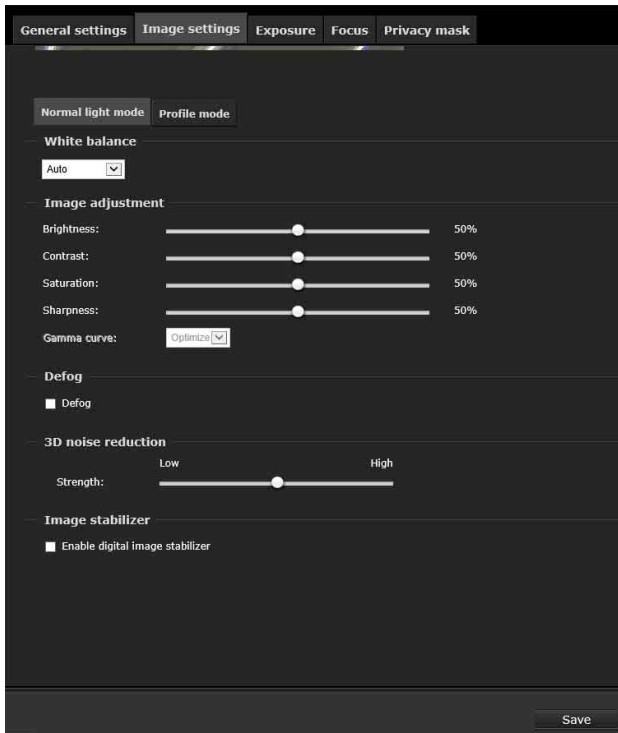
Adjust the sensitivity of IR cut filter to Low, Normal, or High according to the lighting conditions.

When completed with the settings on this page, click **Save** to enable the settings.

Note

If Auto mode is set in the Day/Night settings, profiles for the exposure settings cannot be configured.

Image settings



Channel: Select one of the 4 Channels (sensors).

White balance

Select the White balance mode.

Auto: Adjusts the color automatically towards the original color which is hard to be influenced by the illumination.

Fix current value: Select **ON**, the current white balance is fixed.

Manual: Select this to set **RGain** and **BGain**. The gain value can be in the range 0% to 100%.

You may follow the steps below to adjust the white balance to the best color temperature.

- 1 Place a sheet of paper of white or cooler-color temperature color, such as blue, in front of the lens, and then allow the Network Camera to automatically adjust the color temperature by selecting **Auto** mode.
- 2 Click **ON** button to **Fix current value** and confirm the setting while the white balance is being measured.

Image adjustment

Brightness

Adjust the image brightness level, which ranges from 0% to 100%.

Contrast

Adjust the image contrast level, which ranges from 0% to 100%.

Saturation

Adjust the image saturation level, which ranges from 0% to 100%.

Sharpness

Adjust the image sharpness level, which ranges from 0% to 100%.

Gamma curve

Adjust the image sharpness level, which ranges from 0 to 0.45.

Select a value to change the preferred level of Gamma correction towards higher contrast or towards the higher luminance for detailed expression for both the dark and lighted areas of an image.

Tip

The Gamma curve can be set when **WDR** is set to off in the exposure settings.

Defog

Defog

Defog helps improve the visibility quality of captured image in poor weather conditions such as smog, fog, or smoke.

3D noise reduction

Strength

Select the 3D noise reduction strength by the slide bar.

Note that applying this function to the video channel will consume system computing power. 3D noise reduction is mostly applied in low-light conditions. When enabled in a low-light condition with fast moving objects, trails of after-images may occur. In that case, set Strength to Low.

Image stabilizer

Enable digital image stabilizer

If you experience problems such as vibration occurs when on a pole mount, try enabling the image stabilizer.

Notes

- When the image stabilizer is enabled, the angle of view for shooting will be small.
- Depending on vibrations, the image stabilizer may not function even when it is set to enable.
- Enable the image stabilizer when you install the camera.
- Set a privacy mask position, the range of motion detection, etc. before enabling the image stabilizer.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Restore

You can click **Restore** to recall the original settings without incorporating the changes.

Profile mode

You can also click on Profile mode to adjust all settings in **Image settings** for special lighting conditions.

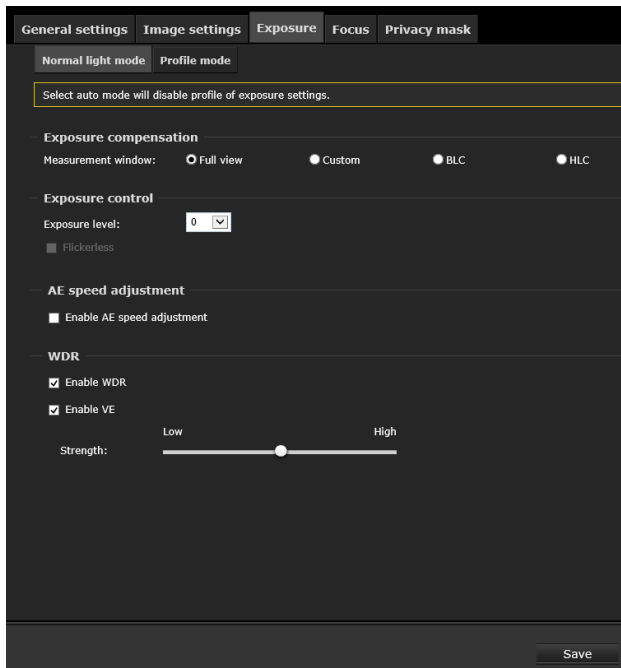
Enable to apply these settings at

Select the mode to apply this profile: Night mode or Schedule mode.

Enter a range of time manually if you choose Schedule mode. Then check Save to take effect.

Exposure strategy

Configure the settings for exposure.



Channel: Select one of the 4 Channels (sensors).

Exposure strategy

You can configure the Exposure measurement window for adjusting the exposure level.

Measurement window

Full view: System calculates the full range of view and provides appropriate light compensation.

Custom: You can manually specify areas to be measured (measurement window) and areas not to be measured (exclusive window). You can specify up to 10 measurement windows and exclusive windows in total.

Add inclusive window: Click to display the frame for the measurement window. Change the frame position and size to set the measurement window.

Add exclusive window: Click to display the frame for the exclusive window. Change the frame position and size to set the exclusive window.

BLC: Enables the backlight compensation function. If you select BLC, a BLC frame is displayed. When a high luminance object is outside the frame, backlight compensation operates.

HLC: Firmware detects strong light sources and compensates on affected spots to enhance the overall image quality. For example, the HLC helps reduce the glares produced by spotlights or headlights.

Exposure control

Exposure level

Select the exposure correction value from the list box to adjust the target brightness for the automatic exposure setting. A larger value brightens the image, and a smaller value darkens the image.

Flickerless

If this option is selected, Flickerless is enabled. Select when you want to reduce the flicker on images.

The Flickerless mode can limit the exposure time to 1/120 ~ 1/5 second. When the exposure time is limited to 1/120 ~ 1/5 second, the over-exposure may be encountered. If the Flickerless option is selected, and users detect over-exposure in the live view, disable the Flickerless option.

Note

The Flickerless function is enabled only when **WDR** is set to off. If you turn on WDR with Flickerless enabled, the Flickerless function will be disabled even though the Flickerless checkbox is selected.

Exposure time

Set the range of automatic control for the exposure time. Determine the minimum value and maximum value by moving the Exposure time slide bar.

Gain control

Set the range of automatic control for the gain. Determine the minimum value and maximum value by moving the Gain control slide bar.

AE speed adjustment

Enable AE speed adjustment

This function applies when you need to monitor fast changing lighting conditions. For example, the camera may need to monitor a highway lane or entrance of a parking area at night where cars

passing by with their lights on can bring fast changes in light levels.

WDR (Wide dynamic range)

Enable WDR

In high-contrast scenes, this function reduces overexposure and underexposure. Select the checkbox to enable the wide dynamic range function.

Enable VE (Visibility Enhancer)

Compensate automatically the intensity and the contrast to brighten the dark part and to reduce the overexposure of the bright part for camera image to be viewed clearly according to the imaging scene.

Select the checkbox to adjust the strength by the slide bar.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Restore

You can click **Restore** to recall the original settings without incorporating the changes.

Profile mode

When the different settings are to be made for night mode and schedule mode respectively, click **Profile** to open the **Profile settings** page.

Select the mode that this profile is to be applied from **Night mode** or **Schedule mode**.

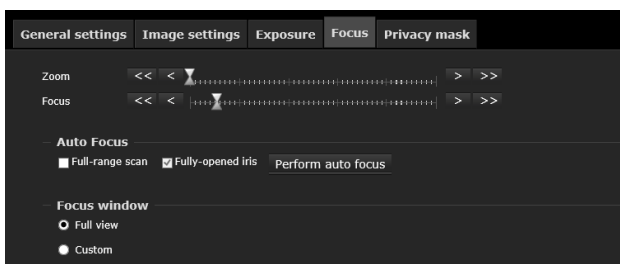
Enter a range of time manually if you choose Schedule mode. Then check **Save** to take effect.

Note

Profile mode is not available when **IR cut filter** is set to **Auto mode**.

Focus

Adjusts the focus.



Channel: Select one of the 4 Channels (sensors).

Zoom

Adjust the optical zoom by moving the slide bar or clicking <<, <, >, >>.

Adjust to the optimized position by monitoring the angle field of the 4 sensors.

Focus

Adjust the focus position manually by moving the slide bar or clicking <<, <, >, >>.

Auto Focus

Full-range scan: When this checkbox is selected, a full-range scan through the camera's entire focal length can take about 30 to 80 seconds.

If not, the auto focus scan will only go through the length where optimal focus may occur, and that takes about 15 to 20 seconds.

Fully-opened iris: Since this camera has the fix Iris, and then checkbox cannot be changed.

Perform auto focus: Click this button to perform auto focus.

Focus window

Select whether you want to perform focus adjustment on the **Full view** or within a **Custom** focus window.

If you select the **Custom**, the focus window is displayed. You can drag the window to a desired position on screen. You can also change the size of the focus window.

Note

Adjust the focus manually when you shoot the following images:

- The low-contrast subject such as the white wall
- The subject through the glass
- The subject that has the lots of the horizontal stripes
- The subject that is shined by the strong light such as the illumination or the reflection of light
- The subject that has the blinking light in the dark background such as the night scene
- The subject that is shined by the illumination or light in the environment that is set to dark color by the exposure adjustment or the exposure correction function

Privacy mask

Using the privacy mask enables you to hide images by masking specified parts of the images when streaming.

Setting a privacy mask

To set a privacy mask in the position of your choice:

1 Click **New**.

A text box appears allowing you to enter a name for the mask.

2 Enter a name for the mask in a window name.

- 3 Click on four points on the Preview screen to specify the privacy mask area.
- 4 Select the **Enable privacy mask** checkbox.
- 5 Click **Save**.
The mask is reflected.

Note

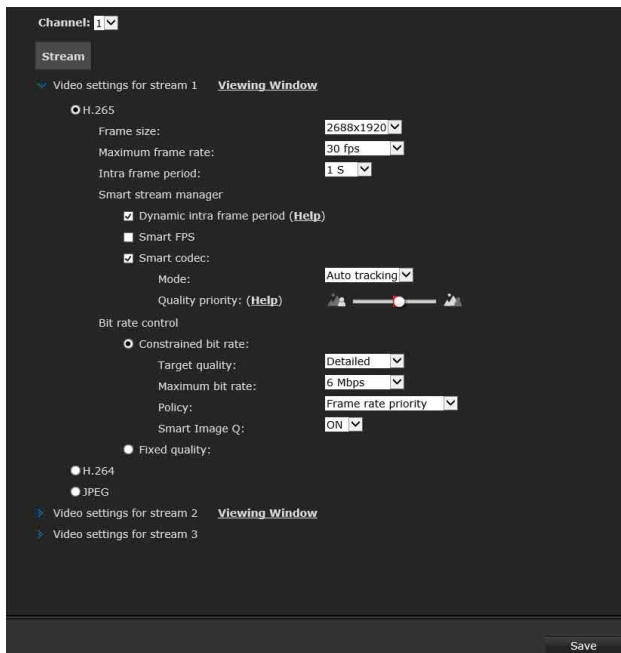
Up to five privacy masks can be set.

Delete privacy mask

To delete privacy masks, click **✖** on the right side of the window name, and then click **OK**.

Media > Video

Three settings for the video stream can be made for each channel. Set the following settings for each stream respectively.



Channel: Select a Channel (one of the 4 sensors) before making configurations. These 4 sensors can be individually configured.

Viewing Window

The stream 1 or stream 2 can be viewed by the frame size that is set in the **Viewing Window**. Click **Viewing Window** to open the viewing region settings page. On this page, you can configure the ROI (Region of Interest) and the Output Frame Size for a video stream.

For example, you can crop only a portion of the image that is of your interest, and thus save the bandwidth needed to transmit the video stream.

Follow the steps below to configure the settings for a stream:

- 1 Select a stream for which you want to set up the viewing region.
- 2 Select the frame size from the drop-down list of the **Region of interest**.
- 3 The region that to be viewed is displayed by the floating frame.

You can resize and drag the floating frame to a desired position using your mouse and determine the ROI.

The floating frame, the same as the one in the **Global view** window on the live viewer, can be resized and repositioned in the **Global view** accordingly.

Note

ROI should not be larger than the Output Frame Size.



When completed with the settings in the **Viewing Window**, click **Save** to enable the settings and click **Close** to exit the window. The selected Output Frame Size will immediately be applied to the Frame size of each video stream. Then you can return to the live view to use the e-PTZ function. For more information about the e-PTZ function, refer to page 34.

Video settings for stream 1, stream 2 and stream 3

Video codec

Select **H.265**, **H.264** or **JPEG**.

When **H.265** or **H.264** is selected, the video is streamed via RTSP protocol.

Note

Depending on the bit rate value settings of stream 1, stream 2 and stream 3, the following symptoms may occur.

- The image is delayed more than usual.
- The frame is skipped when playing an image.
- The voice is broken.

- The response of the camera to commands is delayed.
- When JPEG is selected, the audio data is not sent to the client.

Frame size

Select the frame size that is delivered from the camera.

This camera supports multiple streams with frame sizes ranging from 448 x 320 to 2688 x 1920 pixels. The stream 1 or stream 2 can be viewed by the frame size that is set in the **Viewing Window**.

Note

A larger frame size takes up more bandwidth.

Maximum frame rate

Set the maximum frame rate of the image.

The "fps" is a unit that denotes the number of the delivered frames per second.

If the power line frequency is set to 50Hz, the frame rates are selectable at 1fps to 25fps. If the power line frequency is set to 60Hz, the frame rates are selectable at 1fps to 30fps.

You can also select **Customize** and manually enter a value.

Intra frame period

Intra frame period (H.265 or H.264 is selected)

Set the intra frame period on a second basis. Select the intra frame period from the following durations: 1/4 second, 1/2 second, 1 second, 2 seconds, 3 seconds, and 4 seconds.

The shorter the duration, the more likely you will get better video quality, but at the cost of higher network bandwidth consumption.

Smart Stream management

Dynamic intra frame period

By dynamically prolonging the intervals for I-frames insertion to up to 10 seconds, the bit rates required for streaming a video can be tremendously reduced.

When streaming a video of a static scene, the dynamic intra frame period is prolonged and the bandwidth can be saved. If activities occur in the scene, firmware automatically shortens the I-frame insertion intervals in order to maintain image quality. In the low light or night conditions, the I-frames can have a larger size due to the noises, and hence the bandwidth saving effect is also reduced.

Smart FPS

In a static scene, the algorithm puts old frames in queue when no motions occur in scene. When motions occur, the encoding returns to normal to deliver real-time streaming.

By queuing the old frames from a static scene, both the bit rate and the size of P frames are reduced.

Smart codec

Smart codec effectively reduces the quality of the whole or the non-interested areas on a screen and therefore reduces the bandwidth consumed.

You can manually specify the video quality for the foreground and the background areas.

Mode

Auto tracking:

The Auto mode configures the whole screen into the non-interested area. The video quality of part of the screen returns to normal when one or more objects move in that area. The remainder of the screen where there are no moving objects (no pixel changes) will still be transmitted in low-quality format.

Manual:

The Manual mode allows you to configure 3 ROI windows (Region of Interest, with Foreground quality) on the screen. Areas not included in any ROI windows will be considered as the non-interested areas. The details in the ROI areas will be transmitted in a higher-quality video format.

In the Manual mode, the non-interested area is always transmitted using a low-quality format regardless of the activities inside.

Hybrid:

In the Hybrid mode, any objects entering the non-interested area will restore the video quality of the moving objects and the area around them. The video quality of the associated non-interested area is immediately restored to normal to cover the moving objects.

Quality priority

Use the slide bar to tune the quality contrast between the ROI (Region of Interest) and non-interested areas.

The farther the slide bar button is to the right, the higher the image quality of the ROI areas. On the contrary, the farther the slide bar button is to the left, the higher the image quality of the non-interested area.

Bit rate control

Constrained bit rate (CBR)

Select when you want to compress an image by a constant bit rate.

You can set the average bit rate of image transmission for a line. When the bit rate is set to a high level, better image quality can be enjoyed.

Target quality:

Select the target quality from the five options or select Customize and input the numeric value from 1 to 100%.

Maximum bit rate:

Select a bit rate from the pull-down menu. The bit rate ranges from 20kbps to a maximum of 80Mbps. Or select Customize to input the bit rate directly.

The bit rate then becomes the Average or Upper bound bit rate number. The camera will strive to deliver video streams around or within the bit rate limitation you impose.

Policy:

If **Frame rate priority** is selected, the camera will try to maintain the frame rate per second performance, while the image quality will be compromised.

If **Image quality priority** is selected, the Network Camera may drop some video frames in order to maintain image quality.

Smart Image Q:

Select **ON** or **OFF** to enable or disable the feature. Smart Image Q is scene-aware. The Smart Q reduces frame size and bit rate consumption through the following:

- Dynamically adjusting the image quality for scenes in different luminosities while keeping the same imaging quality in low light.
- Endorsing different qualities for the I frames and P frames.
- Dividing a single frame into different sections, and giving these sections different quality values. For a highly complex image section (high frequency area), such as an area with dense vegetation, screen windows, or repeated patterns (wall paper), having a lower quality actually poses little effects on human eyes.

Fixed quality (VBR)

Select if you want that all frames are transmitted with the same quality.

In this case, bandwidth utilization is therefore unpredictable. The video quality can be adjusted from 5 options. You can also select **Customize** and manually enter a value.

Maximum bit rate: When Fixed quality (VBR) is selected, the transfer bit rate is limited to less than the value set in the Maximum bit rate.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Muting

Select this option to disable audio transmission from the camera to all clients. Note that if muted, no audio data will be transmitted even if audio transmission is enabled on the **Client settings** page.

Microphone source

Select the internal microphone or external input.

Internal microphone input gain

Select the gain of the internal audio input. Adjust the gain from 0% to 100%.

External microphone input gain

Select the gain of the external audio input. Adjust the gain from 0% to 100%.

Audio type

Select the audio codec type.

G.711: G.711 requires about 64Kbps. Select pcmu (μ -Law) or pcma (A-Law) mode.

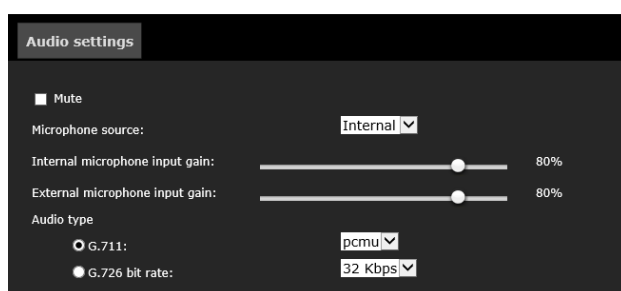
G.726: Select from 16, 24, 32, and 40kbit/s.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Media > Audio

Configure the settings for audio.



Network menu

When you click **Network** in the Configuration menu, the submenus of the Network menu expand. Use this menu to perform the network settings of the camera.

Network > General settings

LAN

Configure the local area network (LAN) setting. Click on the **Save** button when you complete the Network setting.

The screenshot shows the 'Network type' configuration window. The 'Network type' section has 'LAN' selected. Under 'Use fixed IP address', the following fields are filled: IP address: 192.168.222.73, Subnet mask: 255.255.255.0, Default router: 192.168.222.1, Primary DNS: 192.168.222.1. There are also empty fields for Secondary DNS, Primary WINS server, and Secondary WINS server. At the bottom, 'Enable UPnP presentation' and 'Enable UPnP port forwarding' are checked, and 'Enable IPv6' is unchecked.

Get IP address automatically

The IP address is obtained from DHCP server automatically. The IP address, subnet mask and default gateway are assigned automatically.

Note

When you select **Get IP address automatically**, make sure that a DHCP server is operating on the network.

Use fixed IP address

When you use the fixed IP address, enter the network information such as the IP address.

IP address: Enter the IP address of the camera.

Subnet mask: Enter the subnet mask.

Default router: Enter the default gateway.

Primary DNS: Enter the IP address of the primary DNS server.

Secondary DNS: Enter the IP address of the secondary DNS server.

Primary WINS server: Enter the IP address of the primary WINS server.

Secondary WINS server: Enter the IP address of the secondary WINS server.

Enable UPnP presentation:

Select this option to enable UPnP presentation for your camera so that whenever a camera is presented to the LAN, the shortcuts to connected cameras will be listed in **My Network Places**. You can click the shortcut to link to the web browser.

Enable UPnP port forwarding:

To access the Network Camera from the Internet, select this option to allow the Network Camera to open ports automatically on the router so that video streams can be sent out from a LAN. To utilize of this feature, make sure that your router supports UPnP and it is activated.

IPv6

Configure the IPv6 network setting.

The screenshot shows the IPv6 configuration window. The 'Enable IPv6' checkbox is checked. Under the 'IPv6 information' section, the 'Manually setup the IP address' checkbox is unchecked.

Select the checkbox to enable the IPv6 settings.

De-select the **Manually setup the IP address** to get the IPv6 address automatically. The IP address, prefix length and default gateway are assigned automatically.

Note

If you obtain an IP address automatically, ask the network administrator whether an IPv6 address can be assigned.

This function is not available in a multi-prefix environment. The transmission may not work properly.

IPv6 information

Click **IPv6 information** to obtain its information.

Refer to Ethernet

Link-local IPv6 address/
network mask

Link-global IPv6 address/network mask

close

[eth0 address]
2012:abcd:1234:5678:0202:d1ff:fe25:5fcc/64@Global
fe80:0000:0000:0000:0202:d1ff:fe25:5fcc/64@Link
2012:abcd:1234:5678:2c1f:4c31:ffa0:0031/128@Global

[Gateway]
fe80::2c33:8817:a835:4ca8

[DNS]
2012:abcd:1234:5678::2

To link to the IPv6 address, follow the procedure below.

- 1 Open your web browser.
- 2 Enter the link-global or link-local IPv6 address in the address bar of your web browser.

Memo

The address format should be:

[http://\[2001:cf8:1:1117:0:dddd:27b8:b0ce\]/](http://[2001:cf8:1:1117:0:dddd:27b8:b0ce]/)

- 3 Press **Enter** on the keyboard or click the **Refresh** button to refresh the web page.

Note

If you have a Secondary HTTP port (the default value is 8080), you can also link to the web page in the following address format. (See "HTTP streaming" (page 25).)

IPv6 address

Secondary HTTP port

[http://\[2001:cf8:1:1117:0:dddd:27b8:b0ce\]/:8080](http://[2001:cf8:1:1117:0:dddd:27b8:b0ce]/:8080)

To specify the fixed IPv6 address manually

Select the **Manually setup the IP address**. Enter the appropriate values in the **IP address/Prefix length**, **Default gateway** and **Primary DNS** fields respectively.

Optional IP address/Prefix length: Enter the IP address and prefix length of the camera.

Optional default router: Enter the default gateway.

Optional primary DNS: Enter the IP address of the primary DNS server.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Network > Streaming protocols

HTTP streaming

HTTP RTSP AUDIO

Authentication: basic

HTTP port: 80

Secondary HTTP port: 8080

Channel 1

Access name for stream 1: video1s1.mjpg

Access name for stream 2: video1s2.mjpg

Access name for stream 3: video1s3.mjpg

Channel 2

Access name for stream 1: video2s1.mjpg

Access name for stream 2: video2s2.mjpg

Access name for stream 3: video2s3.mjpg

Channel 3

Access name for stream 1: video3s1.mjpg

Access name for stream 2: video3s2.mjpg

Access name for stream 3: video3s3.mjpg

Channel 4

Access name for stream 1: video4s1.mjpg

Access name for stream 2: video4s2.mjpg

Access name for stream 3: video4s3.mjpg

Authentication

Set an authentication system to be used for the user authentication of the HTTP streaming.

basic: use the basic authentication.

digest: use the digest authentication.

When you changed the **Authentication mode**, close the web browser, and access the camera by using the web browser again.

HTTP port

The default setting is 80. If you set to the other port, specify the port number from 1025 to 65535.

Secondary HTTP port

The default setting is 8080. If you set to the other port, specify the port number from 1025 to 65535.

Access name for stream 1 to 3

The camera supports multiple streams simultaneously. The access name is used to identify different video streams.

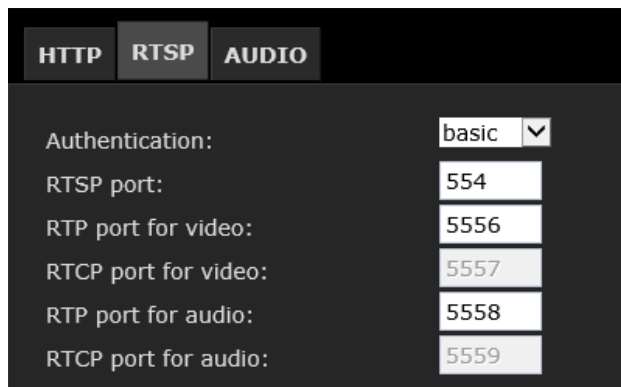
Enter the access name for video stream 1 to 3 per channel respectively.

Save

When completed with the settings on this page, click **Save** to enable the settings.

RTSP streaming

To utilize RTSP streaming authentication, make sure that you have set a password for controlling the access to video stream first. For details, refer to "Security > User accounts" (page 29).



HTTP	RTSP	AUDIO
Authentication: basic		
RTSP port: 554		
RTP port for video: 5556		
RTCP port for video: 5557		
RTP port for audio: 5558		
RTCP port for audio: 5559		

Authentication

Set an authentication type to be used for the user authentication of the RTSP streaming.

disable: No authentication is used.

basic: use the basic authentication.

digest: use the digest authentication.

When you changed the **Authentication**, close the web browser, and access the camera by using the web browser again.

Unicast streaming settings

RTSP port

RTSP (Real-Time Streaming Protocol) controls the delivery of streaming media. By default, the port number is set to 554.

RTP port

The RTP (Real-time Transport Protocol) is used to deliver video and audio data to the clients. By default, the RTP port for video is set to 5556. There is RTP port for Audio in addition to Video.

RTCP port

The RTCP (Real-time Transport Control Protocol) allows the camera to transmit the data by monitoring the Internet traffic volume. By default,

the RTCP port for video is set to 5557. There is RTCP port for Audio in addition to Video.

The ports can be changed to values between 1025 and 65535. The RTP port must be an even number and the RTCP port is the RTP port number plus one, and thus is always an odd number.

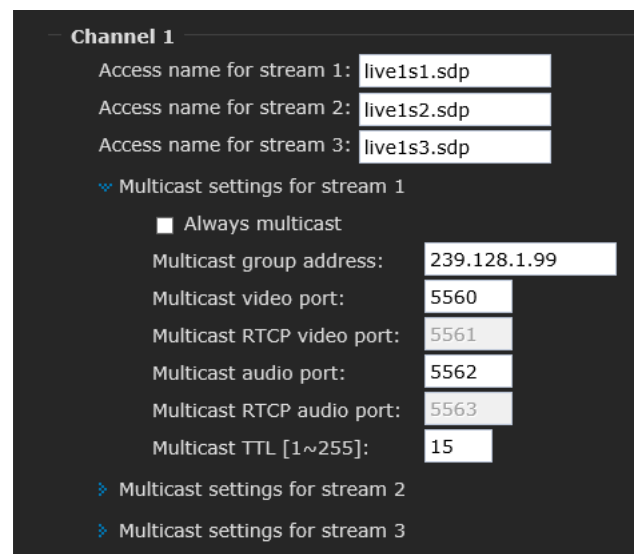
Specify the different number for video port number and audio port number.

Access name for stream 1 to 3

Enter the access name for video stream 1 to 3 per channel respectively.

Multicast streaming settings

Click these items to perform the multicast streaming settings of stream 1, stream 2 and stream 3 for each channel.



Channel 1	
Access name for stream 1:	live1s1.sdp
Access name for stream 2:	live1s2.sdp
Access name for stream 3:	live1s3.sdp
Multicast settings for stream 1	
<input checked="" type="checkbox"/> Always multicast	
Multicast group address:	239.128.1.99
Multicast video port:	5560
Multicast RTCP video port:	5561
Multicast audio port:	5562
Multicast RTCP audio port:	5563
Multicast TTL [1~255]:	15
Multicast settings for stream 2	
Multicast settings for stream 3	

Always multicast

Select the **Always multicast** checkbox to enable multicast for video streams.

Unicast video transmission delivers a stream through point-to-point transmission; multicast, on the other hand, sends a stream to the multicast group address and allows multiple clients to acquire the stream at the same time by requesting a copy from the multicast group address. Therefore, enabling multicast can effectively save Internet bandwidth.

Multicast group address

The multicast address used on the RTSP multicast streaming.

Multicast video port

Specify the video transmission port number used for the multicast streaming. Specify an even number from **1024** to **65534**. Two port numbers (the number specified here and an odd number with 1 added to the specified number) are used for video data communication and control.

Multicast audio port

Specify the audio transmission port number used for the multicast streaming. Specify an even number from **1024** to **65534**. Two port numbers (the number specified here and an odd number with 1 added to the specified number) are used for audio data communication and control.

Note

Set the different number for video port number and audio port number.

Multicast TTL [1 ~ 255]

The multicast TTL (Time To Live) is the value that tells the router the range a packet can be forwarded.

TTL	Range
0	Restricted to the same host
1	Restricted to the same subnetwork
32	Restricted to the same site
64	Restricted to the same region
128	Restricted to the same continent
255	Unrestricted in scope

Save

When completed with the settings on this page, click **Save** to enable the settings.

Using RTSP players

When you access to the network camera using RTSP players, you can use the following command to request the delivering of the streaming data.

```
rtsp:// <ip address>:<rtsp port> / <RTSP streaming access name for stream1, stream2, stream3>
```

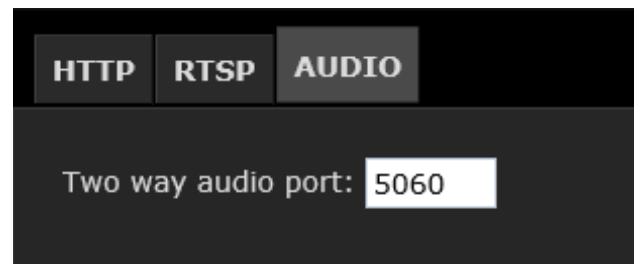
For example, when the access name for stream 1 is set to live1s1.sdp:

- 1 Launch the RTSP player.
- 2 Select File > Open URL.
A URL dialog box will pop up.
- 3 Enter the above URL command in the text box.
- 4 The live video will be displayed in your player.

Note

Set the video mode to H.265 or H.264 if the RTSP player is used.

Audio



Two way audio port

By default, the two way audio port is set to 5060. The ports can be changed to values between 1025 and 65535.

The camera supports two way audio communication so that operators can transmit and receive audio simultaneously. By using the camera's built-in or external microphone and an external speaker, you can communicate with people around the camera.

Note

The audio communication is disabled if JPEG is selected in the video settings.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Network > QoS

You can mark the data traffic packets sent from the camera and configure the settings for QoS control. QoS (Quality of Service) refers to a resource reservation control mechanism, which guarantees a certain quality to different services on the network. QoS guarantees are important if the network capacity is insufficient, especially for real-time streaming multimedia applications.

Requirements for QoS

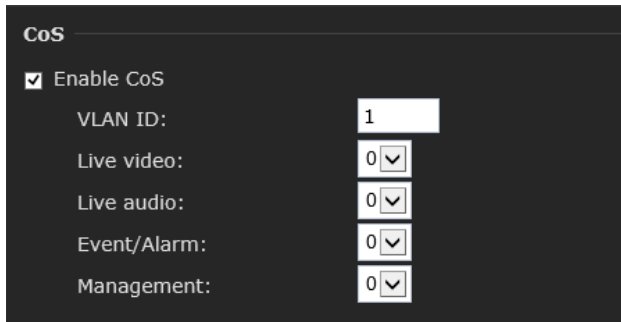
To utilize QoS in a network environment, the following requirements must be met:

- All network switches and routers in the network must include support for QoS.
- The network video devices used in the network must be QoS-enabled.

QoS settings

CoS (Class of Service)

CoS is a kind of QoS, and the eight levels of the frame priority can be set. CoS can be used when VLAN is used.



The screenshot shows the CoS configuration page. It has a title 'CoS' and a checked checkbox 'Enable CoS'. Below this are four rows of settings: 'VLAN ID' with a text input field containing '1', 'Live video' with a dropdown menu showing '0', 'Live audio' with a dropdown menu showing '0', 'Event/Alarm' with a dropdown menu showing '0', and 'Management' with a dropdown menu showing '0'.

Enable CoS

Select the checkbox to enable CoS. Enter the VLAN ID of your switch (0 to 4095) and choose the priority for each application (0 to 7).

Note

When CoS is enabled, only the computer on the same VLAN can access the camera.

QoS/DSCP



The screenshot shows the QoS/DSCP configuration page. It has a title 'QoS/DSCP' and a checked checkbox 'Enable QoS/DSCP'. Below this are four rows of settings: 'Live video' with a text input field containing '0', 'Live audio' with a text input field containing '0', 'Event/Alarm' with a text input field containing '0', and 'Management' with a text input field containing '0'.

Enable QoS/DSCP

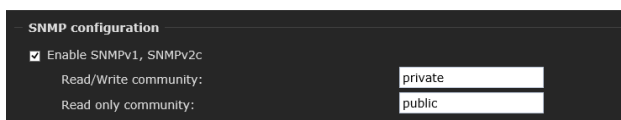
Select the checkbox to configure the QoS/DSCP. Set values (0 to 63) to mark the data traffic.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Network > SNMP

SNMP configuration



The screenshot shows the SNMP configuration page. It has a title 'SNMP configuration' and a checked checkbox 'Enable SNMPv1, SNMPv2c'. Below this are two rows of settings: 'Read/Write community' with a text input field containing 'private', and 'Read only community' with a text input field containing 'public'.

Enable SNMPv1, SNMPv2c

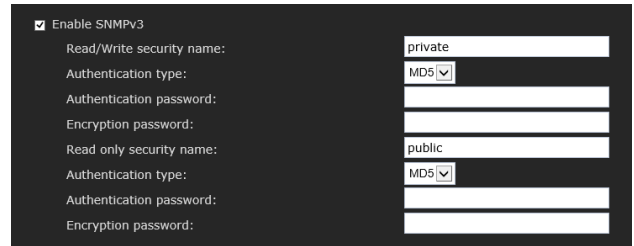
Select the checkbox to enable SNMPv1 and SNMPv2c.

Read/Write community

Enter the name of Read/Write community.

Read only community

Enter the name of Read only community.



The screenshot shows the SNMPv3 configuration page. It has a checked checkbox 'Enable SNMPv3'. Below this are six rows of settings: 'Read/Write security name' with a text input field containing 'private', 'Authentication type' with a dropdown menu showing 'MD5', 'Authentication password' with a text input field, 'Encryption password' with a text input field, 'Read only security name' with a text input field containing 'public', 'Authentication type' with a dropdown menu showing 'MD5', and 'Encryption password' with a text input field.

Enable SNMPv3

Select the checkbox to enable SNMPv3.

Read/Write security name

Enter the name of Read/Write security name.

Authentication type

Select the authentication method.

Authentication password

Enter the password for authentication (at least 8 characters).

Encryption password

Enter a password for encryption (at least 8 characters).

Read only security name

Enter the name of Read only security name.

Authentication type

Select the authentication method.

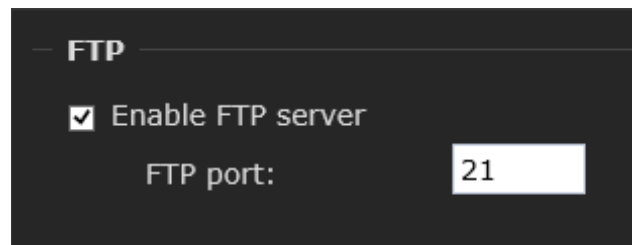
Authentication password

Enter the password for authentication (at least 8 characters).

Encryption password

Enter a password for encryption (at least 8 characters).

Network > FTP



The screenshot shows the FTP configuration page. It has a title 'FTP' and a checked checkbox 'Enable FTP server'. Below this is one row of settings: 'FTP port' with a text input field containing '21'.

Enable FTP server

Select the checkbox to enable FTP Server. When FTP server is used, users can download the video clips stored on the microSD card.

FTP port

By default, the FTP port is set to 21. The ports can be changed to values between 1025 and 65535.

Note

The password will not be coded by FTP protocol, Disable the FTP if you need the security.

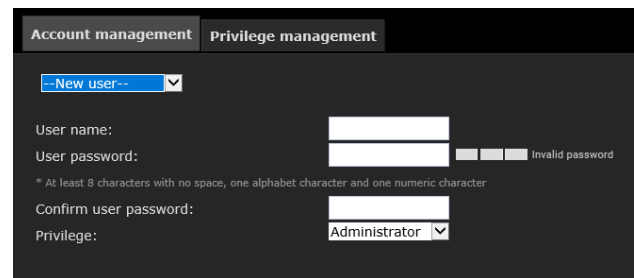
Security Menu

When you click **Security** in the Configuration menu, the submenus of the Security menu expand.

Security > User accounts

Set the user names and passwords of Administrator and users (up to 9 users), and the viewer mode of each user.

The administrator account name is **admin**, which is permanent and cannot be deleted.



Account management

To create a new user,

- 1 Click to unfold the pull-down menu. Select **New user**.
- 2 Enter the new user's name and password.
 - To confirm the password, enter the password that you entered in the password confirmation box.
 - The valid characters for password combination are A-Z, a-z, 0-9, !, %, -, @, _, ^, ~.
 - The strength of your password combination is shown on the right.
 - Use the combination of alphabetic, numeric, upper case, and lower case characters until the password strength is good enough.
 - The password should contain at least 8 characters.
- 3 Select the privilege level for the new user account.
Click **Add** to enable the setting.

The privilege levels are listed below:

Administrator: The administrator can operate all functions. The only administrator can enter the Configuration page.

Operator: The operator can operate the Viewer screen and can transmit the CGI commands.

Viewer: The viewer can only operate the Viewer screen.

In **Account management**, you can also change a user's access rights or delete user accounts.

- 1 Select an existing account to modify.
- 2 Make necessary changes and click **Update** or **Delete** to enable the setting.

Privilege management

Allow anonymous viewing

If you select this item, any client can access the video stream using the method other than live viewer without entering a User ID and Password.

Operator, Viewer

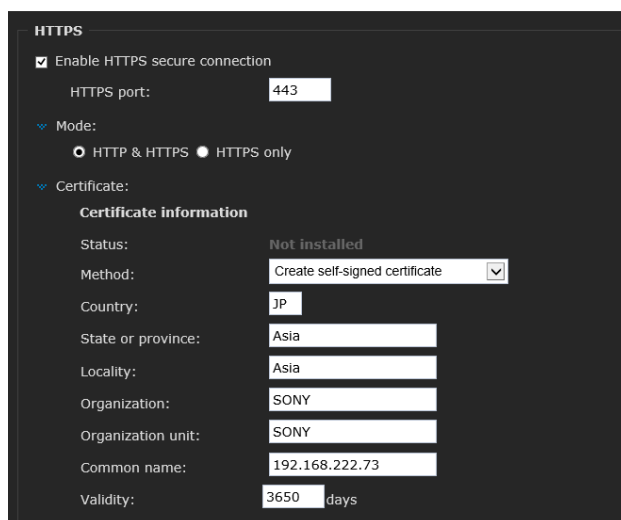
Set the management privilege of **Digital output** and **PTZ control** for each of the operator and the viewer respectively.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Security > HTTPS

Configure the SSL function. The settings allow the camera to communicate with the client PC by using SSL.



Enable HTTPS

Select the checkbox to use HTTPS (SSL).

HTTPS port

Enter the HTTPS port number. The default setting is 443.

Mode

Select the connection mode.

HTTP & HTTPS: You can use HTTP and SSL connection simultaneously.

HTTPS only: Only SSL connection will be allowed.

Certificate

Create self-signed certificate

The private key information corresponding to the certificate is stored in the camera in the **Create self-signed certificate** mode. You do not need to install an external certificate. However, you cannot execute the existence proof, which is one of the SSL functions, for the following reasons.

- The private key generated in the camera is self-signed by the camera.
- A prepared value is set for a distinct name (Common name, etc).
- The certificate is not issued by a trusted CA. For reasons of security, we recommend using this mode only when there is no problem even if perfect security is not saved.

Certificate request and install

Select this method if you use the authenticated certificate.

Steps to create the self signed certificate

- 1 Select **Enable HTTPS** checkbox.
- 2 Select a connection mode.
- 3 Select **Create self-signed certificate** for authentication, and then click **Create certificate** to generate a certificate.

The Certificate Information will be displayed. Click **Certificate properties** to view detailed information about the certificate.

- 4 Click **OK** to save your configuration.

The camera changes to the encrypted connection.

Certificate request and install

- 1 Select **Enable HTTPS** checkbox.
- 2 Select a connection mode.
- 3 Select **Create certificate request and install** for authentication, and then click **Create certificate** to generate a certificate.

- 4 Prepare the authenticated certificate.

- 5 Click **Browse...** in **Select certificate file** to select the authenticated certificate. Click **Upload** to upload the selected file to the camera.

Notes

- The upload will fail if the selected file is not a certificate or is an invalid certificate.
- Make sure to set the date and time on the camera correctly before performing this operation. If the

date and time are not correctly set, it may cause browser connection problems.

- If the connection does not automatically change to an encrypted connection, click **Viewer** to return to the viewer window. Change the URL address from "http://" to "https://" in the address bar, and then press **Enter** on your keyboard.

Some Security Alert dialogs will pop up. Click **OK** or **Yes** to enable HTTPS.

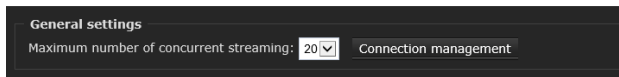
Delete

Click **Delete** to delete a certificate or self-signed certificate imported to the camera.

Security > Access list

Set the security function to restrict the computer that can access the camera.

Likewise, when using IPv6, security settings can be configured for each network.



General settings

Maximum number of concurrent streaming

Select the maximum number of simultaneous live viewing (including stream 1 to stream 3). The default value is 20. If you modify the value and click **Save**, all current connections will be disconnected and automatically attempt to re-link.

Tip

When **Quad display** (quad-screen display) is selected on the live viewer, four streams are used for a browser. Therefore, the maximum number of clients is 5.

Connection management

If **Connection management** is clicked, the only consoles that are currently displaying live streaming will be listed in the **Connection management list**.

IP address: The IP address of the client that is currently accessing the camera.

Elapsed time: How much time the client has been at the web-page.

User ID: The user name of the client will be displayed in the **User ID** column. If the administrator allows clients to link to the web-page without a user name and password, the **User ID** column will be empty.

Refresh: Click this button to refresh all current connections.

Add to deny list: You can select entries from the Connection status list and add them to the Denied list to deny access. If you want to enable the denied

list, check **Enable access list filtering** and click **Save** in the first column.

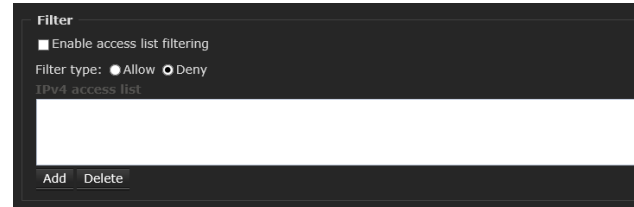
Disconnect: If you want to break off the current connections, select the client and click **Disconnect** button.

Close: Close the Connection management window.

Filter

Enable access list filtering

Select the checkbox to enable access list filtering.



Filter type

Select the filter type.

Allow: only those clients whose IP addresses are on the access list below can access the camera, and the others cannot.

Deny: those clients whose IP addresses are on the access list below will not be allowed to access the Network Camera, and the others can.

Add IP addresses to the access restriction

- 1 Click **Add**.

The filter address window opens in a new window.

- 2 Select the rule for the IP addresses to add to the access list.

Single: You can add an IP address.

Network: You can assign a network address and corresponding subnet mask. The routing prefix is written in CIDR format.

Range: You can assign a range of addresses.

Note

Range is only applied to IPv4.

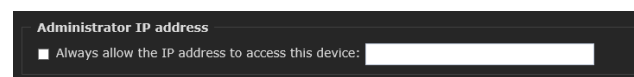
Delete from the access restriction

Select the access restriction that you want to delete, and then click **Delete**.

Note

The access restriction for IPv6 can be displayed only when IPv6 setting is enabled.

Administrator IP address



Always allow the IP address to access this device

You can check this item and add the Administrator's IP address in this field to make sure the Administrator can always connect to the device.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Security > IEEE 802.1x

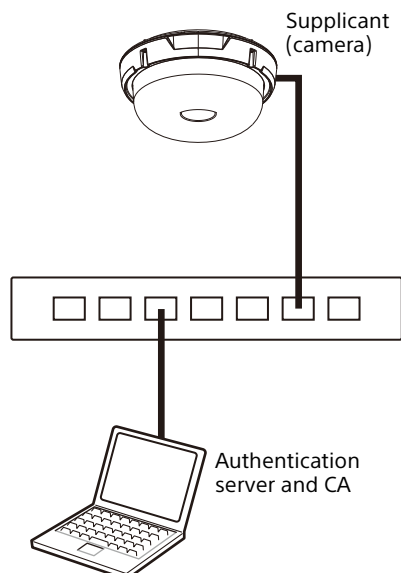
Configure the wired port-based authentication in compliance with the IEEE 802.1x standard.

Notes

- To use the IEEE 802.1x authentication function, you need knowledge of the IEEE 802.1x authentication and digital certificate. To establish an IEEE 802.1x network, you need to configure the authenticator, authentication server and other elements. For details on these settings, refer to the manual of the corresponding equipment.
- When using the IEEE 802.1x authentication function, always configure the settings after setting the date and time of the camera. If the date and time are incorrect, port authentication may not be performed correctly.

System configuration of IEEE 802.1x network

The following figure shows a general system configuration of an IEEE 802.1x network.



Supplicant

A supplicant is a device that connects to the authentication server to join the network. This camera serves as a supplicant in the IEEE 802.1x network. The supplicant can enter the IEEE 802.1x network after appropriate authentication by the authentication server.

Authenticator

An authenticator forwards certificate request data or response data that the supplicant or authentication server issues to the other party. Normally a hub, router or access point serves as an authenticator.

Authentication server

An authentication server has a database of connecting users and verifies whether the supplicant is a valid user or not. It can also be called a RADIUS server.

CA (Certificate Authority)

A CA issues and manages certificates of the authentication server (CA certificates) and user certificates. The CA is essential for certificate-based user authentication. Normally a CA is located inside an authentication server.

Note

This camera supports EAP mode, in which the supplicant and the server authenticate using the certificate. This mode may require a CA to issue the certificate.

IEEE 802.1x settings

Enable IEEE 802.1x

Select the checkbox to enable the IEEE 802.1x authentication function.

EAP method

You can select the authentication method used with the authentication server. This camera supports TLS and PEAP.

EAP-TLS: By this method, the supplicant and the server authenticate each other using a certificate. This enables secure port authentication.

EAP-PEAP: By this method, an EAP password is used for the supplicant authentication and a certificate is used for server authentication.

Identity

Enter the user name to identify the client in the IEEE 802.1x authentication server.

Password

Enter a supplicant EAP password when PEAP is selected with EAP method. The password must contain half-width characters and the length should be within 50 characters.

CA certificate

You can upload a trusted CA certificate (server certificate or route certificate). Only the PEM format is supported.

To upload the CA certificate

Click **Browse...** to select the CA certificate to be imported.

Click the **Upload** button, and the selected file will be imported to the camera.

Note

The upload will fail if the selected file is not a CA certificate.

Click **Delete**, and the CA certificate stored in the camera will be deleted.

Client certificate

When TLS is selected as the EAP method, the client certificate is imported, displayed or deleted for the camera authentication.

To upload the client certificate

Click **Browse...** to select the client certificate to be uploaded.

Click the **Upload** button, and the selected file will be uploaded to the camera.

Note

The upload will fail if the selected file is not a client certificate.

To delete the client certificate

Click **Delete**, and the client certificate stored in the camera will be deleted.

Client private key

When TLS is selected as the EAP method, the private key is uploaded, displayed or deleted.

To upload a client private key

Click **Browse...** to select the client private key to be uploaded.

Click the **Upload** button to upload the file to the camera.

Note

The upload will fail if the selected file is not a client private key.

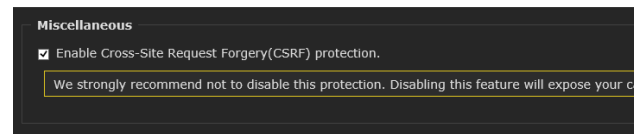
To delete the client private key

Click **Delete**, and the client private key stored in the camera will be deleted.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Security > Miscellaneous



Enable Cross-Site Request Forgery (CSRF) protection.

For security purpose, it is strongly recommended to enable this function.

Save

When completed with the settings on this page, click **Save** to enable the settings.

PTZ Menu

When you click **PTZ** in the Configuration menu, the submenus of the PTZ menu expand.

PTZ > PTZ

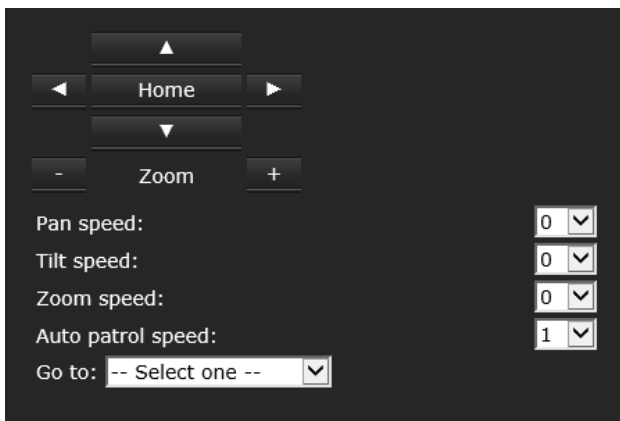
PTZ settings

Channel

Select the channel that PTZ settings are set.

Select stream

Select a stream to configure preset or patrol.



Pan/Tilt control

Click the arrow button of the direction in which you want to move the camera.

To return to the home position, click **Home**.

Zoom control

Click **+** to zoom in, and click **-** to zoom out.

Pan speed

Set the pan speed.

-5 is the slowest and **5** is the fastest.

Tilt speed

Set the tilt speed.

-5 is the slowest and **5** is the fastest.

Zoom speed

Set the movement of zooming in or out.

-5 is the smallest and **5** is the largest.

Auto pan/patrol speed

Select the auto patrol speed.

1 is the slowest and **5** is the fastest.

Go to

Select a preset position from the pull-down list.

The unit will move to the position according to the preset settings.

Home location settings



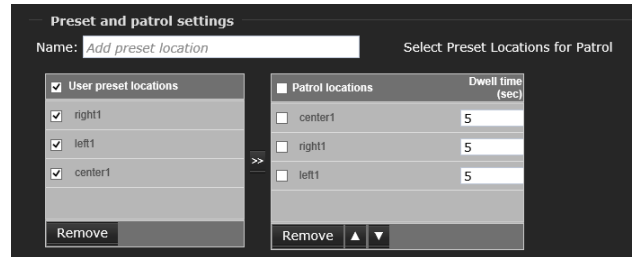
Set current position as home

Set current position as home.

Restore home position to default

Return to home position to the default position.

Preset and patrol settings



To configure a preset position

- 1 Select the channel and the stream.
- 2 Move the camera to the position to be saved using the mouse while you are checking the image on the Preview screen.
- 3 Enter the preset name up to 40 characters.
- 4 Click **Add** to set the preset position. The preset positions will be listed on the **User preset locations**.
(To add more positions, repeat steps 1 to 4.)

To delete a preset position

Select the preset position to be deleted, and then click **Delete**.

To set the Patrol locations

- 1 Select the preset locations to patrol from the preset locations listed on **User preset locations** and click **Go to** button (>>).
The selected preset locations will be displayed on the **Patrol locations** list.

Memo

Sequence of the tour is from top to bottom. You can change the order using the ▲▼ buttons.

- 2 Set a period of time (second) list for which the camera is to stay at each preset position.
- 3 Click **Save** to save the setting.

To delete a preset tour

Select the preset position to be deleted listed in Sequence of the tour, and then click **Delete**.

Misc settings

Zoom factor display

If you check this item, the zoom factor will be displayed in the live view when you zoom in/out the live viewing window.

Save

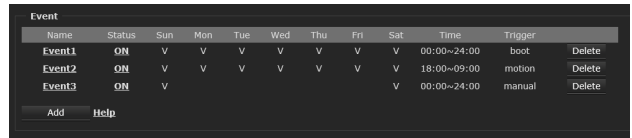
When completed with the settings on this page, click **Save** to enable the settings.

Event Menu

When you click **Event** in the Configuration menu, the submenus of the Event menu expand. The Event settings section explains how to configure the camera to respond to particular situations (event) as notifications or recordings.

Event > Event settings

The event settings which are set are displayed. Click **Add** to set up a new event. You can set up to 3 events.



Name	Status	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time	Trigger	Delete
Event1	ON	V	V	V	V	V	V	V	00:00~24:00	boot	Delete
Event2	ON	V	V	V	V	V	V	V	18:00~09:00	motion	Delete
Event3	ON	V						V	00:00~24:00	manual	Delete

Add Help

Name: Displays the event name.

Status: Displays whether the event is valid or not.

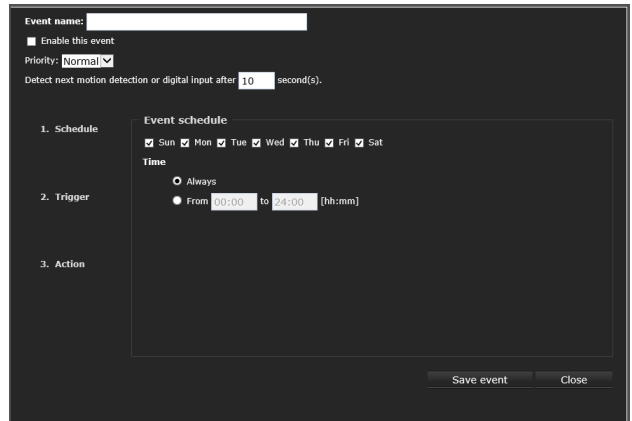
Sun/Mon/Tue/Wed/Thu/Fri/Sat/: Displays **V** on the day(s) of the week that the event is enabled.

Time: Displays the period of time that the event is enabled.

Trigger: Displays the event trigger.

Delete: Deletes the event settings.

Event settings screen



Event name:

Enable this event

Priority: Normal

Detect next motion detection or digital input after second(s).

1. Schedule

Event schedule

Sun Mon Tue Wed Thu Fri Sat

Time

Always

From to (hh:mm)

2. Trigger

3. Action

Save event Close

Event name

Input the event settings name.

Enable this event

Select this checkbox to enable the event settings.

Priority

Select the priority for the event settings (High/Normal/Low). The highest priority event settings are performed first.

Detect next motion detection or digital input after [] second(s).

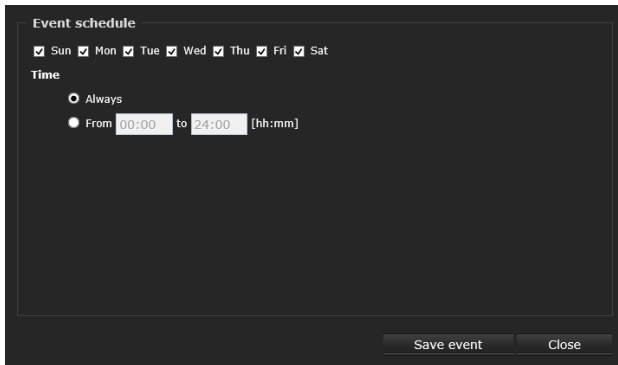
Input the time in seconds before disabling the motion detection or sensor input after they have activated.

To set the event

Set each item of **Schedule**, **Trigger**, **Action** in the Event settings screen to set the event.

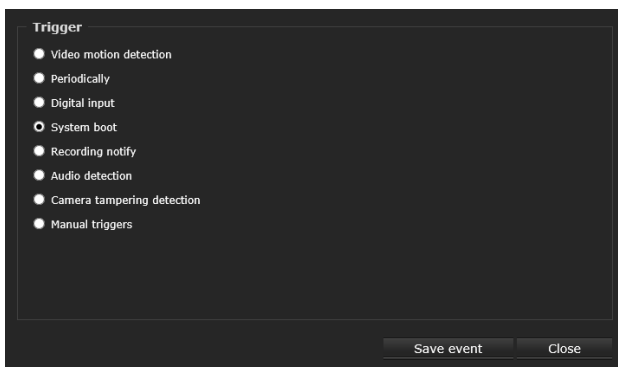
1. Schedule

Set the day(s) of the week or the period of time for enabling the event.



2. Trigger

Select the trigger for performing the event.



Motion detection

When motion is detected, perform the event. When the **Motion detection** is selected, select the checkbox of the window name to be used. The setting of **Motion detection** is required to enable this function. For details, see "Applications > Motion detection" (page 40).

Memo

Multiple motion detection settings can be made.

Periodically

Performs the event after a certain period. Input the trigger interval of the event (1 to 999 minutes).

Digital input

An event can be triggered by the external digital input devices or the sensor input.

Active: Performs the event while the sensor input is active.

Normal to Active: Performs the event when the sensor input shifts to the active status from the normal status.

Active to Normal: Performs the event when the sensor input shifts to the normal status from the active one.

System boot

Performs the event when the camera is being turned on.

Recording notify

Performs the event when the recording media is full or when recording starts to overwrite older data.

Audio detection

A preset threshold can be configured with an external microphone as the trigger to system event. The triggering condition can be an input exceeding or falling below a threshold. Select the option in **Normal** and **Profile** respectively whether the audio detection can take place or not.

Camera tampering detection

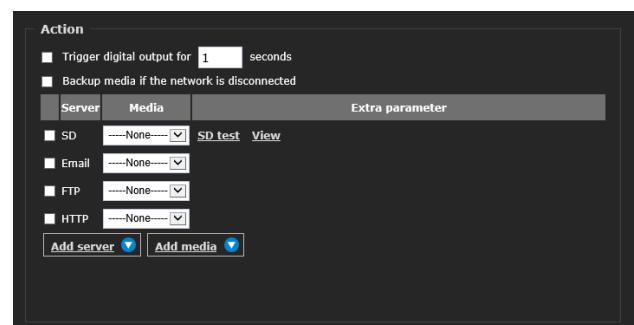
The camera tampering detection is set as the trigger for performing the event. Select the **Camera tampering detection** checkbox to enable this function. For details, refer to "Applications > Tampering detection" (page 42).

Manual triggers

Performs the event according to the checkboxes of the manual triggers 1, 2, 3 setting in the Viewer screen. Set the checkbox for corresponding manual trigger number.

3. Action

Set the action to be performed when the trigger is activated.



Trigger digital output for [] seconds

Select the checkbox to turn on the alarm output (external digital output device) when a trigger is activated. Specify the length of the trigger interval on the second basis.

Note

When the camera is turned on, or the camera is restarted or reset to the factory settings, the alarm is output for about 40 seconds.

Backup media if the network is disconnected

Select this option to backup media files to the SD card when the network is disconnected.

This function is displayed only after the network storage has been set. You can select the backup media type from Snapshot, Video clip, or System log depending on the event settings.

Action

If you want to enable the event action, add the actions as follows, and select the checkbox.

Add server

Click **Add server** to open the server setting window. You can specify where the notification messages are sent to when a trigger is activated. A total of 5 server settings can be configured. There are four choices of server types available: Email, FTP, HTTP, and Network storage. Select the item to display the detailed configuration options. You can configure either one or all of them.

Server name

Enter the name of the server settings.

The screenshot shows a configuration window for an Email server. The 'Server name' field is set to 'Email'. Under 'Server type', 'Email' is selected with a radio button. The configuration fields are: 'Sender email address' (camera@xxx.com), 'Recipient email address' (recipient@xxx.com), 'Server address' (xxxxxxxx), 'User name' (user), 'Password' (masked with dots), and 'Server port' (25). There is a checkbox for 'This server requires a secure connection' which is currently unchecked. At the bottom, there are three buttons: 'Test', 'Save server', and 'Close'.

Server type

Email

Select to send the media files via email when a trigger is activated.

Sender email address: Enter the email address of the sender.

Recipient email address: Enter the email address of the recipient.

Server address: Enter the domain name or IP address of the email server.

User name: Enter the user name of the email account if necessary.

Password: Enter the password of the email account if necessary.

Server port: The default mail server port is set to 25. You can also manually set another port.

This server requires a secure connection: If your SMTP server requires a secure connection (SSL), select this checkbox.

Test

To verify if the email settings are correctly configured, click **Test**. The result will be shown in a pop-up window. If successful, you will also receive an email indicating the result.

Save server

Click **Save server** to enable your settings.

Note that after you configure the server, the new event server will automatically be displayed on the **Server** list. If you wish to add other server options, click **Add server** again.

Click **Close** to close the settings page.

FTP

Select to send the media files to FTP server when a trigger is activated.

The screenshot shows a configuration window for an FTP server. The 'Server name' field is set to 'FTP'. Under 'Server type', 'FTP' is selected with a radio button. The configuration fields are: 'Server address' (ftp.xxx.com), 'Server port' (21), 'User name' (xxx), 'Password' (masked with dots), and 'FTP folder name' (empty). There is a checkbox for 'Passive mode' which is checked. At the bottom, there are three buttons: 'Test', 'Save server', and 'Close'.

Server address: Enter the domain name or IP address of the FTP server.

Server port: The default FTP server port is set to 21. It can also be assigned to another port number between 1025 and 65535.

User name: Enter the login name of the FTP account.

Password: Enter the password of the FTP account.

FTP folder name: Enter the folder where the media files will be placed. If the folder name does not exist, the network camera will automatically create one on the FTP server.

Passive mode: Most firewalls do not accept new connections initiated from external requests. If the FTP server supports passive mode, select this option to enable passive mode FTP and allow data

transmission to pass through the firewall. The firmware default has the Passive mode checkbox selected.

Test

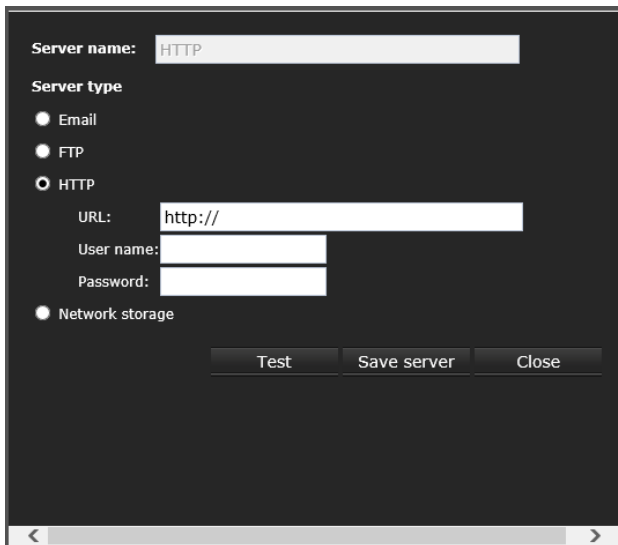
To verify if the FTP settings are correctly configured, click **Test**. The result will be shown in a pop-up window. If successful, you will also receive a test.txt file on the FTP server.

Save server

Click **Save** to enable the settings.
Click **Close** to close the settings page.

HTTP

Select to send the media files to HTTP server when a trigger is activated.



Server name: Enter a name for the server setting.

URL: Enter the URL of the HTTP server.

User name: Enter the user name if necessary.

Password: Enter the password if necessary.

Test

To verify if the HTTP settings are correctly configured, click **Test**. The result will be shown in a pop-up window. If successful, you will receive a test.txt file on the HTTP server.

Save server

Click **Save** to enable the settings.
Click **Close** to close the settings page.

Network storage

Select to send the media files to Network storage when a trigger is activated. Note that only one NAS server can be configured.

Network storage location: Enter the path to the Network storage location.

Workgroup: Enter the workgroup.

User name: Enter the user name.

Password: Enter the password.

Test

To verify if the settings are correctly configured, click **Test**. The result will be shown in a pop-up window. If successful, you will also receive a test.txt file on the Network storage.

Save server

Click **Save server** to enable the settings.
Click **Close** to close the settings page.

Add media

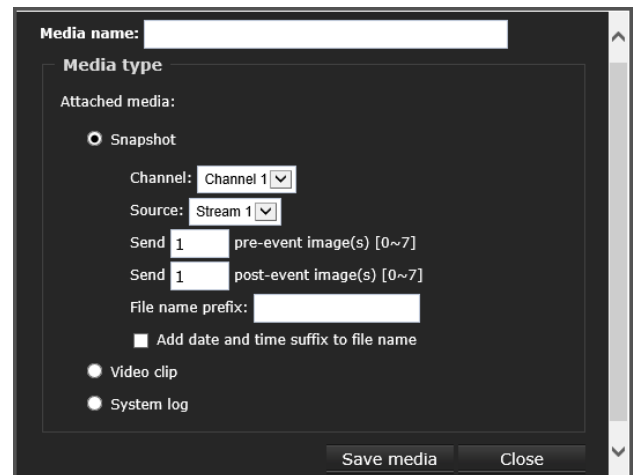
Click **Add media** to open the media setting window. You can specify the type of media that will be sent when a trigger is activated. A total of 5 media settings can be configured.

There are three choices of media types available: Snapshot, Video clip, and System log. Select the item to display the detailed configuration options.

Media type

Snapshot

Select to send snapshots when a trigger is activated.



Media name: Enter a name for the Media setting.

Channel: Select the channel.

Source: Select to take snapshots from any of the video streams.

Send pre-event image(s): Sends the image(s) before activating a trigger. The Network Camera has a buffer to temporarily hold data up to a certain limit. Enter a number of images to capture before a trigger is activated. Up to 7 images can be generated.

Send post-event image(s): Enter a number of images to capture after a trigger is activated. Up to 7 images can be generated.

For example, if both the Send pre-event images and Send post-event images are set to 7, a total of 15 images can be generated after a trigger is activated.

File name prefix: Enter the text which is to be added before the file name.

Add date and time suffix to file name: Select this checkbox to add a date/time suffix to the file name.

Memo

A still image is saved every second.

Save media

When the settings on this page have been completed, click **Save media** to enable the settings.

Click **Close** to close the settings page.

Video clip

Select to save the video clip when a trigger is activated.

The screenshot shows the 'Save media' settings page for 'Video Clip'. The 'Media name' is 'Video Clip'. Under 'Media type', 'Video clip' is selected. The 'Attached media' section includes: 'Channel' set to 'Channel 1', 'Source' set to 'Stream 1', 'Pre-event recording' set to 0 seconds, 'Maximum duration' set to 5 seconds, 'Maximum file size' set to 500 kbytes, and 'File name prefix' is empty. The 'System log' option is unselected. 'Save media' and 'Close' buttons are at the bottom.

Media name: Enter a name for the Media setting.

Channel: Select the channel.

Stream: Select a video stream as the source of video clip from stream 1 to 3.

Pre-event recording: If a trigger is activated, the video before the trigger is activated can be recorded. Up to 9 seconds can be set.

Maximum duration: If a trigger is activated, the video after the trigger is activated can be recorded. Up to 20 seconds can be set.

For example, if pre-event recording is set to 5 seconds and the maximum duration is set to 10 seconds, the camera continues to record for another 4 seconds after a trigger is activated.

Maximum file size: Enter the maximum file size for the recording data (50 KB to 8192 KB).

File name prefix: Enter the text which is to be added before the file name.

Save media

When the settings on this page have been completed, click **Save media** to enable the settings.

Click **Close** to close the settings page.

System log

Select to send a system log when a trigger is activated.

The screenshot shows the 'Save media' settings page for 'System log'. The 'Media name' is 'System log'. Under 'Media type', 'System log' is selected. The 'Attached media' section includes: 'Snapshot' and 'Video clip' are unselected, and 'System log' is selected. 'Save media' and 'Close' buttons are at the bottom.

Save media

When the settings on this page have been completed, click **Save media** to enable the settings.

Click **Close** to close the settings page.

Confirmation of the action

The screenshot shows the 'Confirmation of the action' settings page. The 'Event name' is 'Event1'. The 'Enable this event' checkbox is checked. The 'Priority' is 'Normal'. The trigger is set to 'Detect next motion detection or digital input after 10 second(s)'. The 'Action' section includes: 'Trigger digital output for 1 seconds' (checked), 'Backup media if the network is disconnected' (unchecked), and a table for 'Server' and 'Media' settings. The 'Server' column has 'SD' selected, and the 'Media' column has 'System log' selected. The 'SD test' and 'View' buttons are visible. 'Email', 'FTP', and 'HTTP' are set to 'None'. 'Add server' and 'Add media' buttons are at the bottom. 'Save event' and 'Close' buttons are at the bottom right.

SD test

Click **SD test** to test your SD card. The system will display a message indicating the result as a success or a failure. If you use your SD card for local storage, format it before use.

View

Click the **View** button to open a file list window. This function is only for SD card and Network storage.

If you click the **View** button for an SD card, a **Local storage** page will prompt so that you can manage the recorded files on SD card. For more information about Local storage, refer to page 46.

Save event

When the settings on this page have been completed, click **Save event** to enable the settings.

Close

Click **Close** to close the settings page.

On/Off of Event settings

The configured servers and media are listed in the **Event settings**. Make sure that the event **Status** is ON to enable event trigger action.

Event										
Name	Status	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time	Trigger
Event1	ON	V	V	V	V	V	V	V	00:00~24:00	boot
Event2	ON	V	V	V	V	V	V	V	18:00~09:00	motion
Event3	ON	V						V	00:00~24:00	manual

Buttons: Add, Help

Server settings

Name	Type	Address/Location	Delete
Email	email	xxxxxxx	Delete
FTP	ftp	ftp.xxx.com	Delete
HTTP	http	http://	Delete

Buttons: Add

Media

Available memory space: 99500KB

Name	Type	Delete
System log	systemlog	Delete
Video Clip	videoclip	Delete

Buttons: Add

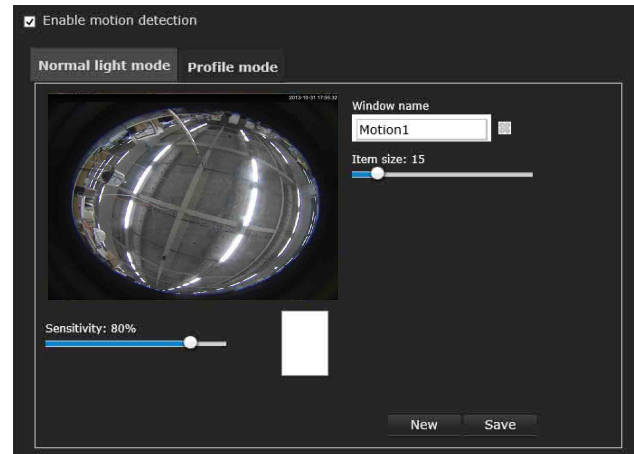
If you want to stop the event trigger, you can click the ON button to turn it to OFF status or click the **Delete** button to remove the event setting. To remove a server setting or a media setting from the list, select a server name or a media name and click **Delete**. Note that you can delete a server setting or a media setting only when it is not applied in an existing event setting.

Applications Menu

When you click **Applications** in the Configuration menu, the submenus of the Applications menu are expanded.

Applications > Motion detection

Motion detection responds to moving objects in the camera image and triggers an alarm. You can set up to 5 motion detection windows.



Channel

Select the channel to perform the settings for motion detection.

Enable motion detection

Select the checkbox to enable the motion detection.

To set the motion detection window

- 1 Click **New**.
- 2 Enter the name of the motion detection window in the **Window name**.
- 3 Click on four points on the Preview screen to specify the motion detection area. Drag one of the four vertexes to change the size of the motion detection area.
- 4 Set the **Item size** and **Sensitivity** by the slide bar.

Item size: Drag the slide bar of the **Item size** to change the minimum size of moving objects to trigger an alarm.

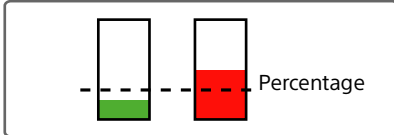
Sensitivity: Define the sensitivity to detect the moving objects by moving the **Sensitivity** slide bar.
- 5 Select the **Enable motion detection** checkbox.

6 Click **Save** to enable your settings.

Memo

You can confirm the status of the motion detection by the indicator.

When the **Percentage** value is exceeded, the indicator lights in red. When the **Percentage** is not exceeded, the indicator lights in green.



To delete a window, click the X mark on the right of the window name.

Note

A high sensitivity is prone to produce false alarms by the fast changes of light (such as day/night mode switch, turning lights on/off).

A movement must persist longer than 0.3 second for the motion to be detected.

Profile mode

If you want to configure the motion detection settings for the profile mode, configure the motion detection setting in the **Profile mode** tab.

Follow the steps below to set up a profile.

- 1 Create a new motion detection window.
- 2 Select the **Enable this profile** checkbox.
- 3 Select the applicable mode: Day mode, Night mode, or Schedule mode. Manually enter a range of time if you choose Schedule mode.
- 4 Click **Save** to enable the settings and click **Close** to exit the page.

This motion detection window will also be displayed on the **Event settings** page. You can go to Event > Event settings > Trigger to select it as a trigger source.

Applications > DI and DO

Configure the direction to detect the signal that is input to the digital input (sensor input) of the camera, the polarity of the signal that is output from the digital output (alarm output).

Digital input	
Normal status:	<input checked="" type="radio"/> High <input type="radio"/> Low
Current status:	High
Digital output	
Normal status:	<input type="radio"/> Open <input checked="" type="radio"/> Grounded
Current status:	Open

Digital input

Normal status

Select **High** or **Low** as the Normal status for the digital input connection.

Current status

Detect the current connection status between the digital input pin of the camera and an external device.

Digital output

Normal status

Select **Grounded** or **Open** as the normal status for the digital output.

Current status

Show the current status of the digital output pin of the camera.

Set up as the digital input (DI) event source.

Select as the trigger source by selecting Event > Event settings > Trigger.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Applications > Tampering detection

Set up the camera tampering detection.

Channel: 1

Camera tampering detection

- Tampering detection
 - Trigger duration: 10 seconds [10~600]
 - Trigger threshold: 12 [0~100]
- Image too dark detection
 - Trigger duration: 2 seconds [1~10]
 - Trigger threshold: 15 [0~100]
- Image too bright detection
 - Trigger duration: 2 seconds [1~10]
 - Trigger threshold: 15 [0~100]
- Image too blurry detection
 - Trigger duration: 10 seconds [1~10]
 - Trigger threshold: 13 [0~100]

Channel

Select the channel to perform the settings for the camera tampering detection.

Camera tampering detection

Enter the setting value for each of the 4 detection patterns listed below.

[Tampering detection]

[Image too dark detection]

[Image too bright detection]

[Image too blurry detection]

Follow the steps below to configure the camera tamper detection function:

- 1 Enter the tamper trigger duration. (10 sec. ~ 10 min.) The tamper alarm will be triggered only when the tampering factor (the difference between current frame and pre-saved background) exceeds the trigger threshold.
- 2 Enter the trigger threshold. The value is the percentage of pixel differentiation of the whole scene.
- 3 Set up the event source as **Camera tampering detection** on Event > Event settings > Trigger.

Note

Enter the trigger threshold for considerations that minor disruptions, such as the vibration caused by wind may trigger false alarm.

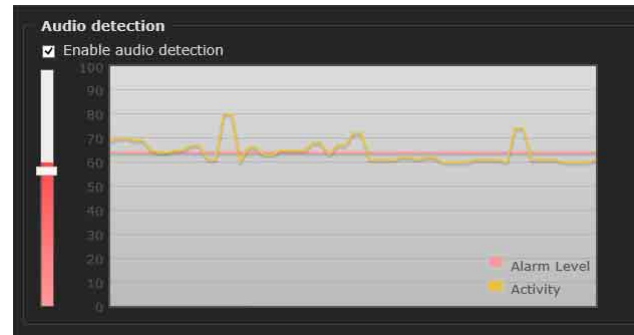
Save

When completed with the settings on this page, click **Save** to enable the settings.

Applications > Audio detection

Set up the audio detection.

The audio alarms can be triggered when breaching or falling below the preset threshold.



To set the audio detection

Follow the steps below to configure the audio detection function:

- 1 Once the Audio detection window is opened, the current sound input will be interactively indicated by a fluctuating yellow wave diagram.
- 2 Use a mouse to drag the alarm level slide bar on the left to a preferred location.
- 3 Select the **Enable audio detection** checkbox and click **Save** to enable the feature.

Notes

- Note that the volume numbers (0~100) on the side of wave diagram does not represent decibel (dB).
- To configure this feature, you must not silence the audio in Media > Audio.

Profile

You can use the Profile window to configure a different Audio detection setting. For example, a place can be noisy in the day time and become very quiet in the night.

- 1 Click on the **Enable this profile** checkbox.
- 2 Use a mouse to drag the alarm level slide bar to a preferred location.
- 3 Select the appropriate mode from the Night mode or Schedule mode. For the schedule mode, you can also manually configure the time to enable this profile.
- 4 Click **Save** and then click **Close** to complete your configuration.

Notes

- If the Alarm level and the received volume are set within a range of 20% on the wave diagram, frequent alarms will be triggered. It is recommended to set the Alarm level farther apart from the detected sound level.
- To enable this feature, you must not configure video stream #1 into Motion JPEG.

Save

When completed with the settings on this page, click **Save** to enable the settings.

Applications > Package management

Users can store the optional software modules onto the camera's flash memory or microSD card in **Package management**.

For details, refer to the "Software Module User's Manual".

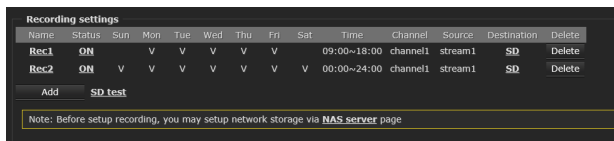
Recording menu

When you click **Recording** in the Configuration menu, the submenus of the Recording menu expand.

The recording menu consists of the **Recording Settings**.

Recording > Recording settings

The Recording settings which are set are displayed.



Name	Status	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time	Channel	Source	Destination	Delete
Rec1	ON	V	V	V	V	V	V	V	09:00~18:00	channel1	stream1	SD	Delete
Rec2	ON	V	V	V	V	V	V	V	00:00~24:00	channel1	stream1	SD	Delete

Add SD test

Note: Before setup recording, you may setup network storage via [NAS server](#) page

Name

Displays the recording name.

Status

Displays whether the recording settings are valid or not.

Sun, Mon, Tue, Wed, Thu, Fri, Sat

Displays **V** on the days of the week that the recording settings are valid.

Time

Displays the period of time for that the recording settings are valid.

Channel

Displays the channel.

Source

Displays the recording image (stream1 to stream 3).

Destination

Displays the destination of the recording file.

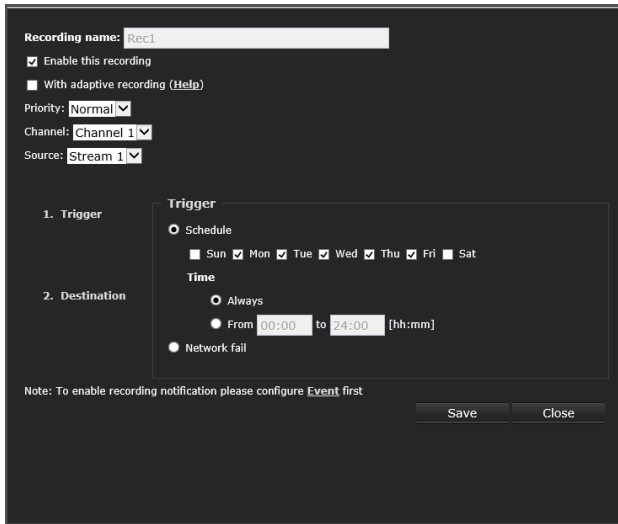
Delete

Deletes the recording settings.

To set the Recording settings

Click **Add** to add the event.

You can configure up to 2 recording settings.



Recording name

Enter the name of the recording settings.

Enable this recording

Select this checkbox to enable the event settings.

With adaptive recording

Select this option to activate the frame rate control according to alarm trigger.

The frame control means that when there is a triggered alarm, the frame rate will raise up to the value you have configured on "Media > Video" (page 21).

If you enable the adaptive recording on a camera, the server will record the full frame rate streaming data only when an event is triggered on camera. Otherwise, it will only request the I frame data during normal monitoring, thus effectively saves bandwidth and storage space.

Memo

- To enable adaptive recording, make sure you have set up the trigger source such as Motion Detection, DI Device, or Manual Trigger.
- When there is no alarm trigger
 - JPEG mode: record 1 frame per second.
 - H.265/H.264 mode: record the I frame only.
- When the I frame period is longer than 1 second on Video settings page, firmware will force decrease the I frame period to 1s when adaptive recording is enabled.

Pre-event recording: If a trigger is activated, the video before the trigger is activated can be recorded. Up to 9 seconds can be set.

Post-event recording: If a trigger is activated, the video after the trigger is activated can be recorded. Up to 10 seconds can be set.

Priority

Select the priority for recording settings (High/Normal/Low). The highest priority Event settings are performed first.

Channel

Select the channel.

Source

Select the recording image (stream 1 to stream 3).

Memo

To enable recording notification, configure Event settings first.

Follow the steps below to set up the recording.

1. Trigger

Select the trigger for performing the Recording settings.

Schedule

Set the day(s) of the week or the period of time for enabling the Recording settings.

Network fail

Select this option to enable the recording settings if the network failed.

2. Destination

Set the destination setting to save the recorded file.

Destination

The destination to save the recorded file. You can select the SD card or Network storage (NAS). If you have not configured a NAS server, enter the NAS information in **Add NAS server**.

Recording file management

Maximum duration: Enter the maximum recording time (1 to 60 minutes) when the trigger set in the **1. Trigger** functions.

Maximum file size: Enter the maximum file size (100 to 2000 MB) when the trigger set in the **1. Trigger** functions.

File name prefix: Enter the text which is to be added before the file name.

Enable recording settings

Select **Enable this recording** in the Recording settings page. Click **Save** to enable the setting and click **Close** to exit this page.

When the system begins recording, it will send the recorded files to the network storage. The new recording name will appear in the drop-down list on the recording page as shown below.

Recording settings													
Name	Status	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time	Channel	Source	Destination	Delete
Rec1	ON		V	V	V	V	V		09:00~18:00	channel1	stream1	SD	Delete
Rec2	ON		V	V	V	V	V	V	00:00~24:00	channel1	stream1	SD	Delete
Add		SD test											

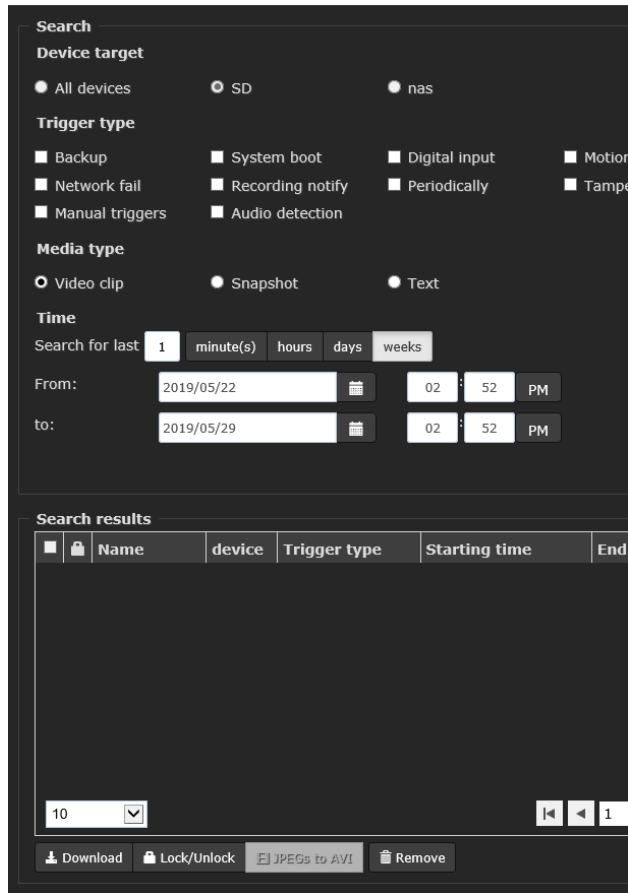
Note: Before setup recording, you may setup network storage via NAS server page

To remove a recording setting from the list, select a recording name from the drop-down list and click **Delete**.

Rec1 (Recording settings name): Click to open the Recording settings page to modify.

ON (Status): Click to change the status to OFF and recording stops.

SD (Destination): Click to open the file list of recordings as shown below.



Storage menu

When you click **Storage** in the Configuration menu, the submenus of the Storage menu expand. The storage menu consists of the **Storage management** and **Content management**.

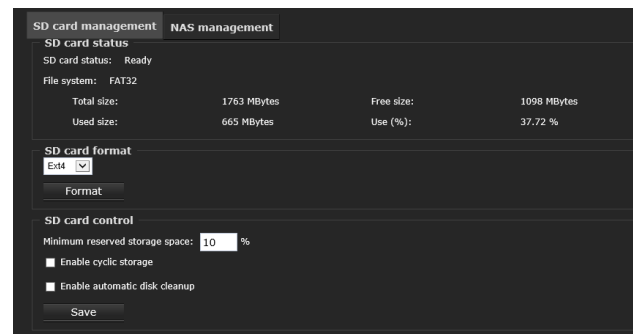
Notes

- The frame rate and operability on the main viewer may be reduced during movie or still image recording.
- The actual interval of recording a still image may be longer than the interval you set.
- Stop the storage recording before you power off the camera with a microSD card inserted.
- Before you remove or insert a card, stop the storage recording and turn off the power of the camera.
- The lifespan of a microSD card is limited. Regular replacement of the microSD card can be necessary.
- Do not modify or change the folder names in the microSD card.

Storage > Storage management

You can view storage status such as the microSD card or NAS and implement storage management.

SD card management



SD card status

Status: Displays the SD card status.

Total size: Displays the total size of the SD card capacity.

Used size: Displays the storage size of the SD card that is already used.

SD card format

Perform the formatting (Initialization) of the microSD card.

Select **Ext4** or **FAT32** as the file system.

The Ext4 is applied to the microSD card larger than 32GB.

Click **Format** to initialize the microSD card. The saved files and folders in microSD card will be erased.

Notes

- When you use the microSD card for the first time, initialize it by clicking **Format**.
- Do not operate **Format** without inserting a microSD card to the microSD card slot.
- If Ext4 is applied, the computers running Windows will not be able to access the contents on the microSD card.

SD card control

Minimum reserved storage space

Enter the percentage of the free space in the SD card into which the writing is not performed.

Enable cyclic storage

Check this item if you want to enable cyclic recording. When the maximum capacity is reached, the oldest file will be overwritten by the latest one.

Enable automatic disk cleanup

Check this item and enter the number of days you wish to retain a file. For example, if you enter **7 days**, the recorded files will be stored on the SD card for 7 days.

Save

Click **Save** to enable your settings.

NAS management

The screenshot shows a software interface for NAS management. It is divided into three main sections: 'NAS status', 'NAS setup', and 'NAS control'.
- **NAS status:** Shows 'Detached' status. It includes a table with 'Total size: 0 MBytes', 'Free size: 0 MBytes', 'Used size: 0 MBytes', and 'Use (%): 0 %'.
- **NAS setup:** Contains a text field for 'Network storage location' with a hint '(For example: \\my_nas\disk\folder)'. Below it are input fields for 'Workgroup:', 'User name:', and 'Password:'. At the bottom of this section are three buttons: 'Unmount', 'Mount', and 'Test'.
- **NAS control:** Features a 'Minimum reserved storage space' field set to '10 %'. There are two checkboxes: 'Enable cyclic storage' and 'Enable automatic disk cleanup'. A 'Save' button is located at the bottom of this section.

NAS status

NAS status: Displays the NAS status.

Total size: Displays the total size of the NAS capacity.

Used size: Displays the storage size of the NAS that is already used.

NAS setup

Network storage location

Enter the path to the Network storage location.

(For example: \\my_nas\disk\folder)

Workgroup: Enter the workgroup.

User name: Enter the user name.

Password: Enter the password.

Test

Click **Test** to confirm to settings. The result is displayed in the pop-up window.

Mount

Connect to the network storage.

Unmount

Disconnect from the network storage.

NAS control

Minimum reserved storage space

Enter the reserved storage size in the network storage into which the writing is not performed in percent basis.

Enable cyclic storage

Check this item if you want to enable cyclic recording. When the maximum capacity is reached, the oldest file will be overwritten by the latest one.

Enable automatic disk cleanup

Check this item and enter the number of days you wish to retain a file. For example, if you enter **7 days**, the recorded files will be stored on the NAS for 7 days.

[Save]

Click **Save** to enable your settings.

Storage > Content management

You can search the recording data and view the search results.

Search

You can set up the search criteria for recorded data.

The screenshot shows the search interface with the following settings:

- Device target:** All devices (selected), SD, nas
- Trigger type:** Backup, Network fail, Manual triggers, System boot, Recording notify, Audio detection, Digital input, Periodically, Motion, Tampering detection
- Media type:** Video clip (selected), Snapshot, Text
- Time:** Search for last 1 minute(s), hours, days, weeks
- From:** 2019/05/22 02:54 PM
- to:** 2019/05/29 02:54 PM

The search results table is empty:

<input type="checkbox"/>	Name	device	Trigger type	Starting time	Ending time
--------------------------	------	--------	--------------	---------------	-------------

Device target

All devices: Search from all devices.

SD: Search from the recording data in the microSD card.

NAS: Search from the recording data in the NAS.

Trigger type

Select the trigger type as the search criteria.

Media type

Select the Media type as the search criteria.

Time

Manually enter the time range you want to search for contents created at a specific point in time.

Search

Click **Search** and the recorded data corresponding to the search criteria will be listed in **Search results** window.

Click **Search** without selecting the search criteria, and then all the recorded data will be listed in **Search results**.

Search results

The search results are displayed. There are four columns: Recording name, Trigger type, Starting time, Ending time. Click title to sort the search results in either direction.

The screenshot shows the search interface with the same settings as the previous image. The search results table now contains four rows:

<input type="checkbox"/>	Name	device	Trigger type	Starting time	Ending time
<input type="checkbox"/>	recording	SD		Today at 1:00 PM	Today at 2:05 PM
<input type="checkbox"/>	recording	SD		Today at 1:00 PM	Today at 2:05 PM
<input type="checkbox"/>	recording	SD		Today at 2:07 PM	Today at 3:50 PM
<input type="checkbox"/>	recording	SD		Today at 2:07 PM	--

Play

Clicking the selected item plays the content. The Play window is displayed on the top of the screen.

Download

Select the file to download using checkbox. Then click the Download button and a file download window will pop up for you to save the file.

Lock/Unlock

Select the checkbox to lock the file. The selected files will become locked, which will not be deleted during cyclic recording.

You can click again to unlock the lock.

JPEGs to AVI

This function only applies to JPEG format files such as snapshots. You can select several snapshots from the list, and then click this button. Those snapshots will be converted into an AVI file.

Delete

Select the checkbox, and then click **Delete** button to delete the files.

Glossary

Capture

To send audio and video converted to digital data from video devices to a computer.

Codec

Software/hardware for coding/decoding video and audio data.

Contrast

The difference in tone between the lightest and darkest portions of the image.

Subnet mask

32-bit number used to identify the network address by deciding which upper bits of an IP address to be used.

Saturation

The degree to which a color is pure.

Sharpness

The degree to which the boundary of two portions is clearly distinguished.

Secondary DNS server

One of the DNS servers that works as a secondary server when a primary DNS server cannot be used.

Digital certificate

An electronic certificate that a CA (Certificate Authority) attests that a public key to cancel a secret code is issued by an authentic publisher.

Default gateway

Device that can be used to access another network.

Network address

The portion that identifies the local network (subnet) in an IP address.

Bit rate

The rate at which data bits are transmitted.

Primary DNS server

One of the DNS servers that can first reply to a request by connected devices or other DNS servers.

Frame rate

The number of frames of a moving image that can be transmitted per a second.

Proxy server

A server or software that acts as an intermediary between a local network and the Internet so that it can connect to the Internet in place of a computer on a local network.

Multicast

The class D IP address assigned between 224.0.0.0 and 239.255.255.255. Using this IP address enables you to transmit the same data to multiple equipments.

Unicast

Transmission of data to specified equipment on a network by specifying a single address.

ActiveX control

The technology for creating ActiveX control is part of software developed by Microsoft. A component program object that can be used with web pages or other application programs.

CBR

Acronym for Constant Bit Rate control. When you select this setting, bits will be consumed at a constant rate.

DHCP server

Acronym for Dynamic Host Configuration Protocol server. The IP address of a terminal without an individual IP address can be automatically distributed by the Dynamic Host Configuration Protocol (DHCP). The DHCP server assigns the IP addresses to the terminals.

DNS server

Acronym for Domain Name System server. As an IP address required for connecting to the device on an IP network is numerical and difficult to remember, the Domain Name System was established. A domain name is alphabetic and is easier to remember. When a client computer uses a domain name to connect to another computer, it asks a DNS server to translate the name into the

corresponding IP address. The client computer can then obtain the IP address of the computer to be connected.

H.264

An image compression format. The standard written by the JVT (Joint Video Team) a joint organization for standardization (composed of ISO and ITU-T). H.264 is capable of transmitting video data at a higher compression rate than that of MPEG4.

H.265

An image compression format. The standard proposed and written by the JCT-VC (Joint Collaborative Team on Video Coding) a joint organization for standardization (composed of ISO/IEC and ITU-T), H.265 is superior in the compression efficiency such as right sizing of the block size, and is also capable of transmitting video data at a higher compression rate than that of H.264.

HTTP port

A port used to communicate between the web server and the web client, such as a web browser.

IP address

Acronym for Internet Protocol Address. An individual IP address is basically assigned to each piece of equipment connected to the Internet.

JPEG

Acronym for Joint Photographic Expert Group. The still image compression technology or standards of ISO (International Organization for Standardization) and ITU-T. Popularly used as an image compression format on the Internet, etc.

NTP server

Time information server used throughout the network.

SMTP server

A server for sending or relaying e-mail messages between servers.

SSL

Acronym for Secure Sockets Layer. This is a protocol developed by Netscape Communications Corporation to be used for communications of encrypted data on the Internet.

TCP

Acronym for Transmission Control Protocol. A standard protocol used for Internet connection. Compared with the other protocol, UDP, TCP provides reliable communication but communication speed is slower.

UDP

Acronym for User Datagram Protocol. A standard protocol used for Internet connection. Compared with the other protocol, TCP, UDP can transmit data faster, but reliable communication is not guaranteed.

VBR

Acronym for Variable Bit Rate control. When you select this setting, the bit rate varies depending on the shooting scene.

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