SAMSUNG TECHWIN

NETWORK CAMERA

User Manual

SNZ-6320

CE

SAMSUNG

Network Camera

User Manual

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- **Design and specifications are subject to change without prior notice.**
- **The initial administrator ID is "admin" and the password should be set when logging in for the first time. Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.**
  Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

IMPORTANT SAFETY INSTRUCTIONS

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 produce 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 are 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. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lighting storms or when unused for long periods of time.
14. 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.
15. This product is intended to be supplied by Power Unit marked "Class 2" or "LPS" and rated 12 Vdc, 0.8 A / 44-57 Vdc(PoE), 0.2 A.

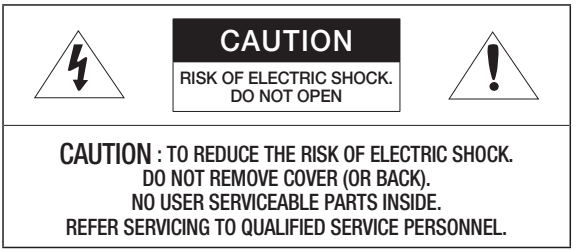
WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENNINGS ON THE EQUIPMENT.

Apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

To prevent injury, this apparatus must be securely attached to the Wall/ceiling in accordance with the installation instructions.

CAUTION



EXPLANATION OF GRAPHICAL SYMBOLS

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Battery

Batteries(battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.

CAUTION

Risk of explosion if battery is replaced by an incorrect type.
Dispose of used batteries according to the instructions.

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.

The CVBS out terminal of the product is provided for easier installation, and is not recommended for monitoring purposes.

Please use the input power with just one camera and other devices must not be connected.

The ITE is to be connected only to PoE networks without routing to the outside plant.

overview

Please read the following recommend safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.
- Do not expose the camera to radioactivity.

User's Manual is a guidance book for how to use the products.
The meaning of the symbols are shown below.

- Reference : In case of providing information for helping of product's usages
- Notice : If there's any possibility to occur any damages for the goods and human caused by not following the instruction

※ Please read this manual for the safety before using of goods and keep it in the safe place.

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PRODUCT FEATURES

- **HD Video Quality**
- **Multi-Streaming**
  This network camera can display videos in different resolutions and qualities simultaneously using different CODECs.
- **Web Browser-based Monitoring**
  Using the Internet web browser to display the image in a local network environment.
- **Alarm**
  If an event occurs, the camera sends the relevant videos to the e-mail address or the FTP server registered by the user, saves them in a Micro SD card or NAS, or sends the signal to the alarm output terminal.
- **Tampering Detection**
  Detects tempering attempts on video monitoring.
- **Motion Detection**
  Detects motion from the camera's video input.
- **Intelligent Video Analysis**
  Analyzes video to detect logical events of specified conditions from the camera's video input.
- **Face Detection**
  Detects faces from the camera's video input.
- **Audio Detection**
  Detects sound louder than a certain level specified by user.
- **Auto Detection of Disconnected Network**
  Detects network disconnection before triggering an event.
- **ONVIF Compliance**
  This product supports ONVIF Profile-S.
  For more information, refer to www.onvif.org.

ONVIF
Driving network video through global standardization

RECOMENDED PC SPECIFICATIONS

- CPU : Intel Core 2 Duo 2.6 GHz or higher (for using 1920x1080 30 fps)
  Intel Core i7 2.8 GHz or higher (for using 1920x1080 60 fps)
  - Web Plug-in is optimized to SSE 4.1 Instruction Set.
- Resolution : 1280X1024 pixels or higher (32 bit color)
- RAM : 2GB or higher
- Supported OS : Windows XP / VISTA / 7 / 8 / 8.1, MAC OS X 10.7 / 10.8
- Supported Browser : Microsoft Internet Explorer (Ver. 8 ~ 11),
  Mozilla Firefox (Ver. 9 ~ 19), Google Chrome (Ver. 15 ~ 32),
  Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) *Mac OS X Only
  - Windows 8 is supported only in the Desktop mode.
  - Neither a beta test version unlike the version released in the company website nor the developer version will be supported.
  - It is recommended to connect to IPv6 in Windows 7.
  - The camera does not support Internet Explorer Compatability View settings.
  - For Mac OS X, only the Safari browser is supported.
- Video Memory : 256MB or higher

  - If the driver of the video graphic adapter is not installed properly or is not the latest version, the video may not be played properly.
  - For a multi-monitoring system involving at least 2 monitors, the playback performance can be deteriorated depending on the system.
  - It is advisable to use Intel Core 2 Duo 2.93GHz or higher in a multi-browser environment.

RECOMENDED MICRO SD/SDHC/SDXC MEMORY CARD SPECIFICATIONS

- 4GB ~ 64GB
- For your camera, we recommend you use a memory card from the following manufacturers:
  Micro SD/SDHC/SDXC Memory Card : Sandisk, Transcend
- It is recommended to use memory cards of at least class 6 speed.

NAS RECOMMENDED SPECS

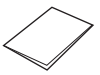
- Recommended capacity : 200GB or higher is recommended.
- Simultaneous access : One unit of NAS can accept a maximum of sixteen camera accesses.
- For this camera, you are recommended to use a NAS with the following manufacturer's specs.

Recommended products	Available sizes
Netgear NAS	A maximum of 16 cameras can access simultaneously.
Synology NAS	A maximum of 16 cameras can access simultaneously.

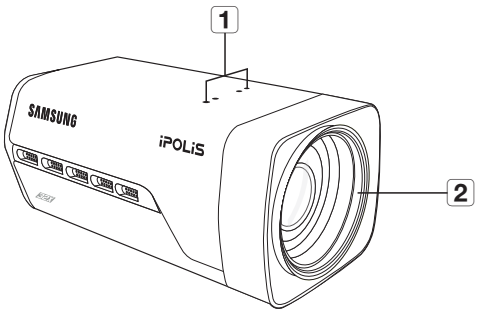
- When you use Netgear's NAS equipment, do not allocate the capacity for use.
- If you use NAS equipment for purposes other than video saving, the number of accessible cameras may be reduced.

WHAT'S INCLUDED

Please check if your camera and accessories are all included in the product package.

Appearance	Item Name	Quantity	Description
	Camera	1	
	Instruction book, Installer S/W CD	1	
	Quick Guide (Optional)	1	
	Warranty card (Optional)	1	
	Camera Holder (Mount)	1	Used to install the camera holder
	Camera Holder (Mount) Screws	2	Used to install the mount
	6 terminal block	1	Used by inserting an alarm in/out terminal
	Cable for the testing monitor	1	Used to test the camera connection to a portable display device

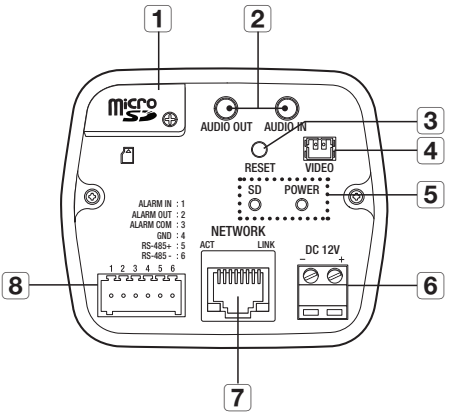
Front Side



Item		Description
1	Camera Holder (Mount) Holes	Used when you mount the camera onto the bracket by fixing the camera holder (mount) adaptor with the bracket.
2	Zoom Lens	Built-in zoom lens.

- Wipe out a dirty surface of the lens softly with a lens tissue or cloth to which you have applied ethanol.

Rear Side



Item		Description	
1	Micro SD Memory Card Compartment	Compartment for the Micro SD memory card.	
2	Audio terminal	AUDIO OUT	Terminal for audio output.
		AUDIO IN	Terminal for audio input.
3	Reset Button	Resets the camera settings to the default. Press and hold it for about 5 seconds to turn off the system indicator and restart the system. ! If you reset the camera, the network settings will be adjusted so that DHCP can be enabled. If there is no DHCP server in the network, you must run the IP Installer program to change the basic network settings such as IP address, Subnet mask, Gateway, etc., before you can connect to the network.	
4	Test Monitor Out	Output port for test monitoring the video output. Use the test monitor cable to connect to a mobile display and check the test video.	

Item		Description	
5 SD, Power Indicators		SD	ON : A memory card is inserted and operates normally. Flashing : Failed to record, insufficient space, or inserted abnormally. OFF : Camera is off, camera is restarting, or memory card is not in place.
		POWER	ON : While the power is on OFF : If the power is off
6 Power Port		Used to plug the power cable.	
7 Network Port		Used to connect a PoE or LAN cable.	
8 I/O Port		ALARM IN	Used to connect the alarm input signal.
		ALARM OUT	Used to connect the alarm output signal.
		ALARM COM	Common port where the alarm output signal is connected.
		GND	Used for earth-grounding.
		RS-485+	RS-485 Data line
		RS-485-	RS-485 Data line

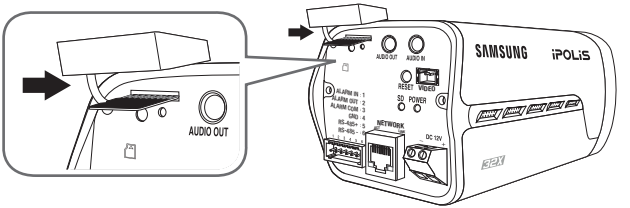
- RS-485 port only supports direct connection with pan/tilt driver and external connections of the RS-485 controller is not supported.

INSERTING/REMOVING A MICRO SD MEMORY CARD

- Disconnect the power cable from the camera before inserting the Micro SD memory card.

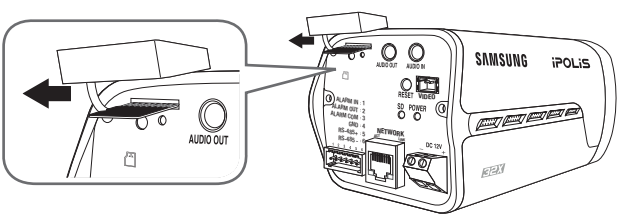
Inserting a Micro SD Memory Card

As shown, loosen the screw before removing the Micro SD memory card. Insert the Micro SD card in the arrow direction.



Removing a Micro SD Memory Card

Gently press down on the exposed end of the memory card as shown in the diagram to eject the memory card from the slot.



- Pressing too hard on the Micro SD memory card can cause the card to shoot out uncontrollably from the slot when released.
- To turn off the camera or remove the Micro SD memory card, set the card to <**Off**> in <**Storage**> menu and press the [**Apply (** Apply **)**] button. (page 88)
- If you turn off the camera or remove the Micro SD memory card that contains data from the product, the data may be lost or damaged.
- If there occurs a problem in the Micro SD memory, the SD LED indicator will blink.

MEMORY CARD INFORMATION (NOT INCLUDED)

What is a memory card?

The memory card is an external data storage device that has been developed to offer an entirely new way to record and share video, audio, and text data using digital devices.

Selecting a memory card that's suitable for you

Your camera supports Micro SD/SDHC/SDXC memory cards.
You may, however, experience compatibility issues depending on the model and make of the memory card.

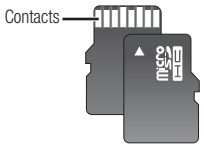
For your camera, we recommend you use a memory card from the following manufacturers:
Micro SD/SDHC/SDXC Memory Card : Sandisk, Transcend

Memory cards of 4GB ~ 64GB is recommended for using with this camera.

Playback performance can be affected depending on the speed of memory card, so use the high-speed memory card.

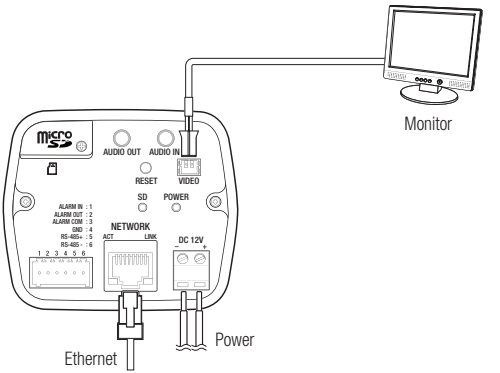
It is recommended to use memory cards of at least class 6 speed.

- **Memory Card Components**



Micro SD/SDHC

CONNECTING WITH OTHER DEVICE



- The BNC Out terminal of the product is provided for easier installation, and is not recommended for monitoring purposes.
  If you keep the BNC cable connected, a risk of lightening may cause damage or malfunction to the product.

Ethernet Connection

Connect the Ethernet cable to the local network or to the Internet.

Power Supply

Use the screwdriver to connect each line (+, –) of the power cable to the corresponding power port of the camera.

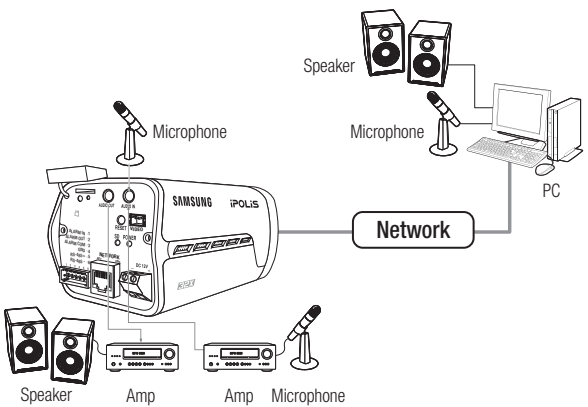
- Be careful not to reverse the polarity when you connect the power cable.
  You can also use a router featuring PoE (Power over Ethernet) to supply power to the camera.
- If PoE and DC 12V are both applied, this camera will get supplied with power from PoE.
- Please make sure the monitor and camera are turned off when connecting them.

Electrical Resistance of Copper Wire at [20°C (68°F)]

Copper Wire Gauge (AWG)	#24(0.22mm²)	#22(0.33mm²)	#20(0.52mm²)	#18(0.83mm²)
Resistance (Ω/m)	0.078	0.050	0.030	0.018
Drop Voltage (V/m)	0.028	0.018	0.011	0.006
Recommended Distance (m)	Less than 20	Less than 30	Less than 30	Less than 30

- As shown in the table above, you may encounter a voltage-sag depending on the wire length. If you use an excessively long wire for camera connection, the camera may not work properly.
  - Camera Operating Voltage: DC 12V ±10%
  - Voltage drop measurements on the chart above may vary depending on the type and manufacture of the copper cable.

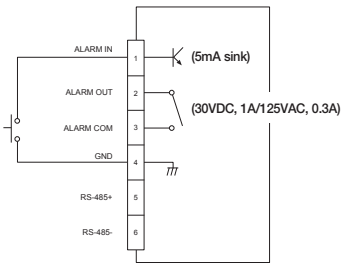
Connecting to Audio Input/Output



1. Connect the AUDIO IN port of the camera with the microphone directly or LINE OUT port of the amplifier that the microphone is connected to.
2. Connect the AUDIO OUT port of the camera with the LINE IN port of the speaker.
3. Check the specifications for audio input.

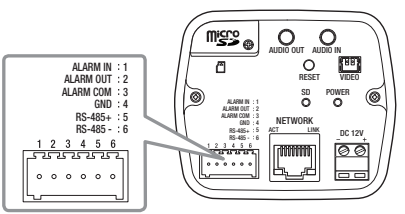
- **Audio Codec** : G.711 PCM. μ-law 64kbps 8kHz sampling
- **Full duplex Audio**
- **Audio in** : Used for mono signal line input (Max.2.4 Vpp)
- **Audio out** : Used for mono signal line output (Max.2.4 Vpp)
- **Line out impedance** : 600Ω

Alarm I/O Wiring Diagram



Connecting to the I/O port box

Connect the Alarm I/O signal to the corresponding port of the rear port box.



- ALARM IN : Used to connect the alarm input signal.
- ALARM OUT : Used to connect the alarm output signal.
- ALARM COM : Common port where the alarm output signal is connected.
- GND : Used for earth-grounding.
- RS-485+ : Communication port for RS-485 receiver (+).
- RS-485- : Communication port for RS-485 receiver (-).

Connecting an external RS-485 device

Connect the camera with an external device using the [**RS-485 +, -**] ports.
You can control the pan/tilt operations of the camera via RS-485 communications.

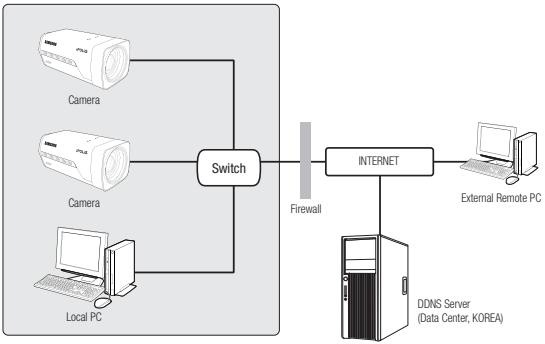
- The GND connection is recommended for RS-485 communications. If you encounter a communication failure, connect the GND pin as appropriate to correct the GND level between camera and external device.

You can set up the network settings according to your network configurations.

CONNECTING THE CAMERA DIRECTLY TO LOCAL AREA NETWORKING

Connecting to the camera from a local PC in the LAN

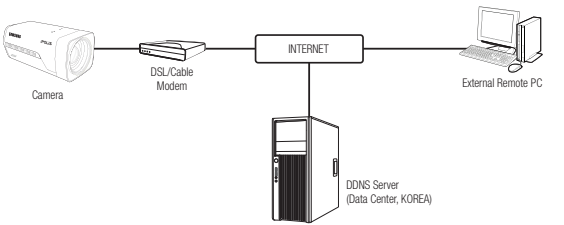
1. Launch an Internet browser on the local PC.
2. Enter the IP address of the camera in the address bar of the browser.



<Local Network>

- A remote PC in an external Internet out of the LAN network may not be able to connect to the camera installed in the intranet if the port-forwarding is not properly set or a firewall is set. In this case, to resolve the problem, contact your network administrator.
- In the IP installer, you can use the initial password, "**4321**" to set IP Address, Subnet Mask, Gateway, HTTP Port, Device Port, IP type. After changing the network interface, for better security, access the web viewer and change the password.
- By factory default, the IP address will be assigned from the DHCP server automatically. If there is no DHCP server available, the IP address will be set to 192.168.1.100. To change the IP address, use the IP Installer. For further details on IP Installer use, refer to "**Static IP Setup**". (Page 26)

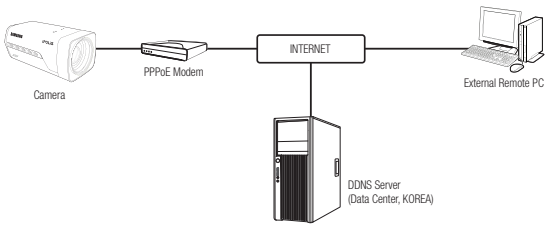
CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM



1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to [**Setup**] page.
5. Move to [**Network**] – [**DDNS**] and configure the DDNS settings.
6. Move to [**Basic**] – [**IP & Port**], and set the IP type to [**DHCP**].
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

- For configuring the DDNS settings, refer to "**DDNS**". (page 78)
- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 79)
- Refer to "**IP & Port**" for how to setup IP. (page 58)

CONNECTING THE CAMERA DIRECTLY TO A PPPoE MODEM

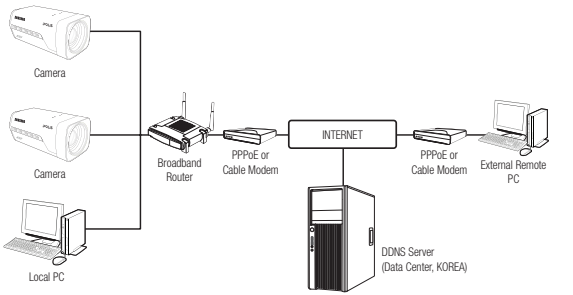


1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to [**Setup**] page.
5. Move to [**Network**] – [**DDNS**] and configure the DDNS settings.
6. Move to [**Basic**] – [**IP & Port**] Setup Page, set the IP type to [**PPPoE**], and enter the network service's ID and password.
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

- For configuring the DDNS settings, refer to "**DDNS**". (page 78)
- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 79)
- Refer to "**IP & Port**" for how to setup IP. (page 58)

CONNECTING THE CAMERA TO A BROADBAND ROUTER WITH THE PPPoE/CABLE MODEM

This is for a small network environment such as homes, SOHO and ordinary shops.



Configuring the network settings of the local PC connected to a Broadband Router

Configuring the network settings of the local PC connected to a Broadband Router, follow the instructions below.

- Select : <**Network**> → <**Properties**> → <**Local Area Connection**> → <**General**> → <**Properties**> → <**Internet Protocol (TCP/IP)**> → <**Properties**> → <**Obtain an IP address automatically**> or <**Use the following IP address**>.
- Follow the instructions below if you select <**Use the following IP address**>:

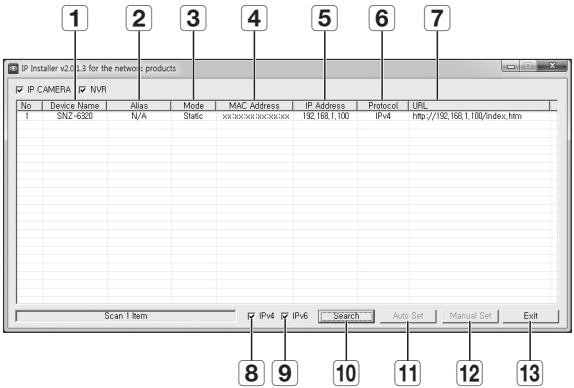
  ex1) If the address (LAN IP) of the Broadband Router is 192.168.1.1
  IP address : 192.168.1.100
  Subnet Mask : 255.255.255.0
  Default Gateway : 192.168.1.1

  ex2) If the address (LAN IP) of the Broadband Router is 192.168.0.1
  IP address : 192.168.0.100
  Subnet Mask : 255.255.255.0
  Default Gateway : 192.168.0.1

  ex3) If the address (LAN IP) of the Broadband Router is 192.168.xxx.1
  IP address : 192.168.xxx.100
  Subnet Mask : 255.255.255.0
  Default Gateway : 192.168.xxx.1

- For the address of the Broadband Router, refer to the product's documentation.
- For more information about port forwarding of the broadband router, refer to "**Port Range Forward (Port Mapping) Setup**". (Page 31)

BUTTONS USED IN IP INSTALLER



Item	Description
1 **Device Name**	Model name of the connected camera. Click the column to sort the list by model name. However, search will be stopped if clicked during the search.
2 **Alias**	This function is not currently implemented.
3 **Mode**	Displays either <**Static**>, <**Dynamic**> or <**PPPoE**> for the current network connection status.
4 **MAC(Ethernet) Address**	Ethernet address for the connected camera. Click the column to sort the list by Ethernet address. However, search will be stopped if clicked during the search.
5 **IP Address**	IP address. Click the column to sort the list by IP address. However, search will be stopped if clicked during the search.
6 **Protocol**	Network setting for the camera. The factory default is “IPv4”. Cameras with the IPv6 setting will be displayed “IPv6”.

Item	Description
7 URL	DDNS URL address enabling access from the external Internet. However, this will be replaced with the <**IP Address**> of the camera if DDNS registration has failed.
8 IPv4	Scans for cameras with the IPv4 setting.
9 IPv6	Scans for cameras with the IPv6 setting. Activated in an IPv6 compliant environment only.
10 Search	Scans for cameras that are currently connected to the network. However, this button will be grayed out if neither IPv4 nor IPv6 is checked.
11 Auto Set	The IP Installer automatically configures the network settings.
12 Manual Set	You should configure the network settings manually.
13 Exit	Exits the IP Installer program.

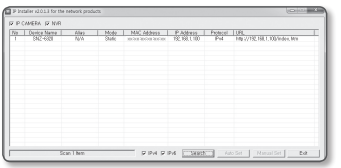
- For the IP installer, use only the installer version provided in the installation CD or use the latest one if available. You can download the latest version from the Samsung web site (www.samsungcctv.com).

STATIC IP SETUP

Manual Network Setup

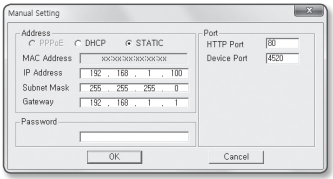
Run <**IP Installer_v2.XX.exe**> to display the camera search list.
At the initial startup, both [**Auto Set**] and [**Manual Set**] will be grayed out.

- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.



1. Select a camera in the search list.
   Check the MAC address of the camera on the camera's label.
   Both the [**Auto Set**] and [**Manual Set**] buttons will be activated.
2. Click [**Manual Set**].
   The Manual Setting dialog appears.
   The default values of <**IP Address**>, <**Subnet Mask**>, <**Gateway**>, <**HTTP Port**> and <**Device Port**> of the camera will be displayed.

3. In the <**Address**> pane, provide the necessary information.
   - MAC (Ethernet) Address : The MAC address imprinted on the camera label is automatically displayed and requires no user setting.

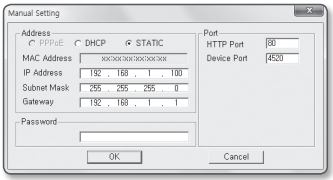


- You can configure the static IP settings only if the DHCP checkbox is unchecked.

If not using a Broadband Router

For setting <**IP Address**>, <**Subnet Mask**>, and <**Gateway**>, contact your network administrator.

4. In the <**Port**> pane, provide necessary information.
   - HTTP Port : Used to access the camera using the Internet browser, defaulted to 80.
   - Device Port : Used to control the video signal transfer, defaulted to 4520.



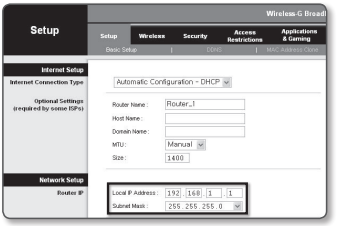
5. Enter the password.
   Enter the password of "**admin**" account, which was used to access the camera.

- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to "**Administrator password change**" of the user setup. (page 55)

6. Click [**OK**].
   Manual network setup will be completed.

If using a Broadband Router

- IP Address : Enter an address falling in the IP range provided by the Broadband Router.
  ex) 192.168.1.2~254,
  192.168.0.2~254,
  192.168.XXX.2~254
- Subnet Mask : The <**Subnet Mask**> of the Broadband Router will be the <**Subnet Mask**> of the camera.
- Gateway : The <**Local IP Address**> of the Broadband Router will be the <**Gateway**> of the camera.



- The settings may differ depending on the connected Broadband Router model. For more information, refer to the user manual of the applicable router.
- For more information about port forwarding of the broadband router, refer to "**Port Range Forward (Port Mapping) Setup**". (Page 31)

If the Broadband Router has more than one camera connected

Configure the IP related settings and the Port related settings distinctly with each other.

ex)

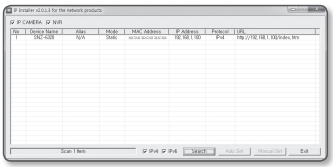
Category		Camera #1	Camera #2
IP related settings	IP Address Subnet Mask Gateway	192.168.1.100 255.255.255.0 192.168.1.1	192.168.1.101 255.255.255.0 192.168.1.1
Port related settings	HTTP Port Device Port	8080 4520	8081 4521

- If the <**HTTP Port**> is set other than 80, you must provide the <**Port**> number in the address bar of the Internet browser before you can access the camera.
  ex) http://IP address : HTTP Port
  http://192.168.1.100:8080

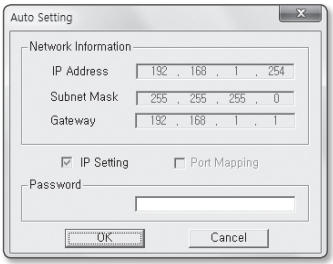
Auto Network Setup

Run <**IP Installer_v2.XX.exe**> to display the camera search list.
At the initial startup, both [**Auto Set**] and [**Manual Set**] will be grayed out.

- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.



1. Select a camera in the search list.
   Check the MAC address of the camera on the camera's label.
   Both the [**Auto Set**] and [**Manual Set**] buttons will be activated.
2. Click [**Auto Set**].
   The Auto Setting dialog appears.
   The <**IP Address**>, <**Subnet Mask**>, and <**Gateway**> will be set automatically.
3. Enter the password.
   Enter the password of "**admin**" account, which was used to access the camera.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to "**Administrator password change**" of the user setup. (page 55)

4. Click [**OK**].
   Auto network setup will be completed.

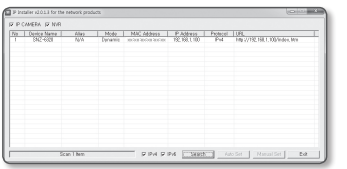
DYNAMIC IP SETUP

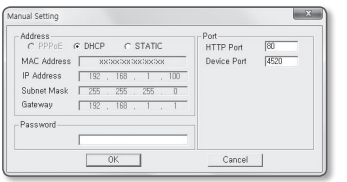
Dynamic IP Environment Setup

- Example of the Dynamic IP environment
  - If a Broadband Router, with cameras connected, is assigned an IP address by the DHCP server
  - If connecting the camera directly to modem using the DHCP protocols
  - If IPs are assigned by the internal DHCP server via the LAN

Checking the Dynamic IP

1. Run the IP Installer on the user's local computer.
   Cameras allocated with <**Dynamic IP**> address are shown in the list.
2. Select a camera from the search result.
3. Click the [**Manual Set**] button and check the camera's <**Dynamic IP**> address.
   If you uncheck <**DHCP**>, you can change IP to <**Static**>.



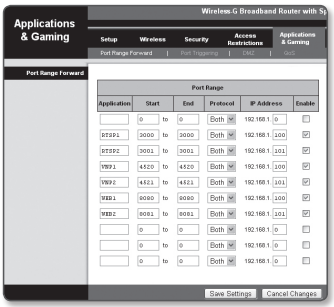


PORT RANGE FORWARD (PORT MAPPING) SETUP

If you have installed a Broadband Router with a camera connected, you must set the port range forwarding on the Broadband Router so that a remote PC can access the camera in it.

Manual Port Range Forwarding

1. From the Setup menu of the Broadband Router, select <**Applications & Gaming**> - <**Port Range Forward**>. For setting the port range forward for a third-party Broadband Router, refer to the user guide of that Broadband Router.
2. Select <**TCP**> and <**UDP Port**> for each connected camera to the Broadband Router.
   Each port number for the Broadband Router should match that specified in <**Setup**> - <**Basic**> - <**IP & Port**> from the camera's web viewer menu.
3. When done, click [**Save Settings**]. Your settings will be saved.

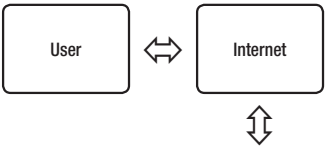


- Above sample instructions are based on the CISCO's Broadband Router.
- The settings may differ depending on the connected Broadband Router model. For more information, refer to the user manual of the applicable router.

Setting up Port Range Forward for several network cameras

- You can set a rule of Port Forwarding on the Broadband Router device through its configuration web page.
- A user can change each port using the camera setting screen.

When Camera1 and Camera2 are connected to a router :



Broadband Router			
Start	End	Protocol	IP Address
3000	3000	TCP/UDP	192.168.1.100
3001	3001	TCP/UDP	192.168.1.101
4520	4520	TCP/UDP	192.168.1.100
4521	4521	TCP/UDP	192.168.1.101
8080	8080	TCP/UDP	192.168.1.100
8081	8081	TCP/UDP	192.168.1.101

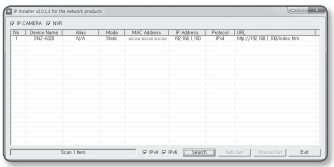
Camera1 (192.168.1.100)	
HTTP port	8080
Device port	4520
RTSP port	3000

Camera2 (192.168.1.101)	
HTTP port	8081
Device port	4521
RTSP port	3001

- Port forwarding can be done without additional router setup if the router supports the UPnP (Universal Plug and Play) function.
  After connecting the network camera, set <**Quick connect**> of <**Samsung DDNS**> to <**On**> in the "**Setup → Network → DDNS**" menu.

CONNECTING TO THE CAMERA FROM A SHARED LOCAL PC

1. Run the IP Installer.
   It will scan for connected cameras and display them as a list.
2. Double-click a camera to access.
   The Internet browser starts and connects to the camera.



- Access to the camera can also be gained by typing the camera's IP address in the address bar of the Internet browser.

CONNECTING TO THE CAMERA FROM A REMOTE PC VIA THE INTERNET

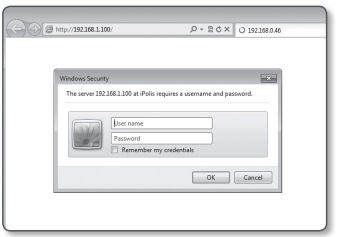
Since using the IP Installer on a remote computer that is not in the Broadband Router's network cluster is not allowed, users can access cameras within a Broadband Router's network by using the camera's DDNS URL.

1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.
2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar.
   ex) http://www.samsungipolis.com/Product ID

- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 79)

CONNECTING TO THE CAMERA

Normally, you would



1. Launch the Internet browser.
2. Type the IP address of the camera in the address bar.
   ex) • IP address (IPv4) : 192.168.1.100
   → http://192.168.1.100
   - the Login dialog should appear.
   • IP address (IPv6) : 2001:230:abcd:ffff:0000:0000:ffff:1111
   → http://[2001:230:abcd:ffff:0000:0000:ffff:1111] - the Login dialog should appear.

If the HTTP port is other than 80

1. Launch the Internet browser.
2. Type the IP address and HTTP port number of the camera in the address bar.
   ex) IP address : 192.168.1.100:HTTP Port number(8080)
   → http://192.168.1.100:8080 - the Login dialog should appear.

Using URL

1. Launch the Internet browser.
2. Type the DDNS URL of the camera in the address bar.
   ex) URL address : http://www.samsungipolis.com/Product ID
   - the Login dialog should appear.

To check the DDNS address

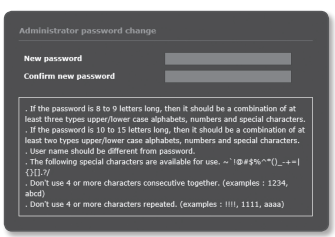
If the camera is connected directly to the DHCP cable modem, DSL modem, or PPPoE modem, the IP address of your network will be changed each time you try to connect to the ISP (Internet Service Provider) server.
If this is the case, you will not be informed of the IP address changed by DDNS.

Once you register a dynamic IP-based device with the DDNS server, you can easily check the changed IP when you try to access the device.
To register your device to the <**DDNS**> server, visit www.samsungipolis.com and register your device first, and then set the Web Viewer's <**Network**> - <**DDNS**> to <**Samsung DDNS**>, as well as providing <**Product ID**> that had been used for DDNS registration.

- You can use a DDNS connection only if you are connected to the external network.

PASSWORD SETTING

When you access the product for the first time, you must register the login password.
When the "**Password change**" window appears, enter the new password.

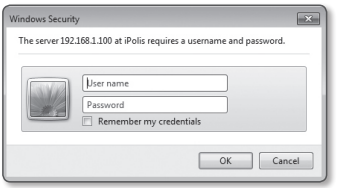


- For a new password with 8 to 9 digits, you must use at least 3 of the following: uppercase/lowercase letters, numbers and special characters. For a password with 10 to 15 digits, you must use at least 2 types of those mentioned.
  - Special characters that are allowed. : ~`!@#$%^*()_-+=|{}[].?/
- For higher security, you are not recommended to repeat the same characters or consecutive keyboard inputs for your passwords.
- If you lost your password, you can press the [**RESET**] button to initialize the product. So, don't lose your password by using a memo pad or memorizing it.

LOGIN

Whenever you access the camera, the login window appears.
Enter the User ID and password to access the camera.

1. Enter "**admin**" in the <**User name**> input box.
   The administrator ID, "**admin**", is fixed and can not be changed.
2. Enter the password in the <**Password**> input field.
3. Click [**OK**].
   If you have logged in successfully, you will the Live Viewer screen.



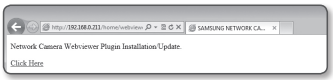
- When you access the camera web viewer, pay special attention to the security by checking whether the image data is encrypted.

- If you check the "**Remember my credentials**" option when your input is done, in future you will be logged in automatically without being prompted to enter the login information.
- You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.

INSTALLING STW WebViewer PLUGIN

If connecting to a camera for the first time, you will see the installation message. Then, install the required WebViewer Plugin to access the camera and control the video from it in real time.

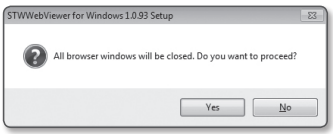
1. When the monitoring page is accessed for the very first time, the installation page is displayed. Click [**Click Here**] to begin installation.



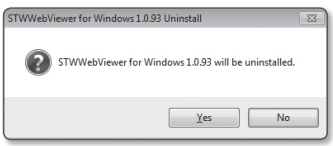
- If the plug-in installation file download status is suspended at 99% in the Internet Explorer browser, retry it after selecting "Release SmartScreen filter" in "Tool → SmartScreen filter".

2. Click [**Run**] in the message window.

3. Click [**Yes**] when the notice window saying that all browser windows will be closed.

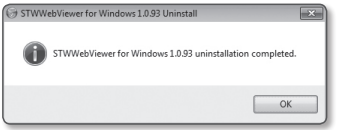


4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed.
Click [**Yes**] when the notice window is displayed.

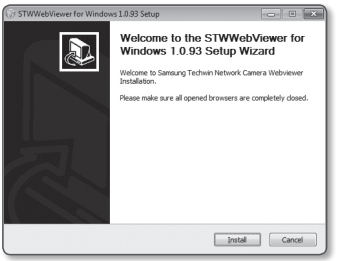


- Steps 4 and 5 will be skipped if no Web Viewer Plug-in is installed.

5. Click [**OK**].
   The old version of Web Viewer Plug-in is deleted.



6. Click [**Install**] to begin installation of the Web Viewer Plug-in.



7. Click [**Finish**].
   STW Web Viewer Plug-in installation is completed.

- In your internet explorer, if you need to move to the installation screen after installing the STW webviewer plugin, check whether webviewer_activexplugin_lib.control in the "Tool → Additional Function Management" menu is "Activated". If not, and if there is a persisting problem, then select "Tools → Internet Options → General" and delete all the search records.

USING THE LIVE SCREEN

Item	Description
1 Monitoring	Move to the monitoring screen.
2 Playback	Move to the screen where you can search for the video recording saved in your Micro SD memory card or NAS.
3 Setup	Move to the Setup screen.
4 Profile access information	You can read the profile information.
5 Viewer Screen	Displays the Live video on the screen. ■ You can use the mouse wheel to activate the digital zooming in Viewer screen.
6 Profile type	You can select a profile type in <**Video profile**> under the <**Basic**> setup menu. ■ When the Web Viewer is connected, the profile information currently using is displayed.
7 Screen Optimization	The video size of the camera will switch to as big as the Web browser.

Item	Description
8 Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 640x480. Press it again to switch back to the default resolution.
9 Full Screen	Switch the current video to the maximum size of the monitor.
10 Capture	Saves the snapshot as an image file in the .jpg format.
11 Manual recording	Users can save their video in the Micro SD memory card or NAS on their own. ■ To take video manually, change the recording setting first. Refer to "**Storage**" for how to set recording (page 88).
12 Audio/Microphone Control	Enable Audio and Microphone are control the Audio volume. ■ Only the Audio volume can be controlled.
13 Alarm output	Activate the Alarm Out port.
14 PTZ	Controls camera zoom and sets or saves a preset.
15 Hide the context menu	The left-corner context menu will disappear but only the menu icon.

To capture the snapshot

1. Click [**Capture (** **)**] on the scene to capture.
2. When a captured video is saved, a notification message appears.
   When using Internet Explorer, the captured video is saved in My Computer / My Documents / Pictures.
   In Mac OS, it is saved in "~/Pictures" or "/Users/{user account}/Pictures/".

- If you encounter an interrupted video when capturing the image with IE8 on a Windows 7-based PC, deselect "**Turn On Protected Mode**" from "**Tools – Internet Options – Security**".
- If the screen is not captured by IE browser in Windows 7 or 8, run the IE Browser with the Admin privilege.

How to record videos manually

1. Press [**Manual recording (** **)**].
2. To end the recording, press [**Manual recording (** **)**] again.

- After inserting the Micro SD card, go to <**Event**> - <**Storage**> and turn on the Micro SD card by selecting "**On**" or turn on NAS by selecting "**On**" after connecting to it. Then you can use the manual recording function.

To fit the full screen

1. Click the [**Full Screen (** **)**] button.
2. This will fit the Viewer to the full screen.
3. To exit the full screen mode, press [**Esc**] on the keyboard.

- For the Internet Explorer and Google Chrome browser, you can switch to the full screen.

To Use Microphone

Click [**Mic (** **)**] icon to activate the microphone.

To Use Audio

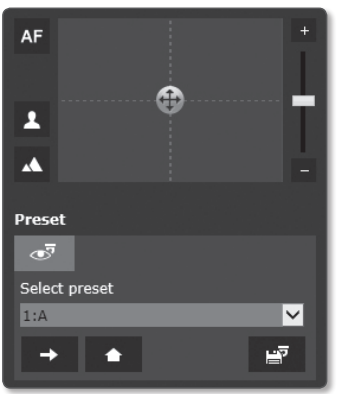
1. Click [**Audio (**)] icon to activate audio communication.
2. Use [ ] bar to control the volume.

- If there is no sound from pulling in and out the audio jack while it is in operation, click the [**Audio (**)] icon to enable it again.

To control the PTZ

1. Press the [**PTZ (**)] tab.
2. Set the zoom using the +, – button on the screen.

- For further details on PTZ use, refer to "**PTZ setup**". (page 60)



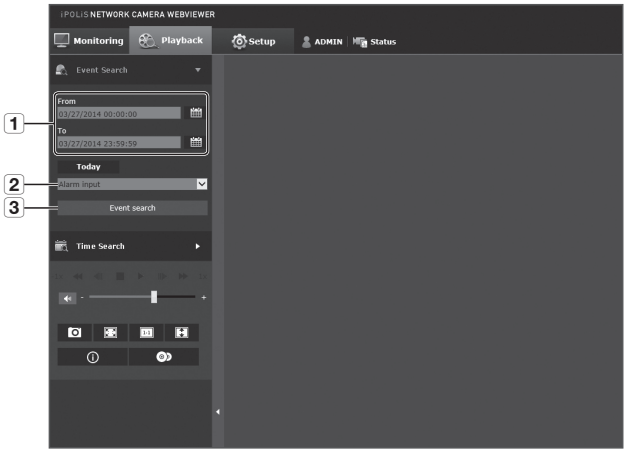
To run a sequence

- : Run a saved preset.
  Refer to "**To configure the detailed settings for the preset**" for details of preset setting. (page 62)
- : Run a saved home position.
  Refer to "**To add the home position**" for details of home position setting. (page 61)
- : Configure preset.
  For details on preset configuration, see "**To configure the detailed settings for the preset**". (page 62)

PLAYING THE RECORDED VIDEO

- Before you can play the video, you must configure the record settings. For details on record settings, refer to "**Storage**". (page 88)

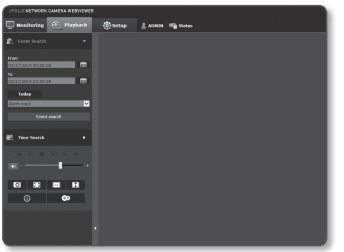
Name of event search screen and its function



Item		Description
1	Search range setting	Set the search date and time range for data saved in your Micro SD memory card or NAS.
2	Search event setting	Set the event type to search within the search period.
3	Event search	Run the event search.

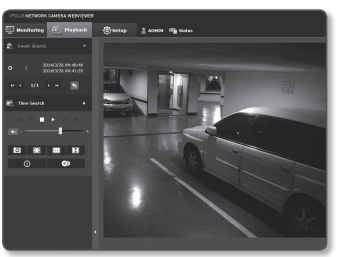
To play the content after searching by event

1. Click the [**Playback (** **)**] button.
2. Specify the start time and end time of your search.
3. Select an event type for your search within the specified period.
4. Click the [**Event search**] button.
   The search results will be displayed in the list.



- If more than 800 events are recorded within the search period, your search will be limited up to the date when the 800th event is recorded.
  For instance, if the search period is between 10th and 15th day of the month, and more than 800 events were recorded 10th through 11th, your search will be limited up to 11th day with a total of 800 events, and events after then (from 12th) will not be found.

5. Select a data item to play in the search list.
6. Click the [**Play (** **)**] button.
7. To stop playing the video, click [**Stop (** **)**].
8. To return to the search screen, click [**Exit (** **)**].



Name of time search screen and its function

Item	Description
1 Time bar	The section in the specific period is played by moving the time bar.
2 Search date setting	Set the search date using the calendar. ■ If there is data saved in your Micro SD memory card or NAS on the day, it is marked as a box on the calendar.
3 Speaker	To listen to a voice signal (if present) in the recorded video, then activate the voice signal icon when you play it.
4 Screen optimization	The camera image is converted to fit the Web browser window.
5 Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 800x600. Press it again to switch back to the default resolution.
6 Capture	The current image is saved as a .jpg image file.
7 Full screen	The current image is converted to cover the maximum size of the monitor.

Item	Description
8 Video information	Time data of the replayed video is displayed on the screen.
9 Backup	Set the desired date to make a backup copy of video data saved in your Micro SD memory card or NAS. ▪ Can be set as up to 5 minutes.

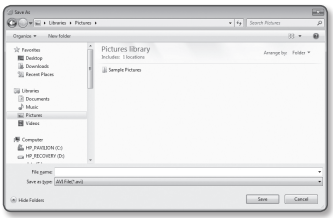
To play after searching by time

1. Click [**Time Search (** **)**].
2. Click a desired date in the calendar.
   The video on the specified date will be played.
3. If the video playback is stopped, select a time and click [**Play (** **)**].
   The video on the selected time will be played.
4. While the video is being played, the recording time for the current video will be shown.
5. Search for the video forward or backward, and control the play speed.
   - How to Control the Play Interval
     ▮▶ : Select this button to move 1 frame forward.
     ◀▮ : Select this button to move 1 second back.
   - To control the play speed
     If selecting ▶▶, the button will switch to x1, x2, x4, x8, and the play speed will increase accordingly.
     When the ◀◀ button is selected, the playing speed is decreased to -1x, -2x, -4x, -8x and the playing speed slows down gradually. Subsequently the quick playing speed is returned to the normal speed and the reverse playing speed increases.
   - To control the playback direction
     If you see the ▶▶ button with the play speed displayed, the video will be played forward; Whereas, if you see the ◀◀ button with the play speed displayed, the video will be played backward.
   - How to set the time bar
     If you press the + button, the details of the time bar section can be viewed.
     If you press the − button, you can view a wider range of times and the desired time can be selected more easily.

6. Move [**Time bar ( )**] to a desired time point of the video before playing it.
   The time containing a normal recoding file will be highlighted in blue; the time with the event recording will be highlighted in red.

To back up the searched video

1. During playback, click [ ] on the scene to back up.
   The scheduling window for backup start and end time appears.
2. Click [ ] button.
   The Save As window appears.
3. Confirm the save path and click [**Save**] button.
   The screenshot will be backed up to the specified path.



To play the backup video

The backed up images are saved in an .avi format. Gom Player, VLC Player, and Window Media Player are recommended as the media player compatible with this format.

- In case of Windows Media Player, download the latest codec from www.windows7codecs.com and install it prior to use.

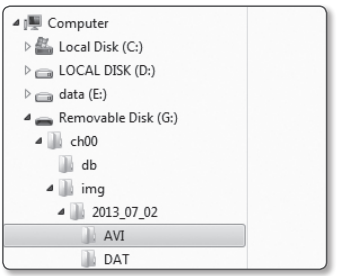
To Play an AVI File

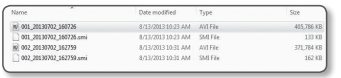
(1) Micro SD memory card

1. Separate the Micro SD memory card from the camera.

- Before separating the Micro SD memory card, set the <**Device**> to <**Off**> in the "**Setup → Event → Storage**" menu.

2. Insert the Micro SD memory card into the PC.
3. Play the AVI file in the "**\ch00\img\ YYYY_mm_DD\AVI**" directory, using a media player.

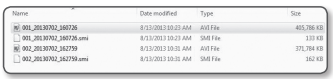




- A filename starts with the format "**001_ YYYYMMDD_HHMMSS.avi**" and the file number is incremented by one. YYYYMMDD_HHMMSS indicates the start time of data saving.
- "**001_YYYYMMDD_HHMMSS.smi**" file is a caption file, and you can view it if it exists in the same directory as its related AVI file.
- The max recording time per AVI file is 5 minutes.
- Once corrupted, the data in the Micro SD memory card cannot be replayed in the Web Viewer's [**Playback**].

(2) NAS (Network-Attached Storage)

1. In Windows browser, use \\<ip address>\ to access.
   ex)\\192.168.20.31\defaultfolder\ch01\img\2013_07_02\AVI
2. Go to <**Computer**> → <**Network drive connection**> → Enter 1.
3. Connected to the NAS.
   The directory structure is same as the directory structure for a Micro SD memory card.



- A filename starts with the format "**001_YYYYMMDD_HHMMSS.avi**" and the file number is incremented by one.
  YYYYMMDD_HHMMSS indicates the start time of data saving.
- "**001_YYYYMMDD_HHMMSS.smi**" file is a caption file, and you can view it if it exists in the same directory as its related AVI file.
- The max recording time per AVI file is 30 minutes.
- If you change or damage the saved data on your own, it will not play back or save properly.

SETUP

On the network, you can set up basic information on the camera, video and audio, network events and system.

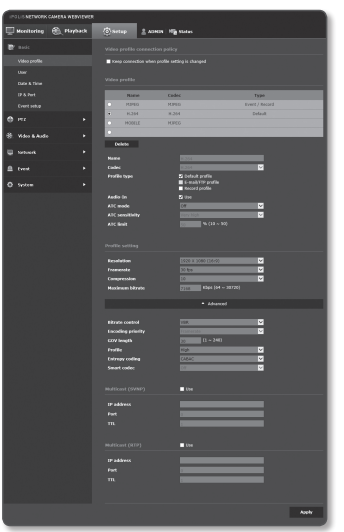
1. In the Live screen, click [**Setup (** Setup **)**].
2. The Setup screen appears.

■ The setting page for preview video requires the STW web viewer plug-in to be installed on the PC. If it is not intalled properly, the installation page automatically apprears.

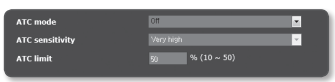
BASIC SETUP

Video profile

1. From the Setup menu, select the <**Basic (** **)**> tab.
2. Click <**Video profile**>.
3. Set the <**Video profile connection policy**>.
   - Keep connection when profile setting is changed : Changing profile properties that is used by existing connection does not affect such connection and remains with old profile setup.
     If not selected, changing a profile used by an existing connection resets such connection.



4. Select each profile properties.
   For more details, refer to "**To Add/Change the Video Profile**". (Page 53)
5. Click the input box of each item and enter / select a desired value.
   - The context menu may differ depending on the selected codec type.
   - Default profile : If no profile is selected when using the Web Viewer, the default video profile is applied.
   - E-mail/FTP profile : Video profile to be transferred to the specified email or FTP site.
     - Only the MJPEG codec can be set as the E-mail/FTP profile.
   - Record profile : This is the profile applied to video recording on Micro SD card or NAS.
   - Audio-In : Sets whether to use audio for video recordings.
6. According to your situation, set ATC (Auto Transmit Control) mode.
   - ATC mode : It adjusts the video properties according to the variance in the network bandwidth, controlling the bit rate. Adjusting the bit rate depends on the ATC mode.



     - Control framerate : Reduce the frame rate if the network bandwidth drops down.
     - Control compression : Control the compression rate if the network bandwidth drops down.
       Compression adjustment can cause deterioration of the image quality.
     - If <**Bitrate control**> is set to <**CBR**>, the encoding priority according to the ATC mode will be fixed as below:

Bitrate control / ATC mode	Control compression
CBR	Compression

- ATC sensitivity : Affect the transfer rate according to the variance in the network bandwidth.
  The transfer rate will be adjusted to the fastest if the bandwidth is <**Very high**>, and adjusted to the latest if the bandwidth is <**Very low**>.
- ATC limit : If the quality or frame rate is adjusted, the property will be changed to the applied value (%) against the previous setting value (100%).
  Note that if you reduce the property value too much, you may encounter flickering on the screen. So it is advisable to adjust the value within the threshold.

- It is recommended to apply ATC control only for cameras supporting ATC.
- Set the ATC sensitivity to <**Very low**> in a network environment with high variance in the network bandwidth.
- If the network connection is unstable, you may encounter flickering on the screen.

7. When done, click [**Apply (** Apply **)**].

- MJPEG, H264 is the default profile and you cannot delete it or change the name and codec.

To Add/Change the Video Profile

The profile setup can be added or modified to accommodate various profiles depending on the recording conditions.

1. Select one from the <**Video profile**> options.
2. Provide the name and select a codec.
3. Specify the conditions under which the codec will be applied.
4. Specify the details of the selected codec including resolution and frame rate. Click <**Advanced**> to display the context menu.
   - Resolution : Set the video size of the H.264 and MJPEG files.
   - Framerate : Set the max number of video frames per sec.

- The <**Sensor**> mode setup in Video Setup changes the maximum configurable framerate.

Sensor	25 fps	30 fps	50 fps	60 fps
Framerate	1~25 fps	1~30 fps	1~50 fps	1~60 fps

- Maximum bitrate : Set the max bit rate of video when the bit rate control is set to VBR.

- As the bit rate can be adjusted limitedly according to the resolution, frame rate and screen complexity, the actual bit rate can be greater than the maximum bit rate. So you must consider the use conditions when setting the value.

- Target bitrate : Set the target bit rate when the bit rate control is set to CBR.
- Bitrate control : You can select one from constant bit rate and variable bit rate for compression. Fixed bitrate means that the network transmission bitrate is fixed while varying the video quality or frame rate, variable bitrate means that a higher priority is placed on the video quality while varying the bitrate.

- After setting the fixed bit rate for bit control, if you select the video quality priority mode, depending on the complexity of the screen, the actual transmitted frame rate may differ from the frame rate setup in order to guarantee the optimal video quality for the given bit rate.

- Encoding priority : You can set the priority of video transmission to frame rate or compression.
- GOV length : It specifies the distance (in terms of number of frames) between two consecutive I-Frames in a video sequence when H.264 codec was selected. (One I-Frame + 0~Several P-Frames)
- Profile : You can select the H.264 profiling method.
- Entropy coding : Reduce the possible compression loss due to encoding.
- Smart codec : Specify the use of Smart codec.

■ The Smart Codec will be active only if the codec is of H.264 and the compression system is CBR.

- Multicast(SVNP) : Specify the use of the SVNP protocol.
  - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
  - Port : Specify the video communication port.
  - TTL : Set the TTL for the SVNP packet.
- Multicast(RTP) : Specify the use of the RTP protocol.
  - IP address : Enter an IPv4 address with which you can connect to the IPv4 network.
  - Port : Specify the video communication port.
  - TTL : You can set the TTL for the RTP packet.

■ If you set the Multicast address to 224.0.0.0~224.0.0.255, multicast may not work properly in all environments. In that case, we recommend you change the multicast address.

What is GOV length?

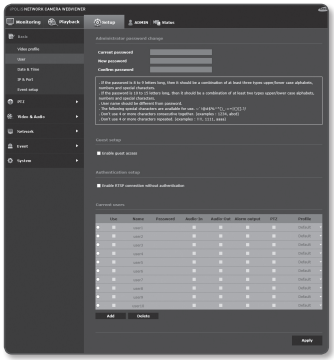
GOV(Group of Video object planes) is a set of video frames for H.264 compression, indicating a collection of frames from the initial I-Frame (key frame) to the next I-Frame. GOV consists of 2 kinds of frames: I-Frame and P-Frame.

I-Frame is the basic frame for the compression, also known as Key Frame, which contains one complete image data. P-Frame contains only the data that has changed from the preceding I-Frame.

For H.264 codec, you can determine the GOV length.
If you set a recording profile with H.264 codec, the GOV length will be framerate/2.

User

1. From the Setup menu, select the <**Basic (** **)**> tab.
2. Click <**User**>.
3. Provide the necessary user information.
   - Administrator password change : Change the password for the administrator.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- It is recommended to change your password once every three months.
- The password length and limits are shown as follows.
  - A combination of at least three types of upper case, lower case, numeric, and special characters: 8 to 9 characters.
  - A combination of at least two types of upper case, lower case, numeric, and special characters: 10 to 15 characters.
  - Should be different from the ID.
  - Cannot repeat the same letter, number of special characters more than 4 times.
  - Don't use 4 or more characters consecutive together. (examples : 1234, abcd)
  - Don't use 4 or more characters repeated. (examples : !!!!, 1111, aaaa)
  - Special characters that are allowed. : ~`!@#$%^*()_-+={}[].?/
  - After the factory setting, the admin and user passwords are initialized. You need to reset the password.
  - When you access the camera web page for the first time or access it after the initialization, you will be moved to the admin password setting menu.
  - In this menu, you need to login again with the new password before using the camera web page menus.

- If the existing password is not matched, when you change the admin password, you cannot change the password.
- After changing your password, if there is a camera connected to a CMS or NVR client, then you need to re-register it with the newly changed password. If the camera is still connected with the same password, then the account may be locked because a client uses the previous password.

▪ If you try to login with the registered account, 5 or more consecutive password authentication has failed, and then the account may be locked for thirty seconds.

▪ When the password is changed while multiple connections are active from a PC, the browser may malfunction. In that case, reconnect to the server.

- Guest setup : If you select <**Enable guest access**>, the guest account can access the Web viewer screen but can only view the live Viewer screen.
  - ▪ The ID/password for the guest account is <**guest/guest**>, which cannot be changed.
- Authentication setup : If you select <**Enable RTSP connection without authentication**>, you can access RTSP without logging in and view the video.
- Current users : If you select <**Use**>, you can set or change the user permissions.
  - ▪ The administrator can set the audio input, audio output, alarm output and PTZ control permissions.
  - ▪ Profile : If you select <**Default**>, you can only see the default profile video; if selecting <**All**>, you can see the full profile videos.

▪ ONVIF functions available to a registered user allowed to use ONVIF functions are limited to those of granted with permission.

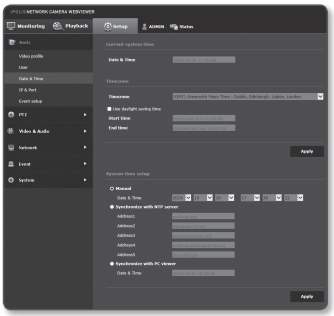
▪ Video Transfer and Changing Video Information: Set the profile to <**All**>, and set Audio Input and Audio Output.

▪ Video Transfer, Changing Video Information, Alarm Output : Set the profile to <**All**>, and select at your preference for the rest.

▪ PTZ control : Select <**PTZ**>.

4. When done, click [**Apply (** Apply **)**].

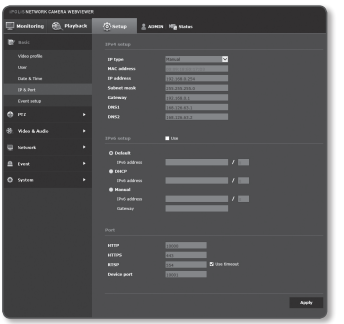
Date & Time



1. From the Setup menu, select the <**Basic (** **)**> tab.
2. Click <**Date & Time**>.
3. Specify the time and date that will be applied to the camera.
   - Current system time : Displays the current time settings of your system.
   - Timezone : Specify the local time zone based on the GMT.
   - Use daylight saving time :
     If checked, the time will be set one hour before the local time zone for the specified time period.
     This option will be displayed only in areas where DST is applied.
   - System time setup : Specify the time and date that will be applied to your system.
     - Manual : Specify the time manually.
     - Synchronize with NTP server : Sync with the time of the specified server address.
     - Synchronize with PC viewer : Sets to the time of the computer connected.
4. When done, click [**Apply (** **)**].

■ If you select the <**Synchronize with PC viewer**>, the standard timezone should be set the same as the current timezone in PC.

IP & Port



1. From the Setup menu, select the <**Basic (** **)**> tab.
2. Click <**IP & Port**>.
3. Set the <**IPv4 setup**>.
   - IP type : Select an IP connection type.
     - Manual : Specify the IP address, Subnet mask, Gateway, DNS1, and DNS2.
     - DHCP : Specify the DNS1 and DNS2.
     - PPPoE : Specify the DNS1, DNS2, ID and Password.
     - If you set it to <**Manual**>, you should specify the IP, Subnet mask, Gateway, DNS 1 & 2 manually.
   - MAC address : Shows the MAC address.
   - IP address : Displays the current IP address.
   - Subnet mask : Displays the <**Subnet mask**> for the set IP.
   - Gateway : Displays the <**Gateway**> for the set IP.
   - DNS1/DNS2 : Displays the DNS(Domain Name Service) server address.
4. Set the <**IPv6 setup**>.
   - Set to <**Use**> to use IPv6 address.
   - Default : Use the default IPv6 address.
   - DHCP : Display and use the IPv6 address obtained from the DHCP server.
   - Manual : Enter IP address and gateway manually and use it.

- The IP addressing system will be defaulted to DHCP. If no DHCP server is found, the previous settings will be restored automatically.
- Once completed with editing, click [**Apply (** **Apply** **)**] to apply changes and the browser exits. After a while, connect again with the changed IP.

5. Type in each item in the Port menu as necessary.
   - Neither the port range between 0 and 1023 nor port 3702 is available.
   - HTTP : HTTP port used to access the camera via the web browser. The default is 80(TCP).
     - Setting the HTTP port for Safari and Google Chrome browsers to 65535 is not allowed by security policy.
   - HTTPS : In this version, the security of the web communication protocol HTTP is strengthened. It can be used when you set HTTPS mode in SSL. The initial value is set to 443(TCP).
     - The available setting range is 1024~65535. (For security reasons, in your Safari or Google Chrome browser, you may not use 65535 as your HTTPS port.)
   - RTSP : Used to transfer videos in the RTSP mode; the default is 554.
   - Use timeout : When connecting to RTSP, this function resets the connection if there's no response for a certain time.
   - Device port : Set a port used to transfer video signals with the Samsung protocols.

- If changed the HTTP port, the browser exits. Afterwards, address should contain the newly assigned HTTP port trailing the IP. ex) IP address: 192.168.1.100, HTTP port : Assigned 8080 → http://192.168.1.100:8080 (If HTTP port is set to 80, no need to specify the port number)
- Using RTSP and HTTPS is recommended in order to prevent the image information from being restored.

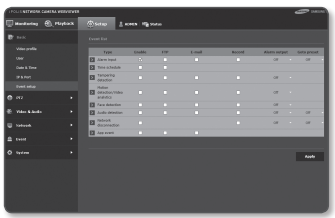
6. When done, click [**Apply (** Apply **)**].

Event setup

You can easily set the event detection items, and move to the detailed setting.

1. From the Setup menu, select the <**Basic (** **)**> tab.
2. Click <**Event setup**>.
3. Activate desired items on the Event list.
4. When done, click [**Apply (** Apply **)**].

- To make detailed event settings, click on your desired settings. Go to detailed <**Event**> setting.

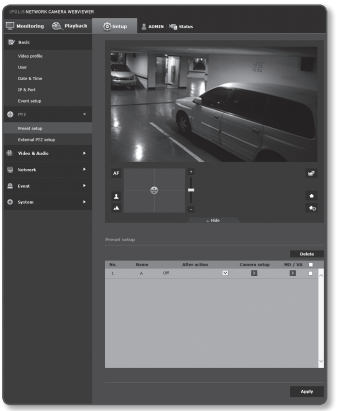


PTZ SETUP

Preset setup

You can change the direction of lens and activate the zoom.

1. From the Setup menu, select the <**PTZ** ( ) > tab.
2. Click <**Preset setup**>.
3. Click [▼ **Show**].
4. Control zoom movement.
   - Zoom In: Move up the bar in the right of the UI, or press the [+] button. The farther the bar is from the center, the faster the screen expands.
   - Zoom Out: Move down the bar in the right of the UI, or press the [−] button. The farther the bar is from the center, the faster the screen reduces in size.
5. Adjust the focus.
   - Manual focus (/) : The user sets the focus.
   - Auto focus (AF) : The system sets the focus automatically.



To add the home position

1. Move to a desired start screen point and press [ ].
   The point will be set to the home position.
2. Click [ ] in the home position. You will move to the predetermined home position.
3. When the camera is rebooted after setting, the screen is located at the home position. (If the camera was on another sequence operation, the sequence is performed.)

To add a preset

1. Click on the [ ] button.
2. Select the preset number to be added.
3. Set the preset name and click on the [**OK**] button.

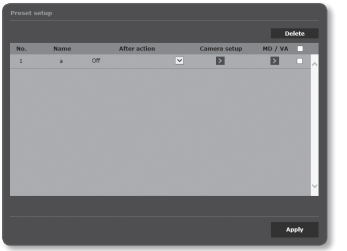
To delete a preset

1. Select the preset number to delete.
2. Press the [**Remove**] button.

To move to a desired preset

1. Double click on the preset number you want to go to at the preset configuration.

To configure the detailed settings for the preset

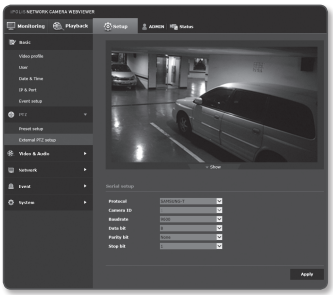


1. Select the number of preset that you want to configure.
   - After action : <**After action**> sets whether to perform a video analysis after the preset is operating.
     - Video analysis : MD/VA operation is run.
   - Camera setup : You can change the camera setting to the environment of the selected preset.
     Refer to "**Camera setup**" for how to set the camera. (page 68)
   - MD / VA : You can set the system to generate an event signal when a movement is detected in the preset, or an intelligent video analysis event is detected.
     For more details, refer to "**MD / VA**". (Page 100)
2. When done, click [**Apply (** Apply **)**].

- After saving the preset setting, make sure to select <**Sequence Setup**> or run the preset. If the operation is not performed, the system may run a wrong operation, such as an unintended change of preset setting.
- While setting preset edit, you cannot use the functions, such as preset setting, home position setting and move to the home position.

External PTZ setup

Configure the connection settings to the external pan/tilt receiver so that you can control the PTZ operations via the receiver connected to the RS-485 port of the camera.



1. From the Setup menu, select the <**PTZ (**)> tab.
2. Click <**External PTZ setup**>.
3. Click <**▼ Show**>.
4. Specify the serial port.
   You can set the RS-485 communication mode for pan/tilt-compliant receiver that is connected to the network camera.
   - Protocol : From SAMSUNG-T/ SAMSUNG-E / PELCO-D / PELCO-P / SUNGJIN / PANASONIC / HONEYWELL / AD / VICON / GE / BOSCH, select the same protocol as that of the receiver.
   - Camera ID : Displays the fixed camera ID.
   - Baudrate : Transfer rate for RS-485 communications.
   - Data bit : Specify the data bit.
   - Parity bit : Specify the parity bit.
   - Stop bit : Specify the stop bit.
5. When done, click [**Apply (** Apply **)**].

- All these operations above mentioned will be enabled only if the network camera is properly connected to the pan/tilt-compliant receiver. And the serial port for the pan/tilt operations should be properly specified.

- Check the functions supported by the receiver when it is connected.
  Some functions may be disabled depending on the receiver or protocol specification.
  Refer to the following table for more details.

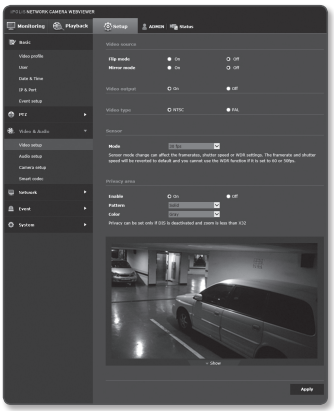
Functions Supported for Each Protocol

Protocol	P control	P movement speed	T control	T movement speed	Zoom control	Zoom movement speed	Focus control	Focus control speed	Preset	Remarks
SAMSUNG-T	O	O (1~6)	O	O (1~6)	O	O (1~4)	O	O (1~4)	O	
SAMSUNG-E	O	O (1~6)	O	O (1~6)	O	O (1~4)	O	X	O	
PELCO-D	O	O (1~6)	O	O (1~6)	O	X	O	X	O	
PELCO-P	O	O (1~6)	O	O (1~6)	O	X	O	X	O	
SUNGJIN	O	X	O	X	X	X	X	X	O	PT direction (Up, down, left, bottom)
PANASONIC	O	O (1~6)	O	O (1~6)	O	O (1~4)	O	O (1~4)	O	
HONEYWELL	O	O (1~6)	O	O (1~6)	O	X	O	X	O	
AD	O	O (1~6)	O	O (1~6)	O	x	O	X	O	
VICON	O	O (1~6)	O	O (1~6)	O	x	O	X	O	
GE	O	O (1~6)	O	O (1~6)	O	O (1~4)	O	X	O	
BOSCH	O	O (1~6)	O	O (1~6)	O	O (1~4)	O	X	X	

VIDEO & AUDIO SETUP

Video setup

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Video setup**>.
3. Select a <**Video source**> mode.
   - Flip mode : Turn upside down the image that is captured by the camera.
   - Mirror mode : Flip horizontal the image that is captured by the camera.
4. Click Activate or Inactivate of the analog video output function.
5. Select the matching <**Video type**> of the display equipment.
6. Select the sensor mode.
   You can set the number of frames captured by the CMOS sensor per second.



- Refer to "**Video profile**" for the framerate setup range of the <**Video profile**> according to mode setup. (Page 50)
- If you set the sensor mode to 50 or 60 fps, <**WDR**> can be available in <**Back light**> mode.

7. Specify the privacy zone.
8. When done, click [**Apply (** **Apply** **)**].

To set the privacy zone

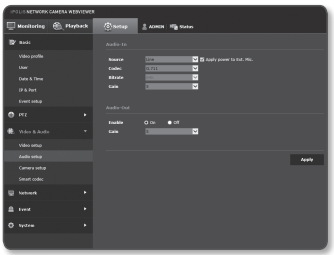
You can specify a certain area of the camera video to be protected for your privacy.

1. Set it to <**On**>.
2. Select the pattern and color of the privacy field to be set.
3. When done, click [**Apply (** Apply **)**].
4. Click [**▼ Show**].
5. Place the cursor at a point in the video and drag it to whatever you need.
6. Check whether the field indicated on the screen is consistent with the field to be set and enter the name. When not using the zoom indication restriction function, select [**Off**] and then click on the [**OK**] button. If the displayed field and setting field are different, press on the [**Cancel**] button and reset.
7. When using the zoom indication restriction function, select [**On**] and click on the [**OK**] button. The privacy field will be set and a popup will appear. At this time, move to the zoom position that you wish to set for the zoom operation and click on the [**OK**] button. To cancel the privacy field setting, click on the [**Cancel**] button and reset.

- Privacy area does not use DIS, and if its zoom is below 32X magnification, the privacy can be set.
- Privacy fields that apply zoom indication restriction functions are shown with [**ZOOM**] following the name.

Audio setup

You can configure the I/O settings of the audio source from the camera.

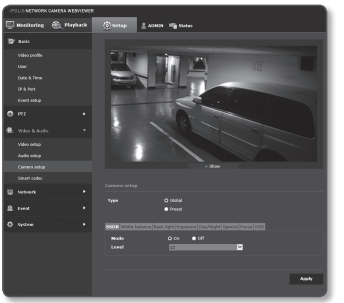


1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Audio setup**>.
3. Set the audio input value.
   - Source : Sets the audio input.
     - Line : Connect the cable to the audio device.
     - External microphone : 3.5 pi(¢) mono type external MIC.
   - Apply power to Ext. Mic. : If the external microphone connected has no separate power supply, check this option to set camera to supply power to the connected external microphone. The option is enabled if <**External microphone**> is selected.
   - Codec : Specify the audio codec.
     - G.711 : A audio codec standard, it uses 64 Kbps PCM (Pulse Code Modulation) encoding.
       ITU standard audio codec that is adequate for digital voice transfer in PSTN network or through a PBX.
     - G.726 : ITU standard audio codec applying ADPCM (Adaptive Differential Pulse Code Modulation) for variable bit rates of 40/32/24/16 Kbps to 64 Kbps PCM encoding.
   - Bitrate : Set the bit rate to differentiate compression ratio if using G.726 codec.
   - Gain : Specify the audio input amplification.
4. Set the audio output level.
   - Enable : Sets whether to use audio output.
   - Gain : Set the amplification value for the audio output.
5. When done, click [**Apply (** Apply **)**].

Camera setup

You can change the camera settings according to the environment where the camera is located.

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Camera setup**>.
3. Configure the settings as necessary of : SSDR, White balance, Back light, Exposure, Day/Night, Special, Focus, OSD
4. When done, click [**Apply (** **Apply** **)**].

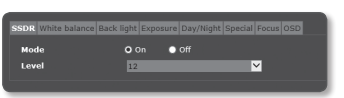


- If a certain time (timeout: 240s) is elapsed with your not pressing the [**Apply (** **Apply** **)**] button after changing the settings, your changes will not be applied.

SSDR (Samsung Super Dynamic Range) Setup

In a scene where the difference between bright and dark is severe, you can increase the brightness of the dark area alone to regulate the overall brightness.

1. Select <**SSDR**>.
2. Set <**Mode**> to <**On**>.
3. Configure the <**Level**> setting as necessary.
   - Level : Adjust the level of the dynamic range.



White balance Setup

You can correct the image colors based on white under any lighting conditions.

1. Select <**White balance**>.
2. Select <**Mode**>.

- ATW : Corrects the colors of the camera video automatically.
  ATW does not work under mercury/sodium lamps.
- Manual : You can adjust the red and blue gains of the camera video manually.
- AWC : Corrects the colors of the camera video to be optimized to the current lighting condition and screen mode.
  To obtain the optimal condition for the current lighting, put the focus of the camera to a white paper and press the [**Set**] button. If the lighting environment is changed, you should readjust the settings accordingly.
- Outdoor : Automatically corrects the video colors of the camera to be optimized to the outdoor environment.
- Indoor : Automatically corrects the video colors of the camera to be optimized to the indoor environment.
- MERCURY : The image automatically compensates to the mercury lamp environment.

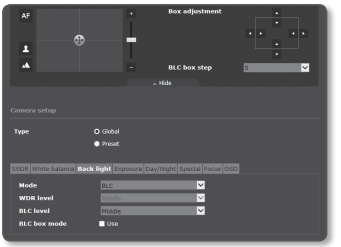
▪ In AWC mode, click the [**Set**] button if you want to keep the white balance level of the current image.

▪ The white balancing may not work properly in the following conditions:
If this is the case, switch to AWC mode.

- If the surrounding condition of the object is out of the temperature correction range
  ex) Clear sky, sunset
- If the surrounding of the object is dark
- If the focus of the camera directly faces the florescent lighting or if the camera is installed in a place of variable illumination, the white balancing operation may be unstable.

BLC Setup

You can specify a desired area on the video manually and set the area to be displayed more clearly.

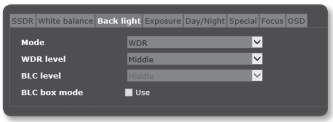


1. Select <**Back light**>.
2. Set <**Mode**> to <**BLC**>.
   If you select BLC, the Box adjustment screen and the BLC box step are displayed on the PTZ Control screen.
3. Select each item and set it properly.
   - BLC level : You can change the level to adjust the brightness of the monitoring area.
   - BLC box Mode : Specify the mode of BLC box.
   - Box adjustment : Use the arrow buttons to adjust the size and position of the BLC Box.
   - BLC box Step : Specify the pixel unit for movement. You can use the arrow buttons of <**Box adjustment**> to add or reduce the pixels.

WDR Setup

You can set to display a sharp image of the objects in a scene where both bright and dark areas exist.

1. Select <**Back light**>.
2. Set <**Mode**> to <**WDR**>.
3. Select each item and set it properly.
   - WDR level : Specify the WDR sensitivity level.



- If WDR mode is active, the shutter mode cannot be changed. Data transfer via the network is available at up to 15 fps.
- If the WDR mode is active, a moving object can cause an afterimage on the screen.

Ex)

<WDR OFF>

<WDR ON>

- If you select WDR, you may encounter the following problems. So set it to Not Used.
  - Unnatural change of colors that cause an unnatural image on the screen
  - Noise on the bright area of the image
- As the performance of the WDR function may differ depending on the bright-area size of the image, it is recommended to optimize the installation angle for the best performance.
- At night operation, this function will be activated only if the incoming highlight exceeds a certain area in a low contrast environment.
- Increasing the maximum value may cause an unnatural portion of the image.

- For the best WDR performance, it is recommended to set the Iris mode to <**Auto**>.
- Since the auto focus operation can be repeated depending on the lighting condition if user backlight compensation is used, it is recommended to use the focusing mode of <**One Shot AF**> or <**Manual**>.

Exposure Setup

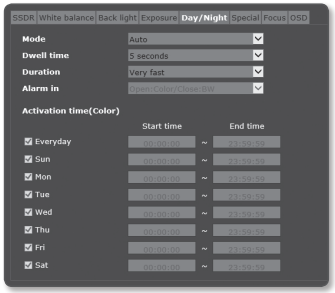
You can adjust the exposure level of the camera.

1. Select <**Exposure**>.
2. Select each item and set it properly.

- Brightness : Adjust the screen brightness.
- Minimum shutter : Set the min. shutter speed manually.
- Maximum shutter : Set the max. shutter speed manually.
- Anti flicker : Select this feature if you encounter a flickering screen due to a frequency mismatch with the ambient lighting.
- SSNR3 : Specify whether you want to remove the noises in the video.
  - When AGC mode is set to <**Off**>, SSNR3 cannot be used.
- SSNR3 level : Set the level of SSNR3.
- Iris : You can set the camera iris to Auto or Manual to your preference.
  - Auto : Automatically sets the iris adaptively to the ambient lighting and shutter speed.
  - Manual : Iris F-No is set manually.
- Iris F-No : If the iris mode is set to Manual, specify the F number of the iris.
  - As F-No increases, the iris decreases, so the screen is darkened, and as F-No decreases, the screen is brightened.
- AGC : Select AGC Control mode.
  Adjust the gain value of the video (that, in particular, was recorded at a low contrast scene and had a lower brightness level than normal) to control the video brightness.
  - If AGC mode is set to <**Off**>, the <**Auto**> mode for SSNR3 and day/night setting cannot be used.

To Set Day/Night

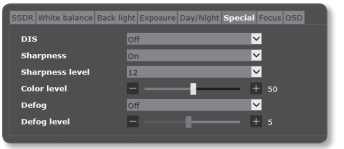
1. Select <**Day/Night**>.
2. Select each item and set it properly.
   - Mode : Mode is used to adjust the color of Color or Black and White.
     - Color : The video is always output in color.
     - B/W : The video is always output in black and white.
     - Auto : Normally, it is set to Color but to B&W under low luminance at night.
       - If AGC of the <**Exposure**> menu is set to <**Off**>, the day/night mode cannot be set to <**Auto**>.
     - External : It controls the color of the video when the alarm input terminal is synchronized with an external device.
     - Schedule : Set the time during which the camera is operated in the color mode.
   - Dwell Time : It specifies the period for which the selected brightness condition must be maintained to switch the lighting mode from Day to Night or vice versa.
   - Duration : It specifies the interval of lighting mode conversion.
   - Alarm in : The video is set to Color or B/W as the alarm sensor is open or closed.
     - If the Day/Night mode is set to External Input, the alarm input function of the Event-Alarm Input page is disabled.
   - Activation time(Color) : It specifies the schedule for color mode operation.
     - If it is set, the Color mode is maintained from 00 second of the starting time to 59 second of the ending time.



- The Day/Night mode may not operate properly if the lens installed in the camera and the lens set in <**Lens**> of the <**Exposure**> menu don't match.
- If you switch the day/night mode, the MD/VA event cannot be detected.

Special Setup

1. Select <**Special**>.
2. Select each item and set it properly.



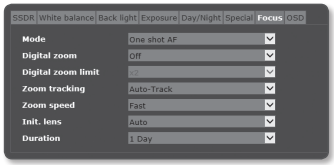
- DIS : Automatically compensates for the flicker on the screen.
  - DIS cannot be used if VA/MD and tempering detection are used.
  - Digital zoom cannot be used if DIS is used.
- Sharpness : Adjust the overall sharpness of the image.
  If selecting <**On**>, you can adjust the sharpness of the image.
- Sharpness level : The higher the level is, the sharper and clearer the outline of the image becomes.
- Color level : Adjust the color level of the image.
- Defog : You can improve images in foggy or cloudy weather.
  - Off : Fog removal function is not active.
  - Auto : Images are compensated automatically according to the amount of fog. To improve the effects of this function, adjust the <**Defog level**>.
  - Manual : You can set the amount of compensation manually for the image.

  - Use this function if the image is unclear due to foggy weather.

  - If <**Auto**> is selected for the defog mode, the level is reduced as the fog is reduced. If you wish to maintain the fog removal level even when the amount of fog is reduced, select <**Manual**>.
  - Note that the image can be dark if the fog level is high with the amount of fog being small.
- Defog level : Adjust the fog removal level.

Focus Setup

1. Select <**Focus**>.
2. Select each item and set it properly.

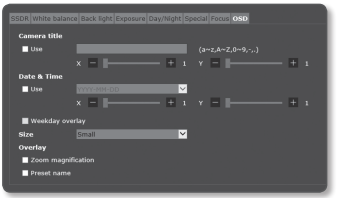


- Mode
  - Manual : The focus will be adjusted manually according to the zoom factor.
  - Auto : The focus will be adjusted automatically according to the zoom factor.
  - One Shot AF : Auto Focus will be performed once after the zooming operation.
- Digital zoom : Specify the use of digital zoom.
  - Digital zoom cannot be used if DIS is used.
- Digital zoom limit : Specify the limit of the digital zoom.
- Zoom tracking : When using the zoom function, this sets how the focus is interconnected.
  - Off : Only the zoom lens will work.
  - Auto-Track : It will control (detect and correct) the zooming operation to keep fitting the focus.
  - Tracking : The zooming operation will be guided by the focus track.
- Zoom speed : Adjust the zoom tracking speed.
- Init. lens : Reset the lens to prevent the step-out in zoom mode.
- Duration : Specify the frequency of resetting the lens.
  - You can specify the date of resetting the lens that will perform in auto focus mode. Specify the time between 1 and 7 days, and the resetting will be performed at 24-hour interval starting from the specified date.

- The auto focus function might not work properly under any of the following conditions:
  - Bright or flashing lights (ex.- neon sign)
  - 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 (sky, wall, etc.)
  - If the camera is taking a picture of a thin horizontal line
- In the auto focus mode, because the camera focuses on the object at the center of the area, other objects which are not in the center can be out of focus.

OSD Setup

1. Select <**OSD**>.
2. Select each item and set it properly.



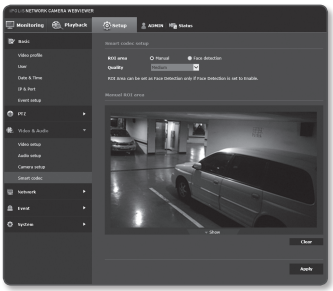
- Camera title : Specify whether or not to display the camera title on the screen.
  - You can enter up to 45 characters for the title.
- Camera title X, Y : Specify the coordinates where the camera title is displayed on the screen.
- Date & Time : You can set the date and time, and if they should be displayed on the screen.
- Date & Time X, Y : Set the position of time to be displayed on the screen.
- Weekday overlay : You can display the day on the screen.
- Size : Set the size of the OSD indicated in the screen. Select from small/medium/large.
- Zoom magnification : Display zoom magnification on the screen.
- Preset name : Specify whether or not to display preset name on the screen.

- A position-adjustable item (Camera title, Date & Time) may not be displayed normally if it overlaps with another fixed OSD item.

Smart codec

Set a desired area of the video incoming from the camera as ROI area and specify the detection sensitivity for the area.

1. From the Setup menu, select the <**Video & Audio (** **)**> tab.
2. Click <**Smart codec**>.
3. Select ROI Area.
   - Manual : Specify the ROI area to monitor manually.
   - Face detection : Active if a face is recognized on the monitoring screen.



- Face detection is enabled only if the following conditions are met:
  - The face is positioned at ±45 degrees to the left or right from the top.
  - The effective range of the face rotation is ±30 degrees vertically, and ±60 degrees horizontally.
  - The minimum size of the face is 20x20 based on the resolution of 320x240.

- Only when a face-detection event is activated can the field of interest be set as face detection. For details on face detection events, see '"**Face detection**". (page 106)

4. Select a quality for the ROI area.
   The ROI area will be displayed in the specified quality.
5. If you set the area of interest by <**Manual**>, then select the desired area with your mouse and drag it.
   - You can specify up to 5 distinct areas.
6. To cancel all the settings for the area, click the [**Clear (** Clear **)**] button.
7. When done, click [**Apply (** Apply **)**].

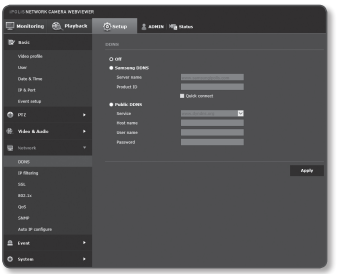
- The Smart codec will not be active if it is set to <**Off**> in <**Video profile**>. (page 50)

NETWORK SETUP

DDNS

DDNS is an abbreviation of Dynamic Domain Name Service that converts the IP address of a camera into a general Host Name so that the user can easily remember it.

- You can use the DDNS service only if the internet is connected.



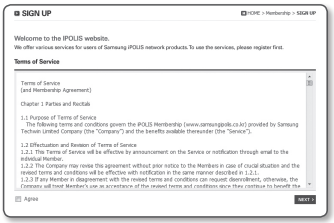
1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**DDNS**>.
3. Select the <**DDNS**> connection type.
4. Type in the DDNS items according to the selected type.
   - Samsung DDNS : Select this if you use the DDNS server provided by Samsung Techwin.
     - Product ID : Enter the product ID that is registered with the Samsung DDNS service.
     - Quick connect : It sets port forwarding automatically when used with a UPnP (Universal Plug and Play) supporting router.
   - Public DDNS : Select one of provided public DDNS servers when you use a public DDNS server.
     - Service : Select desired public DDNS service server.
     - Host name : Enter the name of the host that is registered with the DDNS server.
     - User name : Enter the user name for the DDNS service.
     - Password : Enter the password for the DDNS service.
5. When done, click [**Apply (** Apply **)**].

- If selected <**Quick connect**>, be sure to select Samsung DDNS service.

Registering with DDNS

To register your product with the Samsung DDNS

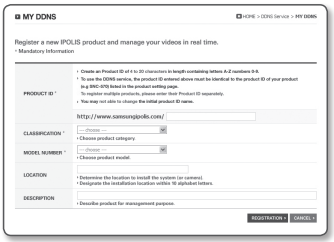
1. Visit the iPOLiS web site (www.samsungipolis.com) and sign in with a registered account.



2. From the top menu bar, select <**DDNS SERVICE**> - <**MY DDNS**>.

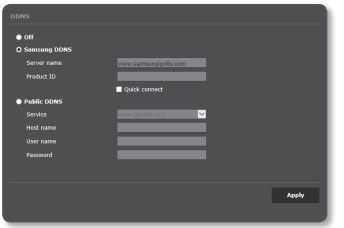
3. Click [**PRODUCT REGISTRATION**].
4. Enter the product ID.
   - You must perform the duplicate check for the ID that you entered.

5. Select a <**CLASSIFICATION**> and specify the <**MODEL NUMBER**>.
6. Specify the product location with a description if necessary.
7. Click [**REGISTRATION**].
   The product will be added to the product list that you can check.



To connect to the Samsung DDNS in camera setup

1. From the DDNS setup page, set <**DDNS**> to <**Samsung DDNS**>.
2. Provide the <**Product ID**> that you registered product ID with the DDNS site.
3. Click [**Apply (** Apply **)**].
   When the connection is successfully made, you will see the message of <**(Success)**> on the screen.



Configuring public DDNS in Camera Settings

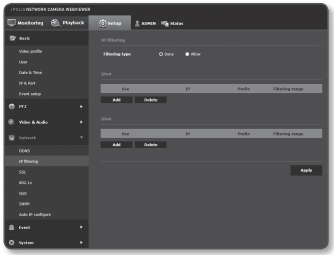
1. Open the DDNS settings page and select <**Public DDNS**> for <**DDNS**>.
2. Enter the corresponding site's host name, user name and password.
3. Click [**Apply (** Apply **)**] button.
   If the connection properly establishes, <**(Success)**> appears.
4. When done, click [**Apply (** Apply **)**].

- To use DDNS service properly, both DDNS setup and the router's port forwarding setup are required.
  For port forwarding setup, refer to "**Port Range Forward (Port Mapping) Setup**". (page 31)

IP filtering

You can create a list of IPs that you want to grant or deny access to them.

1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**IP filtering**>.
3. Select <**Filtering type**>.
   - Deny : If selecting this, access from those IPs that are added to the filtering will be restricted.
   - Allow : If selecting this, access from only those IPs that are added to the filtering will be accepted.
4. Click the [**Add (** **Add** **)**] button.
   The IP list will be created.



5. Provide the IP that you want to grant or deny access from.
   When you enter an IP address and a Prefix, the list of IP addresses available will appear in the right-side filter range column.

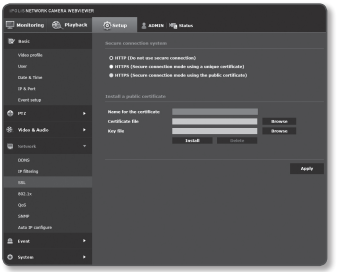
- If selected <**Allow**> for IP Filtering and <**IPv6 setup**> of <**IP & Port**> is set to <**Use**>, both IPv4 and IPv6 addresses of the computer currently configuring should be assigned.
- The IP address of the computer used for the current setup cannot be added to <**Deny**>, it should be added to <**Allow**>.
- Only the IP addresses that are set to <**Use**> will be displayed in the filter column.

6. Select an IP to delete from the list.
   Click the [**Delete (** **Delete** **)**] button.
7. When done, click [**Apply (** **Apply** **)**].

SSL

You can select a secure connection system or install the public certificate for this purpose.

1. From the Setup menu, select the <**Network (**)> tab.
2. Click <**SSL**>.
3. Select a secure connection system.
   - To access the camera using HTTPS mode, you have to type the IP address for the camera in the form of "https://<Camera_IP>".
     If you failed to configure the Web viewer settings in HTTPS mode with Internet Explorer, edit the Internet options as follows: <Menu → Tools → Internet Options → Advanced → Security → Uncheck TLS 1.0, and check TLS 1.1, TLS 1.2>



4. Search for the public certificate that you want to install on the camera.
   To install the certificate on the camera, you need to provide a certificate name (it can be arbitrarily assigned by the user), certificate file issued from the certification authority and a key file.
   - The <**HTTPS (Secure connection mode using the public certificate)**> item will be active only if there exists a public certificate installed.
5. When done, click [**Apply (** Apply **)**].

Installing the certificate

1. Enter the certificate name.
2. Click the [**Browse (** Browse **)**] button, select the public certificate file and key file to be installed, and then click the [**Install (** Install **)**] button.

- Installation of an accredited certificate is available only in an HTTP environment (security access is not used).

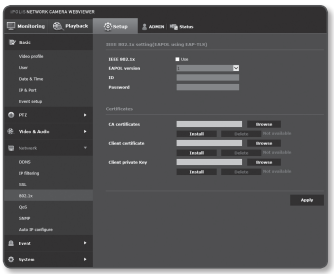
Deleting the certificate

1. Click [**Delete (** Delete **)**] button.
2. To delete a public certificate, you should access the network video decoder in the mode of <**HTTP (Do not use secure connection)**> or <**HTTPS (Secure connection mode using a unique certificate)**>.

802.1x

When connecting network, you can choose whether using 802.1x protocol, and then install the certification.

1. From the Setup menu, select the <**Network (**)> tab.
2. Click <**802.1x**>.
3. Set the <**IEEE 802.1x setting(EAPOL using EAP-TLS)**>.
   - IEEE 802.1x : Specify the use of the 802.1x protocol.
   - EAPOL version : Select version 1 or 2.
   - ID : Enter the client certificate ID.
   - Password : Enter the client private key password. If the key file used is not encrypted, you don't need to enter it.



- If the connected network device does not support the 802.1x protocol, the protocol will not operate properly even if you set it.

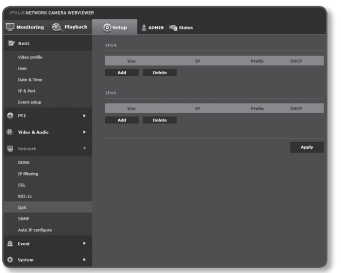
4. Install/remove the certificate.
   - CA certificates : Select a public certificate that contains the public key.
   - Client certificate : Select a public certificate that contains the client certificate key.
   - Client private Key : Select a public certificate that contains the client private key.
5. When done, click [**Apply (** Apply)].

To install/remove 802.1x related certificates

1. Press the [**Browse (** Browse)] button for each item and select a certificate to install.
2. If no certificate is installed, you will see "Not Available" appearing next to the selected item.
3. Press the [**Install (** Install)] button to start installation with a message of "Installed" next to the item.
4. Press the [**Delete (** Delete)] button to remove the certificate.

QoS

You can specify the priority to secure a stable transfer rate for a specific IP.



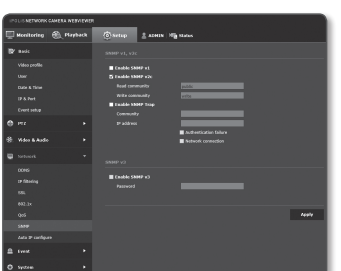
1. From the Setup menu, select the <**Network (**)> tab.
2. Click <**QoS**>.
3. Click the [**Add (** Add **)**] button.
   The IP list will be created.
4. Enter an IP address to which you will apply QoS.

- The default prefix for IPv4 is 32;
  For DSCP, the default is set to 63. (For IPv6, prefix should be set as 128)
- Only the IP addresses that are set to <**Use**> can be prioritized.

5. Select an IP to delete from the list.
   Click the [**Delete (** Delete **)**] button.
6. When done, click [**Apply (** Apply **)**].

SNMP

With the SNMP protocols, the system or network admin can monitor the network devices on a remote site, and configure the environment settings.



1. From the Setup menu, select the <**Network (**)> tab.
2. Click <**SNMP**>.
3. Specify the <**SNMP**>.
   - Enable SNMP v1 : SNMP version 1 will be active.
   - Enable SNMP v2c : SNMP version 2 will be active.
     - Read community : Provide the name of the read community where you can access to the SNMP information.
       The default name is <**public**>.
     - Write community : Provide the name of the write community where you can access to the SNMP information. The default name is <**write**>.

- Enable SNMP Trap : SNMP trap is used to send important events and conditions to the Admin.
  - Community : Enter the trap community name to receive messages.
  - IP address : Enter the IP address to which messages will be sent.
  - Authentication failure : It specifies whether an event shall be generated when the community information is invalid.
  - Network connection : It specifies whether an event shall be generated when the network disconnection is restored.
- Enable SNMP v3 : SNMP version 3 will be active.
  - Password : Specify the default password for SNMP version 3. The default password is <**admin4321**>.
    - The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.
      Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
    - Password should be longer than 8 characters, no more than 16 characters.

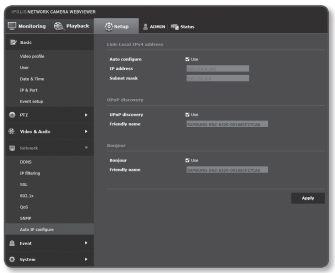
4. When done, click [**Apply (** Apply **)**].

- SNMP v3 is only able to be set when the secure connection mode is HTTPS.
  Refer to "**SSL**". (page 82)
- If you don't use SNMP v3, there may be a security issue.

Auto IP configure

You can set the IP available for access and camera searching automatically.

1. From the Setup menu, select the <**Network (** **)**> tab.
2. Click <**Auto IP configure**>.
3. Set the <**Link-Local IPv4 address**>. An additional IP address may be assigned to assess the camera from the Link-Local network.
   - Auto configure : It specifies Able or Disable for the Link-Local IPv4 address.
   - IP address : Display the assigned IP address.
   - Subnet mask : Display the subnet mask of the assigned IP.



4. Set the <**UPnP discovery**>.
   Cameras can be automatically searched in the client and operating system in support of the UPnP protocol.
   - UPnP discovery : It specifies Able or Disable for UPnP Discovery.
   - Friendly name : Display the camera name.
     Friendly name is displayed in the format of SAMSUNG-<Model Name>-<MAC Address>.

   ▪ In the Windows operating system which basically supports UPnP, the cameras connected to the network are displayed.

5. Set the <**Bonjour**>.
   Cameras can be automatically searched in the client and operating system in support of the Bonjour protocol.
   - Bonjour : It specifies Able or Disable for Bonjour.
   - Friendly name : Display the camera name.
     Friendly name is displayed in the format of SAMSUNG-<Model Name>-<MAC Address>.

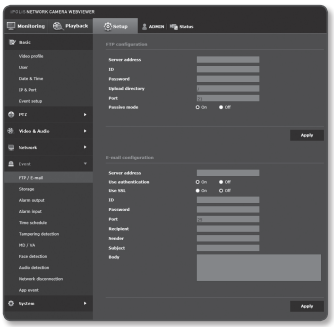
   ▪ In the Mac operating system, which support Bonjour by default, the connected cameras are automatically displayed in the Bonjour bookmark of the Safari web browser.
   If the Bonjour bookmark is not displayed, check Bookmarks Setup in the “Preference” menu.

6. When done, click [**Apply (** Apply **)**].

EVENT SETUP

FTP / E-mail

You can configure the FTP/E-mail server settings so that you can transfer the images taken with camera to your PC if an event occurs.



1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**FTP / E-mail**>.
3. Select <**FTP configuration**> or <**E-mail configuration**> and enter / select a desired value.
   - FTP configuration
     - Server address : Enter the IP address of the FTP server that you transfer the alarm or event images to.
     - ID : Enter the user ID with which you will log in to the FTP server.
     - Password : Enter the user account password for logging into the FTP server.
     - Upload directory : Specify the FTP path where you will transfer the alarm or event images.
     - Port : The default port of the FTP server is 21; however, you can use a different port number according to the FTP server settings.
     - Passive mode : Select <**On**> if you need to connect in passive mode due to the firewall or the FTP server settings.

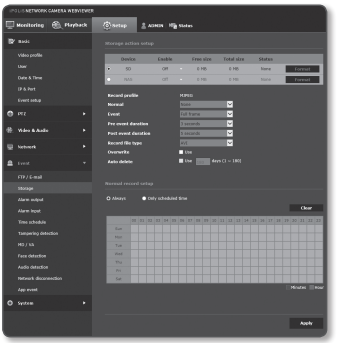
- E-mail configuration
  - Server address : Enter the IP address of the email server that you transfer the alarm or event images to.
  - Use authentication : Select whether to use authorization.
  - Use SSL : Specify the use of SSL.
  - ID : Enter the user ID for logging into the email server.
  - Password : Enter the user account password for logging into the email server.
  - Port : The default port of the email server is 25; however, you can use a different port number according to the email server settings.
  - Recipient : Enter the address of the email recipient.
  - Sender : Enter the address of the email sender. If the sender address is incorrect, the email from the sender may be classified as SPAM by the email server and thus may not be sent.
  - Subject : Enter a subject for your email.
  - Body : Provide the text for the massage. Attach the alarm or event images to the email that you are preparing.

4. When done, click [**Apply (** Apply **)**].

Storage

You can activate recording on your device, set the recording conditions, check the saved data capacity and format the device itself.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Storage**>.
3. Select a device to save data in.



- If your device is properly recording data, it will display "**Recording**".
- If you see an "**Error**" message, check the following:
  - Check the storage to see if it is connected to the device.
  - Check the files in the storage to see if they are damaged.
  - Check the storage to see if they are physically damaged.
- If the "Error" message does not disappear after following the instructions, format the Micro SD card. After formatting, if the error message still remains, replace the Micro SD card.

To make recording on the Micro SD memory

1. Check the memory card's <**Free size**> and <**Total size**>.
2. Otherwise, check the stored data and if you find them not important, then click <**Format**> to format the Micro SD memory.
   - Some frames may be skipped if the Micro SD memory card operates at the lower speed than recommended.
     For more details, refer to "**Recommended Micro SD/SDHC/SDXC Memory Card Specifications**". (Page 11)
   - For a Micro SD memory card with a large capacity, the formatting will be slowed down accordingly.
   - The data traffic will increase when the camera is set to higher resolution, higher bit rate, and/or higher framerate.
     If there is too much data traffic, some frame may be skipped although it is stored in a full frame.
   - When a frame skip occurs, images are saved at the rate of min. one image per sec.
3. Specify the storage action.
   - Record profile : The name of the recorded profile will be displayed.
   - Normal : Make recording at a certain frame rate.
   - Event : Set the recording type for a certain event that occurs.
   - Pre event duration : Specify the time point before the occurrence of the event; starting from the time point, the images will be transferred. You can specify up to 5 seconds before the occurrence of the event.
   - Post event duration : Specify the time point after the occurrence of the event; to the specified time point, the images will be transferred. You can specify up to 120 seconds after the occurrence of the event.
   - Record file type : It specifies the file format of the recorded images.
     If you insert a Micro SD card saved in another saving file type (AVI/STW), you will need to format it before use.
     - STW : It is Samsung Techwin's unique file format.
     - AVI : It is the conventional avi format.
   - Overwrite : If the Micro SD memory is full, this will delete old data and store new data in replacement.
   - Auto delete : Data for a certain period is deleted, while other data is not deleted. This can be set within the range of one day to 180 days.

- If the storage period is expired, data is automatically deleted and new data will be recorded. Once deleted, it cannot be recovered.

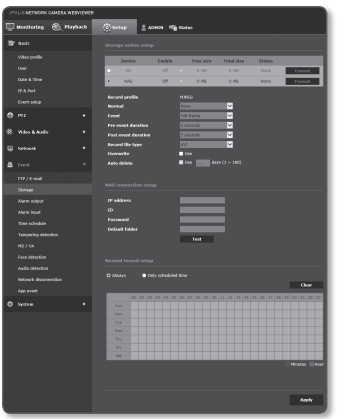
4. Specify the <**Normal record setup**>.
   - Always : Always save recorded video in the Micro SD memory card.
     - If set to Always, the activation time cannot be changed.
   - Only scheduled time : Records only on the specified time of the specified day of week.
   - [Clear (Clear)] : Reset all settings.
5. When done, click [**Apply (Apply)**].

If you want to record in your NAS

1. Set the saving operation and basic recording.

   - Auto deletion is supported only if your NAS meets the recommended specifications.

2. Enter the information registered in your NAS.
   - IP address : Unique IP address assigned to the NAS.
   - ID : An ID registered in the NAS.
   - Password : Password registered in the NAS.
   - Default folder : Designate the NAS user folder to save data in.
3. Click the [**Test**] button to see if you can successfully connect to the NAS.



- If the success message is displayed, it means that you can successfully save data in the NAS.
- If the fail message is displayed, check the following.
  - Confirm that the IP address of the NAS is valid.
  - Confirm that the ID/password of the NAS is valid.
  - Confirm that you can access the folder designated as the default folder using the ID of the NAS.
  - Confirm that the NAS SMB/CIFS items are unchecked.

- Confirm that the NAS IP address and the camera IP address are in the same format.
  ex) The NAS & camera subnet mask initial value is 255.255.255.0.
  If the IP address is 192.168.20.32 then the NAS IP address should be in the range of 192.168.20.1~192.168.20.255.
- Check whether you tried to access as another user without formatting the default folder saved or used.
- Confirm that you used recommended NAS equipment.

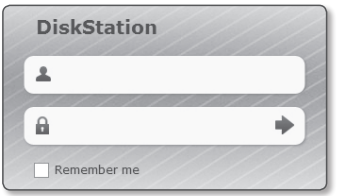
4. Once the setting is complete, change the setting of the NAS from <**Off**> to <**On**> and click the [**Apply (** Apply **)**] button.
5. Access the NAS to check the available capacity and the total capacity.
6. If there is not enough space, check the data size and click on the [**Format**] button to format the NAS folder connected to the webpage.
   - Due to network access errors, you might be unable to save the NAS temporarily.
   - The data traffic will increase when the camera is set to higher resolution, higher bit rate, and/or higher framerate.
     If there is too much data traffic, some frame may be skipped although it is stored in a full frame.
   - When a frame skip occurs, images are saved at the rate of min. one image per sec.

NAS (Network Attached Storage) guide

- When you use the NAS, you might be unable to save data due to temporary network disconnections.
- If the setting allows a Micro SD memory card and the NAS to be simultaneously connected for use, the higher priority for recording goes to the NAS.
- If you activate Overwrite to the NAS by setting it to <**Off**> and the available capacity is below 10%, it will be saved in the Micro SD card.
- If you are saving data in the NAS, you might be unable to save it when you insert a Micro SD memory card used by another camera.
- NAS recommended specs : Refer to "**NAS recommended specs**". (Page 11)
- If you change the NAS saving while saving data in the NAS, it will not be reflected in the system immediately.
- If you remove NAS equipment on your own while saving data, or if the network is disconnected, NAS saving operation will be terminated abnormally.
- As a rule of thumb, you are recommended to use one NAS sharing directory per camera without duplicated use.

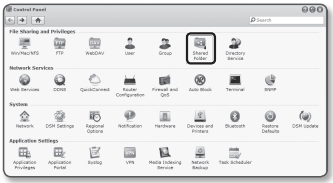
The following is a description of how to save data using the NAS according to the Synology NAS method, which is one of the recommended products.

1. Access the Synology NAS as an admin. In this example, the NAS IP Address is set to [**192.168.20.253**].

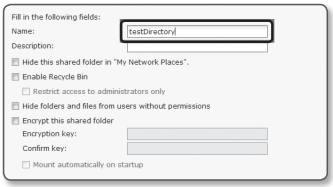


2. If you access it as an admin, the following screen will be displayed. Click the [**Control Panel**].

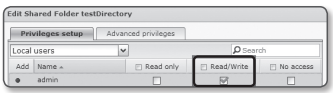
3. Click the <**Shared Folder**> in the file sharing and privilege menu.



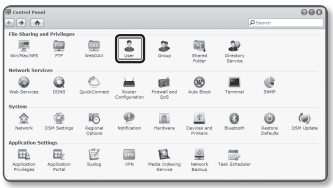
4. Click the [**Create**] button.
5. After entering the shared folder name(ID), click the [**OK**] button to create a shared folder.
   In this example, the shared folder name is [**testDirectory**].



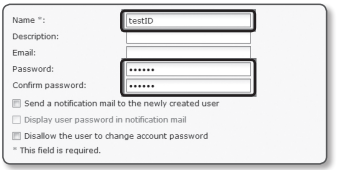
6. In Windows, for NAS access, set the privilege for the shared folder as follows.
   Check the admin's [**Read/Write**].



7. Click on the <**User**> in the file sharing and privilege menu.

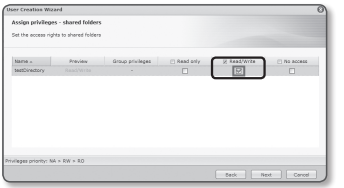


8. After clicking the [**Create**] button, enter name(ID) and password.
In this example, name(ID) is set to [**testID**] and password is also set to [**testID**].

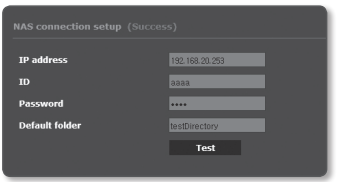


- According to the NAS recommendations, when you use Netgear's NAS equipment, do not allocate the capacity for use.

9. In Windows, set the privilege for NAS access.
For the shared folder created in step 4 called "testDirectory" check [**Read/Write**].

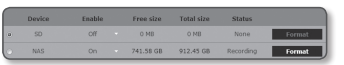


10. Basic setting in the NAS is completed.
Connect your camera to the actual NAS.
As shown below, enter the NAS connection setting items.



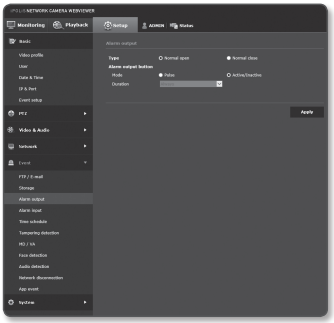
11. After entering item 10, check <**On**>.

12. Click the [**Apply (** Apply **)**] button.
Finish saving by using the NAS.



Alarm output

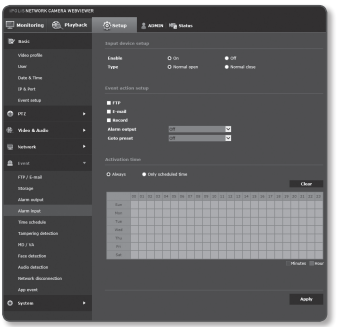
1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Alarm output**>.
3. Set the camera's type of alarm output.
   - If you change the alarm output type, the alarm out button on the monitoring page and alarm output type displayed on Event Setup page will be changed accordingly.
   - Type
     - Normal open : Considers "Open circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Closed circuit" status.
     - Normal close : Considers "Closed circuit" status of the sensor or alarm input device as normal, and triggers alarm event if becomes "Open circuit" status.



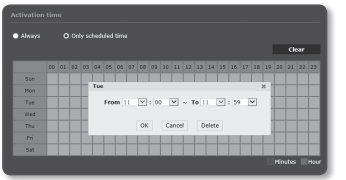
4. Set the alarm output button.
   - Mode : Sets the alarm output method.
     - There is difference between operations when clicked alarm output button while disabled.
     - Pulse : It is activated during the time period specified by the duration (switching interval) and then becomes inactive automatically.
     - Active/Inactive : It maintains as activated until the user clicks the button again to make it inactive.
   - Duration : Set the alarm duration that maintains activated if the mode is set to pulse, from 1 to 15 seconds.
5. When done, click [**Apply (** **Apply** **)**].

Alarm input

You can set the alarm input type, activation time, and operation mode.



1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**Alarm input**>.
3. Set whether or not to <**Enable**>.
4. Select the type.
   - Normal open : It is normally open, but if it is closed, an alarm will be triggered.
   - Normal close : It is normally closed, but if it is open, an alarm will be triggered.
5. Specify the <**Activation time**>.
   - Always : Always check if an alarm occurs. It activates in operated mode when the alarm occurs.
     - If set to <**Always**>, the activation time cannot be changed.
   - Only scheduled time : Check if an alarm occurs at a specified day of the week for a specified time period. It activates in operated mode when the alarm occurs.
   - [Clear (**Clear**)] : Reset all settings.
   - Minute : Click an area in Activation Time and set the time by minutes.
   - Hour : Drag your mouse at Activation Time and set the time by hours.

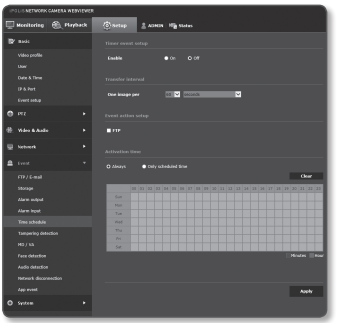


- The transfer interval setting value must be smaller than the preset activation interval to succeed in image transmission.

6. Specify an operation that will perform if an alarm occurs.
   - FTP : Specify the use of FTP transfer in the alarm input setup.
     - Refer to "**FTP / E-mail**" for more details. (page 87)
   - E-mail : Specify the use of email transfer in the alarm input setup.
     - Refer to "**FTP / E-mail**" for more details. (page 87)
   - Record : Specify the use of recording in the alarm input setup.
     - Set <**Record**> to <**On**> in <**Storage**>. (page 88)
   - Alarm output : Select whether to set the alarm output if an alarm is incoming, and specify the alarm output time.
   - Goto preset : Moves to the specified preset location when setting the alarm input.
7. When done, click [**Apply (** Apply **)**].

Time schedule

You can set to save the video data at a certain interval as scheduled regardless of the actual occurrence of the event.



1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Time schedule**>.
3. Set whether or not to <**Enable**>.
4. Specify the <**Transfer interval**>.
5. Specify the <**Activation time**>.
   - Always : Always activates in operated mode at the set interval.
   - Only scheduled time : Periodically activates in operated mode at a specified time and date.
6. Specify the activation conditions.
   - FTP : Specify the use of the FTP transfer if an event occurs.
     - Refer to "**FTP / E-mail**" for more details. (page 87)
7. When done, click [**Apply (** Apply **)**].

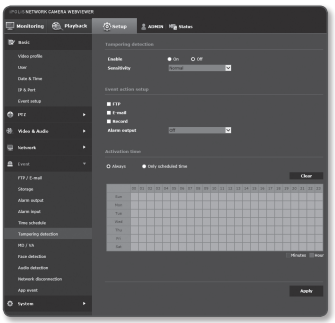
Tampering detection

You can set to detect tampering attempts and trigger events, such as sudden change of camera's framing direction, blocked lens and other overall change of scenes from the video.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Tampering detection**>.
3. Set whether or not to <**Enable**>.

   - DIS cannot be used if tampering detection is used.

4. Set the tampering detection sensitivity. The higher the sensitivity, detects the minutest tampering attempts.
5. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 96)
6. When done, click [**Apply (** Apply **)**].



- The default tampering detection function may not work properly in the following cases:
  - Under circumstances of simple background or low illumination and night time may lower the detection sensitivity.
  - A severe shaking of the camera or a drastic change to the illumination can be considered a tampering by mistake.
  - Detection of the tampering may take some time (maximum 5 seconds) right after the tampering was made.
  - Once a tampering is detected, the camera will resume a normal operating after a certain stability time (approx. 5 seconds) during which no detection will be performed.

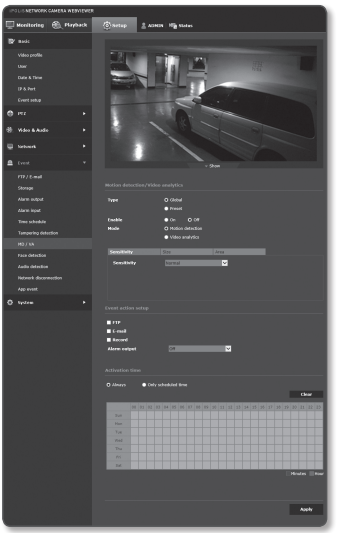
MD / VA

Events of motion detection and video analysis can be set to trigger event signal output.

1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**MD / VA**>.
3. Set whether or not to <**Enable**>.

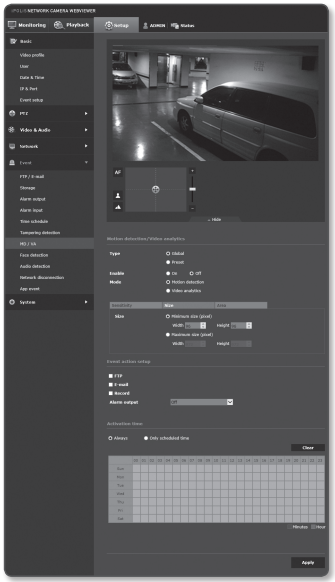
   - DIS cannot be used if Motion detection/ Video analytics is used.

4. According to your purpose, select from motion detection and intelligent video analysis.
5. Set <**Sensitivity**>, <**Size**> and <**Area**>. When selected Intelligent Video Analysis, set <**Analytics**> too.
6. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 96)
7. When done, click [**Apply (** Apply **)**].



To use the Motion Detection (MD) function

1. Select the <**Motion detection**> mode.
2. Select the sensitivity of separating movement from the background.
   You can select 5 levels of sensitivity (very low/low/normal/high/very high).
3. Select the size of the object for observation.
   - Minimum size (pixel) : To restrict the minimum movement to be observed, select <**Minimum size (pixel)**> and enter the width and height. The unit is pixel, and you can select any value equivalent to or higher than 32 x 32.
   - Maximum size (pixel) : To restrict the maximum movement to be observed, select <**Maximum size (pixel)**> and enter the width and height. The unit is pixels, and you can select any value up to 1920x1080.



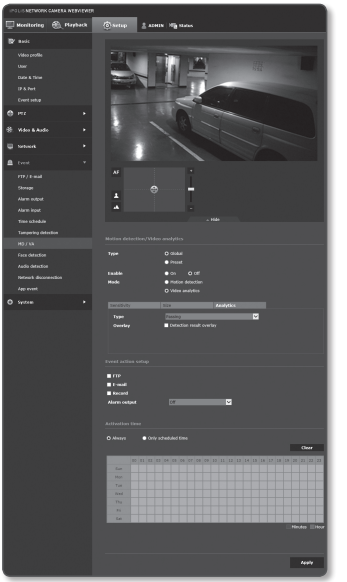
- Motions smaller than the specified minimum size or bigger than the maximum size are not detected. To avoid unintended detections caused by great and small noises, set minimum/maximum motion sizes appropriately in accordance to your environments.
- Note that same motions on the same location can be differently detected in their detection size; it is recommended to consider and include the tolerable difference when setting the minimum/maximum detection sizes.

4. Set the area in which movement is detected.
   You can drag the area on the screen. You can set up to 4 areas.
5. When done, click [**Apply (** Apply **)**].

- Unlike the video analysis function, the motion detection function provides no overlay mark on the screen. A yellow box appears at a side of the monitoring screen, and the operation function is recorded in the system log.

To use the Intelligent Video Analysis (VA) function

1. Select the <**Video analytics**> mode.
2. Select the sensitivity of separating movement from the background. You can select 5 levels of sensitivity (very low/low/normal/high/very high).
3. Select the size of the object for observation.
   - Minimum size (pixel) : To restrict the minimum movement to be observed, select <**Minimum size (pixel)**> and enter the width and height. The unit is pixel, and you can select any value equivalent to or higher than 32 x 32.
   - Maximum size (pixel) : To restrict the maximum movement to be observed, select <**Maximum size (pixel)**> and enter the width and height. The unit is pixels, and you can select any value up to 1920x1080.



- Motions smaller than the specified minimum size or bigger than the maximum size are not detected. To avoid unintended detections caused by great and small noises, set minimum/maximum motion sizes appropriately in accordance to your environments.
- Note that same motions on the same location can be differently detected in their detection size; it is recommended to consider and include the tolerable difference when setting the minimum/maximum detection sizes.

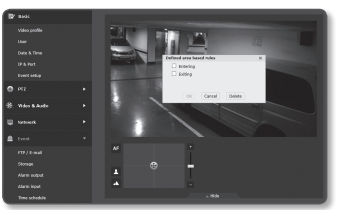
4. Select the type of analysis.
   - Passing : The system detects the change in which an object passes the preset line.
   - Entering/Exiting : The system detects the change in which an object passes the preset area.
   - Appearing (Disappearing) : The system detects the change in which an object appears or disappears in the present area.
5. Select use of <**Overlay**>.
   - Detection result overlay : The detection result is indicated on the video.
6. When done, click [**Apply (** Apply **)**].

To set the video analysis rules

▪ Passing

1. Set the type to <**Passing**>.
2. Click the start and end point on the screen to set the base line.
   You can cancel the line while drawing an area by right-clicking the mouse.
3. Select the desired rule:
   - Right: Detects motions of moving from the left to the right, over the virtual line.
   - Left: Detects motions of moving from the right to the left, over the virtual line.
4. Click [**OK**].
5. To remove a defined rule, right click on the displayed virtual line to open popup context menu and select [**Delete**] button.

▪ Entering/Exiting



1. Set the type to <**Entering/Exiting**>.
2. Click 4 points on the screen to set the base area.
   You can cancel the line while drawing an area by right-clicking the mouse.
3. Select the desired rule:
   - Entering : Detects motions of moving object whose center point entering into the defined area, from outside of the area.
   - Exiting : Detects motions of moving object whose center point exiting from the defined area, from inside of the area to outside.
4. Click [**OK**].
5. To remove a defined rule, right click on the displayed side lines of the area to open popup context menu and select [**Delete**] button.

▪ Appearing (Disappearing)

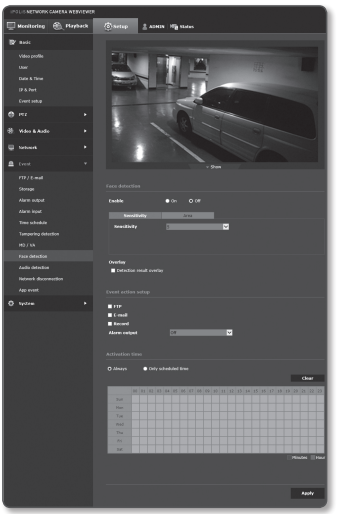
1. Set the analysis type to <**Appearing (Disappearing)**>.
2. Drag the desired location of the image. The dragged grey area will be set as an area of interest.
   - Appearing/Disappearing : It detects event of appearing object that appears in the area and remaining for a certain time period while not passing through the area borders, and opposite case of disappearing of objects existed in the area.

3. If you want to remove the existing rule, then right click with your mouse and click on the [**Delete**] button.

- Motion detection and Video analytics cannot be used simultaneously.
- Before using, set the minimum and maximum motion sizes to suit desired motion range to be detected.
- Detected size of an object may have difference with the actual size according to its shape.
- Up to 16 objects from the top side of the screen can be displayed.
- If camera is capturing a close object, the video analysis capability may degrade.
- In the following cases, motion detection and intelligent video analysis function may be degraded or cause improper detection.
  - The object color or brightness is similar to the background.
  - Small activities around the border area of the camera's field of view.
  - Multiple movements continue occurring at random due to a scene change, rapid lighting changes or other reasons.
  - A fixed object continues moving in the same position.
  - Motions of less position changing such as approaching to the camera or fading away from the camera.
  - Moving object approaches to the camera too close
  - An object hides other objects behind.
  - Two or more objects overlap or one object divides in multiple portions.
  - Too fast object (for a proper detection, one object should be found overlapping between contiguous frames).
  - Reflection / blur / shadow due to a strong light such as direct sunlight, illumination, or headlamp.
  - In severe snow, rain, wind or in dawn / dusk.

Face detection

You can set to detect recognized face and trigger an event accordingly.

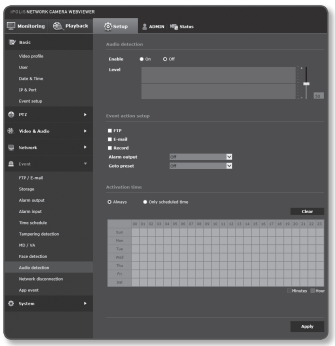


1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**Face detection**>.
3. Set whether or not to <**Enable**>.
4. Select <**Sensitivity**> tab to set the sensitivity level.
   - As the sensitivity grows, face detection becomes more close and detailed.
5. Select <**Area**> tab and drag on the screen to define the desired detection area.
   - You can specify up to 4 detection areas.
   - While drawing the area, you can cancel an area by right-clicking.
6. To delete an area, right-click on the area, and select delete [**OK**] on the pop-up menus.
7. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 96)
8. When done, click [**Apply (** Apply **)**].

Audio detection

You can set to detect sound over the specified level and trigger an event accordingly.

1. From the Setup menu, select the <**Event (** **)**> tab.
2. Click <**Audio detection**>.
3. Set whether or not to <**Enable**>.
4. Set the audio detection's sound level. The lower the level, the smaller the sound change is detected.



- The audio detection level is designed to normalize the input data to a value between 1 and 100 and detect the signal larger than threshold level. It is unrelated to the decibel (dB) level.

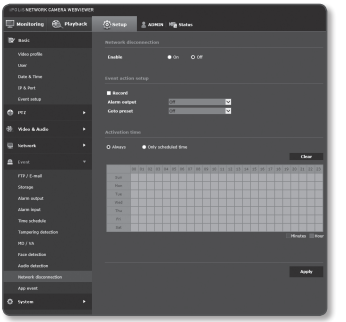
5. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 96)
6. When done, click [**Apply (** **Apply** **)**].

- If detected audio level is too low, set the audio input gain to a higher level in <**Audio setup**>.
- You can use the audio detection function when the camera is connected with an audio input device.

Network disconnection

When the network is physically disconnected, it is considered as an event to be saved.

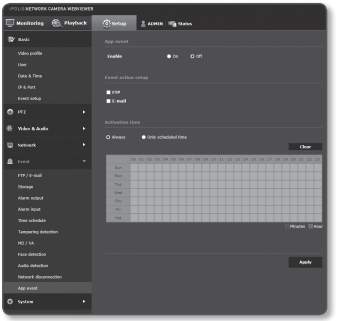
1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**Network disconnection**>.
3. Set whether or not to <**Enable**>.
4. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 96)
5. When done, click [**Apply (** Apply **)**].



App event

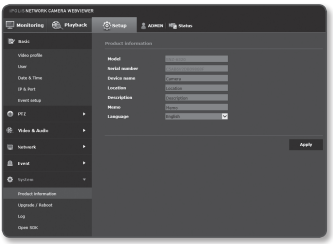
You can set the system to generate signals for the events defined on the application. The event signals provided vary depending on the application function.

1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**App event**>.
3. Set whether or not to <**Enable**>.
4. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 96)
5. When done, click [**Apply (** Apply **)**].



SYSTEM SETUP

Product information

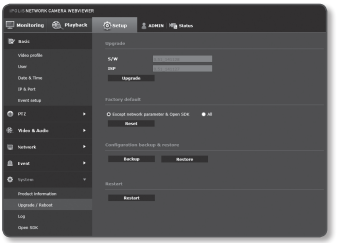


1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Product information**>.
3. Check the camera information, or provide details according to your network environment.
   - Model : Model name of the product.
   - Serial number : Product serial number.
   - Device name : Provide a device name that will be displayed on the Live screen.
   - Location : Specify the location where the camera is installed.
   - Description : Provide detailed information about the camera location.
   - Memo : Provide an explanation about the camera for better understanding.
   - Language : Select a preferred language for the Web Viewer OSD.

   ■ The default language is set to <**English**>.

4. When done, click [**Apply (** Apply **)**].

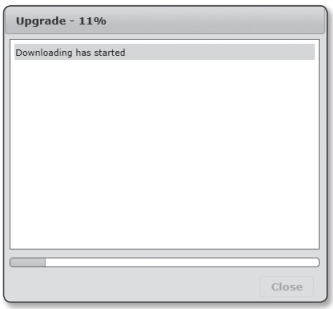
Upgrade / Reboot



1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Upgrade / Reboot**>.
3. Select a desired item and set it appropriately.
   - Upgrade : Performs upgrading the system.
   - Factory default : Resets the system to the factory default.
     - Except network parameter & Open SDK : Initialize all except for the network setting and lens settings as well as the open SDK installation files and internal settings.
     - All : Resets all settings including the camera settings. (however, the log information will not be reset)
       - The IP addressing system will be defaulted to DHCP if you reset the camera. If no DHCP server is found, the previous settings will be restored automatically.
   - Configuration backup & Restore : Backs up the current system settings before performing the restoration process. The system is automatically restarts after backup or restoration.
   - Restart : Restarts the system.

To perform the upgrade

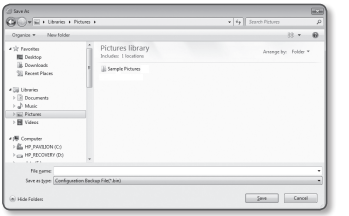
1. Click [**Upgrade**].
2. Click [**Browse**] and specify a file to upgrade.
3. Click [**Send**].
4. The "**Upgrade**" dialog appears where the progression will be shown in the bottom.
5. Once completed upgrading, the browser exits and the camera restarts.



- It may take a max of 10 minutes for the upgrade process.
  If you forcibly terminate the upgrade process, upgrade will not be completed properly.
- During restarting the system, accessing with web viewer will not be made.
- You can download the latest version from the Samsung web site (www.samsungcctv.com).

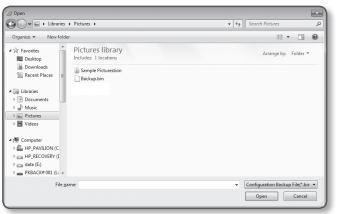
To back up the current settings

1. Click [**Backup**].
   The Save As dialog should appear.
2. Specify the backup path with a proper file name, and click [**Save**].
   The backup file will be saved to the specified path in the format of "**.bin**".



To restore the backup settings

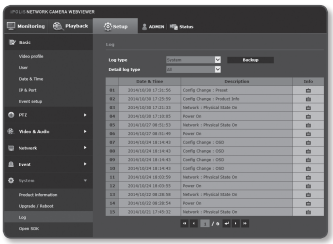
1. To restore the backup settings, click [**Restore**].
2. Select a backup file and click [**Open**].



- If you perform the backup or restoration, the web browser will be closed and the camera will reboots.
- If you try to recover the config file backed up in other model, some functions may malfunction and you need to change the setting manually.

Log

You can check the system log or event log.

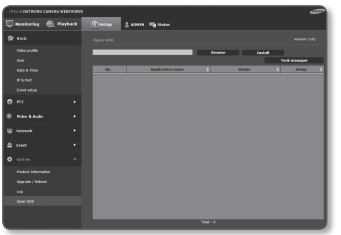


1. From the Setup menu, select the <**System ( )**> tab.
2. Click <**Log**>.
3. Select a log type.
   - System : You can check the system logs where any system changes are recorded including the time information.
   - Event : You can check the event logs including the time information.
4. From the right log list, select an item to search for.
   - If you select <**All**> in the top left dropdown list, all logs for the applicable log type will be displayed.
5. If one page can not display all the logs available, use the bottom buttons to move to the previous, next, or the last item.
6. Click on the <**Backup**> button to save all the log data for the currently selected mode (system, event) in the "time stamp value create by camera in modelname-mode-camera.txt file" in the download folder for the browser.

- By clicking on [**Info ( )**] to the right of each log message, you can check the details of the corresponding log message.
- Each page displays 15 logs with the latest one displayed at the top.
- The event/system log list can contain up to 1000 logs; after that, the existing logs will be deleted from the oldest one each time a new log is created.

Open SDK

A user can install an application on their camera to execute additional functions.



1. From the Setup menu, select the <**System (** **)**> tab.
2. Click <**Open SDK**>.
3. Click the [**Browse (** **Browse** **)**] button to select the *.cap file from the user folder.
4. Click the [**Install (** **Install** **)**] button to install your application.
5. The information of the installed application is displayed in the list.
   - Uninstall : Deletes installed or operating applications.
   - Go App : Move to the web page of each application.
   - Start : Execute an installed application.
   - Stop : Terminates a running application.
   - Health : Displays the currently running application's resource occupation rate, thread counts and execution time, etc.
   - Priority : Sets the priority of running applications.
     If the total resource utilization rate of the camera (including main tasks and applications) exceeds 80%, an ongoing application will be forced to stop. In this case, the priority set by the user is used to determine which application should be stopped first.
   - Auto start : When the camera's power supply or main task is running, a certain application for which auto execution has been activated will run automatically.
   - Task manager : This displays the resource occupation rate of an application currently running in your camera.
     - Memory Usage (%) : This is the memory utilization rate for each application.
     - CPU Usage (%) : This is the CPU utilization rate for each application.
     - Thread count : This is the number of threads created by each application.
     - Duration : This is the total execution time of each application.
     - Kill Task : Terminates an application.
     - Total Usage : This is the total resource occupation rate of the camera (including main tasks and applications).

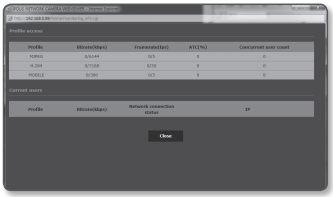
▪ For questions about application use or installation, check the Techwin developer website.

VIEWING PROFILE INFORMATION

Profile access

You can check the profile information.

1. Click [**Status (** **)**] on the live screen.
2. The profile information screen is displayed.
   - Profile access : Show the information of the newly added profile.
     - Profile : Show the information of the newly added codec.
     - Bitrate(kbps) : Show both the actual bit rate and the set bit rate.
     - Framerate(fps) : Show both the actual frame rate and the set frame rate.
     - ATC(%) : Show the ATC status.
     - Concurrent users count : Show the number of concurrent users who access the profile.
   - Current users : Shows information on users accessing web viewer and displaying monitoring video.
     - Profile : Show the name of the profile accessed by the user.
     - Bitrate(kbps) : Show the current bit rate.
     - Network connection status : It shows whether the network is working fine.
     - IP : Show the IP address of the current user.



- To check information on the profile currently used, click [**Status (** **)**] again to refresh it. It takes a certain time for any changes to be applied.

SPECIFICATION

Items		Description
Video	Imaging Device	1/2.8" PS Exmor 2.38M CMOS
	Total Pixels	1952(H) x 1116(V), 2.18M
	Effective Pixels	1944(H) x 1104(V), 2.14M
	Scanning System	Progressive
	Min. Illumination	Color : 0.3 Lux (1/30sec, F1.6, 50IRE) B/W : 0.03 Lux (1/30sec, F1.6, 50IRE)
	S / N Ratio	50dB
	Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - DIP connector type
Lens	Focal Length (Zoom Ratio)	4.44~142.6mm(Optical 32X)
	Max. Aperture Ratio	F1.6(Wide) / F4.4(Tele)
	Angular Field of View	H : 62.8°(Wide) ~ 2.23°(Tele) V : 36.80°(Wide) ~ 1.26°(Tele)
	Min. Object Distance	Wide 1.5m, Tele 1.5m
	Focus Cotrol	Auto / Manual / One Push
	Lens Type	DC Auto Iris
	Mount Type	Board-in type
Operational	Camera Title	Off / On (Displayed up to 45 characters)
	Day & Night	Auto (ICR) / Color / B/W / External / Schedule
	Backlight Compensation	Off / BLC
	Wide Dynamic Range	120dB
	Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
	Digital Noise Reduction	SSNRIII (2D+3D Noise Filter) (Off / On)

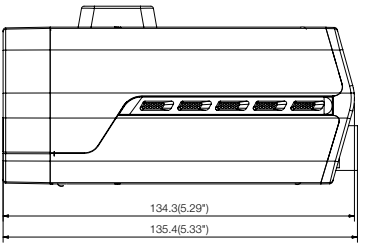
Items		Description
Operational	Digital Image Stabilization	Off / On
	Defog	Auto / Manual / Off
	Motion Detection	Off / On (4ea 4 Points Polygonal zones)
	Privacy Masking	Off / On (32 Zones with 2 Points of rectangle)
	Gain Control	Off / Low / Middle / High
	White Balance	ATW / AWC / Manual / Indoor / Outdoor / Mercury
	Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
	Digital Zoom	16X
	Flip / Mirror	Off / On
	Intelligent Video Analytics	Tampering, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection
	Alarm I/O	Input 1ea / Output 1ea (Relay)
	Audio In	Selectable (Mic IN/Line IN) Supply voltage : 2.5VDC(4mA), Input impedance : approx. 2K Ohm
	Audio out	Line out (3.5mm stereo mini jack) Max output Level : 1Vrms
	Serial Interface	RS-485 - Samsung-T/E, Pelco-D/P, Sungjin, Panasonic, Vicon, Honewell, AD, GE, Bosch
	Alarm Triggers	Motion detection, Tampering Detection, Audio Detection, Face Detection, Network Disconnection, Video Analytics, Alarm Input
	Alarm events	• File upload via FTP, E-Mail • Notification via E-Mail • Local storage(SD/SDHC/SDXC) or NAS recording at Network disconnected & Event (Alarm Triggers) • External output

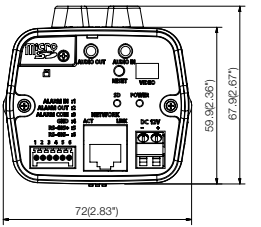
Items		Description
Network	Ethernet	RJ-45 (10/100BASE-T)
	Video Compression Format	H.264(MPEG-4 Part 10/AVC), Motion JPEG
	Resolution	1920x1080 / 1280x1024 /1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 720x576 / 640x480 / 640x360 / 320x240 / 320x180
	Max. Framerate	H.264 : Max 60fps at all resolutions Motion JPEG : 1920x1080 / 1280x1024 /1280x960 / 1280x720 / 1024x768 : Max. 15fps 800x600 / 800x450 / 720x576 / 640x480 / 640x360 / 320x240 / 320x180 : Max. 30fps
	Smart Codec	Manual Mode (area-based : 5EA) Face detection Mode
	Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
	Bitrate Control Method	H.264 : CBR or VBR MJPEG : VBR
	Streaming Capability	Multiple Streaming (Up to 10 Profiles)
	Audio Compression Format	G.711 μ-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps
	Audio Communication	Bi-directional
	IP	IPv4, IPv6
	Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
	Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication

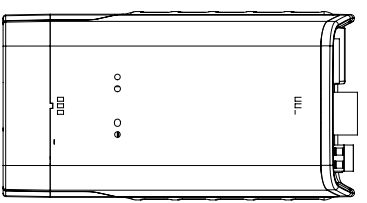
Items		Description
Network	Streaming Method	Unicast / Multicast
	Max. User Access	10 users at Unicast Mode
	Edge Storage	SD/SDHC/SDXC - motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.
	Application Programming Interface	ONVIF Profile S SUNAPI 2.0 SVNP 1.2
	Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Denish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatian, Hungarian, Greek, Norway, Finland
	Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8 / 8.1, MAC OS X 10.7 / 10.8 Supported Browser : Microsoft Internet Explorer (Ver. 8 ~ 11), Mozilla Firefox (Ver. 9 ~ 19), Google Chrome (Ver. 15 ~ 32), Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) *Mac OS X Only
	Central Management Software	SmartViewer, SSM, Mobile viewer
Environmental	Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / Less than 90% RH
	Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Electrical	Input Voltage / Current	DC12V, PoE(IEEE802.3af, Class3)
	Power Consumption	PoE : 10.0W DC12V : 9.0W
Mechanical	Color / Material	Dark Gray / Metal
	Dimension (WxHxD)	W72.0 x H59.9 x D135.4 mm
	Weight	540g

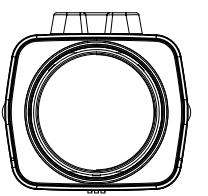
PRODUCT OVERVIEW

Unit : mm (inch)









TROUBLESHOOTING

PROBLEM	SOLUTION
I can't access the camera from a web browser.	• Check to make sure that the camera's Network settings are appropriate. • Check to make sure that all network cables have been connected properly. • If connected using DHCP, verify that the camera is able to acquire dynamic IP addresses without any problem. • If the camera is connected to a Broadband Router, verify that port forwarding is properly configured.
Viewer got disconnected during monitoring.	• Connected Viewers become disconnected upon any change to camera or network configurations. • Check all network connections. • If the camera is connected over an PPPoE network, it' s possible for Viewer to disconnect under poor network conditions.
I cannot connect to the system using a tab browser of Internet Explorer 7.0.	• An error may be generated when connecting with a new window or tab since the cookie data are shared. Do not use a new window or tab, select "File → New session".
The camera connected to the network is not detected in the IP installer program.	• Turn off the firewall settings on your PC and then search the camera again.
Images overlap.	• Check whether two or more cameras are set to a single multicast address instead of different addresses. If a single address is used for multiple cameras, the images may overlap.
No image appears.	• If the transmission method is set to multicast, check whether there is a router that supports multicast in the LAN the camera is connected to.
<MD / VA> is set to <Enable>, but no notification e-mail reaches me even when an analysis event had occurred.	• Verify the settings in the following sequence: A. Check <Data & Time> settings. B. The <Motion detection / Video analytics> should be set to <Enable>. C. Check if the <E-mail> option of <Event action setup> menu is checked to use.

PROBLEM	SOLUTION
Can I define event rules even when I don't use <Motion detection / Video analytics>?	• Yes, it can be. You can set rules for events despite of the intelligent video analysis setting.
No signal is found at the Alarm Output port even when an intelligent video analysis event is generated.	• Check alarm output port settings.
Cannot record into the Micro SD memory card.	• Check if the memory card is defective.
Micro SD memory card is inserted but the camera does not operate properly.	• Check if the memory card is inserted in the proper direction. Operation of memory card that is formatted by other devices is not guaranteed with this camera unit • Format the memory card again in <Setup> → <Event> → <Record> menu.
Cannot record in the NAS.	• Confirm that the information registered in the NAS is correct.
It reports that NAS setting has failed.	• Confirm that the IP address of the NAS is valid. • Confirm that the ID/password of the NAS is valid. • Confirm that you can access the folder designated as the default folder using the ID of the NAS. • Confirm that the NAS SMB/CIFS items are unchecked. • Confirm that the NAS IP address and the camera IP address are in the same format. ex) The NAS & camera subnet mask initial value is 255.255.255.0. If the IP address is 192.168.20.32 then the NAS IP address should be in the range of 192.168.20.1~192.168.20.255. • Check whether you tried to access as another user without formatting the default folder saved or used. • Confirm that you used recommended NAS equipment.

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GPL SW

Component Name	License	URL
Base Kernel	GPL 3.0	
Busybox	GPL 2.0	http://www.busybox.net/downloads/snapshots
iproute2-3.1.0	GPL 2.0	
alsa-utils-1.0.24.2	GPL 2.0	
alsa-lib-1.0.24.1	GPL 2.0	
iptables-1.4.12.2	GPL 2.0	http://ftp.netfilter.org/pub/iptables
ethtool-3.2	GPL 2.0	
mtd-1.4.1	GPL 2.0	ftp://ftp.infradead.org/pub/mtd-utils
mii-diag-2.11	GPL 2.0	
rp-pppoe-3.10	GPL 2.0	http://www.roaringpenguin.com/pppoe/
wpa_supplicant-0.7.3	GPL 2.0	
bash-4.2	GPL 3.0	
zeroconf	GPL 2.0	

LGPL SW

Component Name	License	URL
gLibc	LGPL 2.0	
Inetutils	LGPL 3.0	
neon-0.29.6	LGPL 2.0 (The Manual and test suite are GPL)	http://www.webdav.org/neon/

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established by T-Engine Forum
on January 23, 2004
revised on June 17, 2004
revised on December 21, 2006
revised on March 24, 2009

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1. This License Agreement sets forth copyrights and the terms and conditions of use applicable to the source code of T-Kernel distributed by T-Engine Forum and any derivative work created therefrom.

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1. "T-Kernel" means a real-time operating system controlled and distributed by T-Engine Forum on behalf of the copyright holder thereof.

2. "Source Code" means a source program, including related comments and documentations, for the T-Kernel and the Ported Source Code defined in Article 2.8 which is registered with T-Engine Forum.

3. "Hardware-dependent Part" means the part of the Source Code which depends on hardware and needs to be changed when the Source Code is ported and operated on the target hardware, and is designated and separated as such part.

4. "Compiler-dependent Part" means the part of the Source Code which depends on compiler and needs to be changed when the Source Code is ported and operated on the target hardware, and is designated and separated as such part.

5. "Header File" means the part of the Source Code which contains definitions necessary to develop application programs.

6. "T-Engine Hardware" means the hardware which is manufactured in accordance with the T-Engine Hardware specifications or the µT-Engine Hardware specifications issued by T-Engine Forum, and registered with T-Engine Forum.

7. "Similar Hardware to T-Engine Hardware" means any hardware (including software which emulates hardware) other than that defined in Article 2.6 above, on which the T-Kernel can be operated.

8. "Ported Source Code" means a source program produced from the Source Code by modifying only its Hardwaredependent Part and/or Compiler-dependent Part to enable it to be operated on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware. The Ported Source Code which is registered with T-Engine Forum shall be included in the Source Code.

9. "Modified Source Code" means a source program modified from the Source Code for the purpose of improving its performance, increasing or decreasing its function, and the like. The Ported Source Code shall not be included in the Modified Source Code.

10. "Binary Code" means an executable code form which is created by compiling programs, which include all or part of the Source Code or the Modified Source Code.

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17. "Vicarious Execution of Patch Processing" means vicarious execution service to create the Modified Source Code applying the Patch for Modification to the Source Code or the Binary Code thereof.

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2. to transmit a work to the general public through the Internet communication, broadcasting, and the like automatically in response to a request from the public; and

3. to distribute a copy of a work to the general public or a large number of specific persons.

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3. to run the Source Code modified in accordance with the provision of Article 4.3 (1) above for its own research, development and the like.

4. to distribute the Binary Code created from the Source Code provided by T-Engine Forum hereunder or from the Source Code modified in accordance with the provision of Article 4.3 (1) above.

4. In accordance with the license granted under Article 4.1 above, the System Developer may perform the following acts:

1. to perform any and all acts set forth in the Article 4.3 above.

2. to develop and manufacture the Embedded Product containing the Binary Code, and, whether with or without payment, provide the End User with the same and make the Binary Code available to the End User on the Embedded Product.

5. The Source Code User and the System Developer shall be obligated to give a notice that the Source Code is used, in such a way as separately specified by T-Engine Forum, when they use the Source Code or the Binary Code, or make the Binary Code available for the End User on the Embedded Product.

Article 5. Distribution of Modified Source Code

1. Any of A- members of T-Engine Forum may become the Distributor of Modification by obtaining the approval of T-Engine Forum through the registration procedure as prescribed by the Forum provided that only the department of the A- member which has taken the registration procedure may distribute the Modified Source Code in such a way as provided for in this Article as long as it holds the Amembership.

2. The Distributor of Modification may create the Modified Source Code based on the Source Code provided by T-Engine Forum and the Patch for Modification to be applied to create such Modified Source Code from the Source Code.

3. The Distributor of Modification shall, prior to the distribution, inform T-Engine Forum of and register a name and description of the Modified Source Code in such a way as specified by T-Engine Forum.

4. The Distributor of Modification shall determine the name of the Modified Source Code subject to the rules separately established by T-Engine Forum and publish an appropriate notice as required by the rules on the Patch for Modification and the Modified Source Code.

5. The Distributor of Modification may distribute the Modified Source Code to a third party, whether with or without payment, provided that the Distributor of Modification shall take the necessary measures to prohibit the third party from making the re-Distribution of the Modified Source Code.

6. Developer with the Patch for Modification. Provided, however, that the Distributor of Modification shall be obligated to confirm that the System Developer is the Source Code User duly licensed under Article 4.1.

7. The Distributor of Modification may perform the Vicarious Execution of Patch Processing for the System Developer.

8. The System Developer shall not distribute the Modified Source Code in further modified form to any third party as a stand-alone software product.

9. The System Developer may, under the same obligation as imposed in Article 4.5, make the Embedded Product available for the End User through use of the Patch for Modification distributed by the Distributor of Modification or the Derivative Works obtained through the Vicarious Execution of Patch Processing.

Article 6. Distribution and Registration of the Ported Source Code

1. The Source Code User and the System Developer may, whether with or without charge, distribute to any third party only the following parts of the Ported Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware:

1. The Hardware-dependent Part and/or Compiler-dependent Part; provided that the Source Code User and the System Developer shall inform T-Engine Forum of, and T-Engine Forum may publish, a method for distributing said Part(s) to third parties.

2. The Header File; provided that the Header File shall be distributed together with the Binary Code of the Ported Source Code.

2. Any member of T-Engine Forum may request T-Engine Forum to register and distribute, as an original source code for T-Kernel, the Ported Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.

3. Any member of T-Engine Forum who requests the distribution mentioned in the preceding paragraph shall accede to the following conditions:

1. The member shall confirm that the object hardware is the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.

2. The member shall provide T-Engine Forum with a complete set of operational environment for the object hardware and T-Kernel free of charge when requesting the distribution.

3. The member shall submit test results of the Ported Source Code to T-Engine Forum when requesting the distribution.

4. In the event that T-Engine Forum accepts the request mentioned in Article 6.2, T-Engine Forum shall register and distribute the Ported Source Code as the Source Code for T-Kernel. Provided, however, that the Ported Source Code may be treated in the same way as the Modified Source Code until the time of registration hereunder.

5. The provision set forth in Article 3 shall apply to the Ported Source Code registered in accordance with this Article.

Article 7. Use for Other Purpose

1. Any use of the Source Code, the Modified Source Code or the Ported Source Code other than those stipulated in Articles 4, 5 and 6 shall be subject to the prior approval of T-Engine Forum.

Article 8. Limited Warranty

1. T-Engine Forum and the copyright holder of the Source Code warrant that the Source Code does not infringe third party's copyrights. Provided, however, that T-Engine Forum and the copyright holder of the Source Code make no warranty as to the Hardware-dependent Part and/ or Compiler- dependent Part set forth in Article 6.2 in the Ported Source Code by any third party.

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2. In case of breach of this License Agreement by a member of T-Engine Forum, T-Engine Forum may take appropriate measures against the member; for example, the member is disqualified from membership, depending on what kind of breach has been committed by it.

3. Any legal dispute which may arise in relation to any breach of this License Agreement shall be subject to the exclusive jurisdiction of the Tokyo District Court.

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Feng Qin

Kevin Gibbs

John Estabrook

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The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files http://www.ietf.org/rfc/rfc1950.txt (zlib format), rfc1951.txt (deflate format) and rfc1952.txt (gzip format).

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
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(Applicable in the European Union and other European countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.

Correct disposal of batteries in this product

(Applicable in the European Union and other European countries with separate battery return systems.)

This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

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