WISENET

NETWORK CAMERA

User Manual

PNP-9200RH

CE

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 the contaminated area on the product surface with a soft, dry cloth or a damp cloth.
   (Do not use a detergent or cosmetic products that contain alcohol, solvents or surfactants or oil constituents as they may deform or cause damage to the product.)
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 a Listed Power Supply Unit marked "Class 2" or "LPS" and rated from 24 Vac (50/60 Hz) min.4.2 A.

WARNING

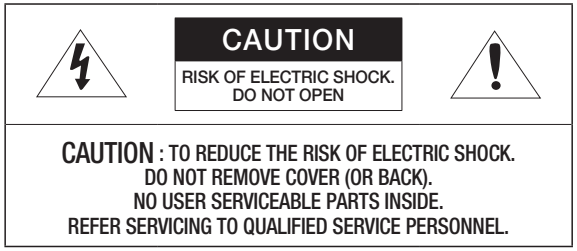
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENNINGS ON THE EQUIPMENT.

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.

Pan/Tilt/Zoom motors and slip ring are warrantied for one year under continuous operation.

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.

Class I construction

An apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

Battery

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

Disconnection Device

Disconnect the main plug from the apparatus, if it's defected. And please call a repair man in your location.

When used outside of the U.S., it may be used HAR code with fittings of an approved agency is employed.

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

ATTENTION

IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT.
METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX 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.

The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802-3af shall be a UL Listed device with the output evaluated as a Limited Power Source as defined in UL60950-1.

Unit is intended for installation in a Network Environment 0 as defined in IEC TR 62102. As such, associated Ethernet wiring shall be limited to inside the building.

Please read the following recommended safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not install on a surface where it is exposed to direct sunlight, near heating equipment or heavy cold area.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not place a glass of water on the product.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.
- Please wear protective gloves when installing/removing the camera.
  The high temperature of the product surface may cause a burn.

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.

In particular installation environments, there might be interference in radio communications. When interference of electromagnetic waves occurs between the product and radio communication device, it is recommended to keep a certain distance between the two or change the direction of the receiving antenna.

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RECOMMENDED PC SPECIFICATIONS

- CPU : Intel(R) Core(TM) i7 3.4 GHz or higher
- Supported OS : Windows 7, 8.1, 10, Mac OS X 10.9, 10.10, 10.11
- **Plug-in free web viewer**
  Supported web browsers : Google Chrome, MS Edge
  Support Codec : Video-H.264, MJPEG (Max. 1M 15fps)
- **Plug-in Webviewer**
  Supported web browsers : MS Explorer 11, Mozilla Firefox, Apple Safari 9 ※ Mac OS X only
- VGA : To play a 4K (3840 x 2160) resolution video at 30fps, a GPU that supports 3840 x 2160 resolution and 4K/H.264 decoding is required

RECOMMENDED SD/SDHC/SDXC MEMORY CARD SPECIFICATIONS

- Recommended capacity : 4GB ~ 128GB (HS class)
- For your camera, we recommend you use a memory card from the following manufacturers:
  SD/SDHC/SDXC Memory Card : Sandisk, Transcend

NAS RECOMMENDED SPECS

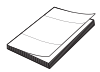
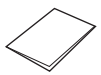
- Recommended capacity : 200GB or higher is recommended.
- Simultaneous access : One unit of NAS can accept a maximum of sixteen camera accesses.
- For this camera, you are recommended to use a NAS with the following manufacturer's specs.

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.

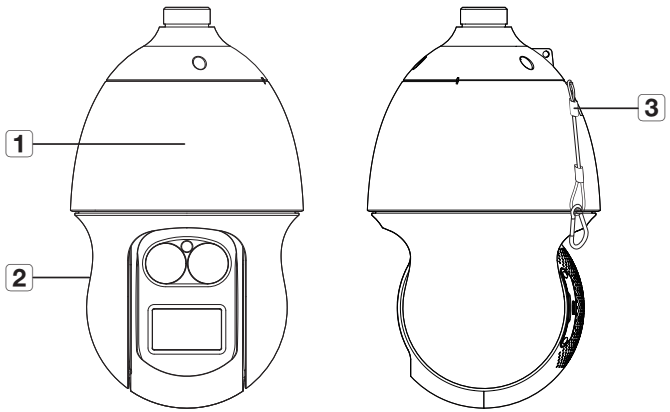
WHAT'S INCLUDED

Please check if your camera and accessories are all included in the product package.
(As for each sales country, accessories are not the same.)

Appearance	Item Name	Quantity	Description
	Main Body	1	
	Quick Guide (Optional)	1	
	Warranty card (Optional)	1	
	Cable for the testing monitor	1	Used to test the camera connection to a portable display device
	Hexagon screw	3	Used for attaching the installation base to the camera
	L Wrench	1	Used for fixing the installation base after attaching it to the camera
	Installation base	1	Bracket for mounting outdoors
	Waterproofing accessory	1	Install and use where there is high humidity.

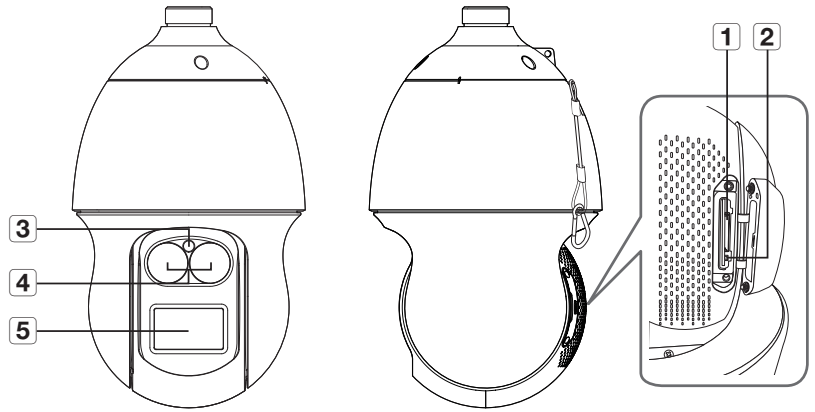
AT A GLANCE

Appearance



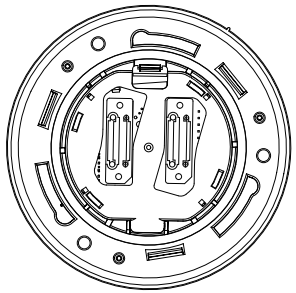
Item	Description
1 Main unit	Protects the internal PTZ mechanism from the direct sunlight, rain or external impact.
2 Shield cover	Shield cover for the lens and unit protection.
3 Safety Cable	The cable prevents the product from dropping during installation.

Inside

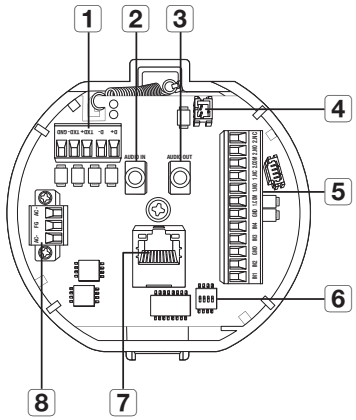


Item	Description
1 SD Memory Card Compartment	Compartment for the SD memory card. Refer to <**Inserting/Removing a SD Memory Card**> for the SD memory card insertion position. (page 15)
2 Reset Button	The button restores all camera settings to the factory default. Press and hold for about 5 seconds to reboot 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.
3 Illumination Sensor	Detects incoming light to control the IR LED.
4 IR LED	These infrared LED's are controlled by the illumination sensor.
5 Lens	Lens for the camera.

Bottom View of Installation Base



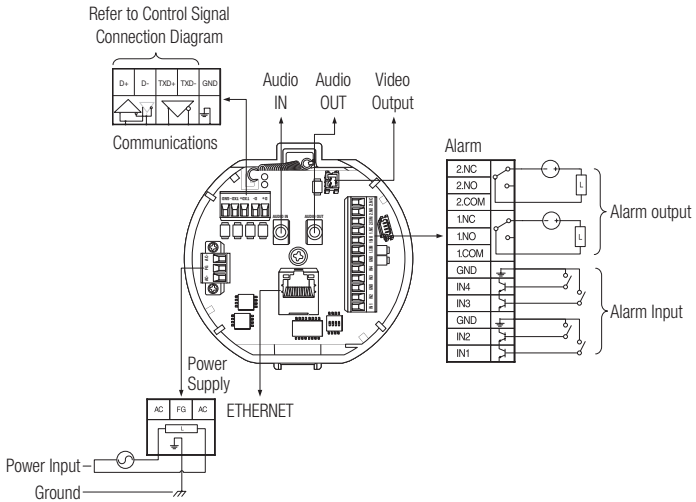
Inner View of Installation Base



Item	Description
1 Communications Ports	Used for RS-485/422 communications.
2 Audio Input Port	Used to connect the audio input cable.
3 Audio Output Port	Used to connect the audio output cable.
4 Video Out Port	Analog video output port. (for installation)
5 Alarm I/O Port	Used to connect the alarm I/O cable.
6 Communications Setup Switch	Set communication protocol (RS-485/422) and indicate whether to terminate.
7 Network Connections	Port for connection with the network using an Ethernet cable.
8 Power Port	Used to connect the power.

▪ **Camera Wiring Interface Board**

For the camera wiring, please refer to the picture below.

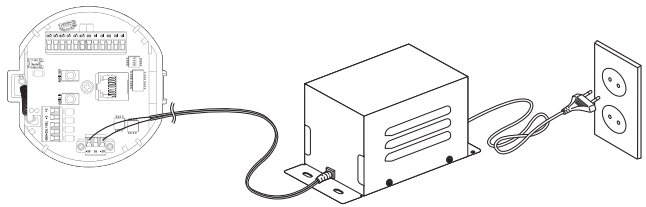


- Select Normal Open in the setup menu.
  - The sensor input is activated during a short for contact type, or when it is at "Low" level for the active type.
- Select Normal Close from the Setup menu.
  - The sensor input is activated when open for the contact type or when in high impedance state (open collector) for the active type.
- The maximum capacity of the alarm output terminal is 30V DC/2A, 125V AC/0.5A and 250V AC/0.25A.
- When connecting alarm input and output cables, be sure to connect one cable to each terminal respectively.
- To connect products over the camera's capacity, please use an additional relay device.
- If power and GND cables are connected inappropriately to the NC/NO or COM port, a fire or breakdown of equipment may occur.

CONNECTING WITH OTHER DEVICE

Preparing Adapter and Cable

- Connect the camera to the power adaptor. Then, plug the power cord of the adaptor to the wall outlet.



Check out the rated voltage and current before making connections.

Rated Power	Allowable Input Voltage	Current Consumption
AC 24V	AC 22V ~ 26V	6 A

- The product cannot be used at -50°C or below ambient temperature.
- The product may not be defrosted depending on the installation area at -50°C.
- Leave the product always turned on to maintain the internal temperature of -10°C or higher.
- After the product is left alone under a low temperature environment, it will take up to 1 hours to normally operate.
- The zooming speed of the IR dimmer may slow down at -40°C or lower environment.
- If the product is turned on after being exposed to -20°C or below environment for some time, reset the time.

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

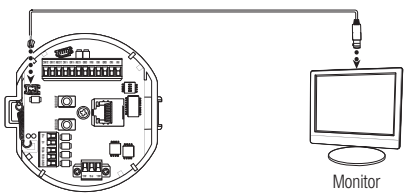
- As shown in the table above, you may encounter a voltage-sag depending on the wire length.
  If you use an excessively long wire for camera connection, the camera may not work properly.
  - Camera Operating Voltage: AC 24V±10%
  - Voltage drop measurements on the chart above may vary depending on the type and manufacture of the copper cable.

Ethernet Connection

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

Connecting the installation monitor

Connect the cable to the camera's rear video output terminal and the installation monitor's video input terminal.



- The wiring varies depending on your monitor type and peripheral devices; please refer to the user manual for each device.
- Please make sure the monitor and camera are turned off when connecting them.

- This product is a network camera that transfers video over a network; the video output terminal is used to set the imaging range of the camera at installation.
- Using the terminal for monitoring purposes may cause problems such as degradation in video quality.
- It is not suitable for 24-hour monitoring using professional CRT monitors or TFT/LCD portable monitors.
- Use the network transfer screen for 24-hour monitoring and storage.

INSTALLATION

Preparing & Installing Camera Bracket

For installation guidelines for brackets and housings, refer to the installation manual that is enclosed with the bracket or housing.

- **Available Bracket Models**

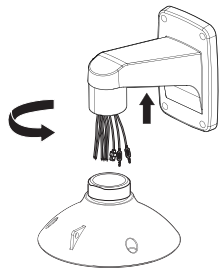
Model	Item
SBP-300WM1	Wall Mount
SBP-300WM	
SBP-300CM	Ceiling Mount
SBP-300LM	Parapet Mount
SBP-300KM	Corner Mount
SBP-300PM	Pole Mount

- See "**Optional Accessories for Installation**" for the appearance of each bracket (unbundled). (page 13)

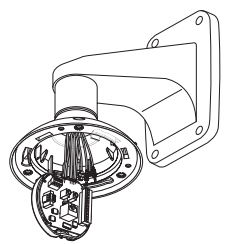
Installing by wall mount

- **Fix the installation base with the bracket**

1. Fix the base with the bracket by turning it clockwise.



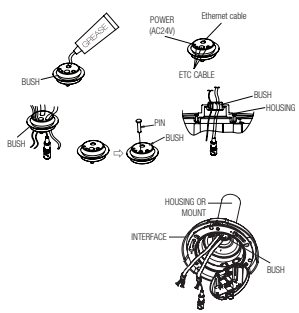
2. As shown in the picture below, gently press and lift up the handle of the hinged door on the bottom of the installation base. Please refer to the "**Camera Wiring Interface Board**" on page 10, connect the wires.



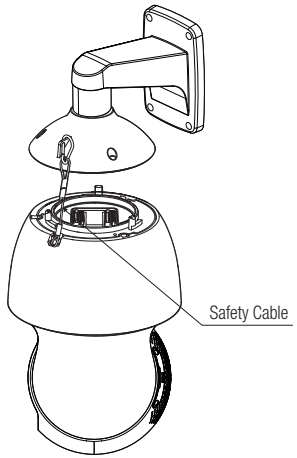
- Do not connect the camera to a power outlet until the installation is complete. Supplying power while the installation is in progress may cause fire or damage the product.

Check cable connection method and install.

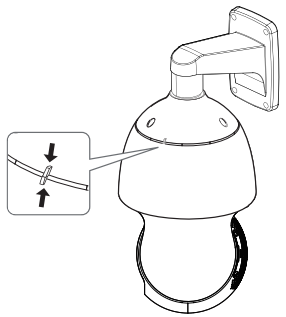
- Note that **BUSHING**s are provided for outdoor installations where exposed to a moisture condition through the **PIPE** or **MOUNT**, install the **HOUSING** using the **BUSHING** to prevent moisture entering.
  - Apply grease of proper dose on the **BUSHING** before assembling, and run cables through each hole of the bushings. Use **PINS** to stop up empty holes having no cable running.
  - Assemble the **BUSHING** to the top side of **HOUSING**'s inside as shown in the diagram below. At the moment, apply pressure evenly on the **BUSHING** to secure it tightly to the **HOUSING** as shown in the diagram.



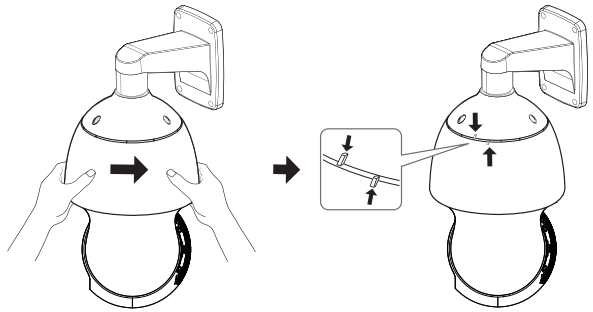
3. Connect the camera safety wire to the installation base.



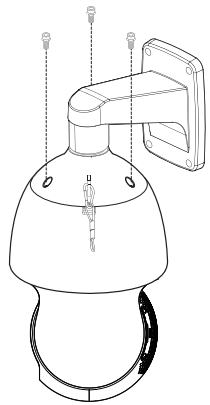
4. Assemble Camera and Installation Base
Assemble the installation base and camera by matching the installation direction guides.



5. Attach Camera
Rotate the main body of the camera clockwise to position the reference mark in the upper section and the lower section as shown in the figure.



6. Secure Camera and Installation Base
As shown in the picture below, secure the installation base and camera using 3 hexagon screws.



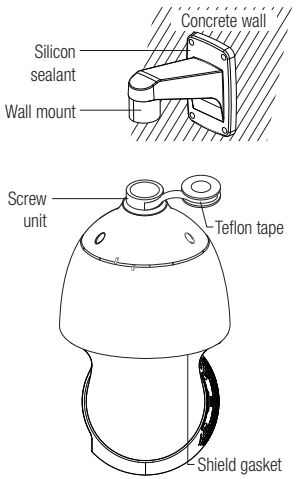
Notes for Waterproofing

This model is an integrated housing product for outdoor installation.

▪ When combining the main body and the wall mount for installation on the wall

1. Install the wall mount on the vertical wall. When it is installed on an inclined wall, moisture may permeate into the main body through the external cable.
2. Wrap the screw part of the housing with a sufficient amount of Teflon tape for assembly.
3. Please make sure that the gasket is not disassembled from the shield cover when the shield cover is separated and mounted on the housing body.
4. Install the wall mount adapter for waterproofing, and apply the silicon sealant between and around the wall and wall mount for sealing.

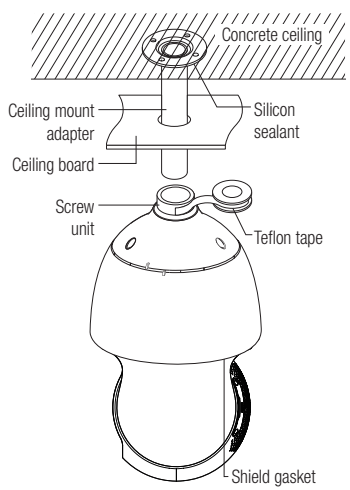
▪ Take particular caution to ensure that there is proper sealing if the installed side is not flat.



▪ When combining the main body and the ceiling mounting adaptor for installation on the wall

1. Wrap the screw part of the housing with a sufficient amount of Teflon tape for assembly.
2. Please make sure that the gasket is not disassembled from the shield cover when the shield cover is separated and mounted on the housing body.
3. Install the ceiling mount adapter for waterproofing, and apply the silicon sealant between and around the wall and ceiling mount for sealing.

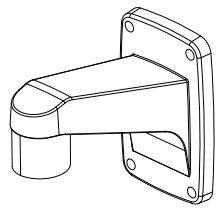
▪ Take particular caution to ensure that there is proper sealing if the installed side is not flat.



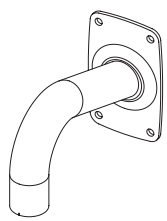
Optional Accessories for Installation

For your easier installation, you can purchase appropriate optional accessories available.

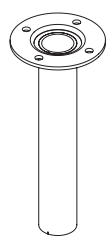
1. If installing the camera on the wall
   - Wall mount (SBP-300WM1)



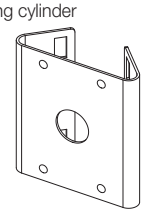
   - Wall mount (SBP-300WM)



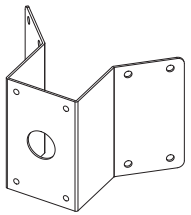
2. If installing the camera on the ceiling
   - Ceiling Mount (SBP-300CM)



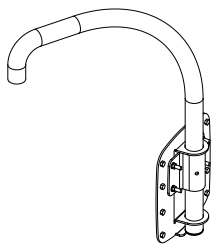
3. If installing the wall mount (SBP-300WM/SBP-300WM1) on an at least 80mm-long cylinder
   - Pole Mount (SBP-300PM)



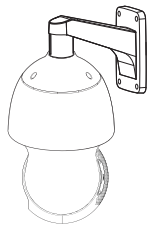
4. If installing the wall mount (SBP-300WM/SBP-300WM1) on a corner of the wall
   - Corner Mount (SBP-300KM)



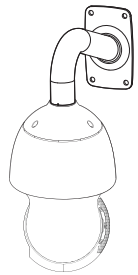
5. If installing on a building rooftop
   - Parapet Mount (SBP-300LM)



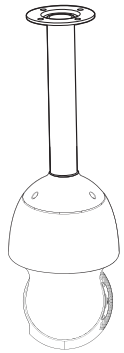
▪ **Mount Joint**



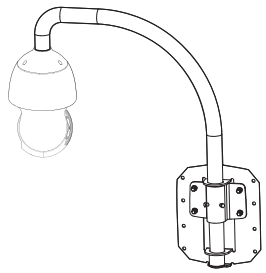
Wall mount (SBP-300WM1)



Wall mount (SBP-300WM)



Ceiling Mount (SBP-300CM)



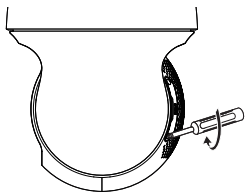
Parapet Mount (SBP-300LM)

INSERTING/REMOVING A SD MEMORY CARD

- Disconnect the power cable from the camera before inserting the SD memory card.
- It is not recommended to remove the SD memory card in rainy or highly humid weather.
- Tighten the screws when assembling the camera body, shield cover and SD holder bracket to prevent moisture penetration.
- When mounting or dismounting an SD memory card, place the main body on the floor first to prevent part loss and falling accident.

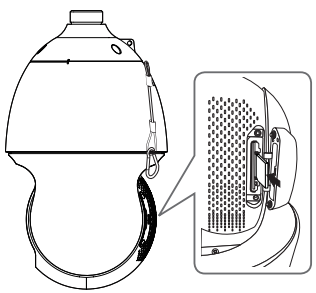
Inserting a SD Memory Card

1. Unfasten two screws on the SD holder bracket by turning them counterclockwise using the driver.



- Do not remove the screws.

2. Pull up the SD holder bracket and push the SD memory card to the arrow direction as shown in the figure.



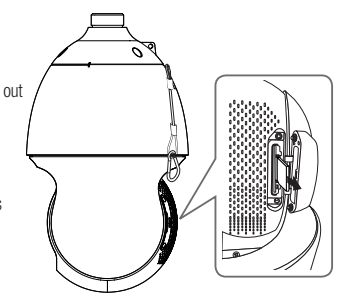
- Do not insert the SD memory card while it's upside down by force. Otherwise, it may damage the SD memory card.

3. Assemble the camera in the reverse order of disassembly after the SD memory card is inserted.

- Tighten the screws when assembling the camera to prevent moisture penetration.

Removing a 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 SD memory card can cause the card to shoot out uncontrollably from the slot when released.
- To turn off the camera or remove the SD memory card, set the card to <**Off**> in <**Storage**> menu and press the [**Apply**] button. (page 51)
- If you turn off the camera or remove the SD memory card that contains data from the product, the data may be lost or damaged.

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 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:
SD/SDHC/SDXC Memory Card : Sandisk, Transcend

It is recommended to use a 4 to 128GB (HS class) memory card for this camera.

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

Memory Card Use

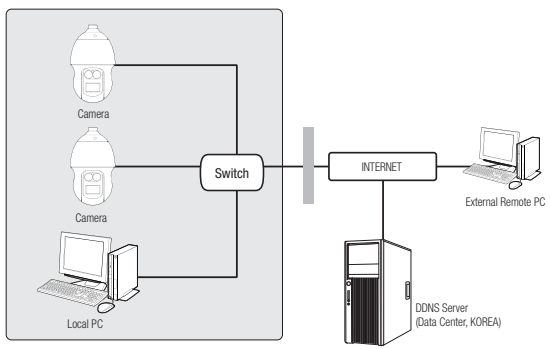
SD and SDHC/SDXC memory cards feature a switch that disables writing data on to the media.
Having this switch to the Lock position will prevent accidental deletion of data stored in the memory card but at the same time will also prevent you from writing data on to the media.

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

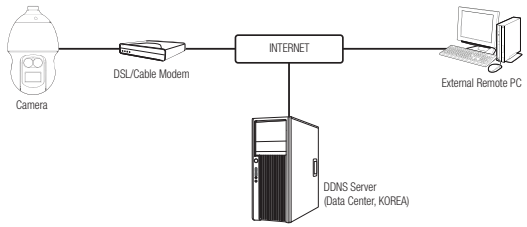
1. Launch an Internet browser on the local PC.
2. Enter the IP address of the camera in the address bar of the browser.



<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, VNP 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 18)

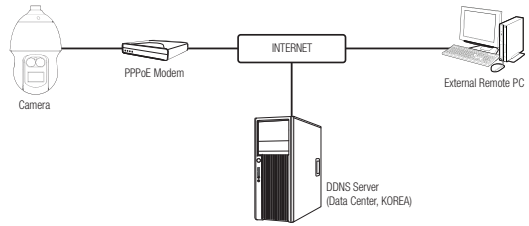
CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM



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 47)
- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 48)
- Refer to "**IP & Port**" for how to setup IP. (page 36)

CONNECTING THE CAMERA DIRECTLY TO A PPPoE MODEM

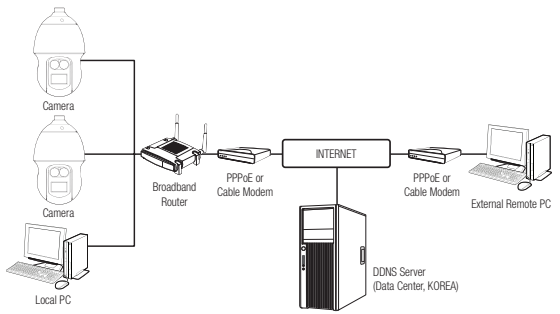


1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to [**Setup**] page.
5. Move to [**Network**] – [**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 47)
- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 48)
- Refer to "**IP & Port**" for how to setup IP. (page 36)

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**>:

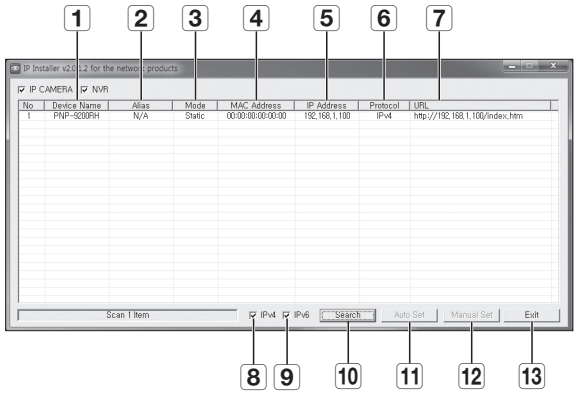
  ex1) If the address (LAN IP) of the Broadband Router is 192.168.1.1
  IP address : 192.168.1.100
  Subnet Mask : 255.255.255.0
  Default Gateway : 192.168.1.1

  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 20)

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".
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 Hanwha Techwin web site.

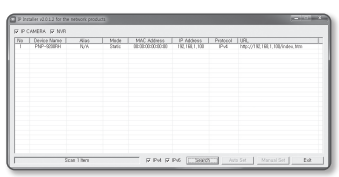
STATIC IP SETUP

Manual Network Setup

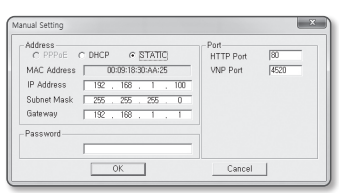
Run <**IP Installer_v2.XX.exe**> to display the camera search list.
At the initial startup, both [**Auto Set**] and [**Manual Set**] will be grayed out.

- 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.
   <**IP Address**>, <**Subnet Mask**>, <**Gateway**>, <**HTTP Port**>, and <**VNP Port**> of the camera are displayed in the preset values.
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.

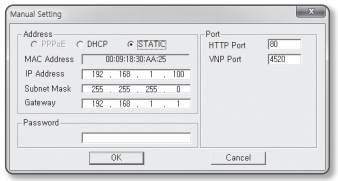


- IP related parameters can be set only when DHCP is not checked.

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.
   - VNP 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.

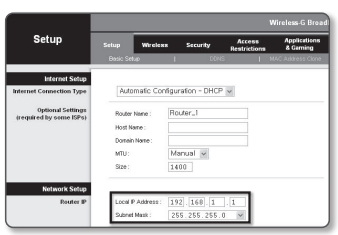


- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- If you want to change the password, refer to "**Administrator password change**" of the user setup. (page 35)

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 20)

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 VNP Port	8080 4520	8081 4521

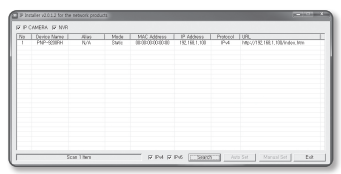
- If the <**HTTP Port**> is set other than 80, you must provide the <**Port**> number in the address bar of the Internet browser before you can access the camera.
  ex) http://IP address : HTTP Port
  http://192.168.1.100:8080

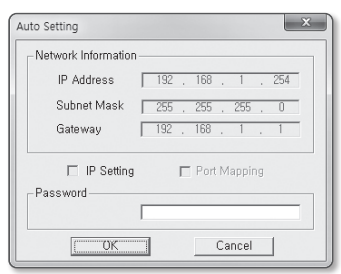
Auto Network Setup

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 35)

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

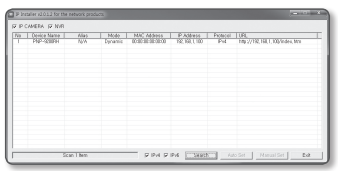
DYNAMIC IP SETUP

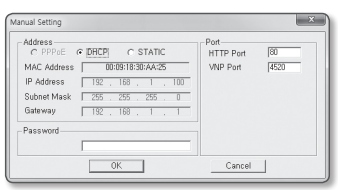
Dynamic IP Environment Setup

- 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**>.



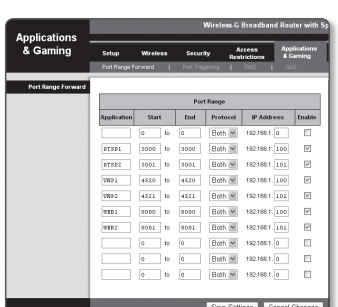


PORT RANGE FORWARD (PORT MAPPING) SETUP

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.
   The number of each port to be configured to the IP router should be set according to the port number designated in <**Setup**> - <**Basic**> - <**IP & Port**> on the camera web viewer.



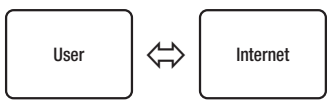
3. When done, click [**Save Settings**].
   Your settings will be saved.

- 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

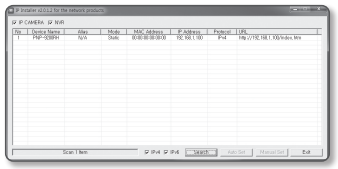
Camera1 (192.168.1.100)	
HTTP port	8080
Device port	4520
RTSP port	3000

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 <**Wisenet 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.

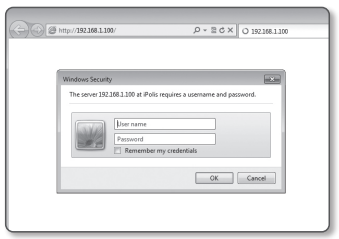
1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.
2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar.
   ex)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

- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 48)

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://ddns.hanwha-security.com/ID
   - the Login dialog should appear.

▪ Network connection is disabled in the LAN only environment.

Connecting via UPnP

1. Run the client or operating system in support of the UPnP protocol.
2. Click the camera name for search.
   In the Windows operating system, click the camera name searched from the network menu.
   - The login window is displayed.

Connecting via Bonjour

1. Run the client or operating system in support of the Bonjour protocol.
2. Click the camera name for search.
   In the Mac operating system, click the camera name searched from the Bonjour tab of Safari.
   - The login window is displayed.

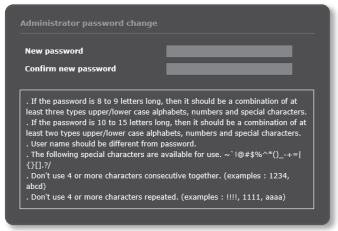
To check the DDNS address

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 http://ddns.hanwha-security.com and register your device first, and then set the Web Viewer's <**Network**> - <**DDNS**> to <**Wisenet DDNS**>, as well as providing <**Product ID**> that had been used for DDNS registration.

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.

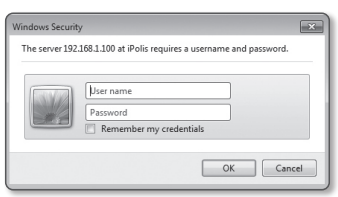


- For a new password with 8 to 9 digits, you must use at least 3 of the following: uppercase/lowercase letters, numbers and special characters. For a password with 10 to 15 digits, you must use at least 2 types of those mentioned.
  - Special characters that are allowed. : ~`!@#$%^*()_-+=|{}[].?/
- For 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.

PLUG-IN SUPPORT SPECIFICATIONS FOR EACH BROWSER

The existing plug-in web viewer and a new plug-in free web view is embedded together.
Therefore, it is possible to use the web viewer even in the latest browser environment that does not support plug-ins such as Chrome and EDGE.
According to the browser environment, the following differences may be observed.

- **Chrome, EDGE browser** : Although they don't support plug-ins, you can use a web viewer as a plug-in free web viewer is embedded.

- As the plug-in free webviewer has lower performance than the plug-in webviewer, it has a limit on the monitoring of high quality profiles and playback of saved videos.
  To monitor high quality profiles and play saved videos, use either a plug-in webviewer or SmartViewer.
  - Plugin-free webviewer : The optimal profile for the plugin-free webviewer is as follows.
    H.264 - 1280x720 20fps
    H.265 - 800x600 30fps
  - Plug-in free profile generation conditions: If the selected profile exceeds the optimal plugin-free resolution, an optimal resolution profile is automatically created and monitored.
  - Plug-in free playback conditions: A recorded video with an HD resolution or lower

- **IE, Firefox, or Safari browser** : You can use a web viewer even if you don't install the existing plug-in web viewer.

- To monitor/play saved video seamlessly, you are required to install a plug-in.

INSTALLING WebViewer PLUGIN

To access to the plug-in webviewer and play a live video (H.264/H.265) or a recorded video, an installation message will be prompted. At this time you need to install the webviewer plug-in to use the function properly.

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.

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

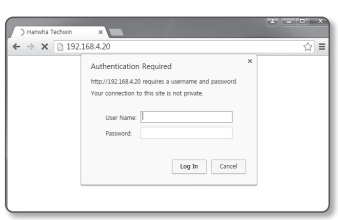
4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed.
   Click [**Yes**] when the notice window is displayed.
5. Click [**OK**].
   The old version of Web Viewer Plug-in is deleted.
6. Click [**Install**] to begin installation of the Web Viewer Plug-in.
7. Click [**Finish**].
   Web Viewer Plug-in installation is completed.

> ▪ In your internet explorer, if you need to move to the installation screen after installing the 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.

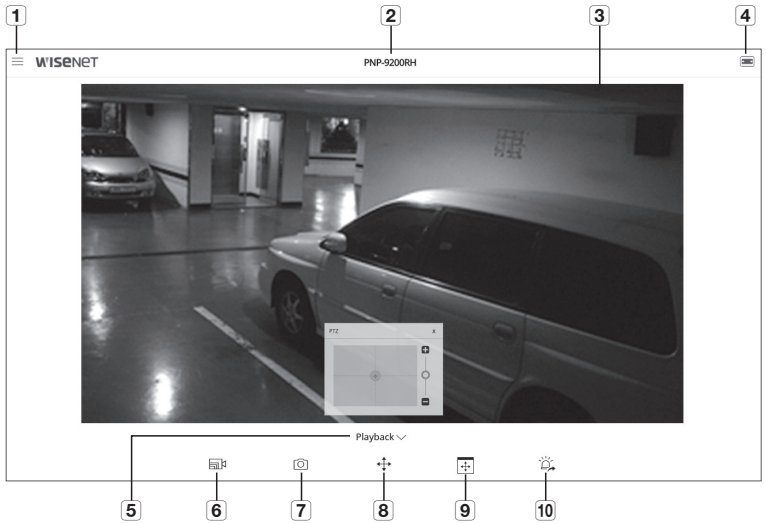
USING A PLUG-IN FREE WEBVIEWER

If you access the camera from Google Chrome or MS Edge web browser, you can check and control the camera image in real time without installing separate plug-in(s).

1. Enter your username and password to log in.
2. When you are logged in, a camera live view screen appears.



USING THE LIVE SCREEN (PLUG-IN FREE WEBVIEWER)



Item		Description
1 Setup		Move to the Setup screen.
2 Camera Model Name		Displays the model name of the camera accessed.
3 Viewer Screen		Displays the Live video on the screen. ▪ You can use the mouse wheel to activate the digital zooming in Viewer screen.
4 Switch View Mode	Flt ( )	A view mode in which the size of the camera video automatically fits to the web browser size.
	Original Size ( )	View mode in which the video is played in the actual resolution.
	Aspect Ratio ( )	View mode that adjusts the aspect ratio to best fit the resolution.
	Full Screen	Double click on the video screen, and the current video will be played in the full screen of the monitor.
5 Playback		Move to the screen where you can search for the video recording saved in your SD memory card or NAS. ▪ To search a recorded video, go to the play screen, place the mouse over the video and double click.

Item	Description
6 Profile type	You can select a profile type in <**Video profile**> under the <**Basic**> setup menu. ▪ Click the icon to display the name of the current profile. ▪ Afterimages can be displayed on the screen under the following conditions if the video is played in the monitoring page: - The resolution is changed due to a profile change. - Incoming data is being slowed due to a network delay when the profile is changed. - The web browser window size and location is changed.
7 Capture	Saves the snapshot as an image file in the png format.
8 Switch PTZ mode	Switches the camera to the Digital Zoom/PTZ mode.
	Switches to the digital zoom mode.
	Switches to the PTZ mode.
9 PTZ Control	It is a function that displays the control panel for the PTZ control. Pan and tilt functions can be used within the rectangular area, and the slide function enables use of zoom. It can also be used in full screen.
10 Alarm output	Activate the Alarm Out port.

To capture the snapshot

1. Click [**Capture (**)] on the scene to capture.
2. When a captured video is saved, a notification message appears.
   The captured image is saved in the designated folder for each browser.

To fit the full screen

1. Place the mouse over the video and double click.
2. This will fit the Viewer to the full screen.
3. To exit the full screen mode, press [**Esc**] on the keyboard.

To control PTZ

1. Switch to full screen.
2. Press the [ ] button at the bottom to enter PTZ mode.
3. You can use the Preset, Swing, Group, Tour, Trace, Tracking, Auto Focus and Digital Zoom functions using the icons on the first page.
4. You can use the Near, Far. Zoom in, Zoom out, Area Zoom, Goto 1x, Prev and Next functions using the icons on the second page.

To control Move and Optical Zoom

- To move the screen using the PT function, click and drag in the desired direction.
- To optically zoom in/out, use the +/- icon at the bottom.

To use a preset

- Select the preset button at the bottom, and you can use the home position function and presets.
- Click the Preset icon and select Home Position, and you will be moved to the home set.
- If there is a preset saved and you select it, the selected preset will be activated.
- Click the + button to add a preset.

To use a sequence

- From the setup page, run Swing, Group, Tour or Trace on a saved item. (page 37)
- Select an icon and click an item, and the selected function will be activated.

To use the tracking function

- If you select Auto Tracking, auto tracking mode will be enabled and it will track a moving object automatically.
- If you select the manual locking mode, manual mode is activated and you can click on an object to track.

To use Area Zoom

- Click the Area Zoom icon, and a reference point will be displayed in the center of the screen. Then, you can drag a block on an area you want to zoom in to.
- To disable Area Zoom, click the activated (colorized) Area Zoom icon again.
- Click the 1x icon to switch the zoomed-in magnification to the current magnification.
- Move to the previous or next setup using the Prev/Next icon.

USING THE LIVE SCREEN (PLUG-IN WEBVIEWER)



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 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 Webviewer plug-in installation	You can install webviewer plug-ins to play a live video or a recorded video.
7 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. ! Afterimages can be displayed on the screen under the following conditions if the video is played in the monitoring page: - The resolution is changed due to a profile change. - Incoming data is being slowed due to a network delay when the profile is changed. - The web browser window size and location is changed.

Item	Description
8 Screen Optimization	The video size of the camera will switch to as big as the Web browser.
9 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.
10 Full Screen	Switch the current video to the maximum size of the monitor.
11 Capture	Saves the snapshot as an image file in the .jpg format.
12 Manual recording	The user can save the video on the PC.
13 Audio/Microphone Control	Enable Audio and Microphone are control the Audio volume. ▪ Only the Audio volume can be controlled.
14 Alarm output	Activate the Alarm Out port.
15 Pixel Counter	Checks the number of pixels in the selected area on the video screen.
16 PTZ	Controls the Pan/Tilt/Zoom motion of the camera.
17 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.
   The captured image is saved in the designated folder for each browser.

▪ If the screen is not captured by IE browser in Windows 7 or higher, 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.

▪ You can save the recorded file on the PC in an avi file format. Designate a path and save the video.

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.

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 Use Microphone

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

▪ This function is not supported on Safari browsers running on Mac OS X.

To count the number of pixels

1. Click the [**Off**] icon to activate it.
2. Drag the mouse on the video to select an area.
3. The number of pixels in the selected area is displayed on the screen.

To control the PTZ

1. Press the [**PTZ (** **)**] tab.
2. Move the jog dial [ ] on the Move Screen pad to move the camera direction, or zoom in or out by moving the bar on the right side of the UI up or down.

▪ For further details on PTZ use, refer to "**PTZ setup**". (page 37)



To run a sequence

- : Run a saved preset.
  Refer to "**To configure the detailed settings for the preset**" for details of preset setting. (page 37)
- : Run a saved swing.
  Refer to "**To configure the swing settings**" for details of swing setting. (page 38)
- : Run a saved group.
  Refer to "**To set a group**" for details of group setting. (page 38)
- : Run a saved tour.
  Refer to "**To configure the tour settings**" for details of tour setting. (page 38)
- : Run a saved trace.
  Refer to "**To set the tracing function**" for details of trace setting. (page 39)
- : Run a saved home position.
  Refer to "**To add the home position**" for details of home position setting. (page 37)
- : Configure preset.
  For details on preset configuration, see "**To configure the detailed settings for the preset**". (page 37)

To enable the Area Zoom mode

- : For zoom movement, click and drag to the location on the screen that you want to move to.
- : Change the current zoom factor to x1.
- : Return to the previous area and settings.
- : If navigated with Prev, it is switched to area and setting before navigation.

To use the auto tracking function

- : Run auto tracking action for the set tracing time.
  Refer to "**Auto tracking setup**" for detailed setting methold. (page 39)

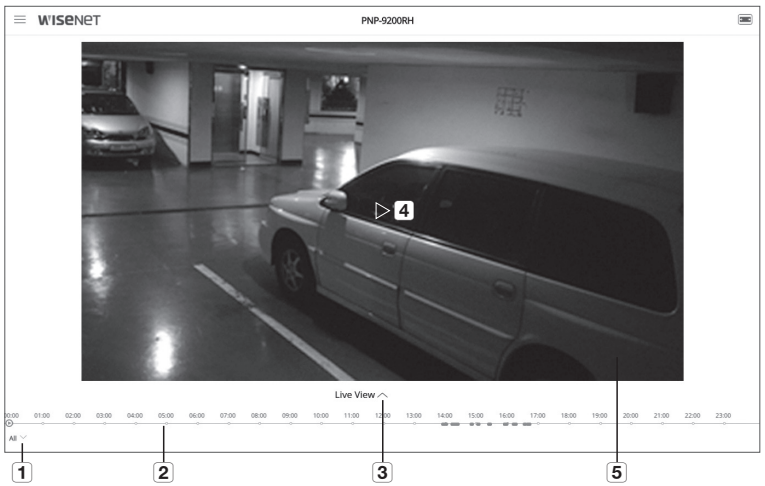
To use the Lock-On function

Right-click on a video, and select the object of auto tracing manually.

PLAYING THE RECORDED VIDEO (PLUG-IN FREE WEBVIEWER)

- Before you can play the video, you must configure the record settings. For details on record settings, refer to "**Storage**". (page 51)
- To search a date-specific recorded video, move to the play screen, place the mouse over the video and double click.

Name of event search screen and its function



Item	Description
1 **Search event setting**	Set the event type to search within the search period.
2 **Time Bar**	Move the time bar to play the video at a desired time.
3 **Move Menu**	You can toggle between the Live and Play Recorded Video menu.
4 **Play**	Plays/Pauses the video.
5 **Full Screen**	Double click on the video screen, and the current video will be played in the full screen of the monitor.

To play the content after searching by event



1. On the live screen, click the [**Show ( )**] button.
2. If there is a video recorded on the date of search, the applicable video is displayed on the time bar.
3. To perform event-specific search, click the [**All**] button at the bottom of the time bar to select an event type.
4. Click the [**OK**] button.
   Event searched is displayed on the time bar.
5. Click the [**Play ( )**] button.
6. To pause the video, click the [**Pause ( )**] button.

Name of time search screen and its function



Item	Description
1 **Setup**	Move to the Setup screen.
2 **Video Information**	Displays the time information of the video played.
3 **Play Speed**	Controls the play speed.

Item	Description
4 Capture	Saves the video currently played as an image file in a jpg format.
5 Search Date Settings	Sets a desired time and date on the calendar. ■ The data on which a video is saved is circled under the date.
6 Switch View Mode	Switches the size of image displayed on the screen.
7 Play	Plays/Pauses the video.
8 Move Playback Interval	Click the ◀◀/▶▶ button to move 1 frame forward/backward.
9 Time Bar	Move the [**Time Bar (** ⊙ **)**] to play the video at a desired time.
10 Search Event Settings	Set the type of event to search in the search field.
11 Search Event	Displays the type and time of an event searched.

To play after searching by time

1. On the live screen, click the [**Show (** ∨ **)**] button.
2. Place the mouse over the video and double click.
   The screen changes to full screen.
3. Click the [**Search (** 🔍 **)**] icon.



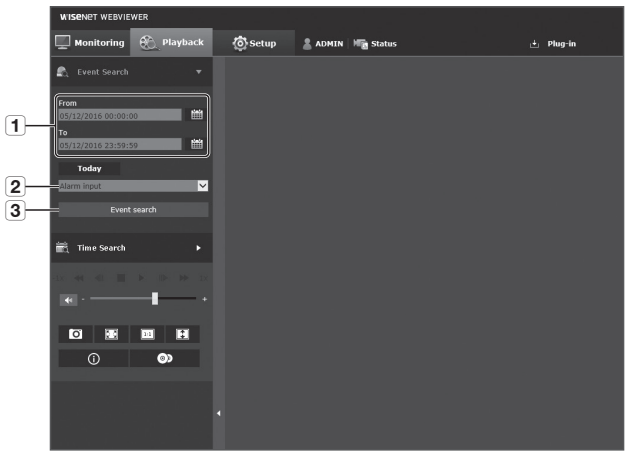
4. On the calendar, set the search date, start time and end time.
   The event searched is displayed on the time bar.
5. To perform an event-specific search, click the [**All**] button at the bottom of the time bar to select an event type.
6. Click the [**Play (** ▷ **)**] button.
   The video at the selected time will be played.
7. When a video is played, the recording time of the video currently being played is displayed.
8. Search the video forward and backward and adjust the playback speed.
   - How to Move Playback Interval
     Select the ◀◀/▶▶ button to move 1 frame forward/backward.
   - How to Control Playback Speed
     When you click the 1x, 2x, 4x, or 8x button, the playback speed increases accordingly.
     When you click the -1x, -2x, -4x, or -8x button, the playback speed decreases -1x, -2x, -4x or -8x and the rewind speed increases.
9. Move the position of the [**Time Bar (** ⊙ **)**] to play the video at a desired time.



PLAYING THE RECORDED VIDEO (PLUG-IN WEBVIEWER)

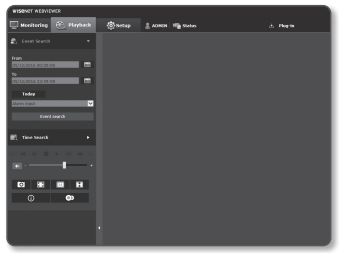
■ Before you can play the video, you must configure the record settings. For details on record settings, refer to "**Storage**". (page 51)

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 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 SD memory card or NAS on the day, it is marked as a box on the calendar.
3 Audio	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.
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 SD memory card or NAS. ■ You can set up to 5 minutes for the backup of a saved video.

To play after searching by time

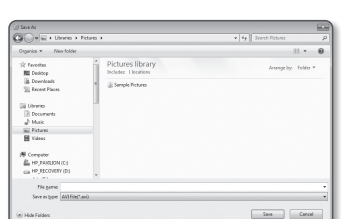


1. Click [**Time Search (**)].
2. Click a desired date in the calendar.
   The video on the specified date will be played.
3. If the video playback is stopped, select a time and click [**Play (**)].
   The video on the selected time will be played.
4. While the video is being played, the recording time 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 you select the ◀◀ button, the playback speed decreases -1x, -2x, -4x or -8x and the rewind 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

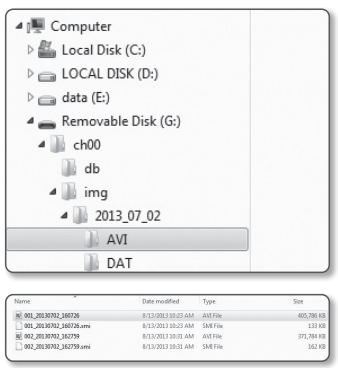
(1) SD memory card

1. Separate the SD memory card from the camera.

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

2. Insert the 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 SD memory card cannot be replayed in the Web Viewer's [**Playback**].

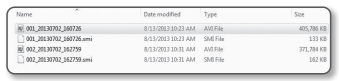


(2) NAS (Network-Attached Storage)

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 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

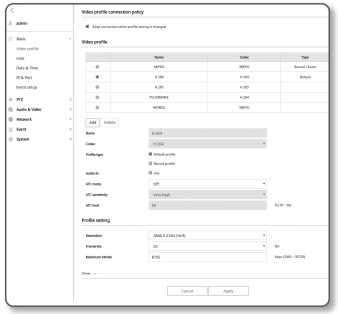
You can configure basic camera information, PTZ, video and audio, network, event and system settings on the network.

1. On the live screen, click the [**Menu (☰)**] button.
2. On the menu list, click the [**Setup (⚙)**] tab.
3. The Setup screen appears.

BASIC SETUP

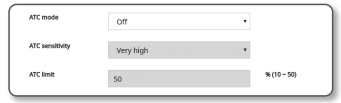
Video profile

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 : Output uses the same settings even when the settings of the active profile are changed.
     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 34)
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 that is applied to video recording.

6. Select whether or not to input audio in the video.
   Select the <**Audio-In**> check box and you can input audio in the video.
7. 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.
     - Event(MD) : Activated when the motion detection (MD) event is set. Frame rate is adjusted when an event occurs.
       If no motion is detected in the surrounding area, the minimum amount of frames is output to save the bandwidth use.
     - 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 framerate	Control compression	Event(MD)
CBR	Compression	Framerate	Framerate

   - 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.

8. When done, click [**Apply**].

To Add/Change the Video Profile

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

1. In <**Video profile**>, click the <**Add**> button.
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 the <**Show**> button to display detailed items.
   - Resolution : Set the video size of the H.264/H.265 and MJPEG files.
   - Framerate : Set the max number of video frames per sec.

   ▪ The maximum available framerate will vary depending on the camera sensor mode settings.

Sensor	25 fps	30 fps
Framerate	1~25 fps	1~30 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/H.265 codec was selected. (One I-Frame + 0~Several P-Frames)
   - Profile : You can select the H.264/H.265 profiling method.
   - Entropy coding : Reduce the possible compression loss due to encoding.
   - Smart codec : Specify the use of Smart codec.

   ▪ You can use this when the bit rate control value is CBR. Detailed settings are configured in the Smart Codec on the Audio & Video tab. (Page 47)

   - Dynamic GOV : When the bit rate control is VBR in H.264/H.265 codec, it makes the GOV length automatically change to the set value of the maximum dynamic GOV.
   - 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(RTSP) : Specify the use of the RTSP 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/H.265 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/H.265 codec, you can determine the GOV length.
If you set a recording profile with H.264/H.265 codec, the GOV length will be framerate/2.

What is dynamic GOV?

Dynamic GOV is a function that enables the GOV to automatically change in a range from the set value of the minimum GOV length to the maximum dynamic GOV set value according to the situation of the video.

In a video with almost no motion, GOV operates with the dynamic GOV settings, which makes the bit rate of the entire video reduced. The I-frame is output right after a motion is detected and GOV operates with the GOV length settings until the motion disappears.

If you use this function, the GOV of a video operates with the minimum GOV length settings.

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.



   - 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.
     - Audio input/Audio output/Alarm output : You can enable/disable Audio input/Audio output/Alarm output in the live mode on the current user account.
     - PTZ control : Select <**PTZ**>.
     - Profile : If you select <**Default**>, you can only see the default profile video; if selecting <**All**>, you can see the full profile videos.

     - 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.

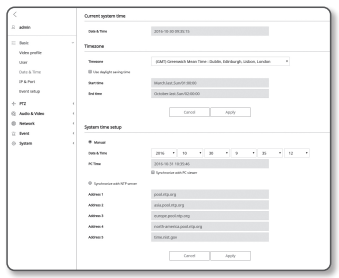
   - Guest setup : If you select <**Enable guest access**>, the guest account can access the Web viewer screen but can only view the live Viewer screen.
     - The ID/password for the guest account is <**guest/guest**>, which cannot be changed.
   - Authentication setup : If you select <**Enable RTSP connection without authentication**>, you can access RTSP without logging in and view the video.

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

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

Date & Time

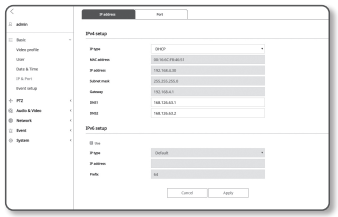
1. From the Setup menu, select the <**Basic (☰)**> tab.
2. Click <**Date & Time**>.
3. Specify the time and date that will be applied to the camera.
   - Current system time : Displays the current time settings of your system.
   - Timezone : Specify the local time zone based on the GMT.
   - Use daylight 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 : Sets the current time of the camera manually.
       When you select the <**Synchronize with PC viewer**> check box, the time of the webviewer is set to the time displayed on the PC that runs the webviewer.
     - Synchronize with NTP server : Sync with the time of the specified server address.
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. Click <**IP address**>.
4. 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.
5. 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**] to apply changes and the browser exits. After a while, connect again with the changed IP.



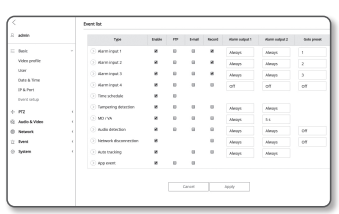
6. Click <**Port**>.
7. Type in each item in the Port menu as necessary.
   - Neither the port range between 0 and 1023 nor port 3702 is available.
   - HTTP : HTTP port used to access the camera via the web browser.
     The default is 80(TCP).
     - Setting the HTTP port for Safari and Google Chrome 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 Hanwha Techwin 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.

8. When done, click [**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**].

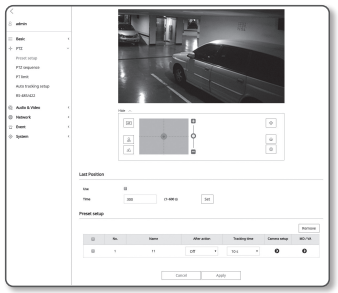
- To configure detailed event settings, click a desired type. You will be redirected to the detailed settings.

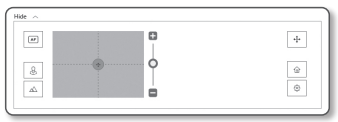
PTZ SETUP

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. Click the cursor [ ] on the screen moving pad to control movement of the screen.
   - Move screen: Scroll the cursor in the direction desired.
   - Control screen movement rate: The further away the cursor is from the center, the faster it moves on the screen.
5. 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.





6. Adjust the focus.
   - Manual focus (/) : Adjusts the focus of the screen for short distance or long distance.
   - Auto focus ( ) : The system sets the focus automatically.

- When performing the sequence action at a high or low temperature, the system may respond slower than the set rate for accurate sequence action.
- You can configure AutoTracking and MD/VA Function Addition in After Action mode on the Edit Preset page.

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

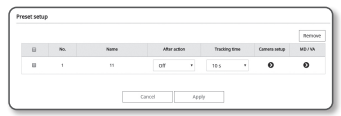
1. Select the preset number to delete.
2. Press the [**Remove**] button.

To move to a desired preset

1. Click preset number you want to move in the preset settings.

To configure the detailed settings for the preset

1. Select the number of preset that you want to configure.
   - After action : In <**After action**> mode, you can enable or disable the autorun/tracking/video analysis operation after activating the preset. (This setting does not apply in the swing function.)
     - Auto run : The sequence setting for auto execution is performed. If you turn off the function or if there is no auto-executing operation, the preset operation status is maintained. (This setting is not applied if preset is run with a group or tour function.)
     - Tracking : Performs AutoTracking operation for the period of time set in the tracking time.
     - 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 42)
   - 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 55)



2. When done, click [**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.

PTZ sequence

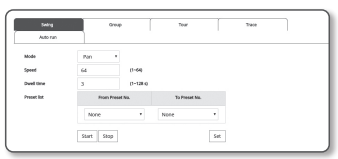
1. From the Setup menu, select the <**PTZ (✣)**> tab.
2. Click <**PTZ sequence**>.
3. Configure settings for swing, group, tour, track and autorun.



To configure the swing settings

Swing is a monitoring function that moves between two preset points and enables you to trace the motion.

1. Select <**Swing**>.
   The menu screen will switch to the swing setting screen.
2. Select a swing setting mode.
   - Pan : You can set the swing monitoring using the PAN function.
   - Tilt : You can set the swing monitoring using the Tilt function.
   - Pan&Tilt : You can set the swing monitoring only using both PAN and Tilt functions.



3. Set <**From Preset No.**> and <**To Preset No.**> to specify a swing range.

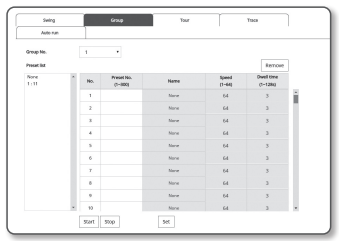
▪ When moving from the start time preset to the end time preset, it moves to the right on the screen. If you set <**Flip/Mirror**> to <**On**> in the video setup, it will move in the opposite direction. (Page 41)

4. Set movement speed and switching time.
5. Press the [**Set**] button.
   The first preset, the second preset, speed, and switching time are saved in accordance with the mode.
6. Press the [**Start**] button.
   It performs the swing operation.
7. Press the [**Stop**] button.
   The running swing will be stop.

▪ If you want to set the swing, then you need at least two presets set already.

To set a group

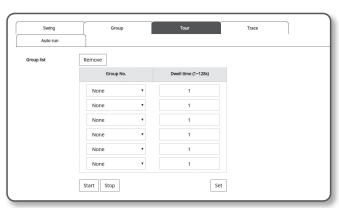
The group function enables you to group various presets before calling them in sequence. Six groups can save a total of 128 presets each.



1. Select <**Group**>.
   The menu screen will switch to the group setting screen.
2. Select a group setting mode.
   - Group No. : Select a group number.
   - Preset No. : Select a preset number.
   - Speed : Specify the speed of movement.
   - Dwell time : Specify the duration for which an operation is kept at the preset position.
3. Press the [**Set**] button.
   Saved in the bottom list.
4. Press the [**Start**] button.
   It performs the group operation.
5. Press the [**Stop**] button.
   The running group will be stop.
6. Press the [**Remove**] button.
   Selected group data will be deleted.

To configure the tour settings

The tour function enables you to call groups of your presets in sequence.



1. Select <**Tour**>.
   The menu screen will switch to the tour setting screen.
2. Configure the tour settings in detail.
   - Group No. : Select a group number.
   - Dwell time : Specify a waiting time before a new group is called.
3. Press the [**Set**] button.
   Saved in the bottom list.
4. Press the [**Start**] button.
   It performs the tour operation.
5. Press the [**Stop**] button.
   The running tour will be stop.
6. Press the [**Remove**] button.
   Selected tour data will be deleted.

To set the tracing function

Tracking remembers the trace of movements instructed using the direction button and reproduces it for your reference.



1. Select <**Trace**>.
   Changed to tracking settings menu screen.
2. Select a tracking number.
   The operation will be saved with display of the memory usage. The saving time differs, depending on the level of the PTZ operation.
   If memory is filled to 100% or the recording end configuration is not completed in 2 minutes from the beginning of saving, it will be automatically terminated.
3. Press the [**Set**] button.
   Selected tracing number will be saved.
4. Move the navigation path of saving using the pan/tilt/zoom.
5. Press the [**Stop**] button.
   Saving is terminated.
6. Press the [**Start**] button.
   Selected tracing number will be activated as set.

To set the auto run

This feature will activate the predefined sequence function if the user does not manipulate anything on the product for a certain time.



1. Select <**Auto run**>.
   Changed to autorun settings menu screen.
2. Select an auto run mode.
   - Home : It is moved to the home position.
   - Preset : It is moved to the selected preset number.
   - Swing : Automatically executes the operation in Swing mode.
   - Group : Automatically executes the operation in Group mode.
   - Tour : Automatically executes the operation in Tour mode.
   - Trace : Automatically executes the operation in Trace mode.
   - Auto pan : Automatically executes the 360° rotation in the pan direction.
     You can designate the tilt angle and speed.
   - Schedule: You can set autorun function by day / time. You can set the action in minutes, and the default setting is home position.
3. Set the start time of autorun. After selecting the mode, select time (5s/10s/20s/30s/1m/2m/3m/4m/5m).
4. Press the [**Set**] button.
   Selected operation will be performed automatically.

PT limit

You can specify restrictions on the pan or tilt function.



1. From the Setup menu, select the <**PTZ (✣)**> tab.
2. Click <**PT limit**>.
3. Decide if you want to limit the PT operations. If so, specify the details.
   - Mode : Select a mode to set between Pan limit and Tilt limit.
   - Use : Select whether to use limit in set mode.
   - Action : PT limiting operation is set.
     - [**Start**] : Start limit setting.
     - [**Enter**] : Provide the start and end points.
     - [**Exit**] : If you want to change the point setting, click this to return to the input dialog.
4. Set the Propotional PT mode.
   Pan and tilt speed is adjusted according to the zoom magnification. As the zoom magnification grows, the pan and tilt speed decreases.
   - Off : Turns off the zoom interworking mode.
   - Slow : The manual pan and tilt control speed is changed according to the zoom magnification. It slows down by 20%.
   - Normal : he manual pan and tilt control speed is changed according to the zoom magnification.
   - Fast : the manual pan and tilt control speed is changed according to the zoom magnification. It speeds up by 20%.

Auto tracking setup

You can set up as per setup environment as appropriate to camera auto tracking or change settings.

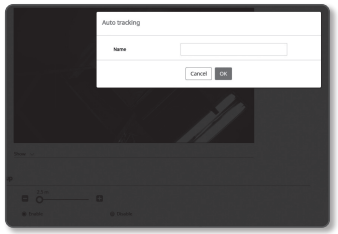


1. From the Setup menu, select the <**PTZ (✣)**> tab.
2. Click <**Auto tracking setup**>.
3. Set the camera auto tracing action.
   - Camera height : Set the height of the camera.
     Height settings as accurate as possible are needed for correct operations. (Range: 2.5 m ~ 30 m)
   - Zoom : Selects whether to include Zoom while auto tracking.
   - Maintain size : When Zoom selected, this designates the size step as you want to maintain within screen for tracked object.
   - Indicator display : Sets up whether to display the square indicator that shows what is tracked on video.
   - Area activaction : Sets up whether to activate auto tracking area you have set up. Auto Tracking function does not work in this area.
   - Auto mode
     - Unlimited : Starts auto tracking without time limit. When an object tracked but missed, it stands by on the position, and then starts tracking again when a moving object detected.
     - It ends when being unable to detect the object. : It ends auto tracking when the auto tracking missed an object. At this time, auto tracking does not start even when an moving object detected.

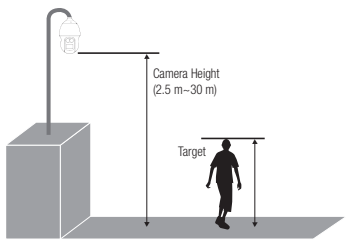
To set the auto tracking area

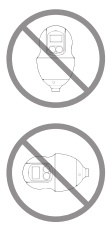
You can set up the area to be excluded from auto tracking objects. (You can set up to 8 non detection areas.)

1. Click <**Show**>.
2. Mouse-click on the image, and drag to set the desired area.
3. Enter name, and click [**OK**].



- Under the following conditions, auto tracking normally works.
  - Setup height : At least 2.5 m or over, Up to 30 m and less
  - Setup type : Level maintained indoor without slope or outdoor ceiling type
  - Tracked object : A person who is walking erect and moving on the horizontal plane (Height about 170 cm)





- It may be unable to track a target or lead to misoperations under the following situations.
  - When multiple moving objects exist in the shot area
  - When it is hidden or overlapped by other moving objects or facilities
  - When there is no little difference between moving object and background
  - An object too small or too large
  - When an object moves too fast or too slow
  - When a moving object passes right below the installed camera
  - When the moving route of a moving object is not the ground with the installed height as its standard
  - Bad weather such as strong wind, snow and rain
  - When the shot area is dark
  - When any sudden light changes exist
  - When there is light flash toward camera or shot area
  - When there is any light or light reflection toward the camera
  - When video shakes due to camera shaking
  - When lens cover and dimmer cover are stained or wet
  - When there is any change in the axis of camera lens

RS-485/422

Configure the controller connection so that the camera's PTZ can be controlled using the controller connected to the camera's RS-485/422 terminal.

1. From the Setup menu, select the <**PTZ (✣)**> tab.
2. Click <**RS-485/422**>.
3. Click <**Show**>.
4. Specify the serial port.
   The communication protocol used by the controller connected to the network camera can be set (RS-485/422).
   - Protocol : Select the same protocol version as the controller, choosing from SAMSUNG-T / SAMSUNG-E / PELCO-D / PELCO-P / PANASONIC / HONEYWELL / AD / VICON / GE / BOSCH.
   - Camera ID : Set the camera ID (1-255).
   - Baudrate : Set the RS-485/422 communication speed.
5. When done, click [**Apply**].



- For this operation, the network camera and controller must be properly connected. Also, the controller must have a serial port set to control the camera.

- There may be functions that are not supported depending on the controller or protocol specifications. Please see the following table for 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	
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	

Company	Protocol Name	Version
AD	RS-422/RS-485 Communications	REV.B
BOSCH	AutoDome Protocol	5/30/11
GE	Calibur ImpacNet(RS485 Protocol)	REV.4.01(05/21/2004)
HONEYWELL	ScanDomell Protocol	V1.05(02/11/2004)
PANASONIC	WV-CS950 Protocol	VER,4.0
PELCO-D	"D" Protocol	Ver.4, Rev.1(4/7/2004)
PELCO-P	"P" Protocol	
SAMSUNG-E	Samsung Protocol	Ver. 2.3(2006/09)
VICON	RS-422 Receiver Communications Protocol	Rev 404(4/08/04)

AUDIO & VIDEO SETUP

Video setup



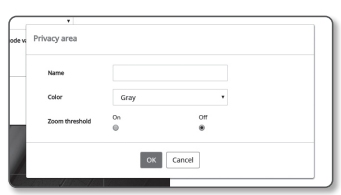
1. From the Setup menu, select the <**Audio & Video ( )**> tab.
2. Click <**Video setup**>.
3. Select a <**Video source**> mode.
   - Flip/Mirror : Displays the video from the camera upside down or reversely.
   - Digital Flip : This limits the vertical screen navigation range of the camera lens.
4. Select Able or Disable for the analog video output.
5. Select the video type.
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 33)

7. Specify the privacy zone.
8. When done, click [**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. When done, click [**Apply**].
3. Click <**Show**>.
4. Place the cursor at a point in the video and drag it to whatever you need.
   Move the set area to the center of the screen by controlling pan/tilt.
5. Check whether the area displayed on the screen matches the area you want to set, and then select a name and color.
   To disable the zoom threshold function, select <**Off**>.
6. 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 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.



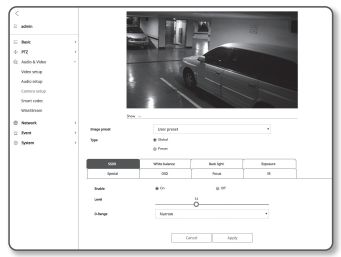
1. From the Setup menu, select the <**Audio & Video ( )**> tab.
2. Click <**Audio setup**>.
3. Set the audio input value.
   - Source : Sets the audio input.
     - Line : Connect the cable to the audio device.
     - External microphone : Uses an external microphone.
   - Apply power to Ext. Mic. : Select this check box when the external microphone is not powered, and the power will be supplied from the camera to the microphone. You can configure settings when selecting <**External microphone**>.
   - 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.
     - AAC : Acronym of Advanced Audio Coding, which is an international standard designed to be the successor of the MP3 format. You can use audio at a higher sampling rate than when you use the existing G.711 or G.726 codec.
   - Sampling rate : Refers to the number of times of sampling when digitalizing an analog soundtrack. The higher this value is, the better the sound quality is.
   - Bitrate : Set the bit rate to differentiate compression ratio if using G.726 codec.
   - Gain : Specify the audio input amplification.

> ■ Sound quality deterioration or howling may occur if the loudness of the sound source or gain value were set excessively.

4. Set the audio output level.
   - Enable : Sets whether to use audio output.
   - Gain : Specify the audio output amplification.
5. When done, click [**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 <**Audio & Video ( )**> tab.
2. Click <**Camera setup**>.
3. Configure the settings as necessary of : Image preset, SSDR, White balance, Back light, Exposure, Special, OSD, Focus, IR
4. When done, click [**Apply**].
   - ■ If a certain time (timeout: 240s) is elapsed with your not pressing the [**Apply**] button after changing the settings, your changes will not be applied.

If you want to set an image preset

Users can set presets easily.
The selected image preset mode will be in operation during the configured period, but at other times the values configured in the user preset mode are reflected.



1. Select a desired mode from the image presets.
   - Definition focus : This is the factory setting for your camera. Select it for video recording, focusing on reproducibility.
   - Motion focus : Record a moving object clearly. If there are many moving objects, such as on a road or in a crowded place like a museum, select this option.

> ■ Noise level can increase in a low illumination environment, and sensitivity can go down.

   - Reduced noise : Select this when you need a video with low noise in the low illumination environment.
   - Bright video : This makes the dark area in a full video brighter.

> ■ Video contracts effects are reduced.

   - Motion focus&Reduced noise : Use this when there are many moving objects, such as on a road or in a crowded place like a museum, or when you need a video with low noise in a low illumination environment.
   - Motion focus&Bright video : Use it when there are many moving objects, such as on a road or in a crowded place like a museum, or when you need to make a dark area in full video brighter.
   - Vivid video : Makes the entire video displayed in vivid colors.

> ■ The contrast of the video reduces and the color reproducibility becomes low.

   - User preset : Select it if you want to display video with settings chosen by you.

> ■ When selecting a mode other than the preset mode, you can't set the shutter speed, AGC, SSDR, SSNR and color.

2. Set the image preset type-specific camera items.
   - If you set the type to <**Preset**>, you can configure settings for SSDR, white balance, exposure compensation, special and focus.
3. When done, click [**Apply**].

Initial setting for each image preset mode

Image preset	Minimum shutter	Maximum shutter	AGC	SSDR	SSNR	COLOR
Definition focus	Default (1/5)	1/12000	Default (High)	Default (12)	Default (12)	Default (50)
Motion focus	1/30	1/12000	Default (High)	Default (12)	4	Default (50)
Reduced noise	1/15	1/12000	Middle	Default (12)	Default (12)	Default (50)
Bright video	Default (1/5)	1/12000	Default (High)	18	Default (12)	Default (50)
Motion focus&Reduced noise	1/30	1/12000	Middle	Default (12)	4	Default (50)
Motion focus&Bright video	1/30	1/12000	Default (High)	18	4	Default (50)
Vivid video	Default (1/5)	1/12000	Default (High)	18	Default (12)	90
User preset	Manual	Manual	Manual	Manual	Manual	Manual

- The preset setup functions as an aid to users to configure setup. If you don't want the preset function, deactivate it before use.
- If you change the image preset, only shutter/AGC/SSDR/SSNR/COLOR are reset to the default value for each model.
- The "**Camera Setting**" value does not change between presets.

To Set SSDR

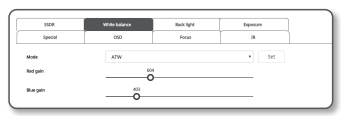
In a scene where the difference between bright and dark is severe, you can increase the brightness of the dark area alone to regulate the overall brightness.



1. Select <**SSDR**>.
2. Set the mode to <**On**>.
3. Configure the <**Level**> and <**D-Range**> settings as necessary.
   - Level : Adjust the level of the dynamic range.
   - D-Range : Select the amplitude area of the dynamic range.

To Set White Balance

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.
   - 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.
   - 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.
   - MERCURY : The image automatically compensates to the mercury lamp environment.
   - SODIUM : The image automatically compensates to the sodium 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.

To Set BLC

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.
   - 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.

To Set WDR

It displays 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. Specify the <**WDR 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)

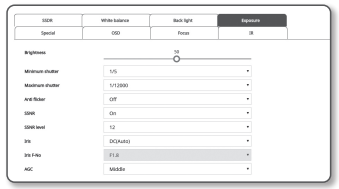


<**WDR OFF**> <**WDR ON**>

- 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**>.

To Set Exposure

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 : The limit of the longest exposure time.
     - Shutter is the mode to set up the range of the sensor exposure time which will specify the upper and lower limits for the electronic shutter movement.
     - The framerate may be reduced in the dark condition if Shutter has a lower value than specified in the Sensor mode.
   - Maximum shutter : The limit of the shortest exposure time.
   - Anti flicker : It prevents screen flickering incurring from the dissonance between the surrounding lighting and the frequency.
   - SSNR
     - On : Noise of the video is removed.
     - Wise NR : Automatically adjusts the nose reduction level when there is a moving object in the video to increase the identifiability.
   - SSNR level : Adjust the noise reduction level.
   - Iris : Selects whether to use the camera lens manually or automatically.
     - DC(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.

- The image exposure can be saturated depending on the Shutter setup range.
- It may take some time from the point when you enable the WiseNR mode to the point when the effect is actually applied/released.
- When the WiseNR mode is enabled, the identifiability of the video will be improved, but the noise may be increased as well.
- In a bright environment with less noise, WiseNR may not be so effective.
- When setting the WiseNR, the MD function is used internally to detect a motion, it follows the operating condition of an MD event. For more information, please refer to "**MD/VA**" (page 55).

To Setup Special

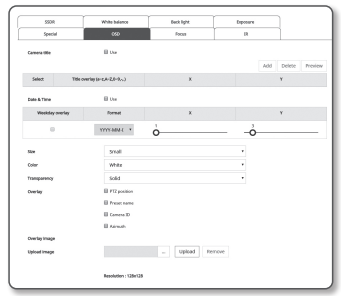


1. Select <**Special**>.
2. Select each item and set it properly.
   - Day/Night : You can switch the mode to adjust the black and white level as well as the colors.
     - Color : Always displays the video in colors.
     - B/W : Always displays the video in black and white.
     - Auto : Displays in color mode during normal daytime and switches to black and white mode in a low contrast scene at night.
     - When the AGC mode of <**Exposure**> is set to <**Off**>, automatic day/night mode setting cannot be selected.
     - If the mode of the <**IR**> menu is set to <**Day/Night**>, you will not be able to configure the Day/Night mode settings.
   - Dwell time : This is the time while each applicable lighting condition is kept in order to enable the switch between day and night modes.
   - Duration : Specify the time interval of lighting at which the sequence operation is triggered.
   - 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.
   - Gamma : Adjust the contrast of the image.
   - Color level : Adjust the strength of video color.
   - Defog : Compensate the video in the foggy or cloudy weather.
     It is set to <**Off**> as a default. Specials are used when the video looks blurry in the foggy weather.
     - Off : Disable the fog elimination function.
     - Auto : The image is automatically compensated according to the foggy level. Adjust <**Defog level**> to be more effective.
     - Manual : The user manually sets the amount of compensation for each image.

     - If the defog mode is set to <**Auto**>, the performance is proportional to the fog level. To keep the set defog level without regard to the fog level, set the defog mode to <**Manual**>.
     - If the manual defog level is high in a thin fog, the image may become too dark.

   - Defog level : Control the defog level.

To Set OSD



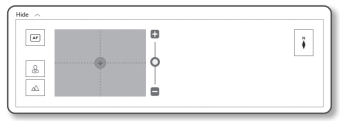
1. Select <**OSD**>.
2. Select each item and set it properly.
   - Camera title : It specifies the name of the camera to be displayed on the screen.
     Select the <**Use**> check box to add a camera name.
     - Add : Click the <**Add**> button and you can add a total of 5 lines, 15 characters per line and a total of 60 characters.
     - Preview : Click the <**Preview**> button to check the name of camera that will be displayed on the screen.
   - Camera title X, Y : It specifies the position of the camera name on the screen.
   - Date & time : Set the time display and date formats on the screen.
   - Date & Time X, Y : Specify the position of time display on the screen.
   - Weekday overlay : Specify the use of date display date on the screen.
   - Size : Sets the size of OSD to small/medium/large.
   - Color : Sets the color of the OSD to white/red/blue/green/black/gray.
   - Transparency : Sets the transparency to opaque/transparency 1/transparency 2/transparency 3.
   - Overlay
     - PTZ position : Set the PTZ location on the screen.
     - Preset name : Specify whether or not to display preset name on the screen.
     - Camera ID : Specify whether or not to display the camera ID number on the screen.
     - Azimuth : This function allows you to indicate the azimuth of the field seen in the current screen. Eight compass directions appear on the lower right side of the screen, reflecting the current orientation: E/W/S/N/NE/NW/SE/SW.
   - Overlay image : The image selected by the user can be displayed at the top left of the screen.
     - Browse (...) : Searches and selects a bitmap type file.
     - Upload : Uploads a selected file.
     - Remove : Deletes the selected file.

   - The specifications of an applicable file include 16bit (RGB565 not supported) or 24bit bitmap file with a length of 128 pixel for the width and height and a file size of 52KB or less.

   - A position-adjustable item (Camera title, Date & Time) may not be displayed normally if it overlaps with another fixed OSD item.
   - If you change the language, the X-Y coordinates are initialized.
     It is recommended to set the X-Y coordinates after setting the language.
   - PTZ coordinates are displayed at the top of the screen; you cannot change the position. Keep this in mind when you set the position of other items.
   - When you use an MJPEG profile, OSD is not output.

Setting Azimuth

1. Click <**Show**>.
2. After pointing the center of the camera view to the north and pressing the [ ] button, the corresponding orientation will be saved as north.



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 : Specify the focus sync mode with the panning/tilting/zooming operation.
     - 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.
     - You can initialize the lens by designating a time and date. You can set initialization schedules for the next 7 days. You can activate the lens initialization either at a designated time or at designated intervals.



- 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.

To Set IR

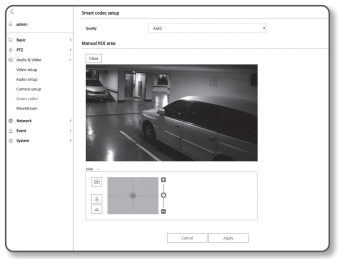
1. Select <**IR**>.
2. Select each item and set it properly.
   - Mode : When the IR indicator turns on in B/W mode, the screen will be protected from saturation on the center area so that you can identify a short-distant object.
     - Off : Turns off IR LED.
     - On : Turns on IR LED.
       When using, the daytime/nighttime mode of the special is set to B/W.
     - Day/Night : Turns on/off IR according to the day & night mode.
       When the mode is set, the day & night mode of the special cannot be set.
     - Sensor : Changes the IR and day & night mode according to the light flux detected by the light sensor.
       When the mode is set, the daytime/nighttime mode of the special cannot be set.
     - Timed : Sets the IR usage time.
       When the mode is set, the day & night mode of the special cannot be set.
   - LED On Level : LED is turned on when the light flux is lower than the LED usage level. 1 ~ 90 can be set.
   - LED Off Level : LED is turned off when the light flux is higher than the LED usage level. 11 ~ 100 can be set.
   - LED On Time : Sets the time when IR will remain turned on.
   - LED Max. Power : Sets the highest brightness of IR.
   - LED Power Control: Controls screen saturation caused by a nearby object.
     If set to <**Off**>, the LED output is not controlled even when the screen is saturated.



- When you set the IR mode to <**On**>, the LED comes on and the screen is automatically set to black-and-white mode. When you set the IR mode to <**Off**>, the LED goes off and day-and-night mode is automatically set.
- If the zoom magnification is changed while the IR dimmer is being used, the IR dimmer is interfaced to the zoom magnification.
  However, the interface of IR dimmer to zoom magnification may slow down at a low temperature.
- If the ambient temperature is too high, IR LED may be forcefully turned off to protect the product.

Smart codec

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

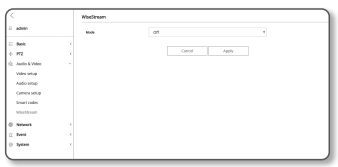


1. From the Setup menu, select the <**Audio & Video ( )**> tab.
2. Click <**Smart codec**>.
3. Select an area to monitor.
   Click and drag the mouse to select a desired area.
   - You can specify up to 5 distinct areas.
4. Set the image quality.
   The ROI area will be displayed in the specified quality.
5. To cancel all the settings for the area, click the [**Clear**] button.
6. When done, click [**Apply**].

- The Smart codec will not be active if it is set to <**Off**> in <**Video profile**>. (page 33)

WiseStream

Function to detect the complexity of the video in an environment in which no major motion is generated and adjust the video quality to lower the output bit rate.
Returns the video quality to the original settings when a motion is generated to prevent video information loss.



1. From the Setup menu, select the <**Audio & Video ( )**> tab.
2. Click <**WiseStream**>.
3. Select an intensity of the Wise Stream.
   - Off : Wise Stream function will be disabled.
   - Low : Reduces the image quality of the video slightly. When the bit rate is OFF, the image quality will be reduced up to 15%.
   - Medium : Reduces the image quality of the video to the medium level. When the bit rate is OFF, the image quality will be reduced up to 30%.
   - High : Reduces the image quality of the video considerably. When the bit rate is OFF, the image quality will be reduced up to 50%.
4. When done, click [**Apply**].

- In the following cases, the WiseStream function may malfunction.
  - Sudden screen switch may cause distortion of the video.
  - It is not appropriate to use in an environment with too much movement and motion on the screen.

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.
   - Wisenet DDNS : Select this if you use the Wisenet DDNS server provided by Hanwha Techwin.
     - Product ID : Enter the product ID that is registered with the DDNS service.
     - Quick connect : It sets port forwarding automatically when used with a UPnP (Universal Plug and Play) supporting router.

       - If you want to use the DDNS service without using a hub that supports the UPnP function, click Quick connect, then go to the hub menu and activate port forwarding for your hub.
         For more on how to set port forwarding for your hub, refer to "**Port Range Forward (Port Mapping) Setup**". (page 20)

   - 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**].

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

Registering with DDNS

To register your product with the Wisenet DDNS

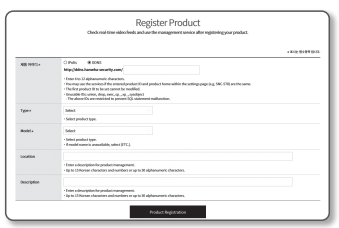
1. Visit the Wisenet DDNS web site (http://ddns.hanwha-security.com) and sign in with a registered account.



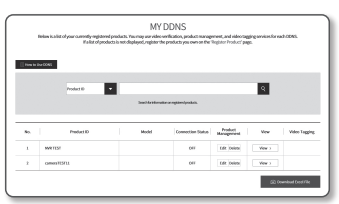
2. From the top menu bar, select <**MY DDNS**>.



3. Click the [**Register Product**] tab.
4. Enter the product ID.

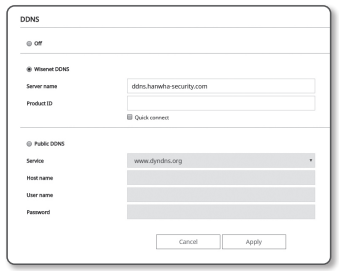


5. Select a <**Type**> and specify the <**Model**>.
6. Specify the product location with a description if necessary.
7. Click [**Product Registration**].
   The product will be added to the product list that you can check.



To connect to the Wisenet DDNS in camera setup

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



Configuring public DDNS in Camera Settings

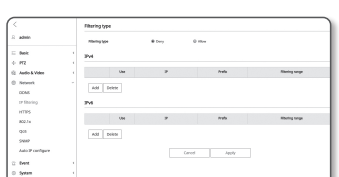
1. Open the DDNS settings page and select <**Public DDNS**> for <**DDNS**>.
2. Enter the corresponding site's host name, user name and password.
3. Click [**Apply**] button.
   If the connection properly establishes, <**(Success)**> appears.
4. When done, click [**Apply**].

■ 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 20)

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**] 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.

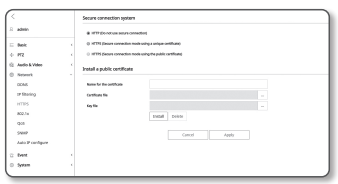


- If selected <**Allow**> for IP Filtering and <**IPv6 setup**> of <**IP & Port**> is set to <**Use**>, both IPv4 and IPv6 addresses of the computer currently configuring should be assigned.
- The IP address of the computer used for the current setup cannot be added to <**Deny**>, it should be added 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**] button.
7. When done, click [**Apply**].

HTTPS

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 <**HTTPS**>.
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**].

Installing the certificate

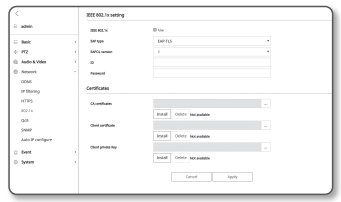
1. Enter the certificate name.
2. Click the [**Browse (...)**] button, select the public certificate file and key file to be installed, and then click the [**Install**] button.

Deleting the certificate

1. Click [**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**>.
   - IEEE 802.1x : Specify the use of the 802.1x protocol.
   - EAP type : Select EAP-TLS or LEAP.
   - EAPOL version : Select version 1 or 2.
   - ID : Enter the client certificate ID in EAP-TLS and the user ID in LEAP.
   - Password : Enter the client private key password in EAP-TLS and the user password in LEAP. You do not have to enter the password in EAP-TLS if it uses a key file that is not encrypted.

- If the connected network device does not support the 802.1x protocol, the protocol will not operate properly even if you set it.
- LEAP is an authentication method with poor security. Use it only in an environment where EAP-TLS is not available.

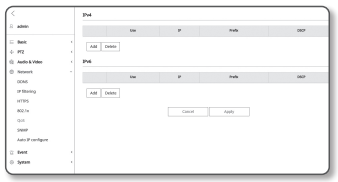
4. Install/remove the certificate.
   The certificate is needed only for EAP-TLS.
   - CA certificates : Select a public certificate that contains the public key.
   - Client certificate : Select a public certificate that contains the client certificate key.
   - Client private Key : Select a public certificate that contains the client private key.
5. When done, click [**Apply**].

To install/remove 802.1x related certificates

1. Press the [**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**] button to start installation with a message of "Installed" next to the item.
4. Press the [**Delete**] button to remove the certificate.

QoS

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



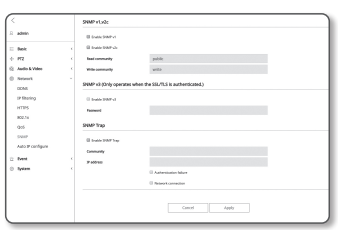
1. From the Setup menu, select the <**Network ( )**> tab.
2. Click <**QoS**>.
3. Click the [**Add**] button.
   The IP list will be created.
4. Enter an IP address to which you will apply QoS.

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

5. Select an IP to delete from the list.
   Click the [**Delete**] button.
6. When done, click [**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 v3 : SNMP version 3 will be active.
     - Password : Specify the default password for SNMP version 3.
       - 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.
   - 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.
4. When done, click [**Apply**].

- SNMP v3 is only able to be set when the secure connection mode is HTTPS.
  Refer to "**HTTPS**". (page 49)
- 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 WISENET-<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 WISENET-<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**].

EVENT SETUP

FTP / E-mail

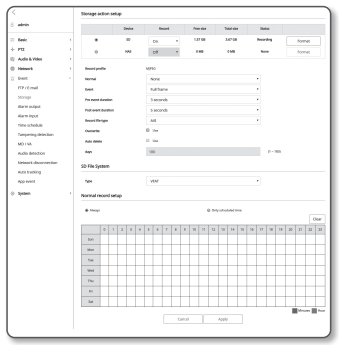
You can configure the FTP/E-mail server settings so that you can transfer the images taken with camera to your PC if an event occurs.



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 SMTP address of the email server that you transfer the alarm or event images to.
     - Use authentication : Select whether to use authorization.
     - Use TLS : Specify the use of TLS.
     - 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**].

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 SD memory card.
  After formatting, if the error message still remains, replace the SD memory card.
- If you remove the SD memory card without changing a button to 'off' position in settings or if you connect a camera to an unstable power source, the SD memory card may be damaged.

- The number of simultaneously accessible new profiles after the recording mode is activated is 2.

To make recording on the SD memory card

1. Set the SD memory card unit to <**On**>.
2. Click the [**Apply**] button.
3. Check the memory card's <**Free size**> and <**Total size**>.
   You can format the SD memory card by clicking the <**Format**> button.
   - Some frames may be skipped if the SD memory card operates at the lower speed than recommended.
     For more details, refer to "**Recommended SD/SDHC/SDXC Memory Card Specifications**". (Page 6)
   - For a 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.
4. Specify the storage action.
   - Record profile : The name of profile to be recorded is 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 alarm; starting from the time point, the images will be transferred. You can specify up to 5 seconds before the occurrence of the alarm.
- Post event duration : Specify the time point after the occurrence of the alarm; to the specified time point, the images will be transferred. You can specify up to 120 seconds after the occurrence of the alarm.
- Record file type : It specifies the file format of the recorded images.
  - STW : It is Hanwha Techwin's unique file format.
  - AVI : It is the conventional avi format.

▪ If the Record file type is changed, the existing data is formatted.

- Overwrite : If the SD memory card 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.

5. Set <**SD File System**>.
   - Type : Camera supports VFAT and ext4 as an SD memory card file system, which can be configured by the user.
     (However, in case of ext4 file system, an additional application is required to recognize the Windows operating system)

▪ If the settings are changed, the existing data will be formatted.

▪ It may take up to 10 minutes to format an SD memory card in the ext4 file system.

6. Specify the <**Normal record setup**>.
   - Always : Always save recorded video in the 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] : Reset all settings.
7. When done, click [**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. After the settings are completed, set the NAS unit to <**On**>.
5. Click the [**Apply**] button.
6. Log in the NAS and check the <**Free size**> and <**Total size**>.
   You can format the default folder specified in the NAS connection setting by clicking the <**Format**> button.

▪ Since data may not be saved after a temporary network interruption when using NAS, it is recommended that you use SD memory card at the same time to prevent loss of recorded images.

▪ 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

- Since data may not be saved after a temporary network interruption when using NAS, it is recommended that you use SD memory card at the same time to prevent loss of recorded images.
- If the setting allows a 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 1%, it will be saved in the SD memory card.
- If you are saving data in the NAS, you might be unable to save it when you insert a SD memory card used by another camera.
- NAS recommended specs : Refer to "**NAS recommended specs**". (Page 6)
- 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.
- NAS saving allows only one camera to a folder. Logging in with another camera is not allowed, and the images will not be saved.

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.

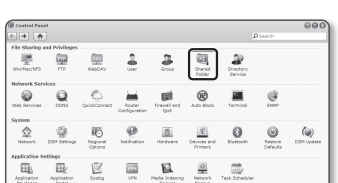
1. Access the Synology NAS as an admin.
   In this example, the NAS IP Address is set to [**192.168.20.253**].



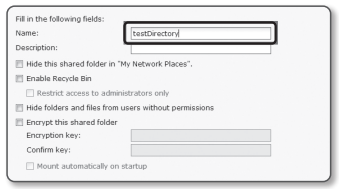
2. If you access it as an admin, the following screen will be displayed. Click the [**Control Panel**].



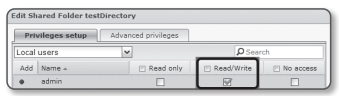
3. Click the <**Shared Folder**> in the file sharing and privilege menu.



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**].

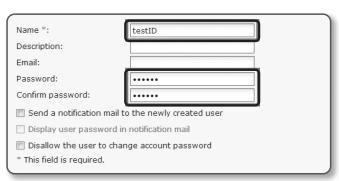


7. Click on the <**User**> in the file sharing and privilege menu.

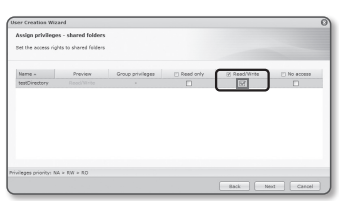


8. After clicking the [**Create**] button, enter name(ID) and password.
   In this example, name(ID) is set to [**testID**] and password is also set to [**testID**].

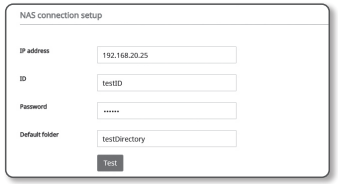
- According to the NAS recommendations, when you use Netgear's NAS equipment, do not allocate the capacity for use.



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**] button.
Finish saving by using the NAS.



Alarm output

1. From the Setup menu, select the <**Event (**)> tab.

2. Click <**Alarm output**>.

3. Configure the camera alarm output settings.

- 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.
- 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.

4. When done, click [**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] : 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.



6. Specify an operation that will perform if an alarm occurs.

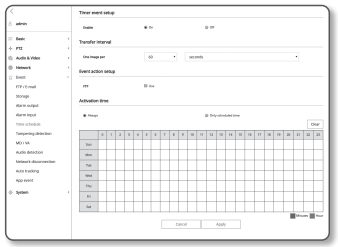
- FTP : Specify the use of FTP transfer in the alarm input setup.
  - Refer to “**FTP / E-mail**” for more details. (page 51)
- E-mail : Specify the use of email transfer in the alarm input setup.
  - Refer to “**FTP / E-mail**” for more details. (page 51)
- Record : You can set up the alarm to record to a SD memory card or an NAS when operating.
  - Set <**Device**> to <**On**> in <**Storage**>. (page 51)
- Alarm output1 / Alarm output2 : 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**].

Time schedule

You can configure settings to transmit images at regular intervals at a scheduled operation time regardless of the occurrence of an 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.



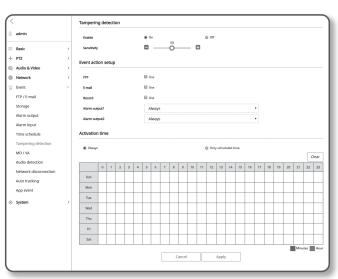
- The transfer interval setting value must be smaller than the preset activation interval to succeed in image transmission.

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 51)
7. When done, click [**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**>.
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 54)
6. When done, click [**Apply**].

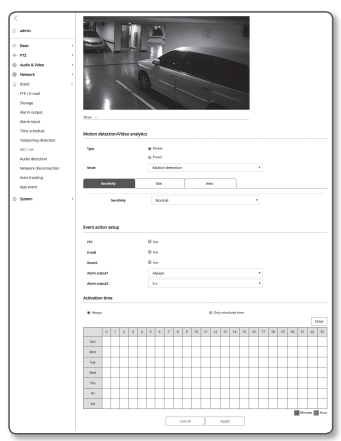


- The default tampering detection function may not work properly in the following cases:
  - Under circumstances of simple background or low illumination and night time may lower the detection sensitivity.
  - A severe shaking of the camera or a drastic change to the illumination can be considered a 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.
- If false alarms are generated frequently, decrease the sensitivity gradually to minimize false alarms. If you choose a lower sensitivity, only a sudden tempering is detected.
- If you use a higher sensitivity, alarms may be generated even from very small changes, but false detection in response to changes in an object or brightness may occur.

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. According to your purpose, select from motion detection and intelligent video analysis.
4. Set <**Sensitivity**>, <**Size**> and <**Area**>. When selected Intelligent Video Analysis, set <**Analytics**> too.
5. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 54)
6. When done, click [**Apply**].



- The same settings for motion detection (sensitivity/size/area) are applied to digital auto tracking.
- 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.

To use Motion detection

It detects a motion that meets all conditions specified by sensitivity, size and area.

1. Select a motion detection mode.
2. Select <**Sensitivity**> tab to set the sensitivity level. You can set the sensor's sensitivity to detect a motion out of the background from the monitoring video.

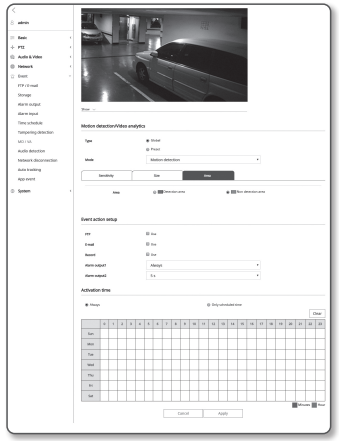


- In a situation that definitely distinguishes objects out of backgrounds, set this to a low sensitivity level. For opposite case that is hard to distinguish objects like low illuminated situation, set this to a high level.

3. Select <**Size**> tab.
   You can limit the minimum/maximum size of motion to be detected.
   - Minimum size (pixel) : To set the minimum size of detected motions, select <**Minimum size (pixel)**> and then point and drag to the desired size on the screen using the mouse.
   - Maximum size (pixel) : To set the maximum size of detected motions, select <**Maximum size (pixel)**> and then point and drag to the desired size on the screen with your mouse.

- 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 <**Area**> tab.
   You can specify an area on the screen to include or exclude the area to/from detection.
   You can specify up to 4 areas.
   - Detection area : Sets the entire screen as excluded from detection, and adds specified area as motion detection area. Select 4 vertices in the image with your mouse to specify the detection area.
   - Non detection area : Sets the entire screen as motion detection area, and excludes specified area as not to be detected. Select 4 vertices in the image with your mouse to specify the non-detection area.
5. To delete a designated area, right click the mouse on the video and click the [**Delete**] button displayed on the popup window.
6. When done, click [**Apply**].

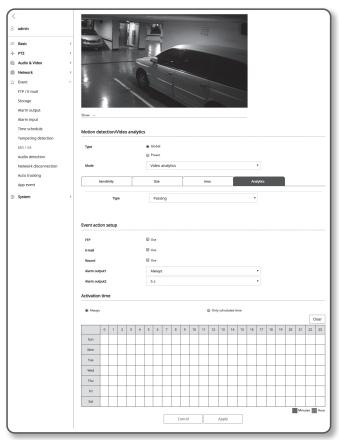


- Unlike the video analysis function, the motion detection function provides no overlay mark on the screen. A yellow box appears at a side of the monitoring screen, and the operation function is recorded in the system log.

To use Video analytics

It detects event that meets all conditions specified by sensitivity, size and area and the event condition rules.

1. Select the video analysis mode.
2. Set <**Sensitivity**>, <**Size**> and <**Area**>.
   For further details on settings, refer to "**To use Motion detection**". (Page 56)
3. Select <**Analytics**> tab.
4. Select the video analysis type.
   - Passing : Detects an object passing by the line set by a user.
   - Entering/Exiting : Detects an object entering or exiting into/from the area set by a user.
   - Appearing (Disappearing) : Detects motions of appearing on or disappearing from the user-defined area or the entire screen area.
5. Set the video analysis rules.
   For further details on settings, refer to "**To set the video analysis rules**". (Page 57)
6. When done, click [**Apply**].



To set the video analysis rules

▪ Passing

1. Set the type to <**Passing**>.
2. On the screen, click on preferred starting and ending point of the virtual line, then a popup window appears.
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. On the screen, click four vertices to define detection area and a popup window appears.
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.

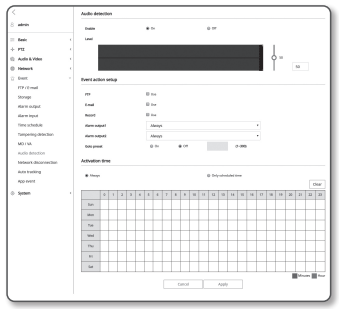
▪ Appearing (Disappearing)

1. Set the analysis type to <**Appearing (Disappearing)**>.
2. On the screen, click four vertices to define detection area and a popup window appears.
3. Select the desired event rule:
   - 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.
4. Click [**OK**].
5. To remove a defined rule, right click on the screen to open popup context menu and select [**Delete**] button.

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.

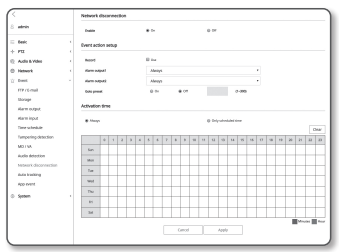
5. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 54)
6. When done, click [**Apply**].

- Select <**Audio & Video**> - <**Audio setup**> and set the proper volume for your MIC as an audio input source, so that the audio detection function can work properly.
- 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.

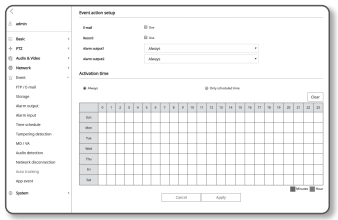
1. From the Setup menu, select the <**Event (** 🔔 **)**> tab.
2. Click <**Network disconnection**>.
3. Set whether or not to <**Enable**>.
4. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 54)
5. When done, click [**Apply**].



Auto tracking

You can set the system to generate event signals when you activate the auto tracing function.

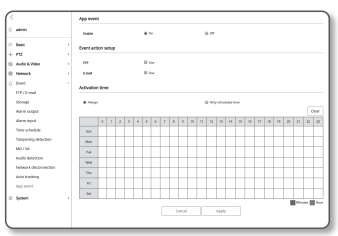
1. From the Setup menu, select the <**Event (**)> tab.
2. Click <**Auto tracking**>.
3. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 54)
4. When done, click [**Apply**].



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 54)
5. When done, click [**Apply**].

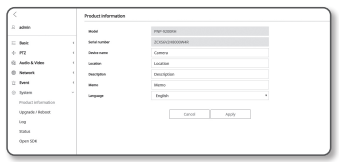


SYSTEM SETUP

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.

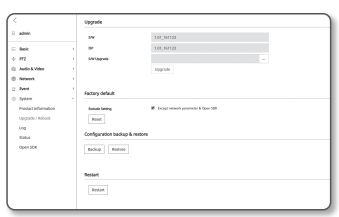
   ■ The default language is set to <**English**>.
4. When done, click [**Apply**].



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 : Initializes all setting information including the camera settings to the factory reset state. (however, logs are not initialized)
     - Exclude Setting : Select the <**Except network parameter & Open SDK**> checkbox, and initialization will be carried out, with the exception of network settings and Open SDK.

     ■ 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 [**Browse (** ... **)**] and specify a file to upgrade.
2. Click [**Upgrade**].
3. An "**Upgrade**" progress bar is prompted to show the upgrading status.
4. 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 Hanwha Techwin web site.

To back up the current settings

1. Click [**Backup**].
2. A file in a "**.bin**" file format is saved in "**Library**" -> "**Document**" -> " **Downloads**".

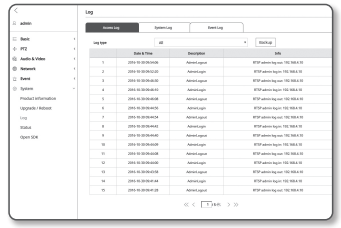
To restore the backup settings

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

- 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.
   - Access Log : You can check the log information that contains the user's access and the access time.
   - System log : You can check the system logs where any system changes are recorded including the time information.
   - Event log : 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 in the "time stamp value create by camera in modelname-mode-camera.txt file" in the download folder for the browser.

- Each page displays 15 logs with the latest one displayed at the top.
- Each log contains up to 1,000 records and after 1,000 records are saved, the oldest log is deleted when a new record is generated.

Status

You can check the profile information.



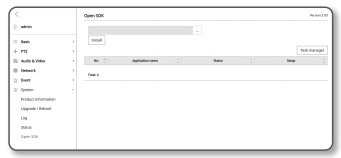
1. From the Setup menu, select the <**System (** ⚙ **)**> tab.
2. Click <**Status**>.
3. The profile information screen is displayed.
   - Profile access : Show the information of the newly added profile.
     - Profile : Show the information of the newly added codec.
     - Bitrate(kbps) : Show both 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 [**Update**] again to refresh it.
It takes a certain time for any changes to be applied.

▪ You can check the profile access status by clicking the [**Menu (** ☰ **)**] - [**Status (** ⚠ **)**] tab.

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 (** ... **)**] button to select the *.cap file from the user folder.
4. Click the [**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 : You will be redirected to the app 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.

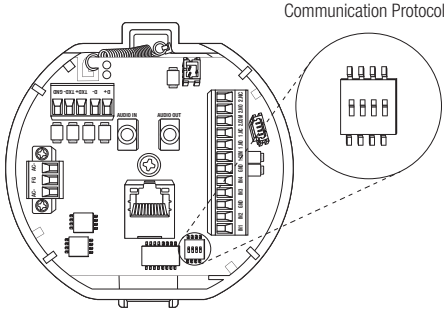
DIP SWITCH SETTING

How to set up Protocols and ID DIP Switches

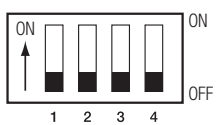
You can control various settings of the camera system using the Communication and ID DIP switches. Before installing the product, please set up the DIP switches according to the installation environment.

1. Set the switches according to your installation environment. For more detailed setup information, please refer to the chart on the next page.
2. The camera may malfunction if the switches are not fully turned On/Off; please double check the switches before finishing setup.
3. Be cautious that the switch can be damaged when it is operated with a sharp tool.
4. Be cautious that the switch can be damaged when it is operated with an excessive force.

Communication Protocol DIP Switch (SW1)



Communication Protocol DIP Switch Settings (SW1)



SW1

SW1 Pin No.	Purpose
1	Set transmission protocol (RS-485/422)
2	Termination setting 1
3	Termination setting 2
4	Reserved

- **Communication Method Settings**

Select a communication method for the camera.

	Function	ON	OFF
SW1-#1	Transfer Mode Switch	RS-422(4Wire)	RS-485(2Wire)

- **Termination Settings**

To prevent the attenuation of communication signals between the camera and controller, the items at the end of line must be set up with the termination settings.

Camera Input Position	SW1-#2	SW1-#3
Termination of Longest Path	ON	ON
On the Path	OFF	OFF

- The default value is shaded in each setting table.
- To use a third party controller with this product, please contact our After-Sales Service or Technology Department.

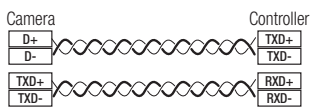
CAMERA WIRING

Control Signal Connection

- RS-485 Communications

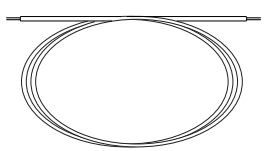


- RS-422 Communications



Communications Cable

For the camera to communicate with the controller, a RS-485/422 communications line is required.



- A 30m or shorter length is recommended for the connection.
- The communication cable is not enclosed with the camera.

TROUBLESHOOTING

PROBLEM	SOLUTION
No video is displayed when accessing the plug-in free webviewer on Safari via HTTPS.	• On the authentication popup window prompted when initially accessing https, click "View Authentication Certificate" and select the "Always trust when connecting to the designated webviewer IP" check box. • If the webviewer continues failing to display a video after you select "Next" on the message window below, press the command key + Q to exit the Safari browser, access again and follow the procedures stated above.
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.
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> of <Event> 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 <MD / VA> should be set to <Enable>. C. Check if the <E-mail> option of <Event setup> menu is checked to use.
Can I define event rules even when I don't use <MD / VA>?	• Yes, it can be. You can set rules for events despite of the intelligent video analysis setting.

PROBLEM	SOLUTION
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 SD memory card.	• Check if the memory card is defective.
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> → <Storage> 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 2.0	
Busybox	GPL 2.0	http://www.busybox.net/downloads/snapshots
iproute2-4.3.0	GPL 2.0	
iptables-1.4.21	GPL 2.0	http://ftp.netfilter.org/pub/iptables
ethtool-4.2	GPL 2.0	
mtd-1.5.2	GPL 2.0	ftp://ftp.infradead.org/pub/mtd-utils
mii-diag-2.11	GPL 2.0	
rp-pppoe-3.11	GPL 2.0	http://www.roaringpenguin.com/pppoe/
wpa_supplicant-2.5	GPL 2.0	
bash-4.3.30	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	http://www.webdav.org/neon/

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- Version 1.1

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The IJG distribution formerly included code to read and write GIF files. To avoid entanglement with the Unisys LZW patent, GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

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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.

11. "Derivative Work" means the Modified Source Code or the Binary Code.

12. "Embedded Product" means any product which operates with executable code form of the Source Code, the Modified Source Code or the Binary Code loaded on its hardware.

13. "End User" means a consumer who uses the Embedded Product.

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16. "Patch for Modification" means a difference, program, system, or the like in order to create the Modified Source Code from the Source Code or the Binary Code thereof.

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.

Article 3. Copyright

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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.

2. Neither T-Engine Forum nor the copyright holder of the Source Code warrants that the Source Code will fit for any particular purpose of the Source Code User.

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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.

Article 11. Governing Law and Language

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Julian Seward, jseward@bzip.org

bzip2/libbzip2 version 1.0.5 of 10 December 2007

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Iperf performance test

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zlib / libpng License

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Component Name	License	URL
zlib-1.2.8	zlib / libpng	http://zlib.net/

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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).

Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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