



VK2-HDX20-SMW

Please read this manual thoroughly before use and keep it handy for future reference.

Before You Begin

Read these instructions before installing or operating this product.

Note: This installation should be made by a qualified service person and should conform to local codes. This manual provides installation and operation information. To use this document, you must have the following minimum qualifications:

- A basic knowledge of CCTV systems and components
- A basic knowledge of electrical wiring and low-voltage electrical connections

Intended use

Only use this product for its designated purpose; refer to the product specification and user documentation.

Customer Support

For assistance in installing, operating, maintaining and troubleshooting this product refer to this document and any other documentation provided. If you still have questions, please contact Norbain Technical Support and Sales:

Norbain SD, 210 Wharfedale Road, IQ Winnersh, Wokingham, Berkshire RG41 5TP, England.

UK +44 (0) 118 912 5000

Note: You should be at the equipment and ready with details before calling Technical Support.

Conventions Used in this Manual

Boldface or button icons highlight command entries. The following **WARNING**, **CAUTION** and **Note** statements identify potential hazards that can occur if the equipment is not handled properly:



*** WARNING:**

Improper use of this equipment can cause severe bodily injury or equipment damage.



**** Caution:**

Improper use of this equipment can cause equipment damage.

Note: Notes contain important information about a product or procedure.



This apparatus is manufactured to comply with the radio interference.

A Declaration of Conformity in accordance with the following EU standards has been made. The manufacturer declares that the product supplied with this document is compliant the provisions of the EMC Directive 2004/108/EC, the CE Marking Directive 93/68 EEC and all associated amendments.



All lead-free products offered by the company comply with the requirements of the European law on the Restriction of Hazardous Substances (RoHS) directive: 2011/65/EU, which means our manufacture processes and products are strictly "lead-free" and without the hazardous substances cited in the directive.



The crossed-out wheeled bin mark symbolizes that within the European Union the product must be collected separately at the product end-of-life. This applies to your product and any peripherals marked with this symbol. Do not dispose of these products as unsorted municipal waste.



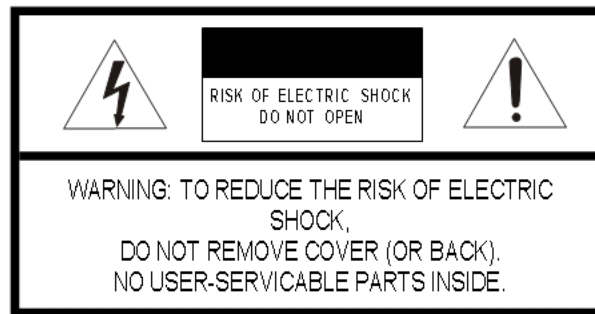
* This symbol indicates electrical warnings and cautions.

** This symbol indicates general warnings and cautions.

NORBAIN SD reserves the right to make changes to the product and specification of the product from time to time without prior notice.

WARNINGS AND CAUTIONS:

To reduce the risk of fire or electric shock, do not insert any metallic objects through the ventilation grills or other openings on the equipment.



IMPORTANT SAFEGUARDS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that product heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. CAUTION - THESE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED SERVICE PERSONNEL ONLY. TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.
15. IEC60950-1/UL60950-1 or Certified/Listed Class 2 power source only.

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1 Introduction

The VK2-HD20-SMW IP PTZ dome is a highly featured CCTV cameras offering the installer and user the following:

1. H265 / H264 Compression
2. PTZ Functions including presets
3. Hi-Stream bandwidth / storage optimizer function
4. 2MP resolution
5. Alarms, Audio and edge recording

1.1 Components

This system comes with the following components;

* Dome Camera	1
* Installation Guide/CD	1)
* Template Sheet	1
* Mounting Bracket	1
* Safety Lanyard	1
* Accessory Kit	1
1) Mounting screws (PH6 x 35.0)	(4)
2) Plastic anchors	(4)
3) O-Rings	(4)
* Accessory Connector	1
1) 2-Pin Terminal Block	(3)
2) 3-Pin Terminal Block	(2)
* RJ-45 Waterproof Cover	1

NOTE: Check your package to make sure that you received the complete system, including all components listed above.

NOTE: Adaptor for 12VDC is not supplied.

1.2 Key Features

- **Brilliant video quality**

The network camera offers the highly efficient H.264/H.265 video compression, which drastically reduces bandwidth and storage requirements without compromising image quality. Motion JPEG is also supported for increased flexibility.

- **Quad Streams**

The network camera can deliver quad video streams simultaneously using H.264/H.265 and Motion JPEG. This means that several video streams can be configured with different compression formats, resolutions and frame rates for different needs.

- **Intelligent video capabilities**

The network camera includes intelligent capabilities such as enhanced video motion detection. The network camera's external inputs and outputs can be connected to devices such as sensors and relays, enabling the system to react to alarms and activate lights or open/close doors.

- **Improved Security**

The network camera logs all user access, and lists currently connected users. Also, its full frame rate video can be provided over HTTPS.

- **PoE (Power over Ethernet)**

This network camera can be powered through PoE, which simplifies installation since only one cable is needed for carrying power, as well as video controls.

- **ONVIF Certificate**

This is a global interface standard that makes it easier for end users, integrators, consultants, and manufacturers to take advantage of the possibilities offered by network video technology. ONVIF enables interoperability between different vendor products, increased flexibility, reduced cost, and future-proof systems.

- **Micro-SD Recording support**

The network camera also supports a Micro-SD memory slot for local recording with removable storage of type SDHC and SDXC.

- **Audio support**

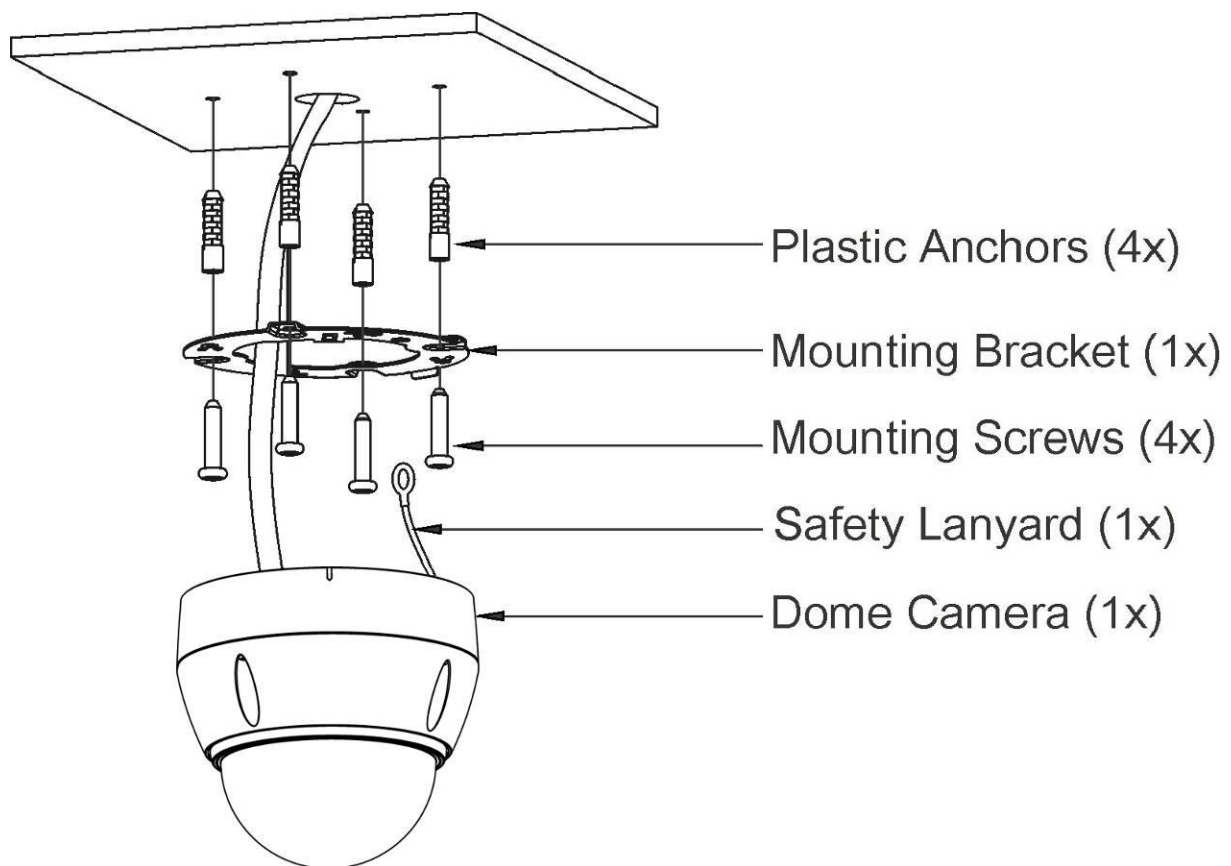
The network camera also supports two-way audio.

2 Installation

2.1 Mounting the Dome Camera

The dome camera is for use in surface or pendent mounting applications, and the mounting member must be capable of supporting loads of up to 10 lb (4.5 kg). (Pendent mounting must use pendent mount accessory.)

The dome camera's mounting bracket should be attached to a structural object, such as hard wood, wall stud or ceiling rafter that supports the weight of the dome camera.



CAUTION: A silicone rubber sealant must be applied to seal the housing to secure waterproofing.

CAUTION: Please reset the camera after 30 ~ 60 minutes when installing it in situations colder than -10°C.

2.1.1 Locking the Dome Camera

1. Make screw holes on the ceiling using the supplied mounting Template Sheet (Figure A).
2. Fix the Mounting Bracket to the ceiling using supplied Anchors (4x) and Mounting Screws (4x) (Figure B).
3. Hook up the Safety Lanyard to the Safety Lanyard Hook of the Mounting Bracket (Figure C).
4. Align the locking tab on the bracket and the locking slot on the base of the dome (Figure D).
5. Turn the dome to the counterclockwise about 10 degree to the locked position (Figure E).

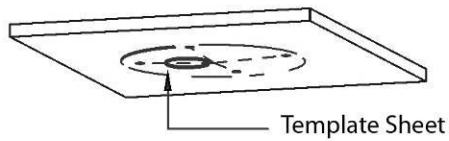


Figure A

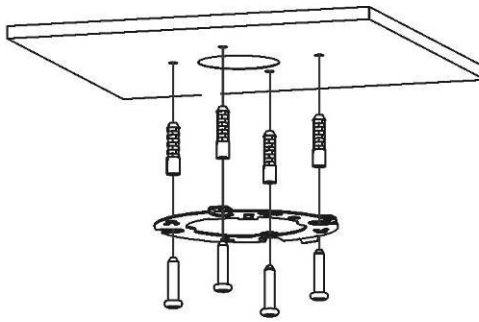


Figure B

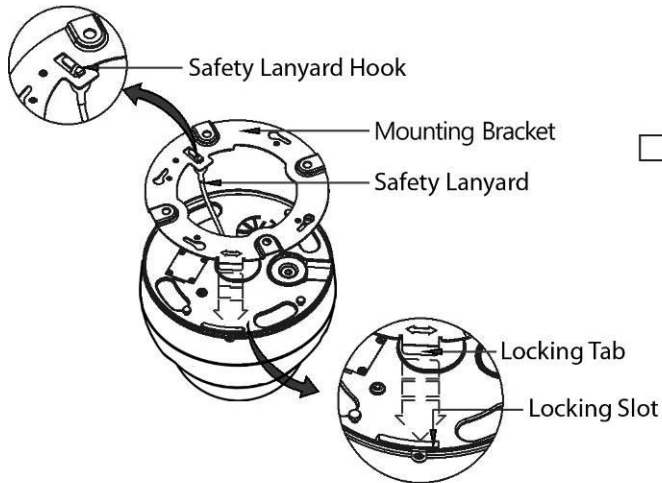


Figure C

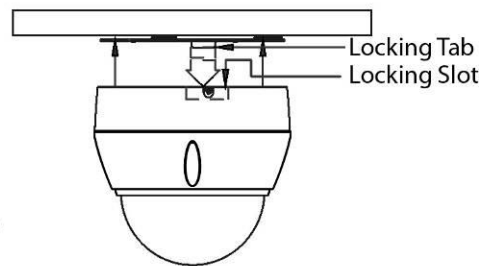


Figure D

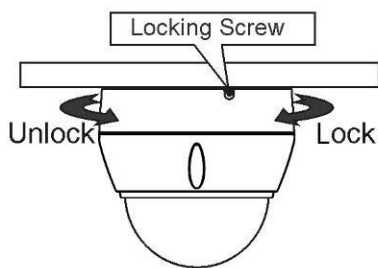


Figure E

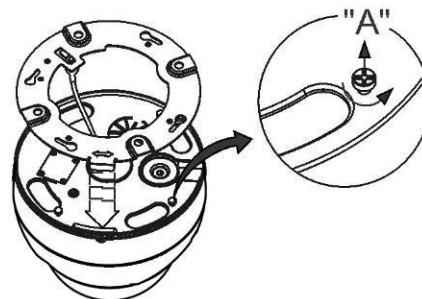


Figure F

CAUTION: Before installing mounting bracket to surface pre-adjust the four mounting screws "A" on the base of the dome camera to best match the mounting bracket locked position. Unscrew the locking screw on the side of the dome's base and fit the tab of the mounting bracket into the locking slot. Screws "A" should not be too tight or too loose when the dome is in the locked position. After setting the proper positions of screws "A" remove the mounting bracket and install it to the proper surface. If it is too difficult to lock the dome in position after the mounting bracket has been installed readjust the screws "A" by unscrewing them a small amount and try to install dome camera again.

2.1.2 Heater Kit Installation (Optional)

1. Assemble the Heater board to two bosses with screws.

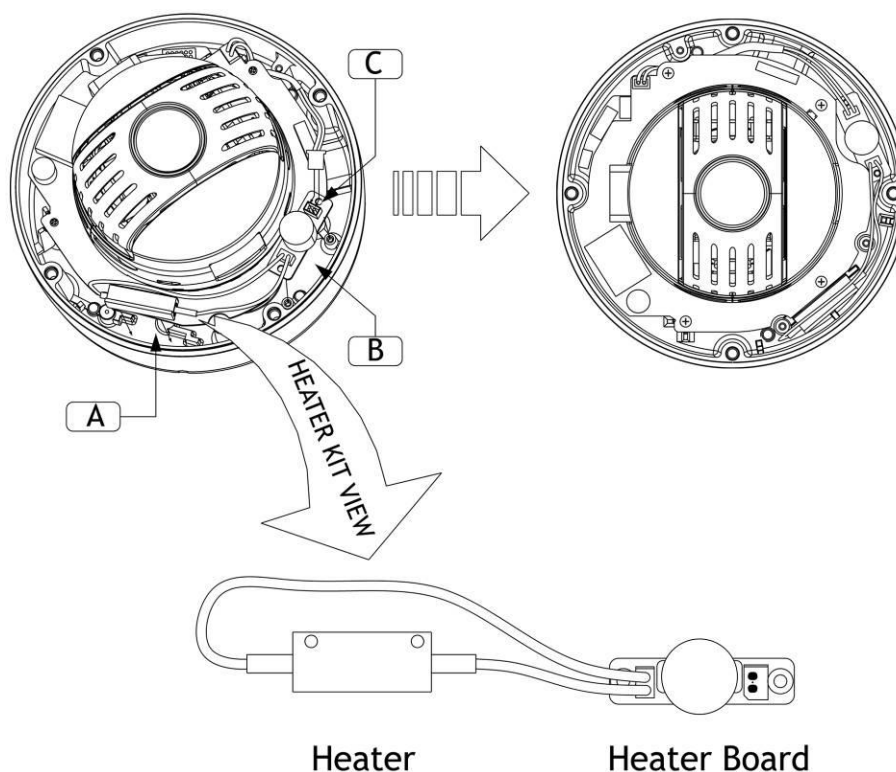
Take it to a reference “B” in the bottom case as below.

2. Place the Heater in the slot “A”.

Heater cable should be placed away from the Main board.

3. Plug the power connector to the socket “C” (J1) of the Heater board.

4. 24VAC is recommended to use for the camera power for stable operation with heater kit.



• HEATER (IF APPLICABLE)

Power Supply	24VAC
Power Consumption	10W
Heater ON	at 59°F (15°C)
Heater OFF	at 77°F (25°C)

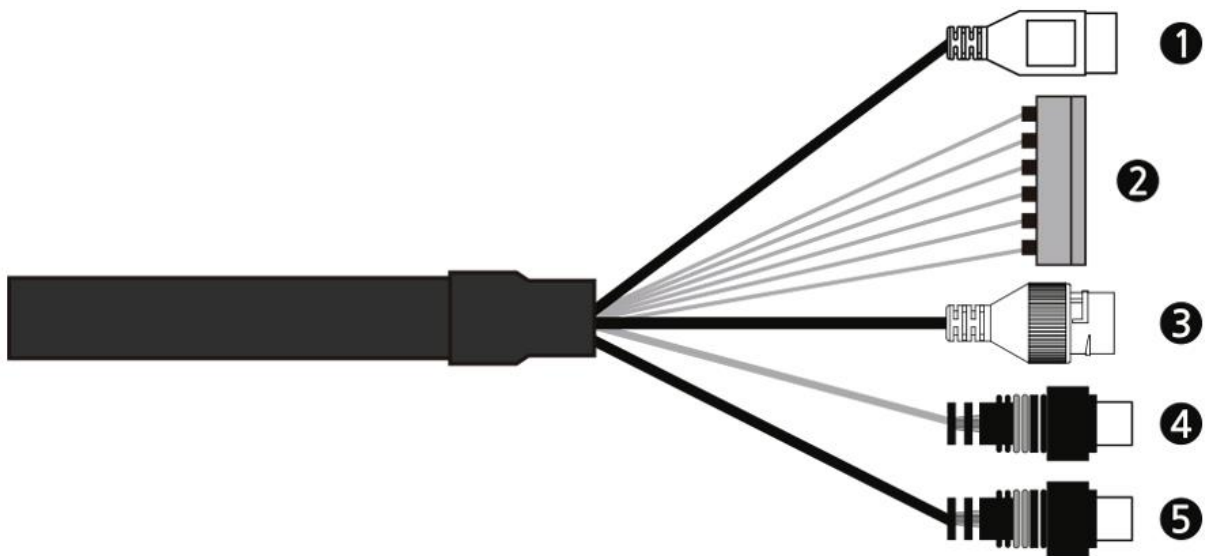
• POWER

Use Certified/Listed power source only.

CAUTION 1: Dehumidify after installing the heater kit. Otherwise, moisture may be generated at certain temperatures. Then close the cover tightly to ensure waterproofing.

CAUTION 2: Please reset the camera after 30 ~ 60 minutes when installing it in situations colder than -10°C.

2.2 Basic Configuration of Dome Camera System

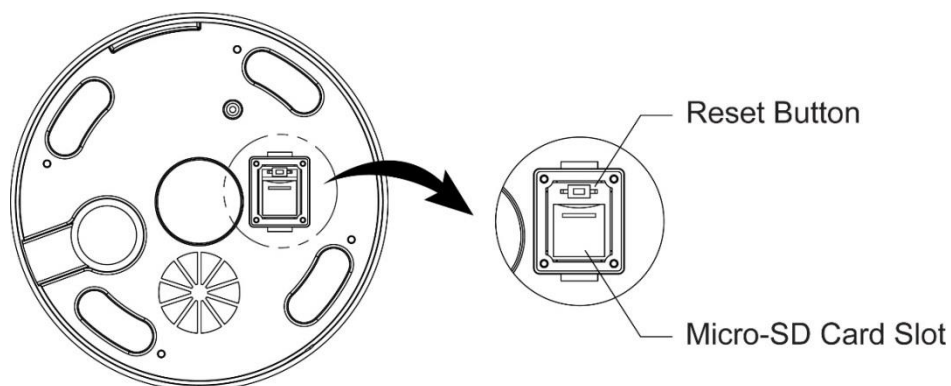


No.	Type	Description
1	3-PIN TERMINAL BLOCK	CAMERA POWER (12VDC, 24VAC)
2	6-PIN TERMINAL BLOCK	A1: ALARM INPUT 1
		A2: ALARM INPUT 2
		A3: ALARM INPUT 3
		A4: ALARM INPUT 4
		G: GND
		AO: ALARM OUTPUT
3	RJ-45	ETHERNET
4	RCA BLACK	AUDIO INPUT
5	RCA GRAY	AUDIO OUTPUT

The camera must be installed by qualified service personnel in accordance with all local and federal electrical and building codes.

2.3 Resetting to the factory default settings

To reset the network camera to the original factory settings, go to the Setup > System > Maintenance web page (described in “System > Maintenance” of User Manual) or use the **Reset** button on the network camera, as described below:



• Using the Reset button:

Follow the instructions below to reset the network camera to the factory default settings using the Reset button.

1. Switch off the network camera by disconnecting the power adapter.
2. Open the Micro-SD card cover.
3. Press and hold the Reset button on the board with your finger while reconnecting the power.
4. Keep the Reset button pressed for about 2 seconds.
5. Release the Reset button.
6. The network camera resets to factory defaults and restarts after completing the factory reset.
7. Close the Micro-SD card cover tightly to ensure waterproofing.

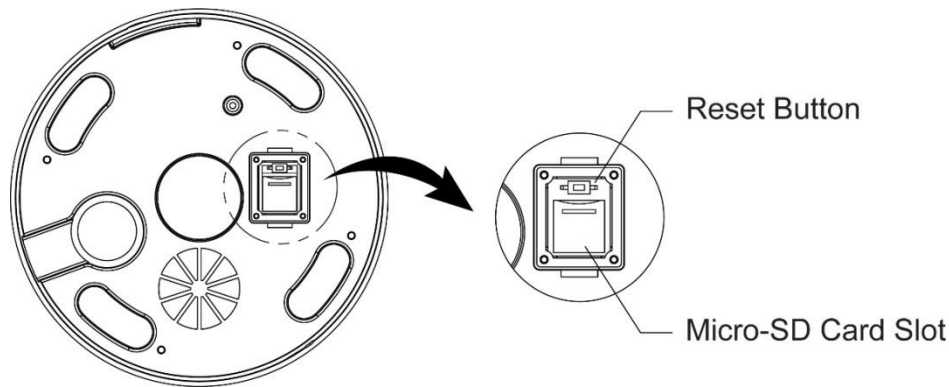
CAUTION: When performing a Factory Reset, you will lose any settings that have been saved.
(Default IP 192.168.30.220)

2.4 Connections

• Micro-SD Card Insertion

User can install and change Micro-SD card as shown in the following picture.

1. Open the Micro-SD card cover.
2. Install or change Micro-SD card.
3. Close the Micro-SD card cover tightly to ensure waterproofing.



• Connecting to the RJ-45

Connect a standard RJ-45 cable to the network port of the camera. Generally a crossover cable is used for directly connection to PC, while a direct cable is used for connection to a hub.

• Connecting Alarms

– A1,A2,A3,A4 (Alarm Input 1,2,3,4)

You can use external devices to signal the camera to react on events. Mechanical or electrical switches can be wired to the A1,A2,A3,A4 (Alarm Input 1,2,3,4) and G (Ground) connectors.

– G (Ground)

NOTE: All the connectors marked G or GND are common.

Connect the ground side of the alarm input and/or alarm output to the G (Ground) connector.

– AO (Alarm Output)

The camera can activate external devices such as buzzers or lights. Connect the device to the AO (Alarm Output) and G (Ground) connectors.

• Connecting Audio

Connect speaker to audio output line and external mic to audio input line.

• Connecting the Power

Connect power of 12VDC or 24VAC for the camera.

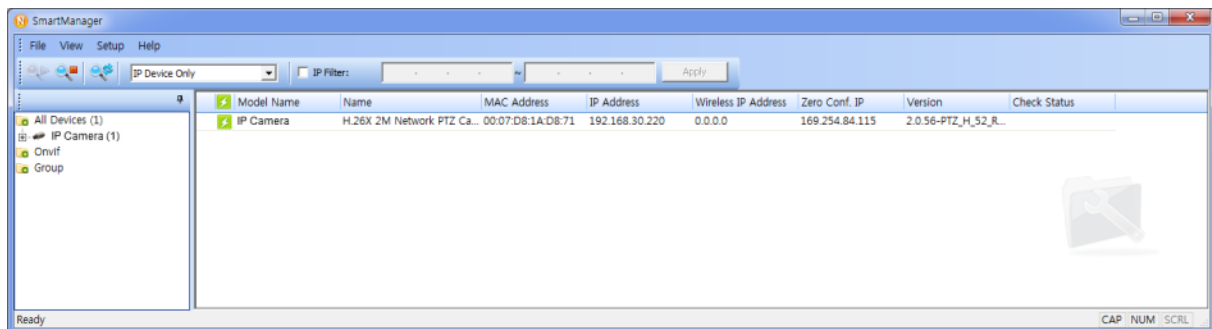
Connect the positive (+) pole to the '+' position and the negative (-) pole to the '-' position.

- Be careful not to reverse the polarity when you connect the power cable.
- You can also use a router featuring PoE (Power over Ethernet) to supply power to the camera.
- 24VAC is recommended to use for the camera power for stable operation with heater kit. If using 12VDC or PoE, the heater will not operate at all.

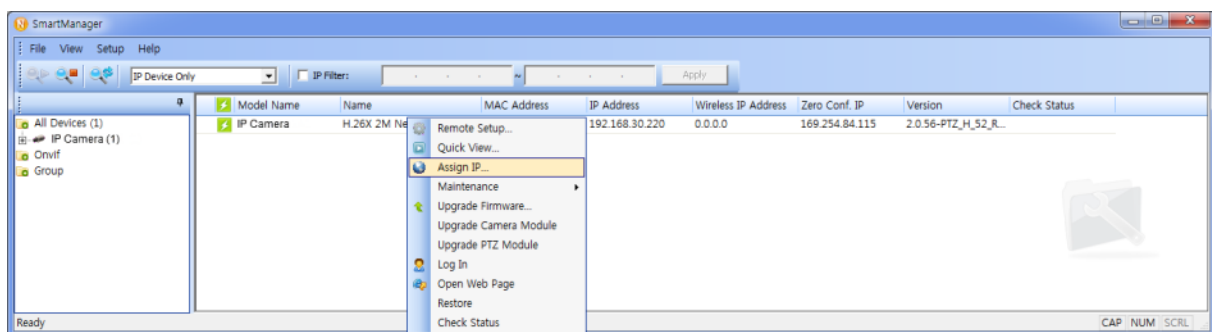
2.4.1 Network Connection & IP Assignment

The camera supports the operation through the network. When a camera is first connected to the network, it is necessary to allocate an IP address to the device with the SmartManager utility on the CD. (Default IP 192.168.30.220)

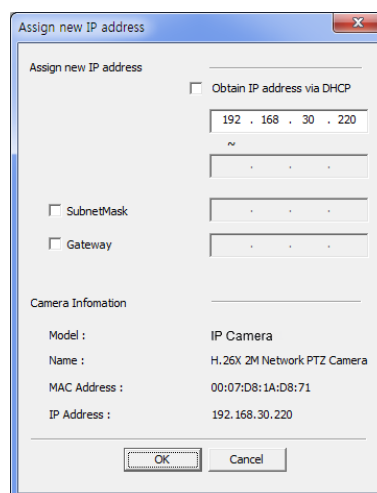
- 1) Connect the network camera/device to the network and power up.
- 2) Start SmartManager utility (Start > All programs > SmartManager > SmartManager).
The main window will display, and after a short while any network devices connected to the network will be displayed in the list.



- 3) Select the camera on the list and click right button of the mouse. You can see the pop-up menu as below.



- 4) Select Assign IP Address. The Assign IP window will display. Enter the required IP address.



NOTE: For more information, refer to the SmartManager User Manual.

3 Operation

The network camera can be used with Windows operating system and browsers. The recommended browsers are Internet Explorer, Safari, Firefox, Opera and Google Chrome with Windows.

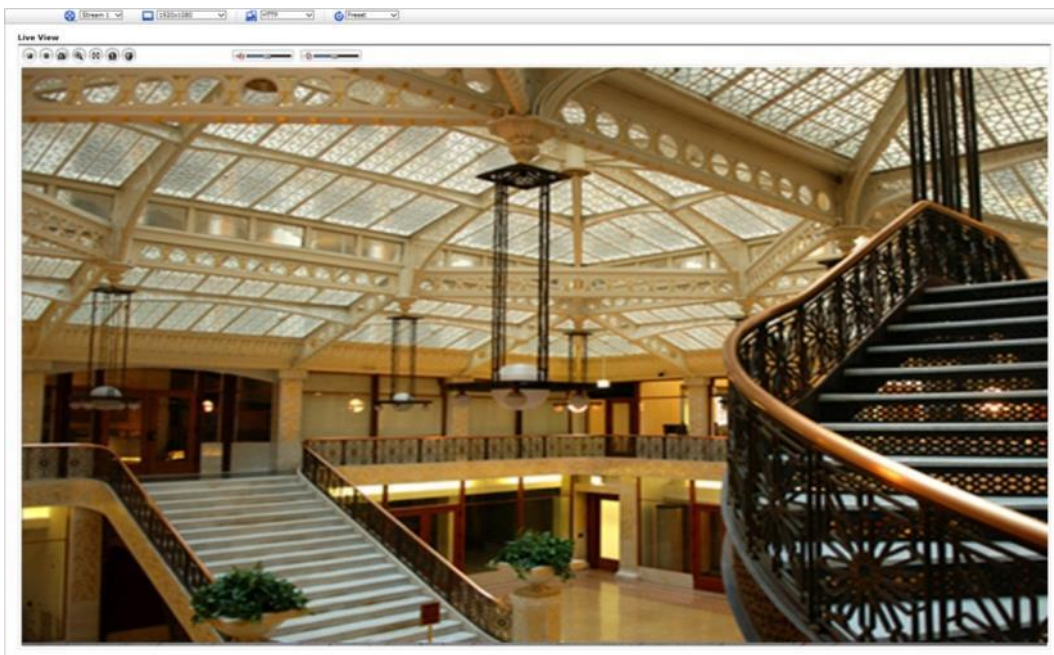
NOTE: To view streaming video in Microsoft Internet Explorer, set your browser to allow ActiveX controls.

3.1 Access from a browser

1. Start a browser (Internet Explorer).
2. Enter the IP address or host name of the network camera in the Location/Address field of your browser.
3. You can see a starting page. Click **Live View**, **Playback**, or **Setup** to enter web page.



4. The network cameras Live View page appears in your browser.



3.2 Access from the internet

Once connected, the network camera is accessible on your local network (LAN). To access the network camera from the Internet you must configure your broadband router to allow incoming data traffic to the network camera. To do this, enable the NAT traversal feature, which will attempt to automatically configure the router to allow access to the network camera. This is enabled from Setup > System > Network > NAT. For more information, please see “System > Network > NAT” of User Manual.

3.3 Setting the admin password over a secure connection

To gain access to the product, the password for the default administrator user must be set. This is done in the Admin Password dialog, which is displayed when the network camera is accessed for the setup at the first time. Enter your admin name and password, set by the administrator.



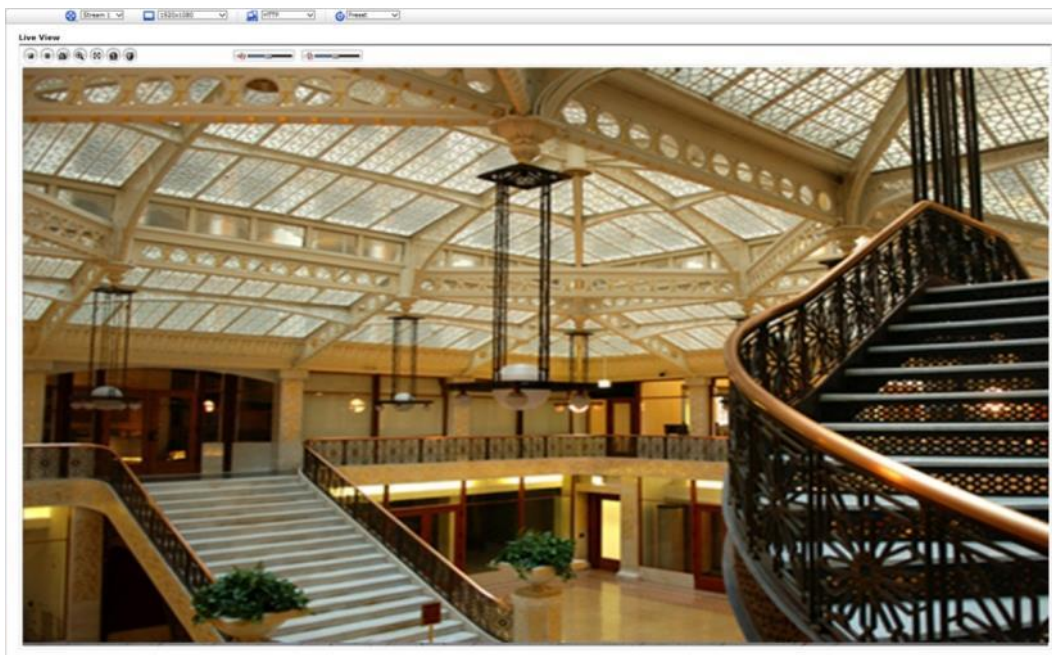
NOTE: The default administrator user name and password is “admin”. If the password is lost, the network camera must be reset to the factory default settings. Please see “Resetting to the factory default settings”.

To prevent network eavesdropping when setting the admin password, this can be done via an encrypted HTTPS connection, which requires an HTTPS certificate (see NOTE below). To set the password via a standard HTTP connection, enter it directly in the first dialog shown above. To set the password via an encrypted HTTPS connection, please see “System > Security > HTTPS” of User Manual.

NOTE: HTTPS (Hypertext Transfer Protocol over SSL) is a protocol used to encrypt the traffic between web browsers and servers. The HTTPS certificate controls the encrypted exchange of information.

3.4 Live View Page

The Live View page comes in several screen modes. Users are allowed to select the most suitable one out of those modes. Adjust the mode in accordance with your PC specifications and monitoring purposes.



1) General controls



Live View Page



Playback Page



Setup Page



Help Page



Stream 1

The video drop-down list allows you to select a customized or preprogrammed video stream on the Live View page. Stream profiles are configured under Setup > Basic Configuration > Video & Image. For more information, please see “Basic Configuration > Video & Image” of User Manual.



1920x1080

The resolution drop-down list allows you to select the most suitable one out of video resolutions to be displayed on Live View page.



HTTP

The protocol drop-down list allows you to select which combination of protocols and methods to use depending on your viewing requirements, and on the properties of your network.
















Preset

The preset drop-down list allows you to select the preset number for the PTZ camera being used. This icon is inactivated if the PTZ settings are not set.

2) Control toolbar

The live viewer toolbar is available in the web browser page only. It displays the following buttons:

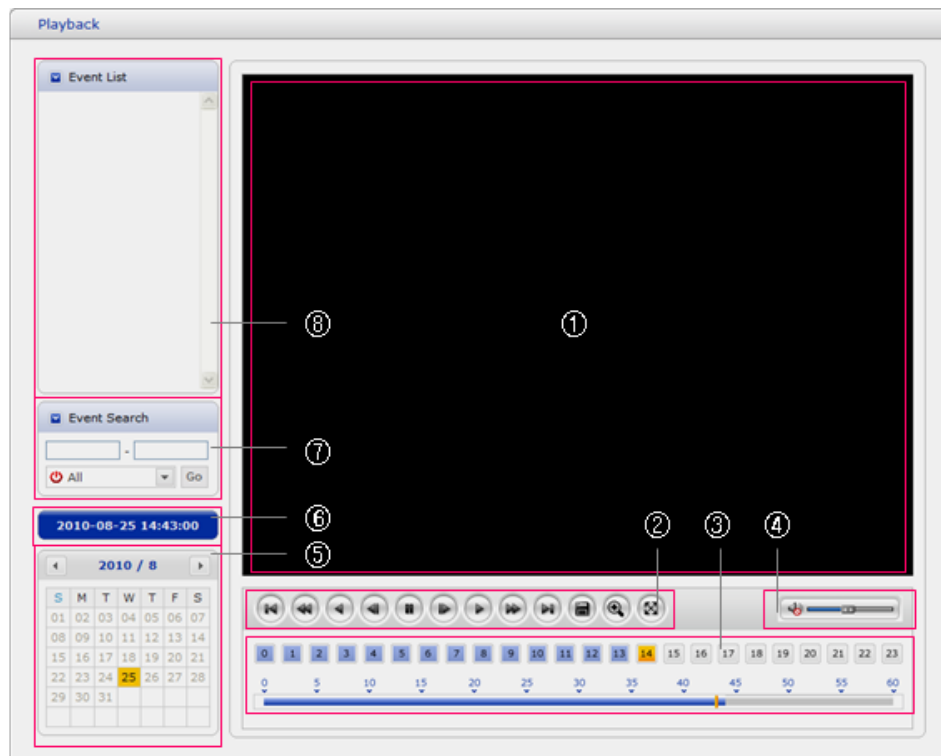
-  The **Stop** button stops the video stream being played. Pressing the key again toggles the play and stop.
-  The **Play** button connects to the network camera or starts playing a video stream.
-  The **Pause** button pauses the video stream being played.
-  The **Snapshot** button takes a snapshot of the current image. The location where the image is saved can be specified.
-  The **Digital Zoom** button activates a zoom-in or zoom-out function for video image on the live screen.
-  The **Full Screen** button causes the video image to fill the entire screen area. No other windows will be visible. Press the 'Esc' button on the computer keyboard to cancel full screen view.
-  The **Manual Trigger** button activates a pop-up window to manually start or stop the event.
-  The **PTZ** button activates a pop-up window for Pan, Tilt and Zoom control.
-  The **Screen Move** button moves to the desired position on the screen. Move the clicked point to the center of the screen. When dragging, it moves to the center of the box and zooms in.
-  The **Relay Output** button manually triggers relay out. (This icon appears only if "Enable alarm out" is selected in "Event > Event Out > Alarm Out".)
-  The **Speaker** button activates/deactivates external speaker.
-  The **Mic** button activates/deactivates microphone input.
-  Use this scale to control the volume of the speakers and microphones.

3) Video Streams

The network camera provides several images and video stream formats. Your requirements and the properties of your network will determine the type you use.

The Live View page in the network camera provides access to H.264, H.265 and Motion JPEG video streams, and to the list of available video streams. Other applications and clients can also access these video streams/images directly, without going via the Live View page.

3.5 Playback



The Playback window contains a list of recordings made to the memory card. It shows each recording's start time, length, the event type used to start the recording, calendar and time slice bar indicates if the recording is existed or not.












The description of playback window follows.


1) Video Screen

You can see the video screen when playing the video clip in the Micro-SD memory.

2) Playback Buttons

To view a recording data in the SD local storage, select it from the list and click the Playback buttons.

-  Go to the first: go to the beginning of the video clip.
-  Fast backward play: fast play backward of the video clip.
-  Backward play: play backward of the video clip.
-  Step backward play: go back one frame of the video clip.
-  Pause: pause playback of the video clip.
-  Step forward play: go forward one frame of the video clip.
-  Forward Play: play forward the video clip.
-  Fast forward play: play fast forward of the video clip.
-  Go to the last: go to the end of the video clip.
-  Clip copy: copy the video clip.
-  Zoom In: zoom in the video clip.

 Full Screen: display full screen of the video.

3) Time Chart

Display an hour-based search screen for the chosen date. If there is recording data, a blue section will be displayed on a 24-hour basis. If you select a particular hour in the chart, a yellow square on the hour will be displayed.

4) Speaker Control Bar

Use this scale to control the volume of the speakers.

5) Search Calendar

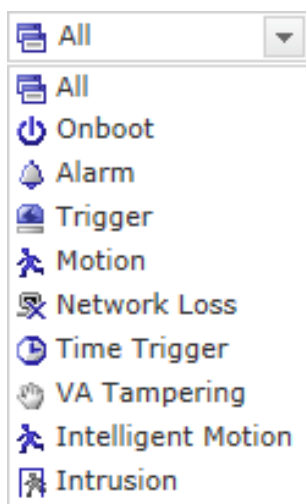
Search results from the SD local storage in the network camera connected are displayed monthly. If there is a recorded data for a particular date, a blue square on the date will be displayed. If you select a particular date in the calendar, a yellow square on the date will be displayed.

6) Play Time

Displays time of the video playing.

7) Event Search Window

Select a search option in the drop-down list and click GO button. You can also enter the time period for searching. If you click Start Date or End Date zone, displays Search Calendar.



8) Event List Window

Event List displays the event(s) that were recorded in the SD local storage. Select a list and click the play button. The video clip will be played.

3.6 Network Camera Setup

This section describes how to configure the network camera.

Administrator has unrestricted access to all the Setup tools, whereas Operators have access to the settings of Basic Configuration, which are Live View, Video & Image, Audio, Event, Dome Configuration, and System.

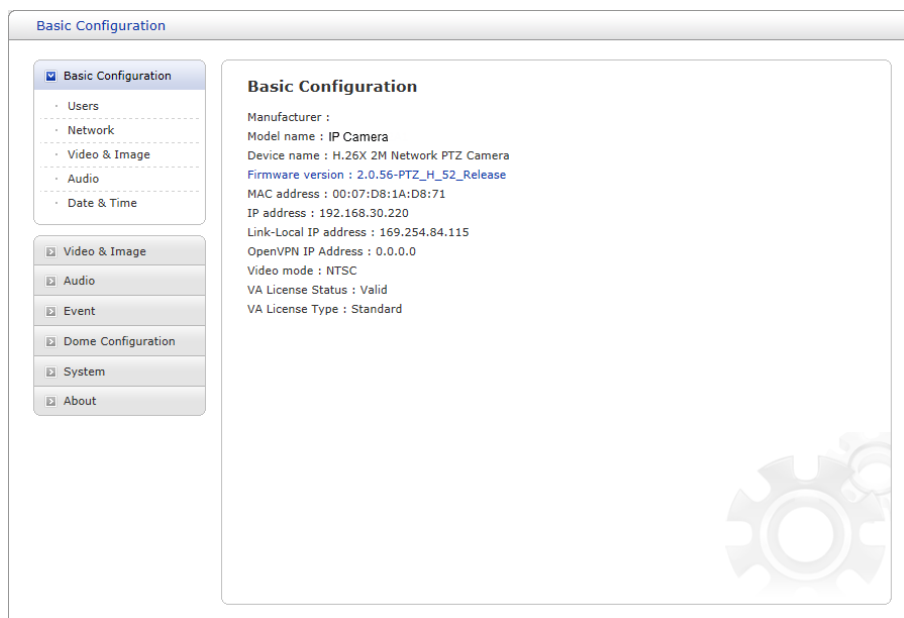
You can configure the network camera by clicking Setup either in the first connection page or the top second-right button of the Live View page. Accessing the network camera from a computer for the first time opens the Admin Password dialog box. Enter your administrator or operator id and password to get into setup page.



NOTE: If the password is lost, the network camera must be reset to the factory default settings. Please see "Resetting to the factory default setting".

3.6.1 Basic Configuration

You can see the device information in this information page.



1) Users

User access control is enabled by default. The administrator can set up other users, by giving user names and passwords. It is also possible to allow anonymous viewer login, which means that anybody may access the Live View page, as described below:

Basic Configuration

☒ Basic Configuration

- **Users**
- Network
- Video & Image
- Audio
- Date & Time

☐ Video & Image

☐ Audio

☐ Event

☐ Dome Configuration

☐ System

☐ About

Users

User Setting

☒ Enable anonymous viewer login

User List Setting

User Name	User Group	Authority
admin	administrator	live, setup, system, ptz

Add Modify Remove

Save Reset

The **user list** displays the authorized users and user groups (levels):

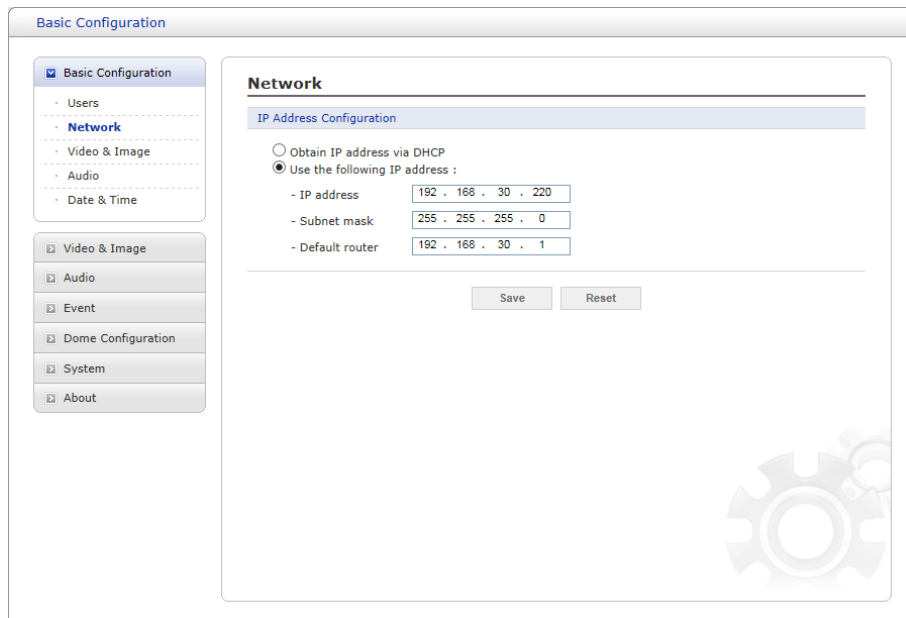
User Group	Authority
Guest	Provides the lowest level of access, which only allows access to the Live View page.
Operator	An operator can view the Live View page, create and modify events, and adjust certain other settings. Operators have no access to System Options.
Administrator	An administrator has unrestricted access to the Setup tools and can determine the registration of all other users.

- **Enable anonymous viewer login:** Check the box to use the webcasting features. Refer to “Video & Image > Webcasting” for more details.

Please refer to “System > Security > Users” for more details about User setup.

2) Network

The network camera supports both IP version 4 and IP version 6. Both versions may be enabled simultaneously, and at least one version must always be enabled. When using IPv4, the IP address for the network camera can be set automatically via DHCP, or a static IP address can be set manually. If IPv6 is enabled, the network camera receives an IP address according to the configuration in the network router. There is also an option of using the Internet Dynamic DNS Service. For more information on setting the network, please see “System > Network > Basic”.



The screenshot shows a web interface titled "Basic Configuration". On the left is a sidebar menu with the following items: "Basic Configuration" (selected), "Users", "Network", "Video & Image", "Audio", "Date & Time", "Video & Image", "Audio", "Event", "Dome Configuration", "System", and "About". The main content area is titled "Network" and contains a sub-section "IP Address Configuration". It has two radio buttons: "Obtain IP address via DHCP" (unselected) and "Use the following IP address:" (selected). Below the radio buttons are three input fields: "IP address" with the value "192 . 168 . 30 . 220", "Subnet mask" with the value "255 . 255 . 255 . 0", and "Default router" with the value "192 . 168 . 30 . 1". At the bottom right of the form are "Save" and "Reset" buttons. A large gear icon is visible in the background of the main content area.

- **Obtain IP address via DHCP:** Dynamic Host Configuration Protocol (DHCP) is a protocol that lets network administrators centrally manage and automate the assignment of IP addresses on a network. DHCP is enabled by default. Although a DHCP server is mostly used to set an IP address dynamically, it is also possible to use it to set a static, known IP address for a particular MAC address.
- **Use the following IP address:** To use a static IP address for the network camera, check the radio button and then make the following settings:
 - **IP address:** Specify a unique IP address for your network camera.
 - **Subnet mask:** Specify the mask for the subnet the network camera is located on.
 - **Default router:** Specify the IP address of the default router (gateway) used for connecting devices attached to different networks and network segments.

NOTES:

1. DHCP should only be enabled if using dynamic IP address notification, or if your DHCP server can update a DNS server, which then allows you to access the network camera by name (host name). If DHCP is enabled and you cannot access the unit, you may have to reset it to the factory default settings and then perform the installation again.
2. The ARP/Ping service is automatically disabled two minutes after the unit is started, or as soon as an IP address is set.
3. Pinging the unit is still possible when this service is disabled.

Please refer to “System > Network > Basic” for more details about Network setup.

3) Video & Image

User can setup and change setting of individual video stream in this page.

Basic Configuration

- Basic Configuration
 - Users
 - Network
 - Video & Image**
 - Audio
 - Date & Time
- Video & Image
- Audio
- Event
- Dome Configuration
- System
- About

Video & Image

Sensor Setting

Capture mode: 1920x1080,30fps,NTSC

Stream 1 Setting

Codec type: ☒ H264 ☐ H265
Codec: H.264 Main Profile
Resolution: 1920x1080
Bitrate control: ☐ CBR ☒ CVBR
Bitrate: 4000 [Kbps]
Framerate: 30
GOP size: 30 [1 ...60]

Stream 2 Setting

Codec: MJPEG
Resolution: 640x480
Framerate: 15
Quality: 1 80 100

Stream 3 Setting

Codec type: ☒ H264 ☐ H265
Codec: H.264 Baseline Profile
Resolution: 640x480
Bitrate control: ☐ CBR ☒ CVBR
Bitrate: 1000 [Kbps]
Framerate: 30
GOP size: 30 [1 ...60]

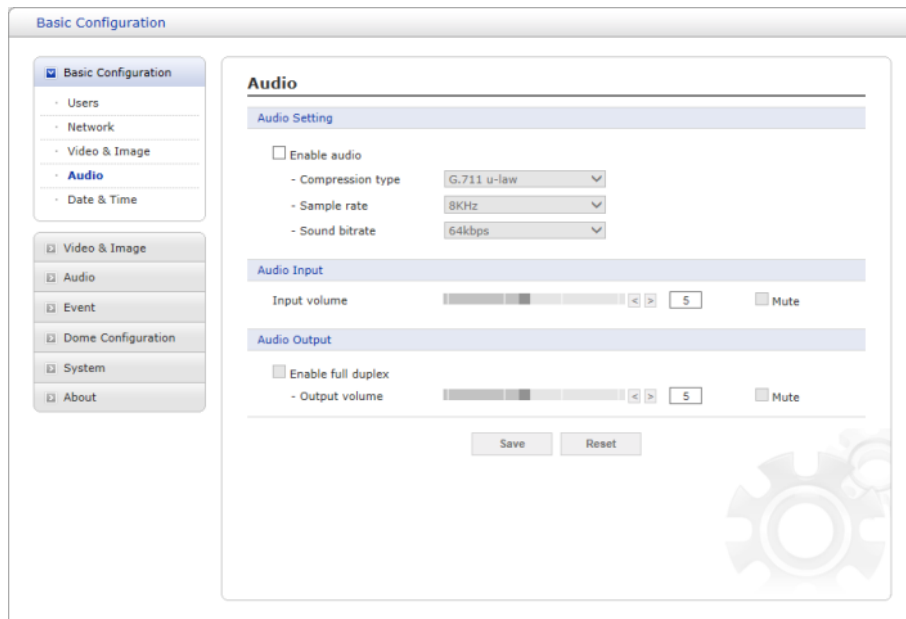
Stream 4 Setting

Codec type: ☒ H264 ☐ H265
Codec: H.264 Baseline Profile
Resolution: 320x240
Bitrate control: ☐ CBR ☒ CVBR
Bitrate: 4000 [Kbps]
Framerate: 15
GOP size: 15 [1 ...30]

Save Reset

Please refer to “Video & Image > Basic” for more details about Video & Image setup.

4) Audio

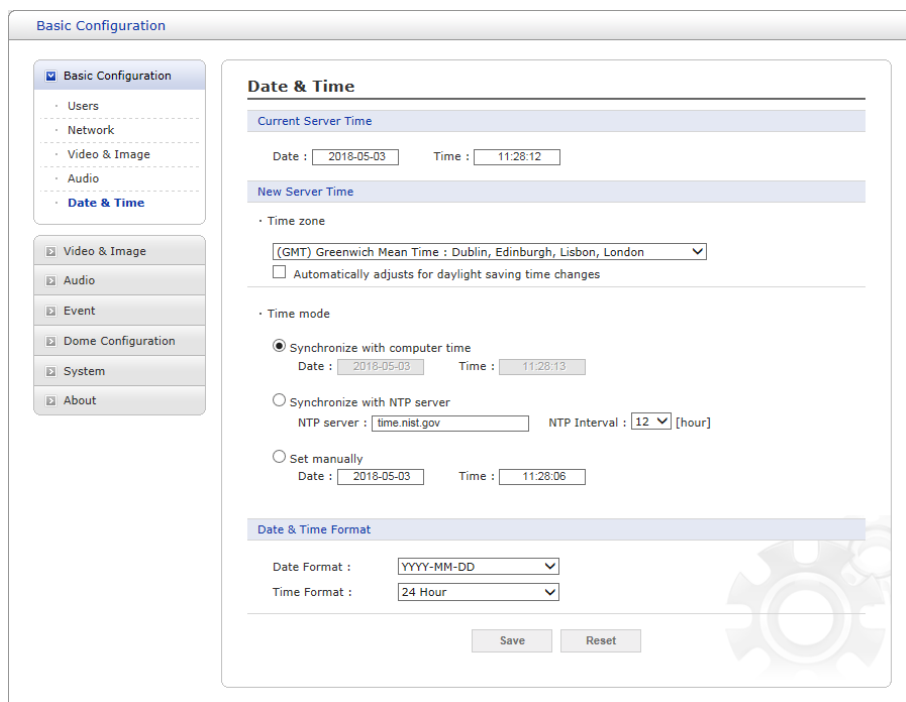


The screenshot shows the 'Basic Configuration' window with the 'Audio' tab selected. The left sidebar contains a tree view with 'Basic Configuration' expanded, showing sub-items: Users, Network, Video & Image, Audio (selected), and Date & Time. Below this are other system configuration categories: Video & Image, Audio, Event, Dome Configuration, System, and About. The main content area is titled 'Audio' and contains three sections: 'Audio Setting', 'Audio Input', and 'Audio Output'. 'Audio Setting' has a checkbox for 'Enable audio' (unchecked) and three dropdown menus for 'Compression type' (G.711 u-law), 'Sample rate' (8KHz), and 'Sound bitrate' (64kbps). 'Audio Input' has a slider for 'Input volume' (set to 5) and a 'Mute' checkbox (unchecked). 'Audio Output' has a checkbox for 'Enable full duplex' (unchecked), a slider for 'Output volume' (set to 5), and a 'Mute' checkbox (unchecked). At the bottom are 'Save' and 'Reset' buttons. A large gear icon is visible in the background.

The network camera can transmit audio to other clients using an external microphone and can play audio received from other clients by attaching a speaker. User can setup and change setting of Audio in this page.

Please refer to “Audio” for more details about Audio setup.

5) Date & Time



The screenshot shows the 'Basic Configuration' window with the 'Date & Time' tab selected. The left sidebar is identical to the previous screenshot, with 'Date & Time' now selected in the tree view. The main content area is titled 'Date & Time' and contains three sections: 'Current Server Time', 'New Server Time', and 'Date & Time Format'. 'Current Server Time' shows 'Date : 2018-05-03' and 'Time : 11:28:12'. 'New Server Time' has a 'Time zone' dropdown set to '(GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London' and an unchecked checkbox for 'Automatically adjusts for daylight saving time changes'. Below this is the 'Time mode' section with three radio buttons: 'Synchronize with computer time' (selected), 'Synchronize with NTP server', and 'Set manually'. The 'Synchronize with computer time' mode shows 'Date : 2018-05-03' and 'Time : 11:28:13'. The 'Synchronize with NTP server' mode shows 'NTP server : time.nist.gov' and 'NTP Interval : 12 [hour]'. The 'Set manually' mode shows 'Date : 2018-05-03' and 'Time : 11:28:06'. The 'Date & Time Format' section has two dropdown menus: 'Date Format : YYYY-MM-DD' and 'Time Format : 24 Hour'. At the bottom are 'Save' and 'Reset' buttons. A large gear icon is visible in the background.

User can set time directly or assign time server to get the current time, as well as determine Date & Time format in this page.

Please refer to “System > Date & Time” for more details about Date & Time setup.

3.6.2 Video & Image

1) Basic

Video & Image - Basic

Sensor Setting

Capture mode: 1920x1080,30fps,NTSC

Stream 1 Setting

Codec type: ☒ H264 ☐ H265
Codec: H.264 Main Profile
Resolution: 1920x1080
Bitrate control: ☐ CBR ☒ CVBR
Bitrate: 4000 [Kbps]
Framerate: 30
GOP size: 30 [1 ...60]

Stream 2 Setting

Codec: MJPEG
Resolution: 640x480
Framerate: 15
Quality: 1 50 100

Stream 3 Setting

Codec type: ☒ H264 ☐ H265
Codec: H.264 Baseline Profile
Resolution: 640x480
Bitrate control: ☐ CBR ☒ CVBR
Bitrate: 1000 [Kbps]
Framerate: 30
GOP size: 30 [1 ...60]

Stream 4 Setting

Codec type: ☒ H264 ☐ H265
Codec: H.264 Baseline Profile
Resolution: 320x240
Bitrate control: ☐ CBR ☒ CVBR
Bitrate: 4000 [Kbps]
Framerate: 15
GOP size: 15 [1 ...30]

Save Reset

- **Sensor Setting:**

- **Capture mode:** User can select sensor capture mode between NTSC and PAL (Some models are fixed to NTSC or PAL).

- **Stream 1 Setting:**

- **Codec:** The codec supported in Stream 1 is H.264 and H.265. There are 3 pre-programmed stream profiles available for quick set-up. Choose the form of video encoding you wish to use from the drop-down list:
 - * **H.264 High Profile:** Primary profile for broadcast and disc storage applications, particularly for high-definition television applications (for example, this is the profile adopted by the Blu-ray Disc storage format and the DVB HDTV broadcast service).
 - * **H.264/H.265 Main Profile:** Primary profile for low-cost applications that require additional error robustness, this profile is used rarely in videoconferencing and mobile applications; it does add additional error resilience tools to the Constrained Baseline Profile. The importance of this profile is fading after the Constrained Baseline Profile has been defined.
 - * **H.264 Baseline Profile:** Originally intended as the mainstream consumer profile for broadcast and storage applications, the importance of this profile faded when the High Profile was developed for those applications.

- **Resolution:** This enables users to determine a basic screen size when having an access through the Web Browser or PC program. The screen size control comes in several modes. Users can change the selected screen size anytime while monitoring the screen on a real-time basis.
- **Bitrate control:** The bit rate can be set as Constrained Bit Rate (CBR) or Constrained Variable Bit Rate (CVBR). Limiting the maximum bit rate helps control the bandwidth used by the H.264 video stream. Leaving the Maximum bit rate as unlimited maintains consistently good image quality but increases bandwidth usage when there is more activity in the image. Limiting the bit rate to a defined value prevents excessive bandwidth usage, but images are degraded when the limit is exceeded.
 - * **CBR:** Constrained Bit Rate.
 - * **CVBR:** VBR with maximum bitrate which is set in **Bitrate**.
- **Bitrate:** Maximum bitrate in the range of 100Kbps ~ 10Mbps.
- **Frame rate:** Upon the real-time play, users should select a frame refresh rate per second. If the rate is high, the image will become smooth. On the other hand, if the rate is low, the image will not be natural but it can reduce a network load.
- **GOP size:** Select the GOP (Group of Picture) size. If users want to have a high quality of fast image one by one, please decrease the value. For the purpose of general monitoring, please do not change a basic value. Such act may cause a problem to the system performance. For the details of GOP setting, please contact the service center.

- **Stream 2 Setting:**

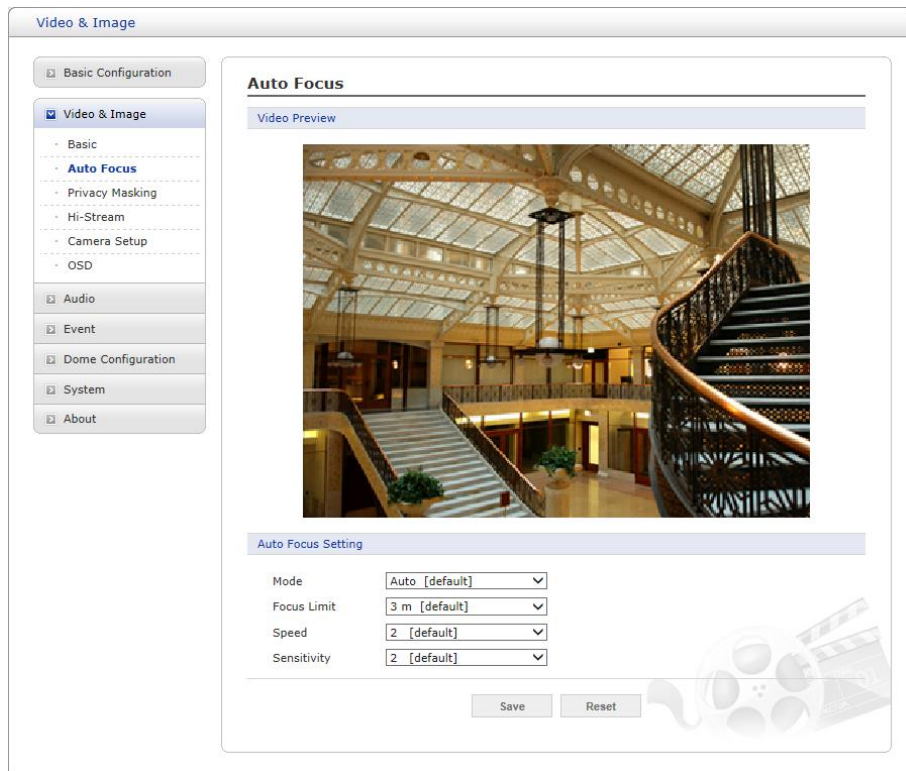
Sometimes the image size is large due to low light or complex scenery. Adjusting the frame rate and quality helps to control the bandwidth and storage used by the Motion JPEG video stream in these situations. Limiting the frame rate and quality optimizes bandwidth and storage usage, but may give poor image quality. To prevent increased bandwidth and storage usage, the Resolution, Frame rate, and Frame Quality should be set to an optimal value.

- **MJPEG Resolution:** Same as the Stream 1 settings.
- **MJPEG Frame rate:** Same as the Stream 1 settings.
- **MJPEG Quality:** Select the picture quality. If users want to have a high quality of fast image one by one, please decrease the value. For the purpose of general monitoring, please do not change a basic value. Such act may cause a problem to the system performance.

- **Stream 3, Stream 4 Setting:** Same as the Stream 1 settings.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

2) Auto Focus



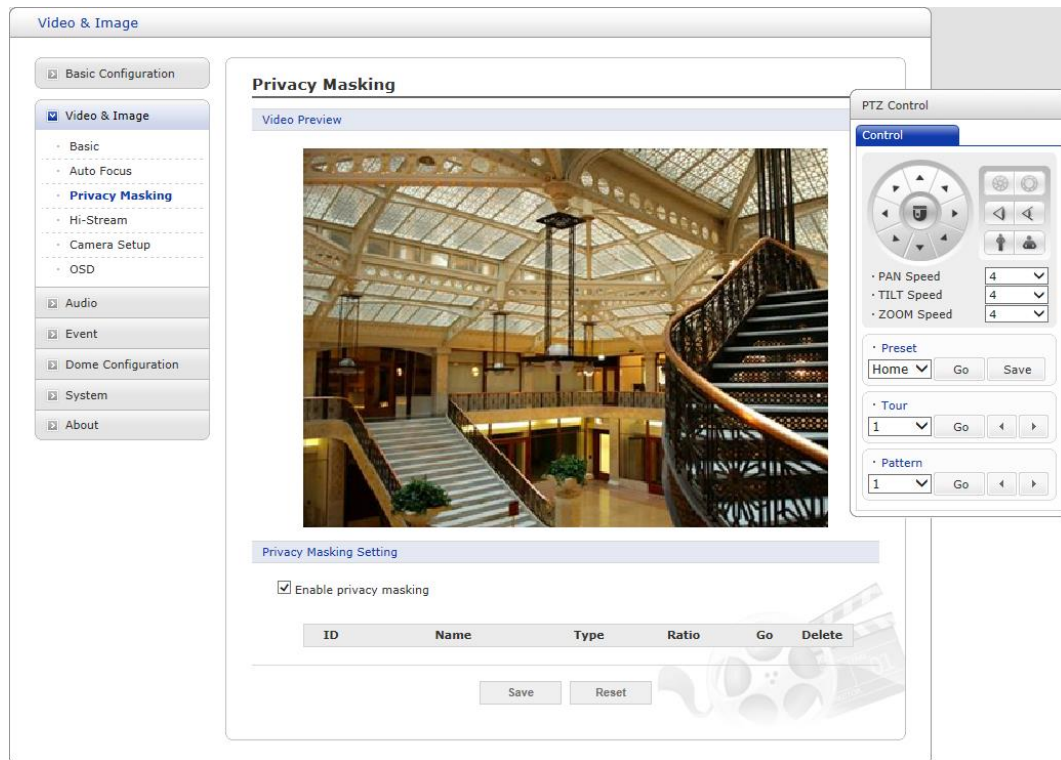
- **Mode:** Determines focus operation method.
 - **Auto:** Auto focus is always active.
 - **Manual:** Manual focus is always a fixed focus.
 - **One Push:** Manual focus mode except that auto focus is activated only after the camera movement stops and lasts for about 5 seconds.
- **Focus Limit:** Minimum distance for Auto Focus operation. Object nearer than this limit may not be clearly focused.
- **Speed:** Focus speed can be adjusted in the range of 1 ~ 7.
- **Sensitivity:** Focus sensitivity can be adjusted in the range of 0 ~ 4.

NOTES:

1. Avoid continuous, 24-hour use of the auto focus. This will shorten the lifespan of the lens.
2. The auto focus function might not work properly under any of the following conditions:
 - Bright or flashing lights.
 - Low illumination of the target area.
 - Slow-shutter action.
 - Dark object.
 - Excessive illumination of the target area.
 - If a short-distance object and a long-distance object are in the target area.
 - If there is no contract gap.
 - If the camera is taking a picture of a thin horizontal line.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

3) Privacy Masking



The privacy masking function allows you to mask parts of the video image to be transmitted. You can set up to sixteen privacy masks. Only up to 8 privacy masks can be displayed on one screen.

The privacy masks are configured by mask windows. Click and drag mouse to designate a mask window area.

NOTE: The masking is displayed only when the “Enable privacy masking” box is selected.

• Masking List

ID	Name	Type	Ratio	Go	Delete
1	NewMasking	Black	1	Go	X

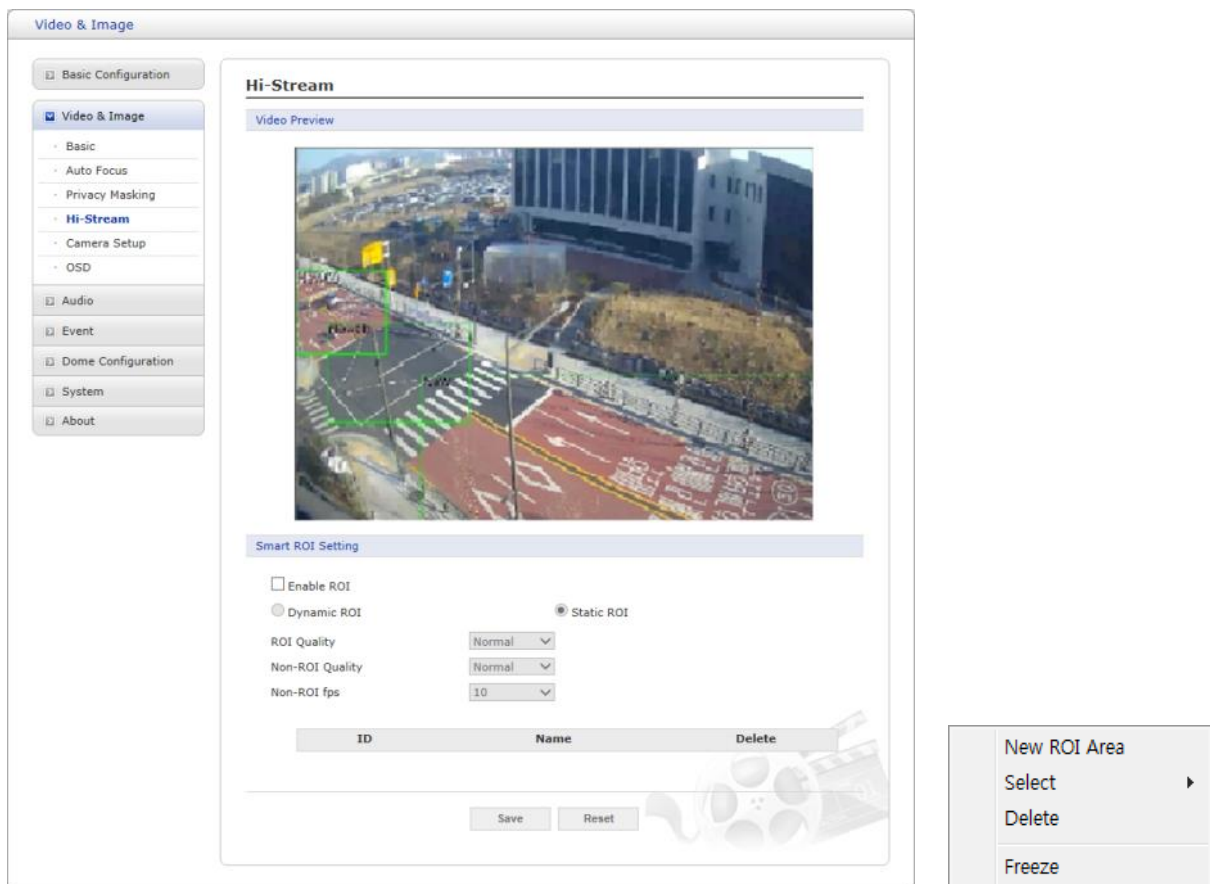
- ID	<input type="text" value="1"/>
- NAME	<input type="text" value="NewMasking"/>
- Type	<input type="text" value="Black"/>
- Ratio	<input type="text" value="1"/>

- **ID:** Making number, 1~16
- **Name:** Masking name
- **Type:** Masking color
- **Ratio:** Minimum zoom magnification to display the masking, the masking will be displayed only when a set magnification or more.
- **Go:** When you click **Go** button, move the saved masking to the center of the screen.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

4) Hi-Stream

The Hi-Stream function allows reduce bandwidth by using compression and frame rate control.



Create: Click right mouse button and select **New ROI Area**. Click the left mouse button and drag to mask window.

Select: User can select any box by clicking name on the preview window or click on the list.

Delete: User can delete selected zone via right mouse click selection for a selected box, or click any one of **X** button in the zone list.

- **Enable ROI:** Select “Enable ROI” to active Hi-Stream function. Video mode will be fixed to CVBR.
- **Dynamic ROI:** ROI Quality, Non-ROI Quality and Non-ROI fps are controlled based on the entire area.
- **Static ROI:** ROI quality, Non-ROI quality and Non-ROI fps are controlled based on the selected area.
- **ROI Quality:** Set quality of the selected area.
- **Non-ROI Quality:** Set quality of the non-selected area.
- **Non-ROI fps:** Set frame rate of the non-selected area.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

5) Camera Setup

In this page, user can setup Exposure Control, Image Appearance, Exposure Control, Day & Night Control, and IR Control.

Video & Image

Basic Configuration

Video & Image

Basic

Auto Focus

Privacy Masking

Hi-Stream

Camera Setup

OSD

Audio

Event

Dome Configuration

System

About

Camera Setup

Profile 1

Video Preview

Exposure Control

Mode

Value

Max. gain

Shutter

Max. shutter

Min. shutter

IRIS

Image Appearance

Brightness

Contrast

Saturation

Hue

Sharpness

White Balance Mode

Enhance Control

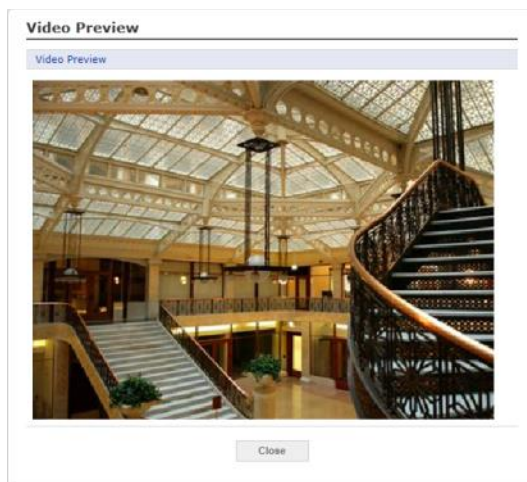
Day & Night Control

IR Control

Save

Reset

- **Video Preview:** User can check the setting via video preview pop-up window



- **Exposure Control**

Exposure Control

Mode

☒ Automatic
 ☐ Flicker-free 50Hz
 ☐ Flicker-free 60Hz

Value

< >

5

Default

Max. gain

☐ Low
 ☒ Middle
 ☐ High

Shutter

☒ Automatic
 ☐ Fixed

Max. shutter

▼

[s]

Min. shutter

▼

[s]

IRIS

☒ Automatic
 ☐ Fixed

- **Mode:** Determines exposure mode between automatic and Flicker-free modes.
 - * **Automatic mode:** Use the full shutter speed.
 - * **Flicker-free mode:** Due to flicker protection, a limited range of shutter is used.
- **Value:** Sets exposure target.
- **Max. gain:** Sets maximum gain threshold.
- **Shutter:** Determines shutter mode between automatic and fixed.
 - * **Max. shutter:** Allows you to set the threshold for slow shutter speeds used in dark environments.
 - * **Min. shutter:** Allows you to set the threshold for fast shutter speeds used in bright environments.

In automatic mode, Max. shutter and Min. shutter speed can be selected.

If you are monitoring a fast object such as a car, please change Max. shutter to a faster value (ex. 1/10 -> 1/120).

In fixed mode, you can manually select the shutter speed.

NOTE: When the shutter speed is manually selected, the screen may be saturated or dark.

- **IRIS:** Determines Iris mode between automatic and fixed.
- **IRIS F number:** Select Iris F number if Iris is in fixed mode.

• Image Appearance

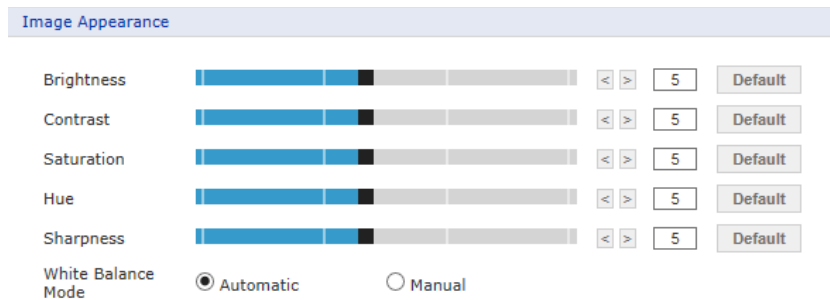


Image Appearance

Brightness 5 Default

Contrast 5 Default

Saturation 5 Default

Hue 5 Default

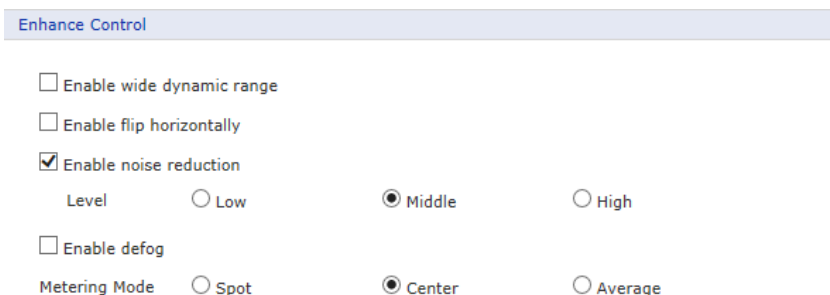
Sharpness 5 Default

White Balance Mode ☒ Automatic ☐ Manual

This provides access to the advanced image settings for the network camera.

- **Brightness:** The image's brightness can be adjusted in the range 1 ~ 10, where a higher value produces a brighter image.
- **Contrast:** Adjust the image's contrast by raising or lowering the value in this field in the range 1 ~ 10.
- **Saturation:** Set an appropriate value in the range 1 ~ 10. Lower values mean less color saturation.
- **Hue:** Set an appropriate value in the range 1 ~ 10. The value distinguishes color, such as red, yellow, green, or violet.
- **White Balance Mode:** Select white balance mode which fits camera installation environment. In case of Manual mode, user can set R, G, B gain manually.

• Enhanced Control



Enhance Control

☐ Enable wide dynamic range

☐ Enable flip horizontally

☒ Enable noise reduction

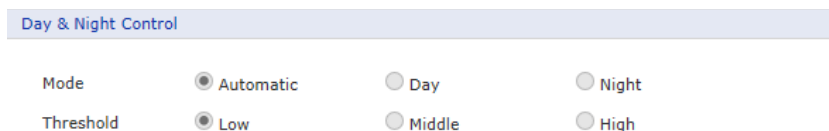
Level ☐ Low ☒ Middle ☐ High

☐ Enable defog

Metering Mode ☐ Spot ☒ Center ☐ Average

- **Enable wide dynamic range:** Activates WDR which cannot be used with Defog function. If WDR is activated, shutter mode becomes automatic mode only.
- **Enable flip horizontal:** Check this box to flip the image.
- **Enable noise reduction:** Check this box to activate the noise reduction. Once enabled, you can select noise reduction level.
- **Enable defog:** Check this box to activate the defog function.
- **Metering Mode:** Users can change the metering mode. This is method of measuring the intensity of the light hitting and reflected by a subject in order to determine the exposure required.

• Day & Night Control



Day & Night Control

Mode: ☒ Automatic ☐ Day ☐ Night

Threshold: ☒ Low ☐ Middle ☐ High

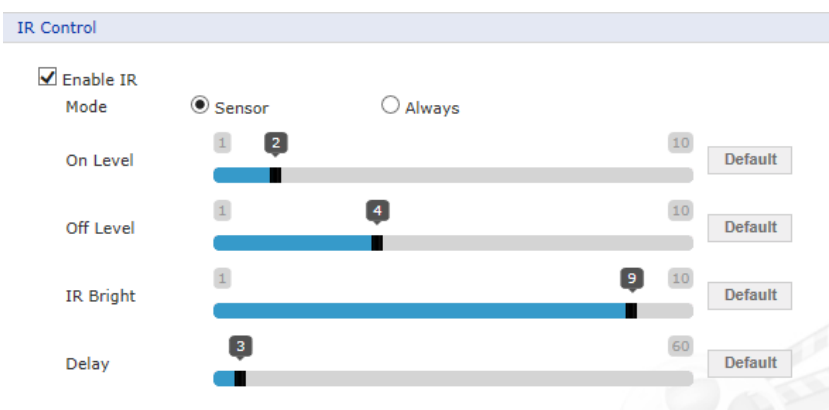
User can setup Day & Night operation mode among Automatic, Day, and Night.

– Mode:

- * **Automatic:** Normally displays color image, and switches automatically to black & white image after the ambient light level reaches a pre-defined threshold.
- * **Day:** Always displays color image.
- * **Night:** Always displays black & white image.

- **DN Threshold:** Adjusts the level of light which the camera automatically switches between color and black & white image.

• IR Control



IR Control

☒ Enable IR

Mode: ☒ Sensor ☐ Always

On Level: 1 2 10 Default

Off Level: 1 4 10 Default

IR Bright: 1 9 10 Default

Delay: 3 60 Default

- **Enable IR:** If the box is unchecked, the IR illuminators are off, otherwise the following controls are applied.

– Mode:

- * **Sensor:** It will be synchronized with the built-in brightness sensor of the camera. The IR mode will be controlled according to the illumination.
- * **Always:** Activates the IR illuminators. Always displays black & white image.

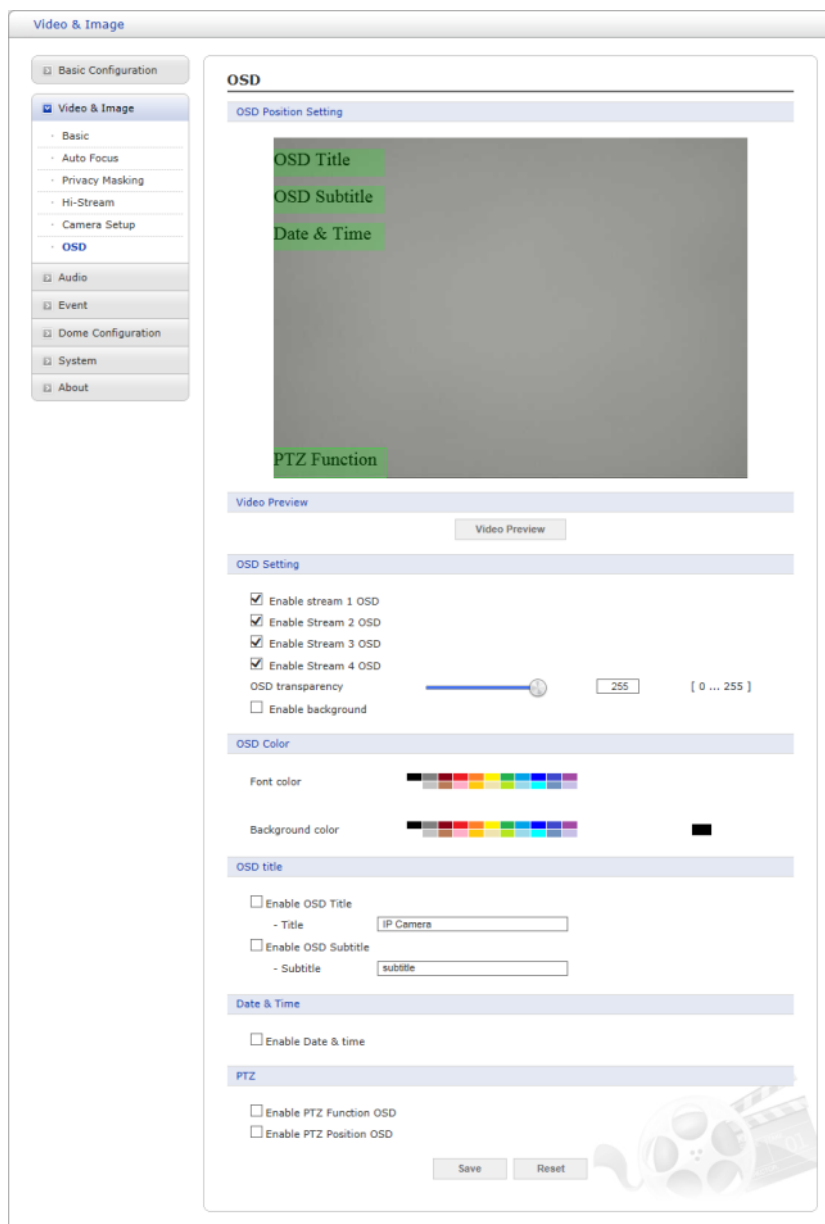
- **On level:** Specify the illumination level that activates the IR mode. If the illumination is below the specified level, the indicator will turn on. (1 ~ 10)
- **Off level:** Specify the illumination level that deactivates the IR mode. If the illumination is above the specified level, the indicator will turn off. (1 ~ 10)
- **IR Bright:** Specify the brightness of the IR illuminator. (1 ~ 10)
- **Delay:** The time duration for both of the lighting conditions can be customized to let the IR illuminators divert between activation and deactivation. (1 ~ 60)

NOTE: On level, Off level, and Delay are activated at Sensor Mode only.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

6) OSD

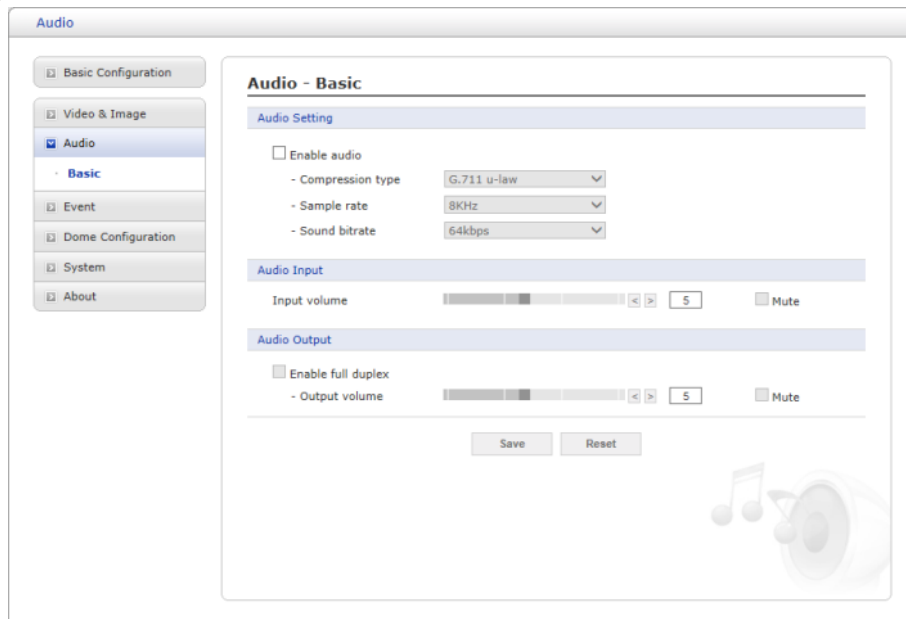
This camera provides OSD's (on screen display) on each stream. User can drag "OSD Title", "OSD Subtitle", "Date & Time" and "PTZ Function" to the desired position and check at preview window.



- **Video Preview:** User can check the position of OSD on actual video via preview popup window.
- **OSD Setting:** User can select show or hide OSD for each stream. Also user can set the transparency level of OSD by slide bar or type in number.
- **OSD Color:** User can change OSD color by type in.
- **OSD Title:** User can show or hide OSD Title/Subtitle, and can change OSD Title/Subtitle by type in. The default of OSD Title is the model name of the camera
- **Date & Time:** User can show or hide date & time on OSD.
- **PTZ:** User can show or hide PTZ Function/Position on OSD.

NOTE: The change in this page immediately affects video stream.

3.6.3 Audio



The network camera can transmit audio to other clients using an external microphone and can play audio received from other clients by attaching a speaker. The Setup page has an additional menu item called Audio, which allows different audio configurations, such as full duplex and simplex.

- **Audio Setting:**

- **Enable audio:** Check the box to enable audio in the video stream.
- **Compression type:** G.711 μ -law
- **Sample rate:** 8KHz
- **Sound bit rate:** 64kps

- **Audio Input:** Audio from an external line source can be connected to the cable of the network camera.

- **Input volume:** If there are problems with the sound input being too low or high, it is possible to adjust the input gain for the microphone attached to the network camera.
- **Mute:** User can disable the input audio transmission by checking the box.

- **Audio Output:**

- **Enable full duplex:** Check the box to enable full duplex mode. This means that you can transmit and receive audio (talk and listen) at the same time, without having to use any of the controls. This is just like having a telephone conversation. This mode requires that the client PC has a sound card with support for full duplex audio.

Uncheck the box enable Simplex mode. The simplex mode only transmits audio from the network camera to any web client. It does not receive audio from other web clients.

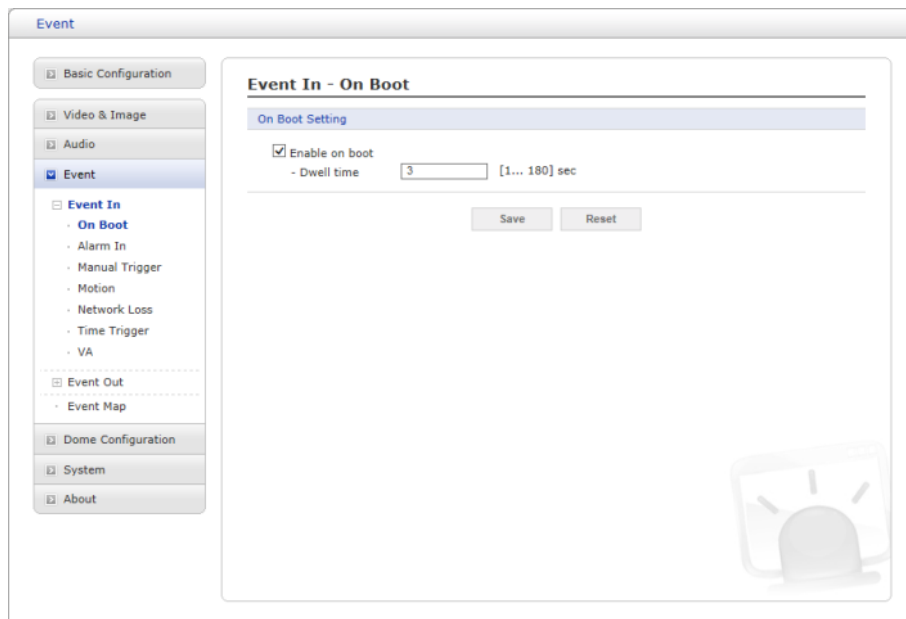
- **Output volume:** If the sound from the speaker is too low or high it is possible to adjust the output gain for the active speaker attached to the network camera.
- **Mute:** User can disable the output audio transmission by checking the box.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

3.6.4 Event

1) Event In

▽ On Boot



This is used to trigger an event every time the network camera is started. Select “Enable on boot” to activate the On Boot event.

Enter the Dwell time the event lasts from the point of detection, 1 ~ 180 seconds.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Alarm In

Event

Basic Configuration

Video & Image

Audio

Event

Event In

- On Boot
- Alarm In
- Manual Trigger
- Motion
- Network Loss
- Time Trigger
- VA

Event Out

- Event Map

Dome Configuration

System

About

Event In - Alarm In

Alarm In Port 1 Setting

☒ Enable alarm in port 1

- Type: NO

- Dwell time: 3 [1... 180] sec

Alarm In Port 2 Setting

☒ Enable alarm in port 2

- Type: NO

- Dwell time: 3 [1... 180] sec

Alarm In Port 3 Setting

☒ Enable alarm in port 3

- Type: NO

- Dwell time: 3 [1... 180] sec

Alarm In Port 4 Setting

☒ Enable alarm in port 4

- Type: NO

- Dwell time: 3 [1... 180] sec

Save Reset

This camera provides 4 Alarm In ports and user can set each ports individually. Each Port can be given as Normally Open or Normally Close state, and their Normal state can be configured. In order to use an alarm port, check the desired “Enable alarm port #” first.

- **Type:** Choose the type of alarm to use from the drop-down list, NO (Normally Open) or NC (Normally Closed).
- **Dwell Time:** Set the dwell time an event lasts from the point of detection of an alarm input.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Manual Trigger

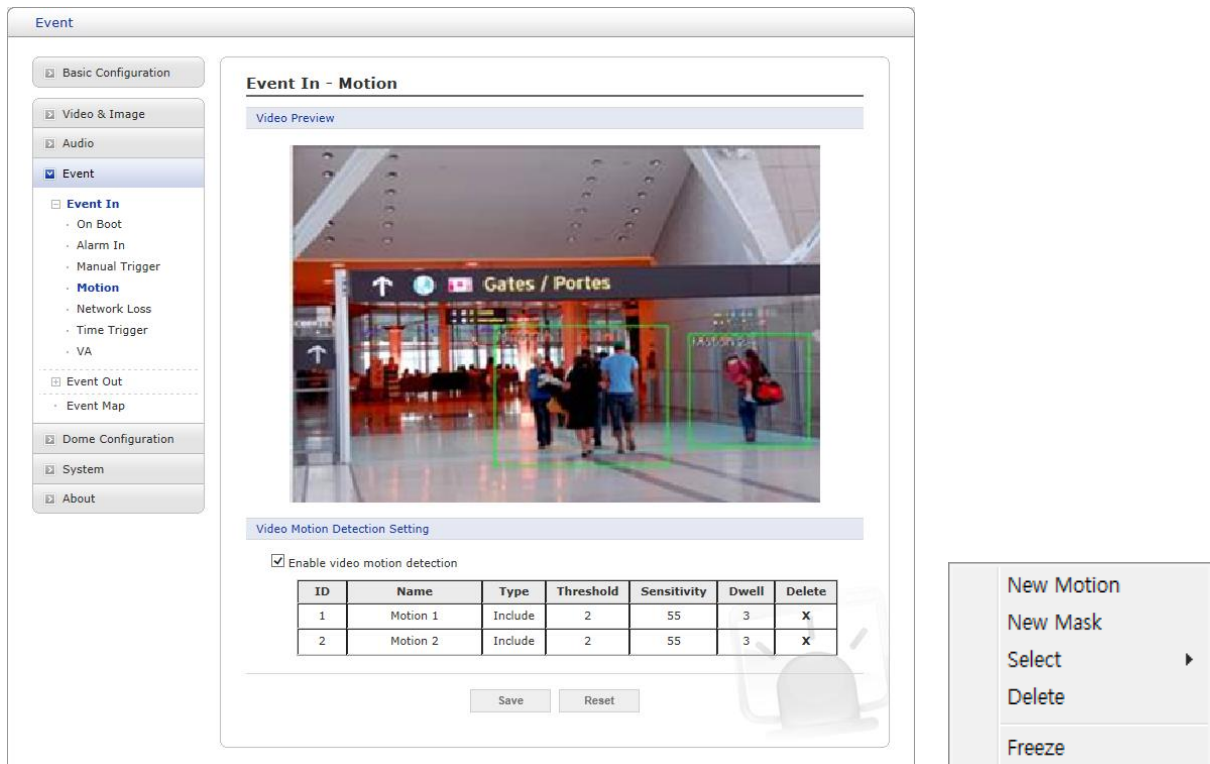
This option makes use of the manual trigger button provided on the Live View page, which is used to start or stop the event type manually. Alternatively, the event can be triggered via the product's API (Application Programming Interface).

Select "Enable manual trigger" to activate the manual trigger (for up to 4 manual triggers).

Set the dwell time the trigger lasts.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Motion



This option makes use of the motion detection function with 16 programmable areas, 8 **Include** and **Exclude** zones each.

Click right mouse button on the preview window shows selection pop-up of **New Motion, New Mask, Select, Delete, and Freeze**.

Select **New Motion** and click&drag generates an **Include** box of green color.

Select **New Mask** and click&drag generates an **Exclude** box of orange color.

Drag corner or line resizes and drag inside moves the box.

Select "Enable video motion detection" to activate motion detection.

NOTE: VA Motion will be automatically off, when activating the Motion Detection.

• Zone List

Video Motion Detection Setting

☒ Enable video motion detection

ID	Name	Type	Threshold	Sensitivity	Dwell	Delete
1	Motion 1	Include	2	55	3	X
2	Motion 2	Include	2	55	3	X

- ID

- Name

- Type

- Threshold [1... 100]

- Sensitivity [1... 100]

- Dwell time [1... 180] sec

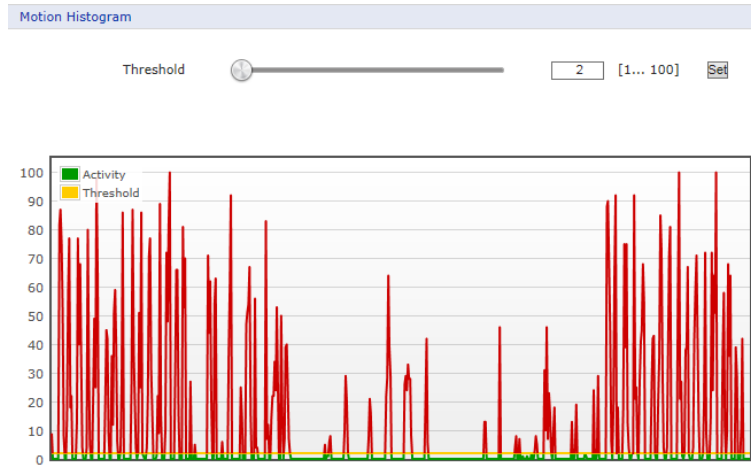
– **ID:** Order of generation, **Include** 1 ~ 8, **Exclude** 9 ~ 16.

– **Name:** User definable zone name.

– **Type:** Shows zone type and cannot be changed.

– **Threshold:** Determines how large the motion in the zone can trigger event in percentage.

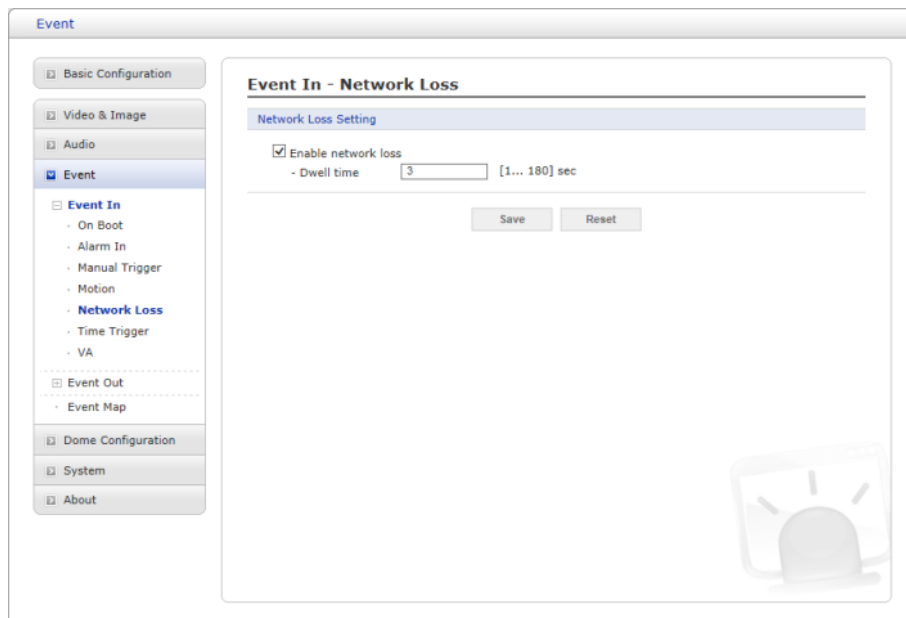
- **Sensitivity:** User can change sensitivity of this function, where large value sets more sensitive detection.
- **Dwell time:** Determines how long the triggered event holds from the last triggering.
- **Show Histogram:** This camera provides live histogram for easy setup of threshold level in motion window. The pop-up window shows activity strength and threshold level, and user can determine threshold level for triggering motion event by slide bar or type in number.



User can select any box by clicking name on the preview window or click on the list. User can delete selected zone via right mouse click selection for a selected box, or click any one of **X** button in the zone list.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Network Loss



This is used to trigger an event every time the network connection is failed. Select “Enable network loss” to activate the Network Loss event. Select a dwell time for how long the event will last from the point of detection.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Time Trigger

Event

Basic Configuration

Video & Image

Audio

Event

Event In

- On Boot
- Alarm In
- Manual Trigger
- Motion
- Network Loss
- Time Trigger**
- VA

Event Out

- Event Map

Dome Configuration

System

About

Event In - Time Trigger

Time Trigger Setting

☐ Enable time trigger

Trigger 1 Trigger 2 Trigger 3 Trigger 4

☐ Enable time trigger 1

☐ Enable specific time

- Date 2018-05-04

- Time 13 : 36

☐ Enable every day

- Time 13 : 36

☐ Enable day of week

- Day of week FRI

- Time 13 : 36

☐ Enable month

- Day 4

- Time 13 : 36

Save Reset

Time Trigger is to set alarms at specific time. User can set up to four time triggers and each time trigger can be set to specific date in the calendar, every day, day of the week, or date of every month.

Select “Enable time trigger” to activate the Time Trigger function.

- **Enable specific time:** User can select a date in the calendar or type in date, and specify time for event trigger.
- **Enable every day:** Trigger event every day at specified time.
- **Enable day of week:** Trigger event at the day of every week at specified time.
- **Enable month:** Trigger event at the date of every month at specified time.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ VA (Video Analysis)

The screenshot shows the 'Event In - Video Analysis' configuration window. On the left is a sidebar with a tree view containing: Basic Configuration, Video & Image, Audio, Event (selected), Event In (expanded), Event Out, Dome Configuration, System, and About. Under 'Event In', sub-items include On Boot, Alarm In, Manual Trigger, Motion, Network Loss, Time Trigger, and VA (selected). The main panel has a title bar 'Event In - Video Analysis' and three tabs: 'Video Preview' (active), 'Video Content Analysis Setting', and 'Video Control'. The 'Video Preview' tab shows a live video feed of a grand staircase. The 'Video Content Analysis Setting' tab contains: 'Enable video content analysis' (unchecked), 'Preset number' (None), 'View Rule' (Motion, Intrusion, Exclusive all checked), 'Object' settings (Sensitivity, Min width/height size, Max width/height size with sliders, and 'Show object size' unchecked), 'Detection Rule' (a table with 3 rows, each with a 'None' dropdown, 'Rule Name' field, and 'off' status), and 'Exclusive Area' (a single row with a '-' dropdown, 'Exclusive Area' field, and 'off' status). The 'Video Control' tab includes a 'Relearn Background' button with a tooltip 'Press this button to recognize the background again.', 'Scene type' (Outdoor), 'View mode' (Horizontal), and 'Save'/'Reset' buttons. A film reel icon is in the bottom right corner of the main panel.


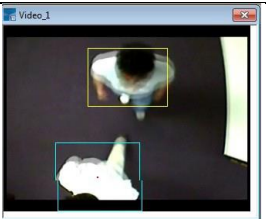


The network cameras provide VA (Video Analysis) functions, and analyzes video to detect logical events of specified conditions from the camera's video input.

- **Video Content Analysis Setting:** Check **Enable video content analysis** box to use a VA function. In order to setup VA function, at least one preset position must exist, and otherwise **Enable video content analysis** may not be activated.
 - **Preset number:** User can assign different rules for each preset position. Select the preset position to set the VA rules.
 - **View Rule:** The selected Events will be displayed on Video Preview, and enables you to setup VA Event.
 - **Object:** Setup the object related configurations such as Sensitivity and Size to optimize the VA detection.

- * **Sensitivity:** As the value becomes bigger, the detection sensitivity increases. If there are lots of motion in the screen such as trees, lower the Sensitivity value.
- * **Min/Max size:** Set the object size to be detected.
- * **Show object size:** The object size will be displayed on Video Preview.

NOTE: Recommendation on object size setting

- * Indoor (10m distance, height about 170cm): Sensitivity 80, Min width size 2, Min height size 6, Max width size 50, Max height size 60
- * Outdoor (30m distance, vehicle): Sensitivity 80, Min width size 2, Min height size 4, Max width size 60, Max height size 50
- * In order to avoid merging of several objects into one or splitting of a single object into multiple, please appropriately set sizes of minimal and maximal object that can enter the scene.
- * Great noise can cause unintended detections. Lower the sensitivity appropriately in accordance to your environments.

Case	Improper setting	Recommended configuration	Proper setting
Two objects are merged to single object.	 <p>Reduce the max. size of the object to avoid two objects are merged into single object.</p>	The minimum size of the object is recommended to be middle of object's width and height. The maximum size is recommended to be approximately 130% of object width and height.	 <p>Each objects are detected separately.</p>
Single object is detected as two objects.	 <p>The maximum and minimum size of the object is too small. Enlarge the maximum and minimum size to be detected.</p>	The minimum size of the object is recommended to be middle of object's width and height. The maximum size is recommended to be approximately 130% of object width and height.	 <p>Single object is detected correctly.</p>

NOTE: In the following cases, video analysis function may be degraded or cause improper detection.

- * The brightness of the background is dark.
- * Sudden light condition change from lighting or cloud.
- * When the object is hidden or overlapped by other moving objects or facilities.
- * When there is any light or light reflection toward the camera (for example: car in the tunnel)
- * When there is any shadow.
- * When the trees or leaves are stirred by the wind. In this case please set the moving

objects as Exclusive Area not to be detected.

* **Fountains**

* Reflection to the river, lake, window, or mirror due to strong light. Inevitable cases, please set the reflected area as Exclusive Area.

* If the portion of the object size on the screen is less than 5% or over 40%.

* Rapid brightness change of the camera from AGC or IRIS operation

* The object color or brightness is similar to the background.

* In severe weather such as snow, rain, wind or in dawn

* Motions of less position changing such as approaching to the camera or fading away from the camera

* When an object moves too fast or too slow.

* When multiple moving objects exist in the shot area

* When video shakes due to camera shaking

* When there is light flash toward camera or shot area.

* If the lens is scratched, stained or out of focus.

– **Detection Rule:** User can setup the VA Event configuration.

Select the Event type you want to setup. Placing the toggle switch to ON will enable you to configure the event in the Video Preview window.

How to setup each VA:

* **Tampering:**

1. Select the Tampering to set the camera to detect tampering attempts and trigger events.
2. Type the Rule Name, and set the preferred Dwell time and Sensitivity. The higher the sensitivity detects the minutest tampering attempts.
3. Light Change menu allows you to decide if the light ON/OFF will also trigger the Tampering event, and also the Light Sensitivity to be detected.

* **Intelligent Motion:**

1. Select Intelligent Motion to trigger motion event when any motion is detected on configured area.
2. Type the Rule Name, and set the preferred Dwell time and Sensitivity.
3. Place the on/off toggle switch on ON, and set the preferred area to detect motion in the Video Preview window. The Intelligent Motion area will be displayed as Blue Cell in the Video Preview.



NOTE: Intelligent Motion of the Video Analysis function cannot be used in conjunction with Motion Detection function. If you choose Enable Intelligent Motion, motion detection function is automatically turned off.

* **Intrusion:**

1. Select Intrusion to setup Intrusion alarm when any object enters/appears/exists into/from the defined area.
2. Type the Rule Name.
3. Place the on/off toggle switch on ON, and set the preferred area to detect Intrusion event in the Video Preview window. The Intrusion area will be displayed as Yellow Cell

in the Video Preview.

- **Exclusive Area:** User can set up the area to be excluded from Object detection. This will reduce false alarm and CPU usage of the camera by cutting down unnecessary operation. Please note Exclusive Area only affect on Object based event. Motion and Tampering event will operate regardless of Exclusive Area setting.

Case	Improper setting	Recommended configuration	Proper setting
Trees exist in the screen.	 When the tree takes big portion of the screen, the shaking leaves could cause unnecessary alarm detection.	Please lower the sensitivity or you can set the trees as an exclusive area.	 The shaking tress will not be detected as an alarm.

How to setup Exclusive Area: Place the on/off toggle switch on ON, and set the preferred area not to detect movement. In the Video Preview window the exclusive area will be displayed as Red Cell.

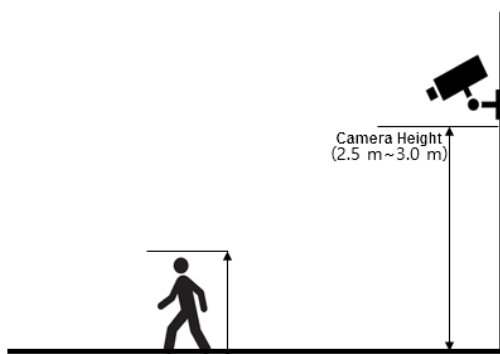
- **Video Control:** User can the settings which affect the object detection can be adjusted.
 - * **Relearn Background:** By the 'Relearn Background' button click, you may learn the current image as background.
 - * **Scene type:** Through drop-down list of Scene type you may assign different scene type in engine. Select the scene type to set the VA Engine.
 - * **View mode:** Through drop-down list of View mode you may assign different view mode in engine. Select the view mode to set the VA Engine.

NOTE: View mode

- . Overhead is suitable to detect Count and direction.
- . Angle is suitable to detect intrusion.
- . Horizontal must be used for home security.

Recommended camera installation conditions

- . Setup height: 2.5m ~ 3.0m
- . Setup angle: The camera faces 30 degree down to the level.
- . Object: The object must be at least 3m away from the camera.



When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

2) Event Out

▽ SMTP(E-Mail)

The screenshot shows the 'Event Out - SMTP(E-Mail)' configuration window. The left sidebar has tabs for 'Basic Configuration', 'Video & Image', 'Audio', 'Event', 'Dome Configuration', 'System', and 'About'. The 'Event' tab is selected, and the 'Event Out' sub-tab is active. The main content area is titled 'Event Out - SMTP(E-Mail)' and contains three sections: 'SMTP(E-Mail) Setting', 'SMTP(E-Mail) Receiver', and 'SMTP(E-Mail) Test'. The 'SMTP(E-Mail) Setting' section has a checkbox for 'Enable SMTP' and a text field for 'Sender'. Below this is a checkbox for 'Image Attachment'. Then, there are input fields for 'Interval' (set to 60) and 'Aggregate events' (set to 60), both with ranges [1... 86400] sec and [1... 100] respectively. Next is a checkbox for 'Use mail server'. Below it are input fields for 'Mail server', 'Port' (set to 25), 'Connections security' (set to None), 'User name', 'Password', and 'Login method' (set to AUTH LOGIN). The 'SMTP(E-Mail) Receiver' section shows a table with 8 receiver slots, each with an input field. The 'SMTP(E-Mail) Test' section has a 'Receiver' input field, a 'Test' button, and 'Save' and 'Reset' buttons. A small icon of a network camera is visible in the bottom right corner of the main content area.

The network camera can be configured to send event and error email messages via SMTP (Simple Mail Transfer Protocol).

- **SMTP (E-Mail) Setting:** Select “Enable” to activate the SMTP operation.
 - **Sender:** Enter an email address to be used as the sender for all messages sent by the network camera.
 - **Interval:** Represents the time interval of the email notification when events occur several times.
 - **Aggregate events:** Shows the maximum number of emails sent within each interval.
 - **Use Mail Server:** Check the box if you are using a mail server to receive event notification and image email.
 - * **Mail Server:** Enter the host names (or IP addresses) for your mail server.
 - * **Port:** Enter the port number for your mail server. Enable the sending of notifications and image email messages from the network camera to predefined addresses via SMTP.
 - * **Connection security:** Select a connection security type in the drop-down list:
None / StartTLS / SSL
 - * **User name/Password:** Enter the User name and Password as provided by your network administrator or ISP (Internet Service Provider).
 - * **Login method:** Choose a log-in method in the drop-down list:
AUTH LOGIN / AUTH PLAIN
- **SMTP (E-Mail) Receiver:** User can assign up to 8 receivers.
 - **Receiver #:** Enter an email address.

- **SMTP (E-Mail) Test:** User can check the SMTP setting via a sample email.

- **Receiver:** Enter an email address and click the Test button to test that the mail servers are functioning and that the email address is valid.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ FTP & JPEG

When the network camera detects an event, it can record and save images to an FTP server. Images can be sent as e-mail attachments. Check the “Enable FTP” box to enable the service. This camera can support multiple FTP servers and user can configure each server settings separately.

• FTP Setting:

- **Server:** Enter the server’s IP address or host name. Note that aDNS server must be specified in the TCP/IP network settings if using a host name.
- * **Passive mode:** Under normal circumstances the network camera simply requests the target FTP server to open the data connection. Checking this box issues a PASV command to the FTP server and establishes a passive FTP connection, whereby the network camera actively initiates both the FTP control and data connections to the target server. This is normally desirable if there is a firewall between the camera and the target FTP server.
- **Port:** Enter the port number used by the FTP server. The default is 21.
- **Remote directory:** Specify the path to the directory where the uploaded images will be stored. If this directory does not already exist on the FTP server, there will be an error message when uploading.
- **User name/Password:** Provide your log-in information.
- * **Anonymous login:** Check the box if you want to use anonymous login method and the

server supports it.

- **Enable time folder:** Create the folder in the FTP Server.

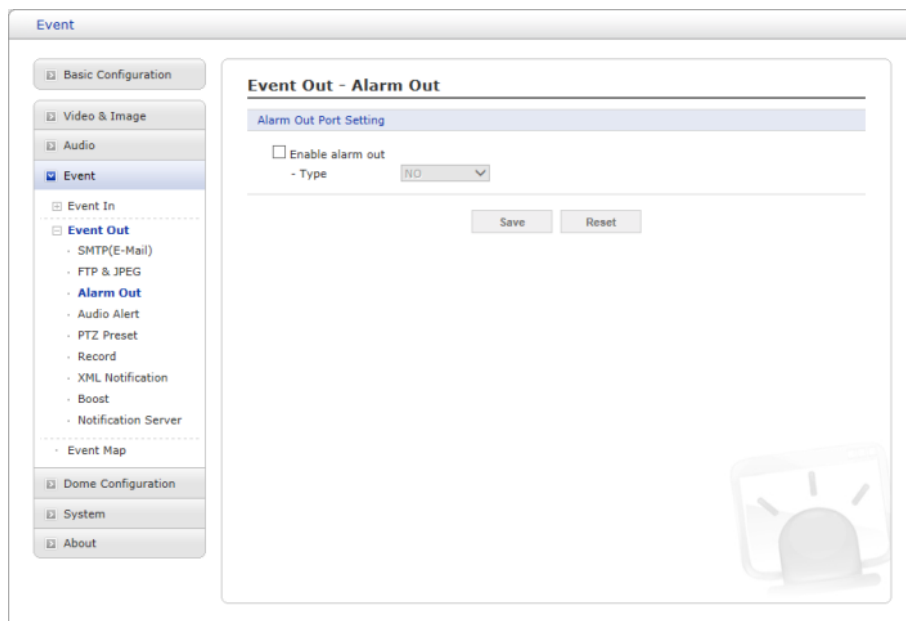
- * **Time type:** User can set the name of the folder where the uploaded image will be saved as the date, time and minute the event occurred.

- **JPEG Setting:**

- **Pre-event:** A pre-event buffer contains images from the time immediately preceding the event trigger. These are stored internally in the server. This buffer can be very useful when checking to see what happened to cause the event trigger. Enter the desired total length in seconds, minutes or hours, and specify the required image frequency.
 - **Event:** This function can set required image frequency (1 ~ 2fps) when event detected.
 - **Post-event:** This function is the counterpart to the pre-trigger buffer described above and contains images from the time immediately after the trigger. Configure as for pre-event.
 - **Prefix file name:** This name will be used for all the image files saved. If suffixes are also used, the file name will take the form <prefix> <suffix>.<extension>.
 - **Additional suffix:** Add either a date/time suffix or a sequence number, with or without a maximum value.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Alarm Out



When the network camera detects an event, it can control external equipment connected to its alarm output port.

- **Enable alarm out:** If selected, the output becomes activated for as long as the event is active.
- **Type:** Select a type of NO (Normally Open) or NC (Normally Closed).

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Audio Alert

Event

Basic Configuration

Video & Image

Audio

Event

Event In

Event Out

- SMTP(E-Mail)
- FTP & JPEG
- Alarm Out
- Audio Alert
- PTZ Preset
- Record
- XML Notification
- Boost
- Notification Server

Event Map

Dome Configuration

System

About

Event Out - Audio Alert

Audio Alert Setting

☐ Enable audio alert

- Audio file 1

- Audio file 2

- Audio file 3

Audio Alert Test

No.	File Name	File Size	Play Time	Bitrate
-----	-----------	-----------	-----------	---------

* Note
Total file size must be less than 512KB.

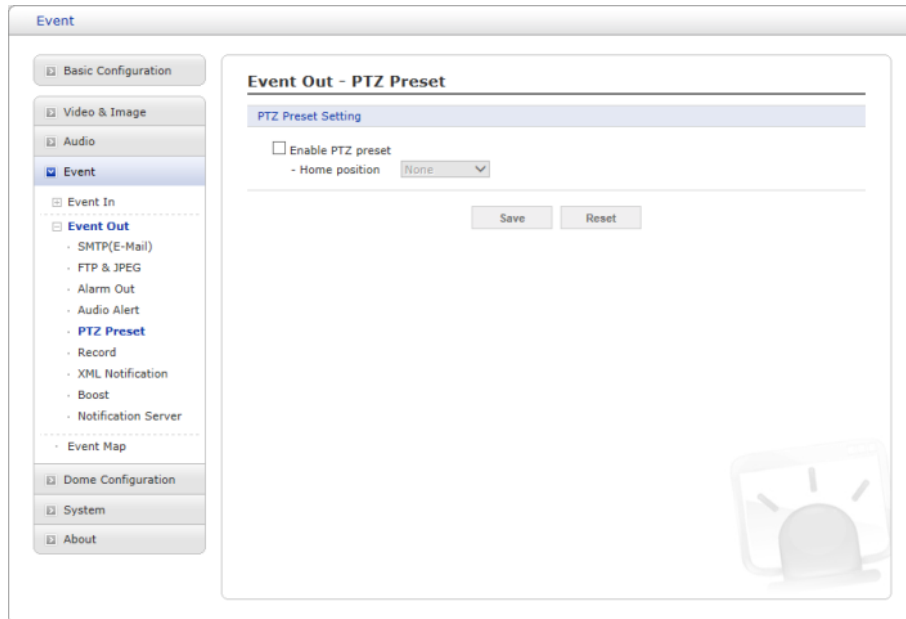
When the network camera detects an event, it can output a predefined audio data to external speaker. Check the “Enable audio alert” box to enable the service.

- **Audio Alert Setting:** To use the audio alert with the network camera, an audio data file made by user must be uploaded from your PC. Provide the path to the file directly, or use the Browse button to locate it. Then click the Upload button. Up to 3 audio files are available. The total file size must be less than 512 KB.
- **Audio Alert Test:** When the setup is complete, the audio output can be tested by clicking the Test button. To remove an audio file, select the file and click the Remove button.

NOTE: For a proper operation of Audio Alert, full duplex must be enabled in the Audio settings page.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ PTZ Preset



When the camera detects an event, you can move the camera to a predefined preset position. Check the box to enable the service and return to the Home position once the event has ended.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Record

Event Out - Record

Record Setting

☐ Enable Record

☒ Overwrite

☐ Continuous Record

* Note : Using continuous recording may shorten life time of SD card.

- Stream Type:

- Pre-event: [0... 10] sec

- Post-event: [0... 60] sec

☐ Audio Record

Record schedule

☐ No Recording ☒ Recording

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
SUN																								
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								

Device Setting

Device Type:

Format

Device Status : No Storage

Device Remove

Device Information

Total	Used	Available	Used Percent	Bad Sector
0.00MB	0.00MB	0.00MB	0.00%	0.00%

When the network camera detects an event, it can record the video stream onto the Micro-SD memory (not supplied) or NAS (Network Attached Device) as a storage device. Check the “Enable Record” box to enable the service.

- **Record Setting:**

- **Overwrite:** Click checkbox to overwrite the storage device; Continuous Record is available when not using an SD card.
- **Stream Type:** You can select Stream 1, Stream 2, Stream 3, or Stream 4.
 - * **Stream 1, 3, 4:** H.264 data
 - NOTE:** Stream 2: MJPEG data cannot be recorded.
- **Pre-event:** Enter pre-event time value for the storage device pre-recording.
- **Post-event:** Enter post-event time value for the storage device pre-recording.
- **Audio Record:** Check the box if you want to record audio with video.

- **Record Schedule:** You can set the weekly recording schedule for each day. Drag or click area by a box unit at first. Clicking the block toggles the recording between on and off. Click the All Select button to set a schedule for the entire week or a whole day, respectively.

- **Device Setting:** Select the device type to be recorded in the drop-down list. The screen changes according to selection.

- **SD:** Mounted SD card.
- **CIFS:** A file format for a NAS device.
- **NFS:** A file format for a NAS device.

NOTE 1: Common Internet File System (CIFS) is a remote file access protocol that forms the basis for Windows file sharing, network printing, and various other network services. CIFS requires a large number of request/response transactions and its performance degrades significantly over high-latency WAN links such as the Internet.

NOTE 2: Network File System (NFS) is a network file system protocol, allowing a user on a client computer to access files over a network in a manner similar to how local storage is accessed. NFS, like many other protocols, builds on the Open Network Computing Remote Procedure Call (ONC RPC) system.

The CIFS screen displays as below.

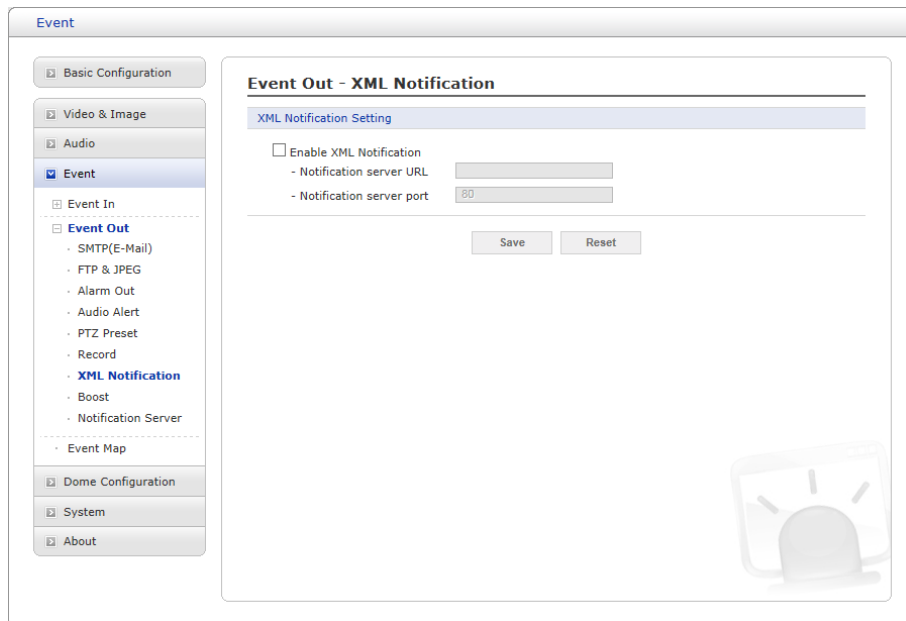
The screenshot shows a 'Device Setting' window with the following fields and controls:

- Device Type:** A dropdown menu currently set to 'CIFS'.
- Address:** A text input field.
- Remote directory:** A text input field.
- Capacity:** A text input field containing '0', followed by 'GB'.
- ID:** A text input field.
- Password:** A text input field.
- Check:** A button located to the right of the Password field.

- **Address:** Enter IP address for NAS device.
- **Remote Directory:** Enter directory or folder location to be recorded in the NAS device.
- **Capacity:** Enter the capacity of storage to be used. This must be less than the total storage capacity.
- **ID/Password:** Enter ID and Password. The network camera will ask for these whenever you access NAS device.
- **Check:** Press the Check button to check the validity of Device Setting data.
- **Format:** Click the Format button to format SD card.
- **Device Remove:** Click the Device Remove button before detaching SD card for data safety in the SD card.
- **Device Information:** Show current SD card information.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ XML Notification



The screenshot shows a web interface for configuring XML notifications. On the left is a sidebar menu with categories: Basic Configuration, Video & Image, Audio, Event (selected), Event In, Event Out (expanded), Dome Configuration, System, and About. Under 'Event Out', options include SMTP(E-Mail), FTP & JPEG, Alarm Out, Audio Alert, PTZ Preset, Record, XML Notification (highlighted), Boost, and Notification Server. The main panel is titled 'Event Out - XML Notification' and contains a sub-section 'XML Notification Setting'. It features a checkbox for 'Enable XML Notification'. Below it are two fields: 'Notification server URL' and 'Notification server port' (with '80' entered). At the bottom right of the main panel are 'Save' and 'Reset' buttons. A small icon of a camera with a light is visible in the bottom right corner of the main panel.

When the network camera detects an event, Notification server is used to receive notification messages as a type of XML data format. Check the box to enable the service.

- **XML Notification Setting:**

- **Notification server URL:** The network address to the server and the script that will handle the request.
- **Notification server port:** The port number of the notification server.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Boost

Event

Basic Configuration

Video & Image

Audio

Event

Event In

Event Out

- SMTP(E-Mail)
- FTP & JPEG
- Alarm Out
- Audio Alert
- PTZ Preset
- Record
- XML Notification
- Boost
- Notification Server

Event Map

Dome Configuration

System

About

Event Out - Boost

Boost Setting

☐ Enable boost

- Boost Stream: Stream 1

	Normal Condition	Boost Condition
Framerate	30	30
Bitrate control	CVBR	
Bitrate	4000 [Kbps]	10000 [Kbps]

Save Reset

The Boost feature is used in conjunction with event detection. When this feature is turned ON, the Frame rate and Bit rate in the boost condition can be set to a different value than the ones in the normal condition field. When an event is detected, the camera will boost the Frame rate and Bit rate from the normal condition to this boosted level for the duration of the event.

Check the box to enable the service.

- **Boost Setting:** You can set the condition in Normal and Boost mode.
 - **Boost Stream:** Select a video stream for each condition in the drop-down list.
 - **Frame rate:** Select a frame refresh rate per second for each condition in the drop-down list.
 - **Bit rate control:** Select CBR or CVBR in the drop-down list in Normal Condition. You cannot change it in Boost Condition.
 - **Bit rate:** Select a value for each condition in the drop-down list.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Notification Server

The screenshot shows the 'Event Out - Notification Server' configuration window. The left sidebar lists various configuration categories, with 'Event' and 'Notification Server' selected. The main panel is divided into two sections: 'Notification Server Setting' and 'Notification Server Test'. The 'Setting' section includes an 'Enable Notification Server' checkbox and fields for 'Type' (HTTP), 'Method' (POST), 'URL', 'Port' (80), 'User name', and 'Password'. The 'Test' section features a 'Send message' text box and a 'Test' button. 'Save' and 'Reset' buttons are located at the bottom of the main panel.

When the network camera detects an event, the Notification Server is used to receive uploaded image files and/or notification messages. Check the box to enable the service.

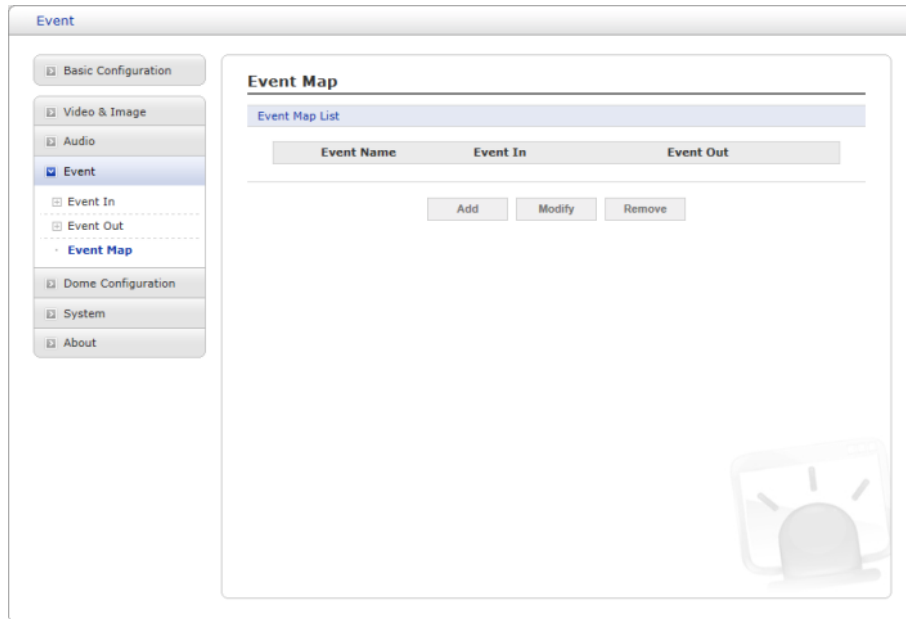
- **Notification Server Setting:**

- **Type:** User can select message transmission type among HTTP, HTTPS, TCP, and UTP.
- **URL:** The network address to the server and the script that will handle the request.
For example: `http://192.168.12.244/cgi-bin/upload.cgi`
- **Port:** The port number of the server.
- **User name/Password:** Provide your log-in information.

- **Notification Server Test:** When the setup is complete, the connection can be tested by clicking the Test button using the contents in “Send message” box.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

3) Event Map



The event map allows you to change the settings and establish a schedule for each event trigger from the network camera; up to a max. 15 events can be registered.

Click the **Add** button to make a new event map; a popup window displays as below. To change an existing event, select that event and click the **Modify** button; this same window will display and the information can be changed as required. Selecting an event and clicking **Remove** deletes the event.

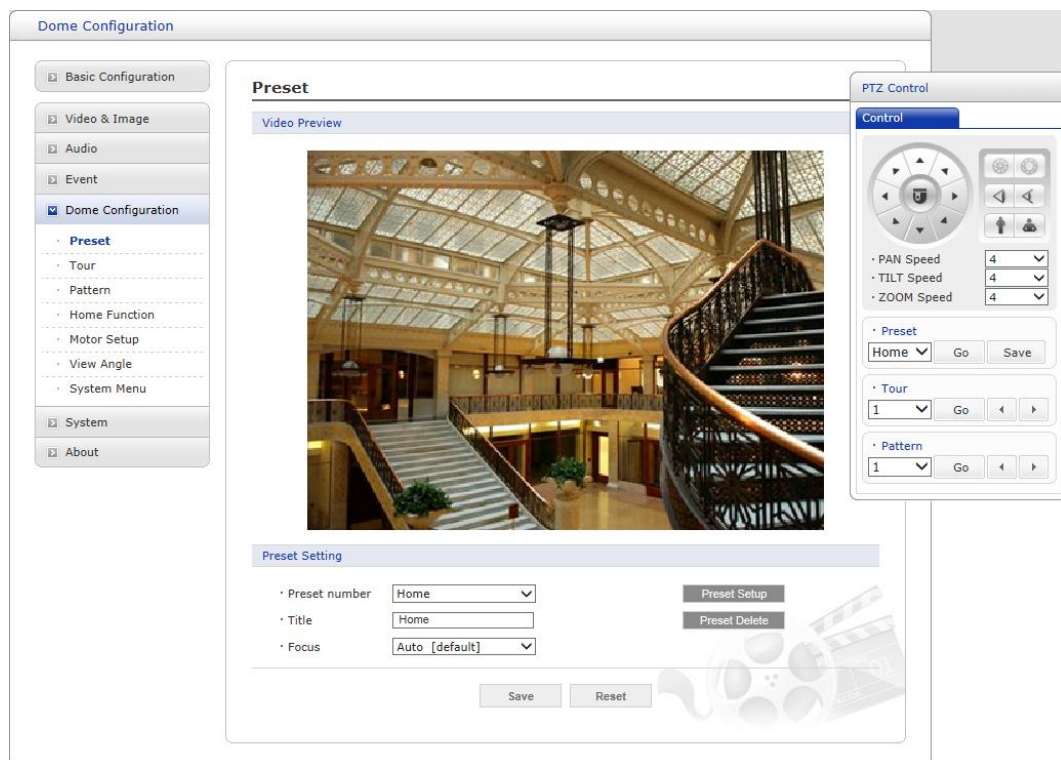
- **General:** Enter the name for a new event map.
 - **Event In:** Select an event type in the drop-down list.
 - **Event Out:**
 - **E-mail:** Select the email addresses you want to notify via email that an event has occurred.
 - **FTP:** Select checkbox beside FTP to record and save images to an FTP server when an event has occurred.
 - **Alarm out:** Check this box to enable the alarm out.
 - **Audio Alert:** Select an Audio Alert file as the Network Transmitter output when audio alert event triggered. The Audio Alert file must first be configured on the Event In page.
 - **XML Notification:** It sends XML messages to a Notification server that listens for these. The destination server must first be configured on the Event In page.
 - **Boost:** When an event has occurred, the camera will boost the Frame rate and Bit rate from the normal condition to this boosted level for the duration of the event. Check the box to enable the Function.
 - **PTZ preset:** Select the preset position you want to move at event. If you want to move back to home position after the event, which is pre-defined in the Alarm Out - PTZ Preset page, check “Return to home position after event” box.
 - **Record:** Record video stream when an event has occurred. The Record option must first be configured on the Event Out page.
- NOTE:** This button disappears if you select AIHM as event in.

- **Notification Server:** It sends notification messages to the notification server that listens for these. The destination server must first be configured on the Event In page. Enter a message you want to send.

When the settings are complete, click **OK** button to save the settings, or click **Cancel** button to clear all of the information you entered without saving it.

3.6.5 Dome Configuration

1) Preset



If you need to view specific places routinely, you should program Presets. A Preset is a programmed video scene with automatic pan, tilt, zoom and focus settings. Once programmed, clicking the Preset number or clicking the Go button in the PTZ Control Panel calls up that Preset automatically.

- **Preset Setting:**

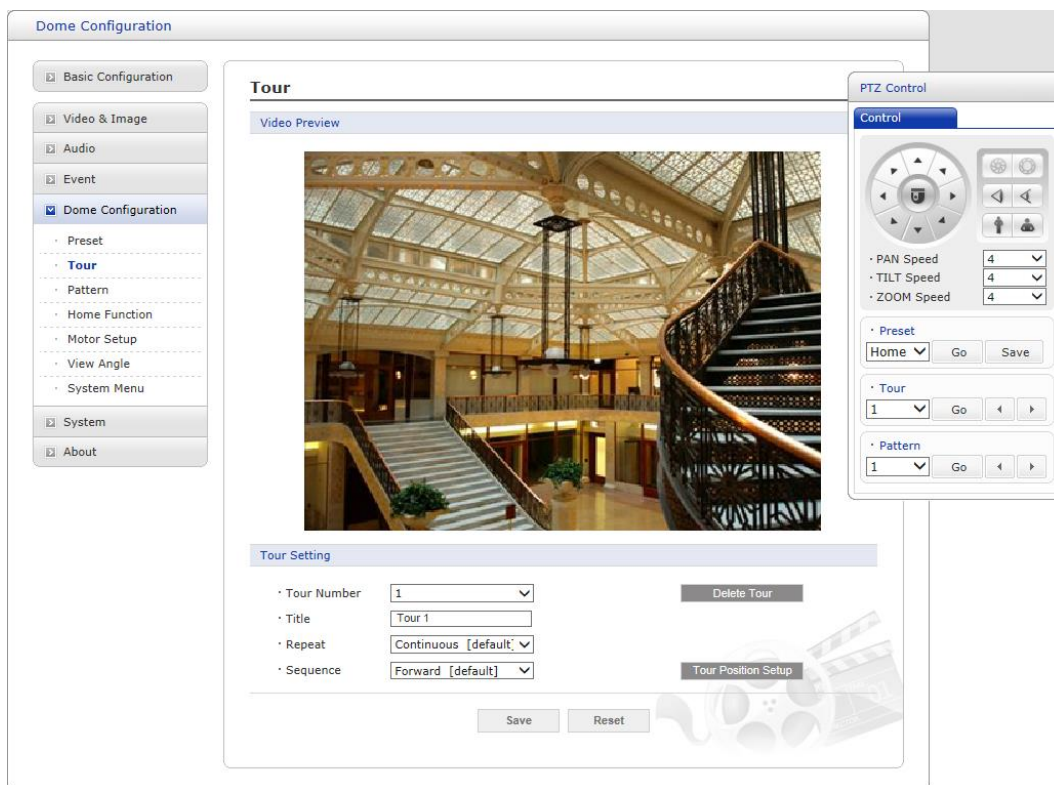
- **Preset number:** The Preset number can be selected in the range 1 ~ 256.
- **Title:** Up to 12 characters (Alphanumeric characters and space)
- **Focus:**
 - * **Auto:** Auto Focus is always active.
 - * **Manual:** Auto Focus is inactive.
- **Preset Setup:** Activate the PTZ Control Panel.
- **Preset Delete:** Delete selected Preset number.

Follow steps below to store the Preset positions:

1. Click the **Preset Setup** button, then shows the PTZ Control Panel.
2. Choose the desired Preset number from the Preset drop-down list:
3. After aiming the camera (view direction and lens control) by using the **Arrow** and **Zoom** button in PTZ Control Panel, click the **Save** button.
4. Repeat step 2 through 3 for each additional Preset position.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

2) Tour



There are 8 programmable Tours. Each Tour consists of up to 64 Presets.

• Tour Setting:

- **Tour Number:** The Tour number can be selected in the range 1 ~ 8.
- **Title:** Up to 12 characters (Alphanumeric characters and space)
- **Repeat:** Select number of repetition from Continuous to 90. The default is Continuous.
- **Sequence:** Select either forward or backward sequence in the Tour position list.
- **Delete Tour:** Delete the stored Tour Position Setup list of Tour number.
- **Tour Position Setup:** Open or close the Tour Position Setup as below.

Tour Setting

• Tour Number 1

• Title Tour 1

• Repeat Continuous [default]

• Sequence Forward [default]

Delete Tour

Tour Position Setup

Tour Position Setup

• Tour position ---

• Preset number ---

• Dwell Time 10 [default] sec

• Speed

Delete Position

Set Position

Pan 31 [del] Tilt 31 [del] Zoom 7 [defa]

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- **Tour Position Setup:**

- **Tour position:** The Tour position can be selected in the range 1 ~ 64.
- **Preset number:** Show the selected Preset number.
- **Dwell Time:** Select the Dwell Time from 0 to 99 seconds. The default is 10 seconds.
- **Speed:** Adjust Pan/Tilt/Zoom Speed if you want to a slow movement. The defaults are maximum Speed.
- **Delete Position:** If you want to remove Tour position from Tour Position Setup list, select the desired Tour Position, and click the Delete Position button.
- **Set Position:** Click the Set Position button, then show the stored Presets on drop-down list.

Follow steps below to program the Tours:

1. Click the desired Tour position of Tour Position Setup list, and click Set Position button, then show the saved Presets on drop-down list. Click a Preset.
2. Repeat step 1 for each desired position.
3. Click the **Save** button to save the settings, or click the **Reset** button to clear all of the information you entered without saving it.

3) Pattern

The screenshot displays the 'Dome Configuration' software interface. On the left is a sidebar menu with options: Basic Configuration, Video & Image, Audio, Event, Dome Configuration (selected), System, and About. The 'Dome Configuration' section is expanded, showing sub-options: Preset, Tour, Pattern (selected), Home Function, Motor Setup, View Angle, and System Menu. The main area is titled 'Pattern' and contains a 'Video Preview' window showing a live feed of a grand interior space with a large glass dome and ornate staircases. Below the preview is the 'Pattern Setting' table. To the right of the main area is a 'PTZ Control' panel with a 'Control' tab, a directional pad, speed settings for PAN, TILT, and ZOOM (all set to 4), and buttons for Preset (Home, Go, Save), Tour (1, Go, left, right), and Pattern (1, Go, left, right).

No.	Title	Pattern	Sec	%	X
1	Pattern01	Set	0	0.0	X
2	Pattern02	Set	0	0.0	X
3	Pattern03	Set	0	0.0	X
4	Pattern04	Set	0	0.0	X
5	Pattern05	Set	0	0.0	X
6	Pattern06	Set	0	0.0	X
7	Pattern07	Set	0	0.0	X
8	Pattern08	Set	0	0.0	X

Pattern is a series of pan, tilt, and zoom movements programmed by administrator or operator. Up to 8 patterns may be programmed for the dome camera.

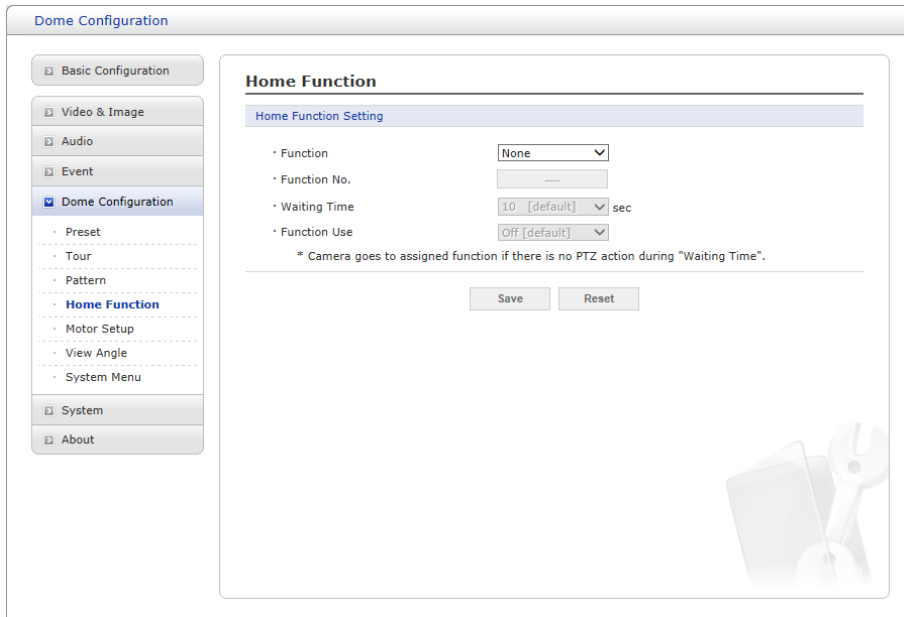
Follow steps below to program the Patterns:

1. Click the **Set** button of desired Pattern number of Pattern Setting list, and move pan, tilt, and zoom using Control box. The movement history is automatically recorded.
2. Click **Done** button after you completed the camera movement program.
3. Repeat step 1 through 2 for each desired Pattern number.
4. If you are not satisfied with the programmed pattern, click **X** button to clear the pattern.
5. You can edit title of each pattern number for easier recognition.

NOTE 1: Each Pattern can store up to 500 seconds of movements.

NOTE 2: The percentage total of 8 Patterns cannot exceed 100.

4) Home Function



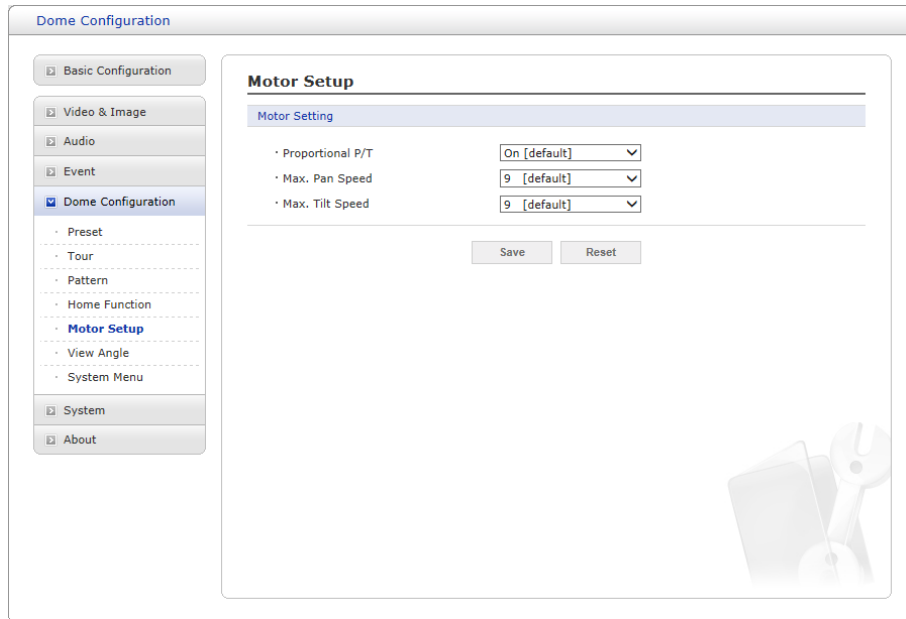
The screenshot shows a web interface titled "Dome Configuration". On the left is a sidebar menu with the following items: Basic Configuration, Video & Image, Audio, Event, Dome Configuration (highlighted), Preset, Tour, Pattern, Home Function (highlighted), Motor Setup, View Angle, System Menu, System, and About. The main content area is titled "Home Function" and contains a "Home Function Setting" section. This section includes four fields: "Function" (a dropdown menu currently set to "None"), "Function No." (a text input field), "Waiting Time" (a dropdown menu set to "10 [default]" with "sec" next to it), and "Function Use" (a dropdown menu set to "Off [default]"). Below these fields is a note: "* Camera goes to assigned function if there is no PTZ action during 'Waiting Time'." At the bottom of the settings area are two buttons: "Save" and "Reset". In the bottom right corner of the interface, there is a faint watermark logo depicting a camera and a wrench.

Camera goes to assigned function if there is no PTZ action during "Waiting Time". User can assign pre-programmed Preset, Tour or Pattern for function.

- **Function:** None / Preset / Tour / Pattern
- **Function No.:** Select Preset, Tour or Pattern number for Home Function.
- **Waiting Time:** 10 ~ 600 Seconds
- **Function Use:** Off / On

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

5) Motor Setup



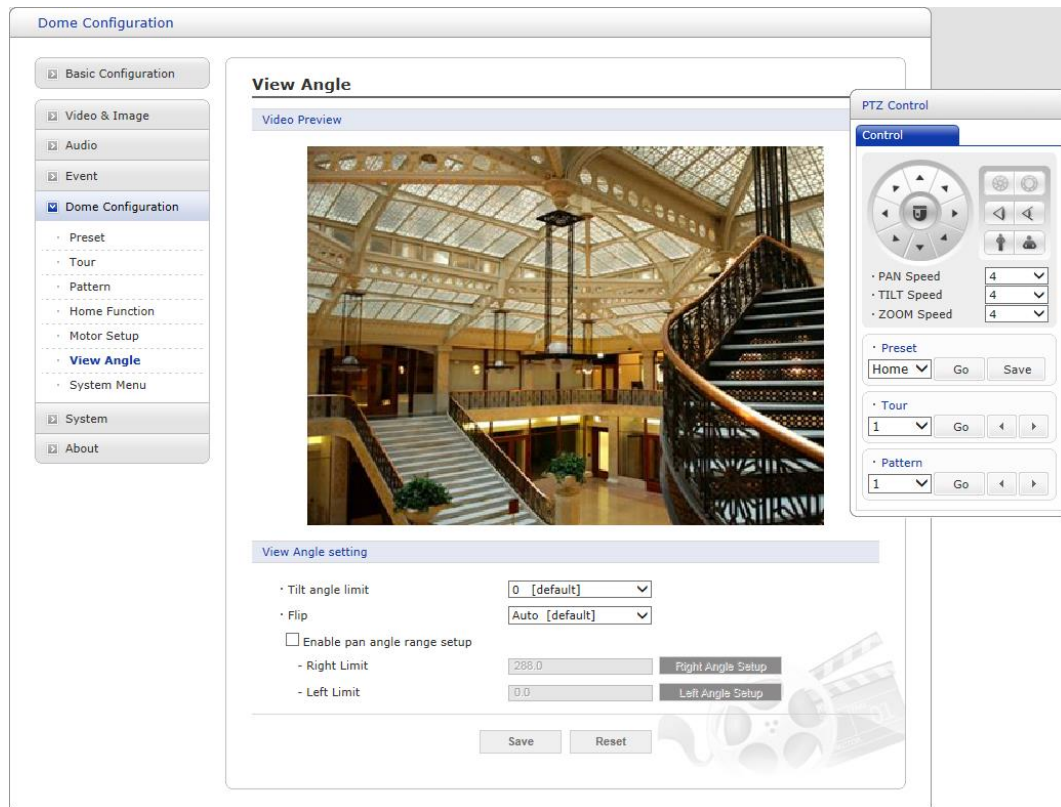
Motor Setup menu provides the pan and tilt speed of a camera.

- **Motor Setting:**

- **Proportional P/T:** Select On or Off.
- **Max. Pan Speed:** The maximum pan speed can be adjusted in the range 1 ~ 30.
- **Max. Tilt Speed:** The maximum tilt speed can be adjusted in the range 1 ~ 30.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

6) View Angle



• View Angle Setting:

- **Tilt angle limit:** This option is designed to limit the view angle as there is some obstruction in zooming out on specific areas of the tilt angle.
- **Flip:**
 - * **Off:** The dome camera moves until 90° vertically.
 - * **Auto:** When the camera reaches the floor directly above the moving object, it will stop. At that time, release instantly and pull it down again to run the auto-flip function. When you use the panning range, it is recommended to use the flip mode to Auto.
- **Enable pan angle range setup:** When the dome camera is installed near a wall, pan angle range can be limited by user.
 - * **Right limit:** Select the right limit of pan angle range.
 - * **Left limit:** Select the left limit of pan angle range.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

7) System Menu

The screenshot shows a web-based configuration interface titled "Dome Configuration". On the left is a sidebar menu with options: Basic Configuration, Video & Image, Audio, Event, Dome Configuration (selected), Preset, Tour, Pattern, Home Function, Motor Setup, View Angle, System Menu, System, and About. The main content area is titled "System Menu" and contains several sections: "Dome Information" with fields for Camera type, Dome Hardware Version, and Dome Software Version; "System Menu setting" with a Calibration dropdown set to "On"; "Origin Check" with a description, an "Origin Check" button, and a checkbox for "Enable schedule origin check"; "PT Module Upgrade" with instructions to upgrade PT Module firmware, a "Browse..." button, and an "Upgrade" button; and "AF Module Upgrade" with instructions to upgrade AF Module firmware, a "Browse..." button, and an "Upgrade" button. At the bottom right of the main area are "Save" and "Reset" buttons. A faint watermark of a dome camera is visible in the bottom right corner of the interface.

- **Dome Information:** The system information provides essential information about the dome if service is required. The information cannot be modified.
- **System Menu setting:** User can set the camera in auto-calibration mode.
- **Origin Check:** If you find the dome in the wrong position during operation, execute this origin check by clicking Origin Check button and the dome camera will return to the right position after the origin check operation.
 - **Enable schedule origin check:** If selected, execute origin check function at scheduled time
 - * **Enable monthly:** Set specific day and time.
 - * **Enable weekly:** Set specific day of the week and time.
 - * **Enable daily:** Set specific time.
- **PT Module Upgrade:** User can upgrade PT Module firmware remotely.
- **AF Module Upgrade:** User can upgrade AF Module firmware remotely.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

3.6.6 System

1) Information

The screenshot displays a web-based configuration interface for a system. On the left, a sidebar menu lists various configuration categories: Basic Configuration, Video & Image, Audio, Event, Dome Configuration, System (selected), Information (sub-selected), Security, Date & Time, Network, Language, Maintenance, Support, and About. The main content area is titled 'Information' and is divided into two sections. The 'Device Name Configuration' section contains a single text input field with the value 'H.26X 2M Network PTZ Camera'. The 'Location Configuration' section contains four text input fields labeled 'Location1', 'Location2', 'Location3', and 'Location4'. At the bottom of the main area, there are two buttons: 'Save' and 'Reset'. A faint icon of a folder and a wrench is visible in the bottom right corner of the main area.

You can enter the system information. This page is very useful when you require device information after installation.

- **Device Name Configuration:** Enter the device name.
- **Location Configuration:** Enter the location information. You can enter up to four locations.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

2) Security

▽ Users

System

Basic Configuration

Video & Image

Audio

Event

Dome Configuration

System

- Information
- Security
 - Users
 - HTTPS
 - IP Filtering
 - OpenVPN
- Date & Time
- Network
- Language
- Maintenance
- Support

About

Security - Users

User Setting

☒ Enable anonymous viewer login

User List Setting

User Name	User Group	Authority
admin	administrator	live, setup, system, ptz

Add Modify Remove

Save Reset

User access control is enabled by default when the administrator sets the root password on first access. New users are authorized with user names and passwords, or the administrator can choose to allow anonymous viewer login to the Live View page, as described below:

- **User Setting:** Check the box to enable anonymous viewer login to the network camera without a user account. When using the user account, users have to log-in at every access.
- **User List Setting:** This section shows how to register a user account. Enter a user name and password to be added, and register them by pressing the Add button. You will see the pop-up window as below.

Add User

User Setting

User name :

Password :

Confirm password :

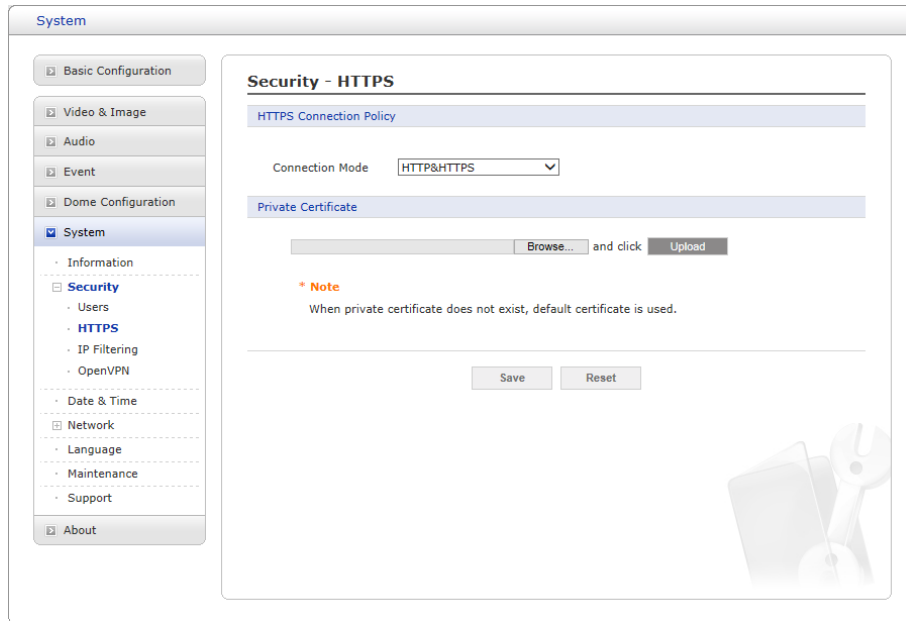
User group :

☒ Enable PTZ control

OK Cancel

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ HTTPS



For greater security, the network camera can be configured to use HTTPS (Hypertext Transfer Protocol over SSL (Secure Socket Layer)). Then all communication that would otherwise go via HTTP will instead go via an encrypted HTTPS connection.

- **HTTPS Connection Policy:** Choose the form of connection you wish to use from the drop-down list for the administrator, Operator and Viewer to enable HTTPS connection (set to HTTP by default).
 - HTTP
 - HTTPS
 - HTTP & HTTPS
- **Upload Certificate:** To use HTTPS for communication with the network camera, an official certificate issued by a CA (Certificate Authority) must be uploaded from your PC. Provide the path to the certificate directly, or use the **Browse** button to locate it. Then click the **Upload** button.

Please refer to the home page of your preferred CA for information on where to send the request. For more information, please see the online help.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ IP Filtering

The screenshot displays the 'IP Filtering Setting' configuration page. On the left, a sidebar lists various system settings, with 'System' and 'Security > IP Filtering' highlighted. The main content area is titled 'Security - IP Filtering' and features a sub-header 'IP Filtering Setting'. Below this, there is a checkbox labeled 'Enable IP filtering'. Underneath the checkbox is a table with five columns: 'On/Off', 'Priority', 'Policy', 'Start IP', and 'End IP'. The table contains five rows, each with a checkbox in the 'On/Off' column, a priority number (1-5), a policy dropdown menu set to 'ALLOW', and two IP address input fields. At the bottom of the table are 'Save' and 'Reset' buttons. A faint watermark of a folder and a wrench is visible in the bottom right corner of the main area.

On/Off	Priority	Policy	Start IP	End IP
<input type="checkbox"/>	1	ALLOW	0 . 0 . 0 . 0	0 . 0 . 0 . 0
<input type="checkbox"/>	2	ALLOW	0 . 0 . 0 . 0	0 . 0 . 0 . 0
<input type="checkbox"/>	3	ALLOW	0 . 0 . 0 . 0	0 . 0 . 0 . 0
<input type="checkbox"/>	4	ALLOW	0 . 0 . 0 . 0	0 . 0 . 0 . 0
<input type="checkbox"/>	5	ALLOW	0 . 0 . 0 . 0	0 . 0 . 0 . 0

Checking the “Enable IP filtering” box enables the IP address filtering function.

When the IP address filter is enabled, addresses added to the list are set as allowed or denied addresses. All other IP addresses not in this list will then be allowed or denied access accordingly, that is, if the addresses in the list are allowed, then all others are denied access, and vice versa. Also see the online help for more information.

NOTE: Users from IP addresses that will be allowed must also be registered with the appropriate access rights. This is done from Setup > System > Security > Users.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ OpenVPN

OpenVPN is a Virtual Private Network using OpenSSL authentication. User can set the camera in either Server mode or Client mode.

• OpenVPN Server Mode

1. Checking the “Enable OpenVPN” box activates mode selection buttons. Choose Server mode, then Server Mode Configuration appears where you can configure Server Mode Settings.
2. In Server Mode Configuration, you can setup Protocol type, Port number, LZO compression usage, and Renegotiation time, as well as download Server certificate file.
 - Choose Protocol type between UDP and TCP, UDP is preferred. Type in Port number you want to use, default is 1194.
 - Default Renegotiation time is 3600 seconds, and 0 means no verification.
 - “Use LZO compression” determines whether to use cypher compression in connection or not.
 - CA certificate is the certification file issued by Server for Client setup.
3. After finishing setup, click Save button and then the camera operates as an OpenVPN Server.

• OpenVPN Client Mode

1. Checking the “Enable OpenVPN” box activates mode selection buttons. Choose Client mode, then Client Mode Configuration appears where you can configure Client Mode Settings.
 - Server URL sets OpenVPN IP address.
 - Protocol type, Port number, and LZO setting must match Server setting.
 - Default Renegotiation time is 3600 seconds, and 0 means no verification.
 - Upload CA certificate issued by Server.
3. Select authentication method between User authentication and Machine authentication.
 - For Machine authentication, upload client certificate and client key provided by Server.
 - For User authentication, type in registered ID and Password.
4. After finishing setup, click Save button and then the camera operates as an OpenVPN Client.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

3) Date & Time

The screenshot shows the 'Date & Time' configuration page. The sidebar on the left lists various system settings, with 'System' and its sub-item 'Date & Time' highlighted. The main panel is divided into three sections: 'Current Server Time' (displaying 2018-05-03 11:28:44), 'New Server Time' (allowing selection of time zone and mode), and 'Date & Time Format' (allowing selection of date and time display formats). The 'Synchronize with computer time' option is selected under the 'Time mode' section.

- **Current Server Time:** This displays the current date and time (24h clock). The time can be displayed in 12h clock format (see below).
- **New Server Time:**
 - **Time zone:** Select your time zone from the drop-down list. If you want the server clock to automatically adjust for daylight savings time, check the box “Automatically adjust for daylight saving time changes”.
 - **Time mode:** Select the preferred method to use for setting the time:
 - * **Synchronize with computer time:** Sets the time from the clock on your computer.
 - * **Synchronize with NTP Server:** The network camera will obtain the time from an NTP server every 60 minutes.
 - * **Set manually:** Allows you to manually set the time and date.
- **Date & Time Format:** Specify the formats for the date and time (12h or 24h) displayed in the video streams. Select Date & Time format from the drop-down list.
 - **Date Format:** Specify the date format. YYYY: Year, MM: Month, DD: Day
 - **Time Format:** Specify the date format. 24 Hours or 12 Hours

NOTE: If using a host name for the NTP server, a DNS server must be configured under TCP/IP settings.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

4) Network

▽ Basic

The screenshot displays the 'Network - Basic' configuration page. The left sidebar lists various system settings, with 'System' expanded to show 'Network' and its sub-items. The main configuration area is divided into several sections: 'IP Address Configuration' (with DHCP selected and static IP fields), 'IPv6 Address Configuration' (with 'Enable IPv6' unchecked), 'DNS Configuration' (with DHCP selected and DNS server fields), 'Host Name Configuration' (with a host name field), 'Services' (with ports for HTTP, HTTPS, and RTSP), and 'Link Speed Control' (with LAN interface and link speed settings). 'Save' and 'Reset' buttons are at the bottom.

• IP Address Configuration:

- **Obtain IP address via DHCP:** Dynamic Host Configuration Protocol (DHCP) is a protocol that lets network administrators centrally manage and automate the assignment of IP addresses on a network. DHCP is enabled by default. Although a DHCP server is mostly used to set an IP address dynamically, it is also possible to use it to set a static, known IP address for a particular MAC address. To obtain IP address via DHCP, check the radio button.

- **Use the following IP address:** To use a static IP address for the network camera, check the radio button and then make the following settings:

- * **IP address:** Specify a unique IP address for your network camera.

- * **Subnet mask:** Specify the mask for the subnet the network camera is located on.

- * **Default router:** Specify the IP address of the default router (gateway) used for connecting devices attached to different networks and network segments.

- **IPv6 Address Configuration:** Check this “Enable IPv6” box to enable IPv6. Other settings for IPv6 are configured in the network router.

- **DNS Configuration:** DNS (Domain Name Service) provides the translation of host names to IP addresses on your network. Check the radio button to obtain DNS server via DHCP or set the DNS server.

- **Obtain DNS Server via DHCP:** Automatically use the DNS server settings provided by the DHCP server.

- **Use the following DNS server address** to enter the desired DNS server by specifying the

following:

- * **Domain name:** Enter the domain(s) to search for the host name used by the network camera. Multiple domains can be separated by semicolons (;). The host name is always the first part of a Fully Qualified Domain Name, for example, myserver is the host name in the Fully Qualified Domain Name myserver.mycompany.com where mycompany.com is the Domain name.

- * **DNS servers:** Enter the IP addresses of the primary and secondary DNS servers.

- **Host Name Configuration:**

- **Host Name:** Enter the host name to be used as device information in the client software or SmartManager.

- **Services:**

- **HTTP port:** Enter a port to receive a service through the HTTP. Default port number is “80”.
 - **HTTPS port:** Enter a port to receive a service through the HTTPS. Default port number is “443”.
 - **RTSP port:** Enter a port to receive a service through the RTSP. Default port number is “554”.

- **Link Speed Control:**

- **LAN Interface:** User can select Auto, Half duplex or Full duplex transmission method.
 - **Link Speed:** User can select either 10Mbps or 100Mbps.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ DDNS

The screenshot shows a web-based configuration interface for a network device. On the left is a sidebar menu with categories like 'Basic Configuration', 'Video & Image', 'Audio', 'Event', 'Dome Configuration', 'System', 'Security', 'Date & Time', 'Network', 'Language', 'Maintenance', 'Support', and 'About'. The 'System' category is selected, and within it, the 'Network' sub-category is expanded. The main content area is titled 'Network - DDNS' and features a section for 'Internet DDNS (Dynamic Domain Name Service)'. This section includes an 'Enable DDNS' checkbox, a note advising the user to configure a primary DNS server, and several input fields: 'DDNS Server' (a dropdown menu showing 'cctv-network.co.kr'), 'Registered host', 'User name', 'Password', 'Confirm password', and 'Maximum time interval' (a dropdown menu showing '1 hour'). There is also a checkbox for 'Register local network IP address' and a corresponding 'Registered IP address' field. At the bottom right of the form are 'Save' and 'Reset' buttons. A faint graphic of a laptop and a wrench is visible in the background of the main content area.

- **Internet DDNS (Dynamic Domain Name Service):** When using the high-speed Internet with the telephone or cable network, users can operate the network camera on the floating IP environment in which IPs are changed at every access. Users should receive an account and password by visiting a DDNS service like <http://www.dyndns.org/>.

– **Enable DDNS:** Check to have DDNS service available.

* **DDNS Server:** Select the DDNS server.

* **Registered host:** Enter an address of the DDNS server.

* **Username:** Enter an ID to access to the DDNS server.

* **Password:** Enter a password to be used for accessing the DDNS server.

* **Confirm:** Enter the password again to confirm it.

* **Maximum time interval:** Set a time interval to synchronize with the DDNS server. Select the time interval from the drop-down list.

* **Register local network IP address:** Register a Network Video Server IP address to the DDNS server by checking the box and enter the Registered IP address.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ RTP

The screenshot displays the 'Network - RTP' configuration page. On the left is a sidebar with a tree view containing categories like Basic Configuration, Video & Image, Audio, Event, Dome Configuration, System (selected), Security, Date & Time, Network (expanded), Language, Maintenance, Support, and About. Under 'Network', sub-items include Basic, DDNS, RTP (selected), UPnP, QoS, NAT, Zeroconf, and Bonjour. The main content area is titled 'Network - RTP' and contains several sections: 'Port Range' with 'Start port' (30000) and 'End port' (30239); 'Multicast (Stream 1)' through 'Multicast (Stream 4)', each with 'Multicast destination IP', 'RTP port', 'RTP TTL', and an 'Always enable multicast' checkbox; 'Multicast (Audio)' and 'Multicast (Meta)' with similar fields. At the bottom right are 'Save' and 'Reset' buttons. A faint watermark of a camera and tools is visible in the bottom right corner of the configuration area.

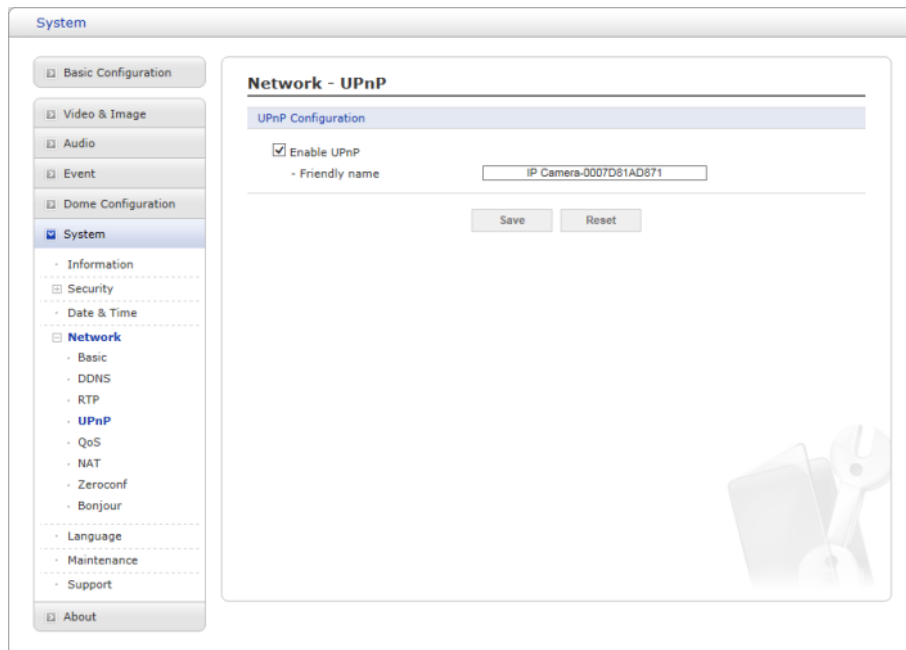
Create a setting for sending and receiving an audio or video on a real-time basis. These settings are the IP address, port number, and Time-To-Live value (TTL) to use for the media stream(s) in multicast H.264 format. Only certain IP addresses and port numbers should be used for multicast streams.

- **Port Range:**
 - **Start port:** 30000 ~ 39920: only even values are available.
- **Multicast (Stream 1 / Stream 2 / Stream 3 / Stream 4 / Audio / Meta):** This function is for sending Video, Audio, and Meta Data to Multicast group.
 - **Multicast destination IP:** Enter an IP between 224.0.0.0 and 239.255.255.255.
 - **RTP port:** Enter a value between 1024 and 65530.
 - **RTP TTL:** Enter a value between 1 and 255. If a network status is smooth, enter a lower value. However, if a network status is poor, enter a higher value. When there are many network cameras or users, a higher value may cause a heavy load to the network. Consult with a network manager for detailed information.

- **Always enable multicast:** Check the box to start multicast streaming without opening an RTSP session.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ UPnP



The network camera includes support for UPnP. UPnP is enabled by default, so the network camera is automatically detected by operating systems and clients that support this protocol.

Enter a name in the Friendly name field.

NOTE: UPnP must be installed on your workstation if running Windows XP. To do this, open the Control Panel from the Start Menu and select Add/Remove Programs. Select Add/Remove Windows Components and open the Networking Services section. Click Details and then select UPnP as the service to add.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ QoS

The screenshot shows a web interface for configuring Quality of Service (QoS). The left sidebar contains a navigation menu with categories like Basic Configuration, Video & Image, Audio, Event, Dome Configuration, System, Information, Security, Date & Time, Network, Language, Maintenance, Support, and About. The 'System' category is expanded, and 'QoS' is selected under the 'Network' sub-category. The main content area is titled 'Network - QoS' and contains two sections: 'DSCP Setting' and 'Automatic Traffic Control'. Under 'DSCP Setting', there are three rows: 'Live stream DSCP' with a value of 0, 'Event/Alarm DSCP' with a value of 0, and 'Management DSCP' with a value of 0. Under 'Automatic Traffic Control', there is a checkbox for 'Enable automatic traffic control' which is unchecked. Below it, there are two options: 'Maximum bandwidth' set to 1 Mbps and 'Priority' set to 'Framerate'. At the bottom right of the main content area, there are 'Save' and 'Reset' buttons. A faint watermark of a folder and a wrench is visible in the bottom right corner of the main content area.

Quality of Service (QoS) provides the means to guarantee a certain level of a specified resource to selected traffic on a network. Quality can be defined as a maintained level of bandwidth, low latency, and no packet losses.

The main benefits of a QoS-aware network are:

1. The ability to prioritize traffic and thus allow critical flows to be served before flows with lesser priority.
 2. Greater reliability in the network, due to the control of the amount of bandwidth an application may use, and thus control over bandwidth races between applications.
- **DSCP Settings:** For each type of network traffic supported by your network video product, enter a DSCP (Differentiated Services Code Point) value. This value is used to mark the traffic's IP header. When the marked traffic reaches a network router or switch, the DSCP value in the IP header tells the router or switch which type of treatment to apply to this type of traffic, for example, how much bandwidth to reserve for it.

NOTE: DSCP values can be entered in decimal or hex form, but saved values are always shown in decimal.

The following types of traffic are marked; enter a value for each type of traffic used:

– **Live Stream DSCP**

– **Event/Alarm DSCP**

– **Management DSCP**

- **Automatic Traffic Control:** Check the box to enable automatic traffic control. Set a limitation on user network resources by designating the maximum bandwidth. Select either the Maximum bandwidth or Automatic framerate radio button.
 - **Maximum bandwidth:** When sharing other network programs or equipment, it is possible to set a limitation on the maximum bandwidth in the unit of Mbit/s.
 - **Priority:** When the maximum bandwidth is exceeded, the data to be reduced is prioritized.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ NAT (Port Mapping)

The screenshot shows a web interface for configuring NAT settings. On the left is a sidebar menu with categories: Basic Configuration, Video & Image, Audio, Event, Dome Configuration, System (selected), Information, Security, Date & Time, Network (expanded), Basic, DDNS, RTP, UPnP, QoS, NAT (selected), Zeroconf, Bonjour, Language, Maintenance, Support, and About. The main content area is titled 'Network - NAT (Port Mapping)' and contains a 'Wire NAT traversal Setting' section. It has a 'Wire NAT traversal Setup' checkbox labeled 'Enable'. Below it are two rows of port settings: 'External http port' with a value of '10000' and a range '[1024... 65535]', and 'External rtsp port' with a value of '10001' and the same range. A note states: '* Note: If the Port is 0, the assigned port of network camera will be set automatically.' There are input fields for 'HTTP URL' and 'RTSP URL'. At the bottom right are 'Save' and 'Reset' buttons. A faint background image of a folder and a wrench is visible in the bottom right corner of the main area.

• Wire NAT traversal Setting

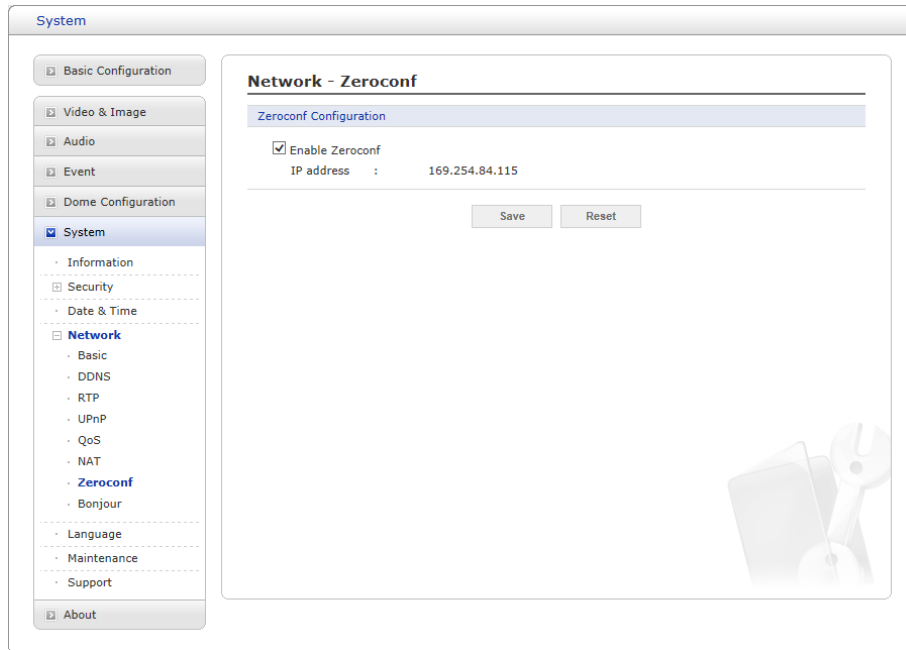
- **Enable:** Check this box to enable NAT traversal. When enabled, the network camera attempts to configure port mapping in a NAT router on your network, using UPnP. Note that UPnP must be enabled in the network camera (see System > Network > UPnP).
- * **Automatic setting:** When selected, the network camera automatically searches for NAT routers on your network.
- * **Manual setting:** Select this option to manually select a NAT router and enter the external port number for the router in the field provided.

NOTES:

- If you attempt to manually enter a port that is already in use, an alert message will be displayed.
- When the port is selected automatically it is displayed in this field. To change this enter a new port number and click Save.
- For NAT (port mapping) to work, this must be supported by the broadband router.
- The broadband router has many different names: “NAT router”, “Network router”, “Internet Gateway”, “Broadband sharing device” or “Home firewall”, but the essential purpose of the device is the same.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Zeroconf



Zero configuration networking (zeroconf) is a set of techniques that automatically creates a usable Internet Protocol (IP) network without manual operator intervention or special configuration servers.

Zero configuration networking allows devices such as computers and printers to connect to a network automatically. Without zeroconf, a network administrator must set up services, such as Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), or configure each computer's network settings manually, which may be difficult and time-consuming.

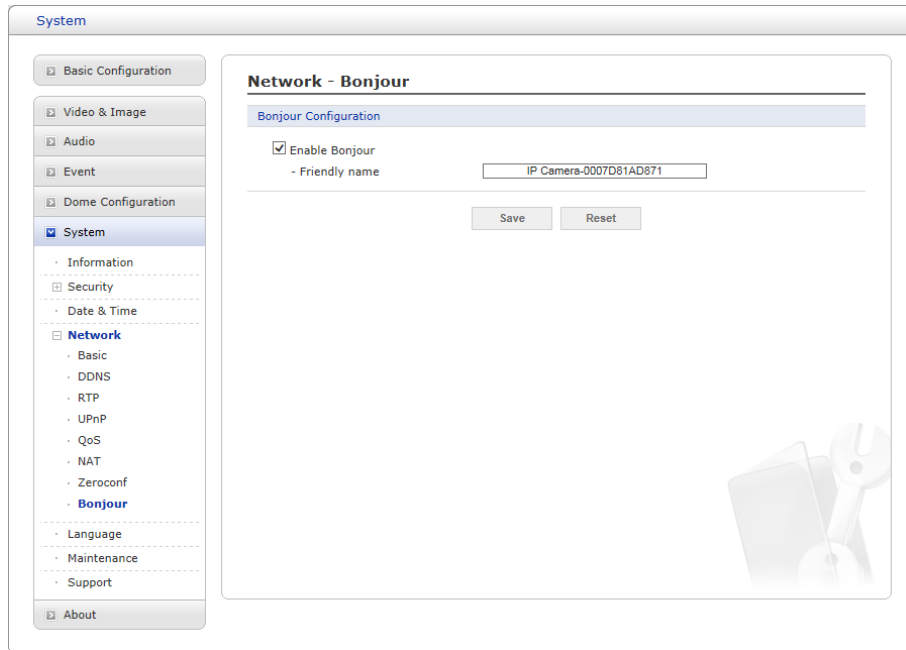
Zeroconf is built on three core technologies:

- Assignment of numeric network addresses for networked devices (link-local address auto configuration)
- Automatic resolution and distribution of computer hostnames (multicast DNS)
- Automatic location of network services, such as printing devices through DNS service discovery.

Click the checkbox to enable Zeroconf.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

▽ Bonjour



The screenshot shows a web interface for configuring a network camera. On the left is a sidebar menu with categories: Basic Configuration, Video & Image, Audio, Event, Dome Configuration, System (selected), Information, Security, Date & Time, Network (expanded), Basic, DDNS, RTP, UPnP, QoS, NAT, Zeroconf, Bonjour (selected), Language, Maintenance, Support, and About. The main content area is titled 'Network - Bonjour' and contains a 'Bonjour Configuration' section. It has a checkbox for 'Enable Bonjour' which is checked, and a 'Friendly name' field containing 'IP Camera-0007D81AD871'. At the bottom right of the main area is a faint icon of a laptop and a wrench. 'Save' and 'Reset' buttons are located below the friendly name field.

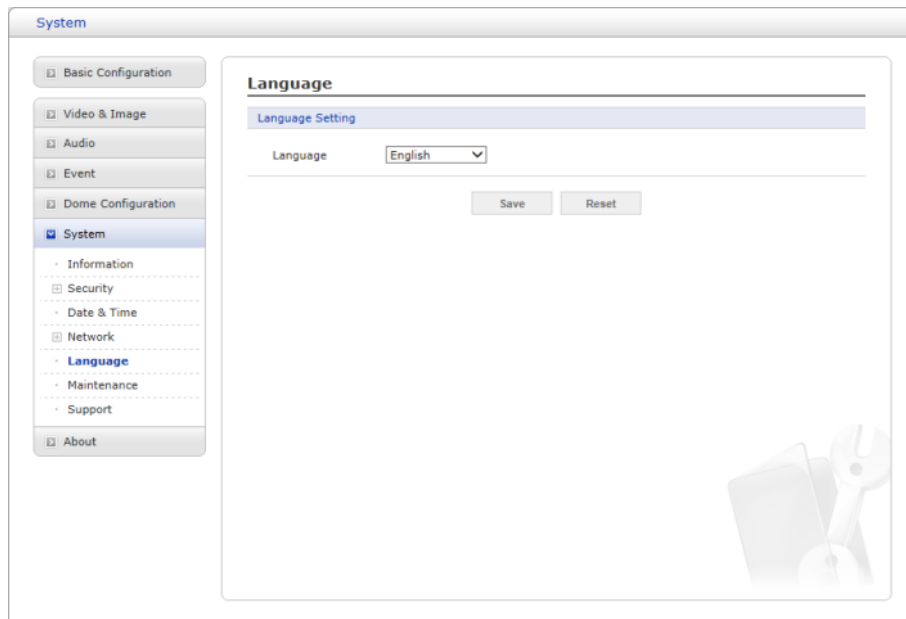
The network camera includes support for Bonjour. When enabled, the network camera is automatically detected by operating systems and clients that support this protocol.

Click the check box to enable Bonjour. Enter a name in the Friendly name field.

NOTE: Also known as zero-configuration networking, Bonjour enables devices to automatically discover each other on a network, without having to enter IP addresses or configure DNS servers. (Bonjour is a trademark of Apple Computer, Inc.)

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

5) Language



Select a user language. The language choices are English, Korean, French, German, Russian, Chinese, and Japanese.

When the settings are complete, click **Save** button to save the settings, or click **Reset** button to clear all of the information you entered without saving it.

6) Maintenance

The screenshot shows a web-based configuration interface for a system. On the left is a sidebar menu with categories: Basic Configuration, Video & Image, Audio, Event, Dome Configuration, System (selected), Information, Security, Date & Time, Network, Language, Maintenance (highlighted), Support, and About. The main content area is titled 'Maintenance' and contains several sections: 'Restart' with buttons for Restart, Reset, and Default; 'Upgrade' with instructions to upload a firmware file and an 'Upgrade' button; 'Backup' with a 'Backup' button; 'Restore' with instructions to restore from a backup file and a 'Restore' button; and 'IV License' with instructions to upload a license key file and an 'Upload' button. Each section includes a 'Note' about not turning off the unit during the process.

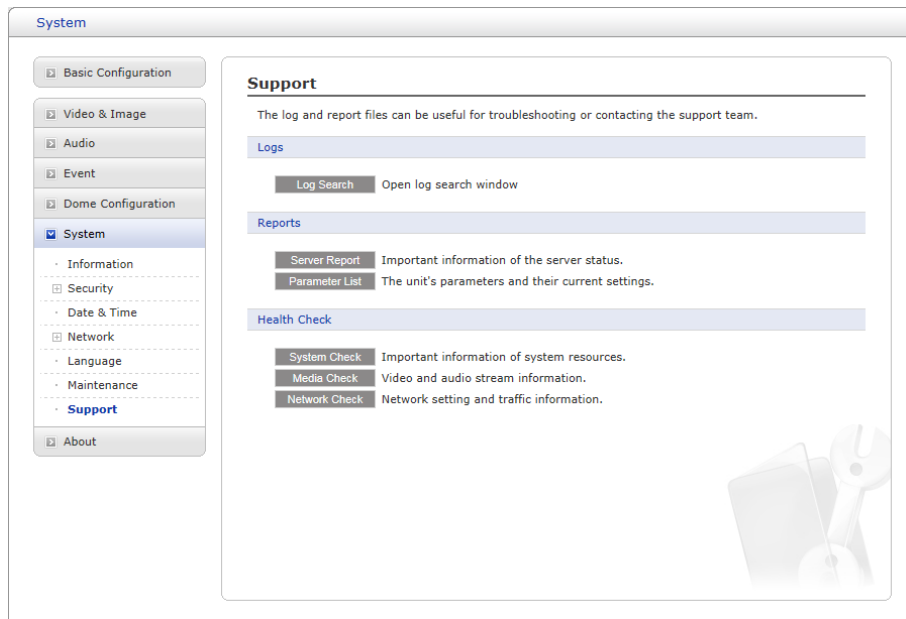
• Maintenance:

- **Restart:** The unit is restarted without changing any of the settings. Use this method if the unit is not behaving as expected.
- **Reset:** The unit is restarted and most current settings are reset to factory default values. The settings that are not affected are:
 - * the boot protocol (DHCP or static)
 - * the static IP address
 - * the default router
 - * the subnet mask
 - * the system time
- **Default:** The **Default** button should be used with caution. Pressing this will return all of the network camera's settings to the factory default values (including the IP address).
- **Upgrade:** Upgrade your camera by importing an upgrade file and pressing the **Upgrade** button. During the upgrade, do not turn off the power of the network camera. Wait at least five minutes and then try to access the camera again.
- **Backup:** Save the setting values that users have entered to the network camera to a user PC.
- **Restore:** Import and apply a setting value previously saved to a user PC.
- **IV License:** Upload your camera by importing an upload file and pressing the **Upload** button. During the upload, do not turn off the power of the network camera. Wait at least two minutes and then try to access the camera again.

NOTE: Backup and Restore can only be used on the same unit running the same firmware. This

feature is not intended for multi-configurations or for firmware upgrades.

7) Support



The support page provides valuable information on troubleshooting and contact information, should you require technical assistance.

- **Logs:** The network camera supports system and event log information. Click the **Log Search** button to search the Access, Event, Setup or Control log data.

Log Search

Type: ☒ All ☒ Access ☒ Event ☒ Setup ☒ Control

Time range: From 2018-05-04 00:00:00 To 2018-05-04 23:59:59 Search

Search within results by keyword

No.	Date & Time	Client IP	User ID	Menu	Message
1	2018 May 04 13:38:10	127.0.0.1	-	[event]->[onBoot]	onboot event occurred
2	2018 May 04 13:38:11	169.254.30.4	-	[access]->[live]	live-view/rtp login success
3	2018 May 04 13:38:12	169.254.30.4	-	[access]->[live]	video(stream1) live-view(rtp over http) start
4	2018 May 04 13:38:12	169.254.30.4	-	[access]->[live]	meta live-view(rtp over http) start
5	2018 May 04 13:42:09	169.254.30.4	-	[access]->[live]	video(stream1) live-view stop
6	2018 May 04 13:42:09	169.254.30.4	-	[access]->[live]	meta live-view stop
7	2018 May 04 13:42:09	169.254.30.4	-	[access]->[live]	live-view/rtp logout
8	2018 May 04 13:42:44	169.254.30.4	-	[access]->[live]	live-view/rtp login success
9	2018 May 04 13:42:45	169.254.30.4	-	[access]->[live]	video(stream1) live-view(rtp over http) start
10	2018 May 04 13:42:45	169.254.30.4	-	[access]->[live]	meta live-view(rtp over http) start
11	2018 May 04 13:55:45	169.254.30.4	-	[access]->[live]	video(stream1) live-view stop
12	2018 May 04 13:55:45	169.254.30.4	-	[access]->[live]	meta live-view stop
13	2018 May 04 13:55:45	169.254.30.4	-	[access]->[live]	live-view/rtp logout

Download

- **Reports:**
 - **Server Report:** Click the **Server Report** button to get the important information about the server's status; this should always be included when requesting support.
 - **Parameter List:** Click the **Parameter List** button to see the unit's parameters and their current settings.
- **Health Check:**
 - **System Check:** Click the **System Check** button to get the important information about the cameras system resources. You can see the pop-up window below.

System Check

Model

NMH-52152A1

Firmware

2.0.56-PTZ_H_52_Relief

Date & Time

. Date

: 2018-05-08

. Time

: 17:18:17

. Running time

: 1 hour 6 min

CPU

. Usage

: 15 %

OK

Refresh

- **Media Check:** Click the **Media Check** button to get the information about the cameras video and audio stream. You can see the pop-up window below.

Video stream

Stream	On/Off	Codec	Size	FPS	Bitrate
Stream1	On	H.264 Main Profile	1920x1080	30	666 Kbps
Stream2	On	MJPEG	640x480	15	1835 Kbps
Stream3	On	H.264 Main Profile	640x480	30	104 Kbps
Stream4	On	H.264 Main Profile	320x240	15	31 Kbps

Audio stream

Type	On/Off	Codec	Sample	Volume	Bitrate
Input	Off	-	-	-	-

OK

Refresh

- **Network Check:** Click the **Network Check** button to get the information about the cameras network setting and traffic. You can see the pop-up window below.

Network Check

Wired configuration

. Current Status

: Connected

. DHCP

: Off

. IP address

: 192.168.30.220

. Subnet mask

: 255.255.255.0

. Gateway

: 192.168.30.1

. DNS

: 168.126.63.1

Wireless configuration

. Current Status

: Disconnected

Traffic

. Wired

: 0 Kbps

Streaming service

. Number of users currently live

: 0

. Number of users currently playback

: 0

Server connection

. Live Push

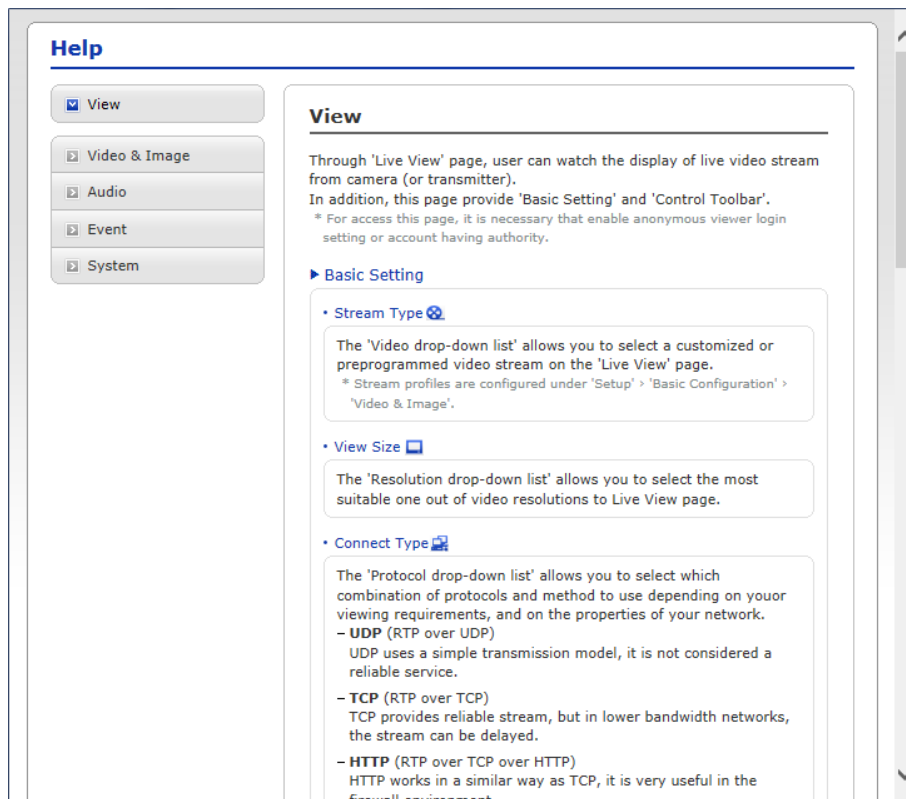
: Disconnected

. Event Push

: Disconnected

OK

3.7 Help



The Help information window will be provided as a popup window so that users can open and read it without needing to log-in. It will offer a description of the setting and Help page so that users can manipulate the network camera without a reference to the manual.

A APPENDIX

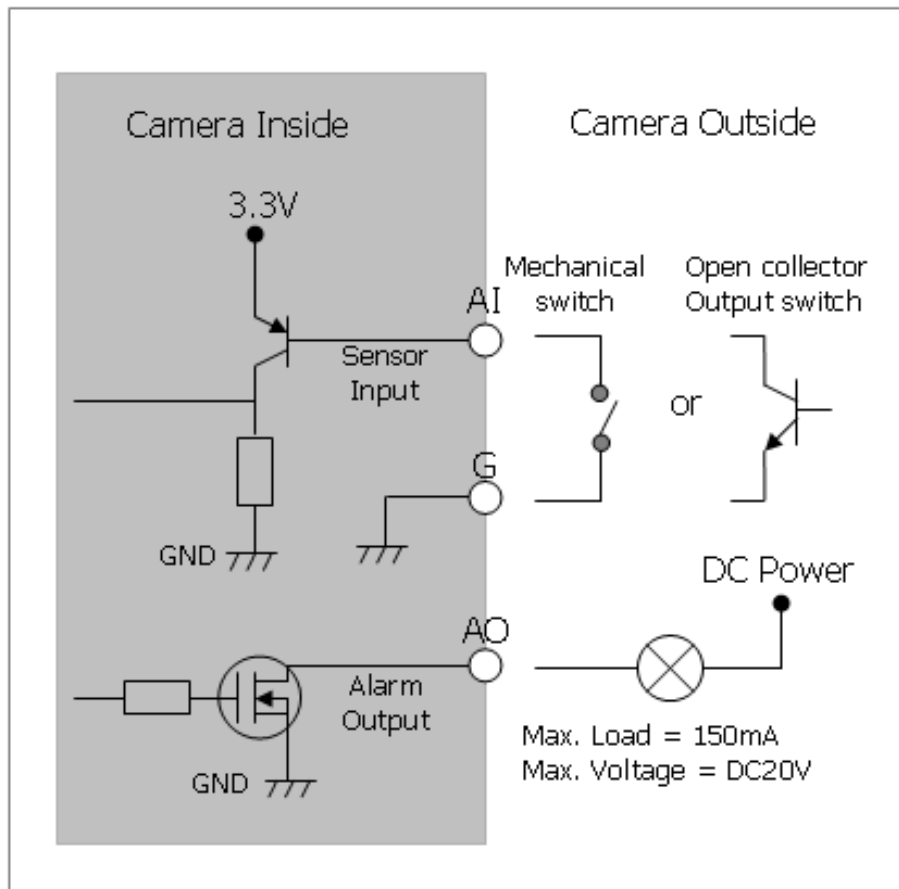
A.1 Troubleshooting

Troubleshooting if problems occur, verify the installation of the network camera with the instructions in this manual and with other operating equipment. Isolate the problem to the specific piece of equipment in the system and refer to the equipment manual for further information.

Problems/Symptoms	Possible Causes or Corrective Actions
The camera cannot be accessed by some clients.	If using a proxy server, try disabling the proxy setting in your browser. Check all cabling and connectors.
The camera works locally, but not externally.	Check if there are firewall settings that need to be adjusted. Check if there are router settings that need to be configured.
Poor or intermittent network connection.	If using a network switch, check that the port on that device uses the same setting for the network connection type (speed/duplex).
The camera cannot be accessed via a host name.	Check that the host name and DNS server settings are correct.
Not possible to log in.	When HTTPS is enabled, ensure that the correct protocol (HTTP or HTTPS) is used. When attempting to log in, you may need to manually type in http or https in the browser's address bar.
No image using Refresh and/or slow updating of images.	If images are very complex, try limiting the number of clients accessing the camera.
Images only shown in black & white.	Check the Video & Image setting.
Blurred images.	Refocus the camera.
Poor image quality.	Increased lighting can often improve image quality. Check that there is sufficient lighting at the monitored location. Check all image and lighting settings.
Rolling dark bands or flickering in image.	Try adjusting the Exposure Control setting under Camera Setup part.
H.264 not displayed in the client.	Check that the correct network interface is selected in the Video & Image/Stream.
Multicast H.264 not displayed in the client.	Check with your network administrator that the multicast addresses used by the camera are valid for your network. Check that the Enable multicast checkbox are enabled in the System/Network/RTP tab. Checks with your network administrator to see if there is a firewall preventing viewing.
Multicast H.264 only accessible by local clients.	Check if your router supports multicasting, or if the router settings between the client and the server need to be configured. The TTL value may need to be increased.
Color saturation is different in H.264 and Motion JPEG.	Modify the settings for your graphics adapter. Please see the adapter's documentation for more information.
Video cannot be recorded.	Check that the Micro-SD card is inserted properly. Check that the Micro-SD card is formatted properly.

A.2 Alarm Connection

The following connection diagram gives an example of how to connect a network camera.



A.3 Preventive Maintenance

Preventive maintenance allows detection and correction of minor faults before they become serious and cause equipment failure.

Every three-month, perform the following maintenance.

1. Inspect all connection cables for deterioration or other damage.
2. Clean components with a clean damp cloth.
3. Verify that all the mounting hardware is secure.

A.4 System Requirement for Web Browser

- **Operating System:** Microsoft Windows OS Series
- **CPU:** Intel Core 2 Duo 2GHz or higher, 1GB RAM or more, 10GB free disk or higher
- **VGA:** AGP, Video RAM 32MB or higher (1024x768, 24bpp or higher)

A.5 General Performance Considerations

When setting up your system, it is important to consider how various settings and situations will affect performance. Some factors affect the amount of bandwidth (the bit rate) required, others can affect the frame rate, and some affect both. If the load on the CPU reaches its maximum, this will also affect the frame rate.

The following factors are among the most important to consider:

- High image resolutions and/or lower compression levels (or high bitrates) result in larger images. Frame rate and Bandwidth affected.
- Accessing both Motion JPEG and H.264 video streams simultaneously. Frame rate and bandwidth affected.
- Heavy network utilization due to poor infrastructure. Frame rate and Bandwidth affected.
- Heavy network utilization via wireless router due to poor infrastructure. Frame rate and bandwidth affected.
- Viewing on poorly performing client PCs lowers perceived performance. Frame rate affected.

A.6 Product Specification

Image	Lens		Optical Zoom 23X 5mm ~ 117mm
	Angle of View		56.6° (H) ~ 3° (H)
	Image Sensor		1/2.8" SONY STARVIS CMOS sensor
	Min. Illumination		Color: 0.35 Lux @ 50 IRE B/W: 0 Lux (IR LED On)
	Scanning Mode		Progressive Scan
	Wide Dynamic Range		True WDR
	Day and Night Mode		True D/N (Auto, Day, Night)
	Noise Reduction		2DNR, 3DNR
	Digital Zoom		Yes (ROI)
	Exposure Control		Auto, Iris Priority
	White Balance Control		Auto, Manual
	Metering Mode		Spot, Center, Average
	Image Effect		Flip, Defog
	Flicker Free Mode		50Hz, 60Hz
	Shutter Speed		Auto (1/10,000 ~ 1sec.)
	IR Illuminator		4 IR LEDs
Video / Audio	Video Compression		H.264 (Baseline, Main, High Profile), H.265(Main Profile), MJPEG
	Bitrate Control		CBR, CVBR
	Resolution		1920x1080, 1440x1080, 1280x1024, 1024x768, 800x600/480, D1, 640x480, 400x240, CIF
	Frame Rate		Max. 25fps/30fps
	Streaming		Quad Stream (H.264/H.265 x 3, MJPEG x 1)
	Composite Out		-
	Audio Compression		G.711
	Audio Streaming		2 Way
PTZ Function	Pan Range		360° Endless
	Pan Speed		Max. 380°/sec (Preset)
	Tilt Range		-5° ~ 90°
	Tilt Speed		Max. 380°/sec (Preset)
	Preset		256
	Tour		8
	Pattern		8
	Home Function		Yes
System	Video Contents Analysis		Tempering, iVMD, Intrusion detector
	Motion Detection Area		16 Programmable Area (Include Area 8, Exclude Area 8)
	Privacy Masking		16 Programmable Zones
	Hi-Stream (Smart Codec)		8 Regions, Quality setup, Non-ROI fps setup
	FTP Uploading		MJPEG
	Event Notification		E-mail, FTP, XML Notification, Notification Server, Audio Alert
	Audio Alert		User-Defined 3 Audio files
	Login Authority		Administrator, Operator, Guest
	Event Buffering	FTP	Pre : 30sec, Post : 30sec
		SD Record	Pre : 10sec, Post : 60sec
	Manual Trigger		4 Programmable Triggers
	Security		Multi User Authority, IP Filtering, HTTPS, SSL
	Network Time Sync		NTP Server, Synchronize Computer, Manual
	Software Reset		Restart, Reset, Factory Default
	Hardware Factory Reset		Yes
	Auto Recovery		Backup, Restore
	Remote Upgrade		Web Browsing (IE, Chrome, Safari, Firefox), SmartManager
	SD Recording Mode		Event / Continuous

Network	Protocols	TCP/IP, UDP, IPv4/IPv6, HTTP, HTTPS, QoS, FTP, UPnP, RTP, RTSP, RTCP, DHCP, ARP, Zeroconf, Bonjour
	Client Software	Web, SmartManager, Client S/W, Mobile S/W
	Max. User Connection	Live : 10 Users, Playback : 3 Users
	API Support	Open API, ONVIF Compliance
	Mobile Support	Android, i-OS
External In/Out	Video Composite Out	-
	Audio	1 Input, 1 Output (Terminal Block)
	Alarm	4 Inputs, 1 Output (Terminal Block)
	Ethernet	RJ-45 (10/100Base-T)
	μ-SD Card	SDHC/SDXC
ETC	RS485	-
	Operating Humidity	0 ~ 90% RH (Non-condensing)
	Operating Temperature	-20°C ~ +50°C
	Power Supply	PoE (IEEE 802.3af compliance, Class4), 12VDC
	Power Consumption	380mA (20W) @ PoE, 1.5A (18W) @ 12VDC
	Dimensions	See dimension drawing
	Net Weight	Approx. 2.8kg
	Ingress Protection	IP66

* Specifications are subject to change without notice.

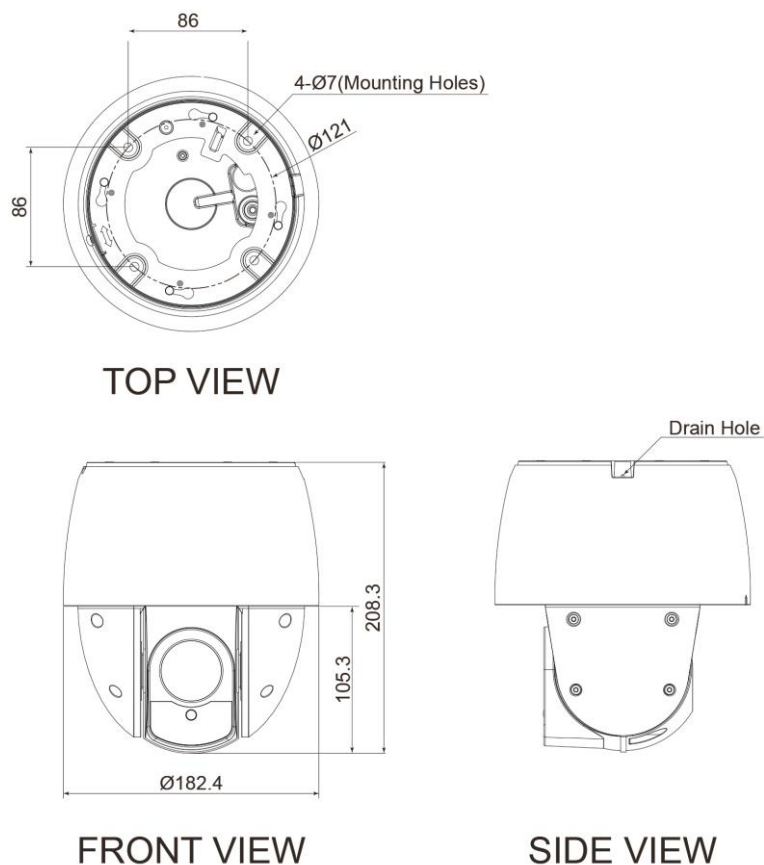


Figure – Dimension



23X 2M NETWORK SPEED DOME CAMERA