

WISeNeT

NETWORK CAMERA

User Manual

SNV-L6013R/SNV-L6014RM



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" and rated from 24 Vac (50/60 Hz) min 1.0 A or 12 Vdc, min 1.0 A.
16. If you use excessive force when installing the product, the camera may be damaged and malfunction.
If you forcibly install the product using non-compliant tools, the product may be damaged.
17. Do not install the product in a place where chemical substances or oil mist exists or may be generated. As edible oils such as soybean oil may damage or warp the product, do not install the product in the kitchen or near the kitchen table.
This may cause damage to the product.
18. When installing the product, be careful not to allow the surface of the product to be stained with chemical substance.
Some chemical solvents such as cleaner or adhesives may cause serious damage to the product's surface.
19. If you install/disassemble the product in a manner that has not been recommended, the production functions/ performance may not be guaranteed.
Install the product by referring to "Installation & connection" in the user manual.
20. Installing or using the product in water can cause serious damage to the product.



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 OPENINGS ON THE EQUIPMENT.

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

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

CAUTION



EXPLANATION OF GRAPHICAL SYMBOLS



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



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

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.

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.

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.

CONTENTS

OVERVIEW	3	3	Important Safety Instructions
		6	Recommended PC Specifications
		6	Recommended Micro SD/SDHC/SDXC Memory Card Specifications
		6	NAS recommended specs
		7	What's Included
		8	At a Glance
INSTALLATION & CONNECTION	9	9	Installation
		11	Inserting/Removing a Micro SD Memory Card
		11	Memory Card Information (Not Included)
		12	Connecting with other Device
NETWORK CONNECTION AND SETUP	14	14	Connecting the Camera Directly to Local Area Networking
		14	Connecting the Camera Directly to a DHCP Based DSL/Cable Modem
		15	Connecting the Camera Directly to a PPPoE Modem
		15	Connecting the Camera to a Broadband Router with the PPPoE/Cable Modem
		16	Buttons used in IP Installer
		16	Static IP Setup
		18	Dynamic IP Setup
		18	Port Range Forward (Port Mapping) Setup
		19	Connecting to the Camera from a Shared Local PC
		19	Connecting to the Camera from a Remote PC via the Internet
WEB VIEWER	20	20	Connecting to the Camera
		20	Password setting
		21	Login
		21	Installing WebViewer Plugin
		22	Using the Live Screen
		23	Playing the recorded video
SETUP SCREEN	27	27	Setup
		27	Basic Setup
		31	Video & Audio setup
		34	Network Setup
		38	Event Setup
		40	NAS (Network Attached Storage) guide
		43	System Setup
		44	Viewing profile information
APPENDIX	45	45	Troubleshooting
		46	Open Source Announcement

RECOMMENDED PC SPECIFICATIONS

- CPU : Intel Core 2 Duo 2.4 GHz or higher (for using 1920x1080 30 fps)
 - Web Plug-in is optimized to SSE 4.1 Instruction Set.
- Resolution : 1280X1024 pixels or higher (32 bit color)
- RAM : 2GB or higher
- Supported OS : Windows 7, 8, 10, MAC OS X 10.8, 10.9, 10.10, 10.11
- Supported Browser : Microsoft Internet Explorer 11, Mozilla Firefox 43, Apple Safari 9 ※ Mac OS X only
 - Windows 8 is supported only in the Desktop mode.
 - Neither a beta test version unlike the version released in the company website nor the developer version will be supported.
 - For IPv6 connection, Window 7 or higher is recommended.
 - For Mac OS X, only the Safari browser is supported.
- Video Memory : 256MB or higher
 - ! ■ If the driver of the video graphic adapter is not installed properly or is not the latest version, the video may not be played properly.
 - For a multi-monitoring system involving at least 2 monitors, the playback performance can be deteriorated depending on the system.

RECOMMENDED MICRO SD/SDHC/SDXC MEMORY CARD SPECIFICATIONS

- Recommended capacity : 4GB ~ 32GB
- For your camera, we recommend you use a memory card from the following manufacturers:
Micro SD/SDHC/SDXC Memory Card : Sandisk, Transcend
- Memory cards with a specification of Class 10 + UHS-1 or higher are recommended.

NAS RECOMMENDED SPECS

- Recommended capacity : under 50GB
- 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.

- ! ■ Models that have been discontinued by the manufacturer are not supported.
- 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

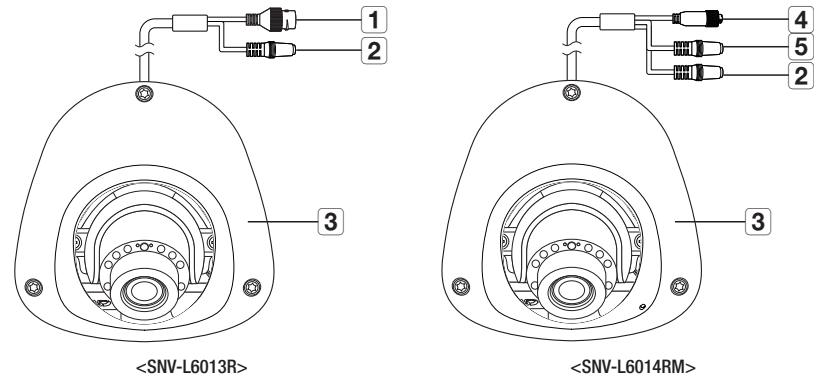
Please check if your camera and accessories are all included in the product package.
(As for each sales country, accessories are not the same.)

Appearance	Item Name	Quantity	Description	Model Name
	Camera	1		SNV-L6013R
				SNV-L6014RM
	Quick Guide (Optional)	1		SNV-L6013R/ SNV-L6014RM
	Warranty card (Optional)	1		SNV-L6013R/ SNV-L6014RM
	L Wrench	1	Used to remove/fix the dome cover	SNV-L6013R/ SNV-L6014RM
	M4 Tapping Screw	2	Used for securing the camera to the wall or ceiling	SNV-L6013R/ SNV-L6014RM
	Plastic Anchor	2	For fixing a screw, Inserted in a hole (reinforced anchoring force)	SNV-L6013R/ SNV-L6014RM
	Template	1	Used when installing the camera	SNV-L6013R/ SNV-L6014RM
	Installation bracket	1	Used when installing the camera on the wall or a gang box (single)	SNV-L6013R/ SNV-L6014RM

Appearance	Item Name	Quantity	Description	Model Name
	M4 screw for installation bracket	2	Used when fixing the camera on the installation bracket	SNV-L6013R/ SNV-L6014RM
	RJ45 waterproof accessory	1	Used for waterproofing the RJ45 connector cable	SNV-L6013R

AT A GLANCE

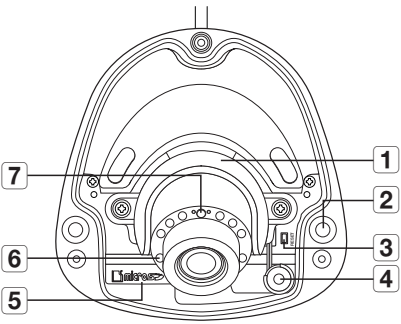
Appearance



Item	Description	
1 PoE Connector	Connects to the network and supplies power through Ethernet cable.	
2 Audio In Jack	SNV-L6013R	Used to connect to a microphone. (black)
	SNV-L6014RM	Used to connect to a microphone. (pink)
3 Dome Cover	Dome cover for the lens and unit protection.	
4 M12 Female connector cable	Connect to the M12 Male connector cable for power supply and network connections.	
5 Audio Out Jack	Used to connect to speakers. (green)	

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

Inside



Item	Description
1 Lens Cover	Used for protecting and fixing the lens.
2 Fixing Hole	Hole used for securing the camera on a ceiling.
3 Reset Button	Resets the camera settings to the 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.
4 Microphone hole	A microphone is embedded. ■ It is applicable only to the SNV-L6014RM model.
5 Micro SD Memory Card Compartment	Compartment for the Micro SD memory card.
6 IR LED	These infrared LED's are controlled by the illumination sensor.
7 Illumination Sensor	Detects incoming light to control the IR LED.

INSTALLATION

Precautions before installation

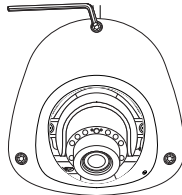
Ensure you read out the following instructions before installing the camera:

- When installing on a ceiling, desired spot must be capable of supporting at least 5 times of the camera's weight.
- Stuck-in or peeled-off cables can cause damage to the product or a fire.
- For safety purposes, keep anyone else away from the installation site. And put aside personal belongings from the site, just in case.
- This camera (SNV-L6014RM) is compliance with the IP66 specifications and is a water proof product, however, no waterproofing will be provided with the jack if you don't use the M12 connector and cables. When you install this product, it is recommended to use an external cable that meets the M12 specification.

Disassembling

Using the L-wrench provided, loosen 3 screws by turning them counterclockwise and separate the dome cover.

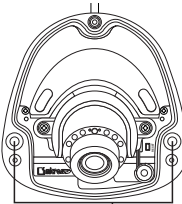
- Note that it is not necessary to loosen the screw completely.



Installing the camera on the ceiling

1. Select a location where you want to install the camera.
2. Prepare a hole for a screw on the wall where you are going to install the device, then insert the plastic drywall anchor that has been provided all the way into the hole.
3. Align the internal hole with the hole into which the plastic anchor has been inserted, and turn the tapping screw clockwise to fasten it.

- Use the enclosed installation bracket when installing the product on the wall.

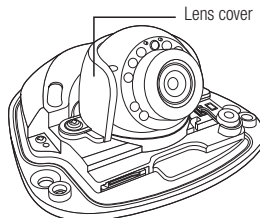


Fixing Hole

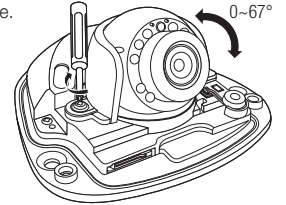
4. Turn the screws on both sides of the camera lens cover counterclockwise to loosen them.

- Forcing to tile the lens (hood) without loosening the screws may cause a product defect.

5. Adjust the lens in a desired direction by referring to the "Adjusting the monitoring direction for the camera" section. (page 10)

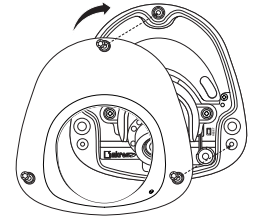


6. After adjusting the angle, turn the screws clockwise to fix the lens angle.



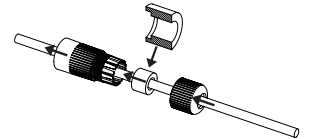
7. Close the dome cover and turn it clockwise using the L-wrench.

- If the cover is not fixed tightly, you may encounter a problem with waterproofing. (IP66)

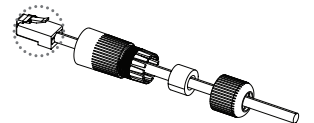


How to connect the RJ45 waterproof cable to a LAN cable (SNV-L6013R)

1. Insert it through the arrow direction.

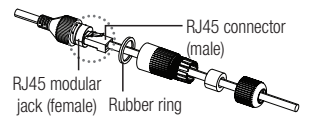


2. Connect the LAN connector (male) to the cable.

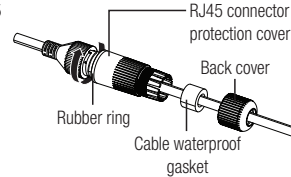


3. Connect the RJ45 modular jack (female) to the RJ45 connector (male).

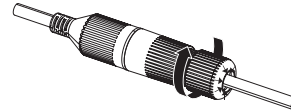
- Please, keep each of the parts separated.



4. Assemble by rotating the RJ45 modular jack (female) and the RJ45 protection cover clockwise (Follow the arrow).



5. Assemble by rotating RJ45 protection cover and back cover clockwise (Follow the arrow).
When the back cover is assembled, the cable waterproof gasket is tightly attached to the cable to make it waterproof.

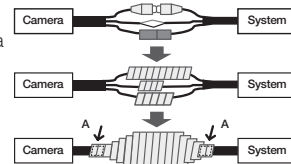


- You must fully assemble it to rotate the back cover up to the end of the screw thread of the RJ45 connector.

Outdoor installation (SNV-L6013R)

When you install it outside of the building, please waterproof it with waterproof butyl rubber tape (can be purchased in stores) so that water does not leak from the gap of the cable connected to the outside.

1. Connect the power, Audio In, and LAN cables.
2. Wrap the black cable jacket (Area A) and the cable connection area with waterproof (butyl rubber) tape so that more than half of the butyl rubber tape is overlapped.

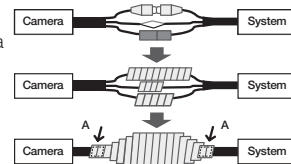


- If the cable jacket is not waterproofed properly, then it can directly cause leakage. Make sure to protect the cable with a dense layer of taping.
- Waterproof butyl tape is made of butyl rubber that can be stretched to twice its normal length.

Outdoor installation (SNV-L6014RM)

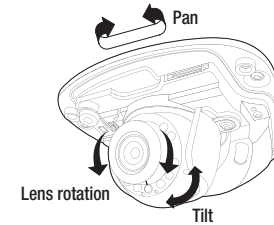
As water can leak from the gap of the externally connected cable if you install it outside a building without using an M12 connector and an M12 cable, you need to use waterproofing butyl rubber tape for waterproofing as shown below.

1. Connect the power, Audio I/O, and LAN cables.
2. Wrap the black cable jacket (Area A) and the cable connection area with waterproof (butyl rubber) tape so that more than half of the butyl rubber tape is overlapped.



- If the cable jacket is not waterproofed properly, then it can directly cause leakage. Make sure to protect the cable with a dense layer of taping.
- Waterproof butyl tape is made of butyl rubber that can be stretched to twice its normal length.

Adjusting the monitoring direction for the camera



■ Adjusting the monitoring direction

You can adjust the camera direction only when the camera is fixed on the ceiling.

Where, rotating the camera unit to the left or right is called Pan, adjusting the tilt is called Tilt, and turning the lens on its axis is called Rotation.

- The maximum PAN range is from -5° to $+5^{\circ}$.
- The angle of ROTATE is either -90° or $+90^{\circ}$.
- The total range of TILT is 67° .

- Use of the camera at an angle that is out of the specifications may cause reflection by IR or blind image.

■ Methods of adjustment

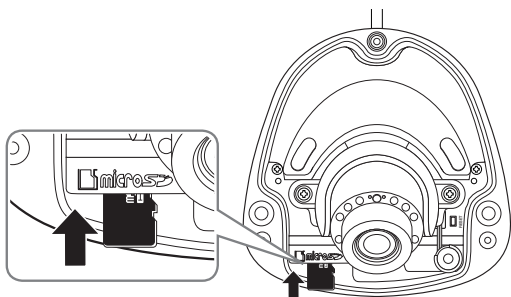
1. After installing the camera, adjust the panning angle in consideration of the monitoring direction.
2. Set the horizontal angle so that the image is not reversed.
3. Adjust the tilt angle so that the camera faces toward the monitoring object.

INSERTING/REMOVING A MICRO SD MEMORY CARD

- ❗ ■ Disconnect the power cable from the camera before inserting the Micro SD memory card.
- Do not insert the Micro SD memory card while it's upside down by force. Otherwise, it may damage the Micro SD memory card.
- When it rains or the humidity is high, insertion or ejection of a Micro SD card is not recommended.
- Disassembly of the product cover should be finished within 5 minutes, or there will be the risk of internal dew condensation.

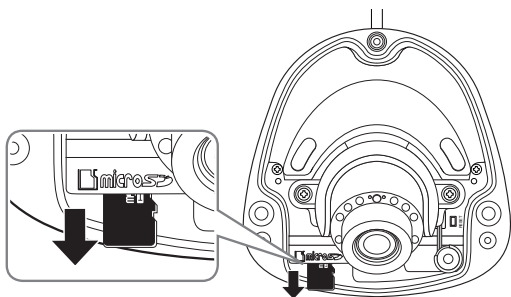
Inserting a Micro SD Memory Card

Push the Micro SD memory card in the direction of the arrow shown in the diagram.



Removing a Micro SD Memory Card

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



- ❗ ■ Pressing too hard on the Micro SD memory card can cause the card to shoot out uncontrollably from the slot when released.
- Before removing your Micro SD memory card, turn off the camera or go to <Storage>, turn the device off, and press the [Apply] button. (Page 38)
- If you turn off the camera or remove the Micro SD memory card that contains data from the product, the data may be lost or damaged.

MEMORY CARD INFORMATION (NOT INCLUDED)

What is a memory card?

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

Selecting a memory card that's suitable for you

Your camera supports Micro SD/SDHC/SDXC memory cards.

You may, however, experience compatibility issues depending on the model and make of the memory card.

For your camera, we recommend you use a memory card from the following manufacturers:

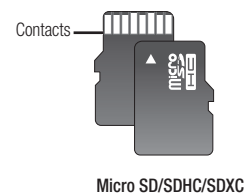
Micro SD/SDHC/SDXC Memory Card : Sandisk, Transcend

Memory cards of 4GB ~ 32GB is recommended for using with this camera.

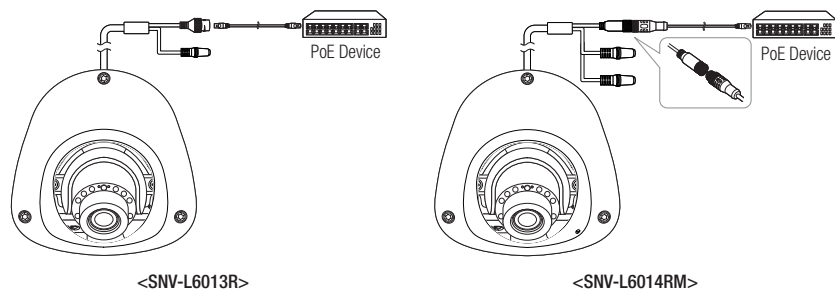
Playback performance can be affected depending on the speed of memory card, so use the high-speed memory card.

Memory cards with a specification of Class 10 + UHS-1 or higher are recommended.

Memory Card Components



CONNECTING WITH OTHER DEVICE

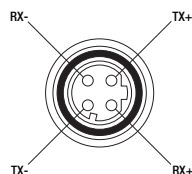


Connecting a connector cable (SNV-L6014RM)

Connect the M12 male connector into the hole of the M12 Female connector of the camera.

- This camera uses Female, D-coded types.
- PoE (Power over Ethernet) is supported.
- You are recommended to use a shielded network connector.

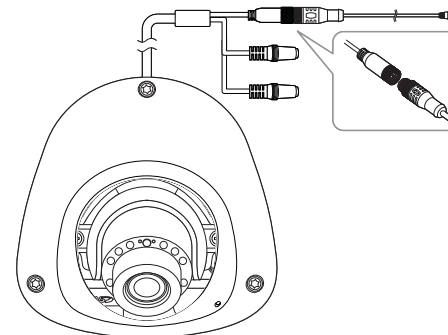
- ! ■ Connect this camera to a shielded network cable (STP).
- Please, use 4 poles, Male, D-coded type external cables that meet the M12 specification.
- Check whether the PoE device is properly connected to the ground.



Making a connection using the M12-RJ45 conversion cable (SNV-L6014RM)

Connect the M12 male connector for the conversion cable to the groove of the M12 Female connector for your camera.

- M12-RJ45 cable is sold separately.



Powering and networking (SNV-L6013R)

Connect a camera to a PoE equipment.

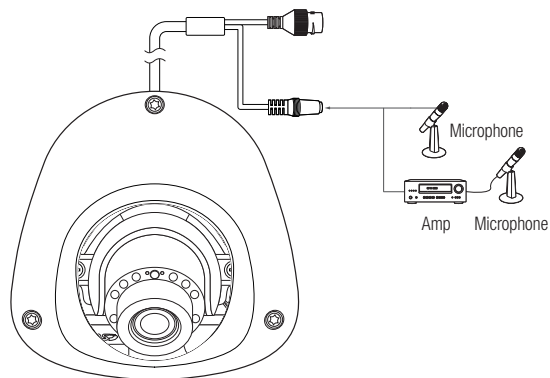
- ! ■ Connect to a PoE (Power over Ethernet) enabled router's PoE connector.
- Use PoE (Power over Ethernet) that is compliant with the IEEE802.3af protocols.

Powering and networking (SNV-L6014RM)

Connect a camera to a PoE equipment or connect the M12-RJ45 connector for the conversion cable of your camera to a PoE equipment.

- ! ■ A connection method may vary depending on the installation environment of a user.
- Connect to a PoE (Power over Ethernet) enabled router's PoE connector.
- Use PoE (Power over Ethernet) that is compliant with the IEEE802.3af protocols.
You can only use a Mode A PoE device that supplies power through data pin pair 1, 2, 3, 6.
- Even if you use the M12-RJ45 conversion cable, you can only use a mode A type PoE equipment that supplies power to data pair pins 1, 2, 3, 6.

Connecting to Audio Input (SNV-L6013R)



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

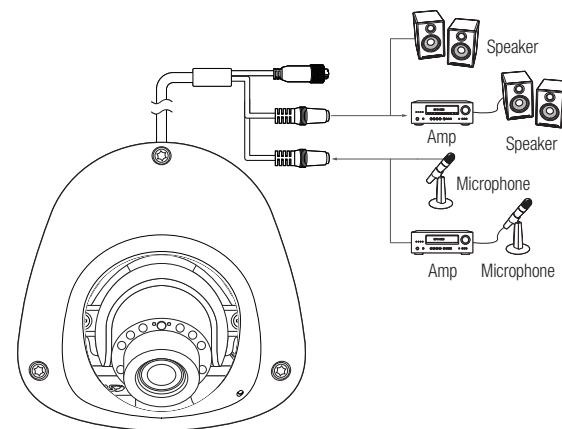
- **Audio Codec**

- Audio In : G.711 PCM (Bit Rate: 64Kbps / Sampling Frequency: 8kHz), G.726 ADPCM (Bit Rate: 16Kbps, 24Kbps, 32Kbps, 40Kbps / Sampling Frequency: 8kHz)

- **Full duplex Audio**

- **Audio in** : Mono signal line input (Max.2.4 Vpp)

Connecting to Audio Input/Output (SNV-L6014RM)



1. Connect the AUDIO IN port of the camera with the microphone or LINE OUT port of the amplifier that the microphone is connected to.

 ■ As a microphone is built in, you can use the built-in microphone instead of an external one.

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

- **Audio Codec**

- Audio In : G.711 PCM (Bit Rate: 64Kbps / Sampling Frequency: 8kHz), G.726 ADPCM (Bit Rate: 16Kbps, 24Kbps, 32Kbps, 40Kbps / Sampling Frequency: 8kHz)
- Audio Out : G.711 PCM (Bit Rate: 64Kbps / Sampling Frequency: 8kHz)

- **Full duplex Audio**

- **Audio in** : Mono signal line input (Max.2.4 Vpp)
- **Audio out** : Mono signal line output (Max.2.4 Vpp)
- **Line out impedance** : 8Ω

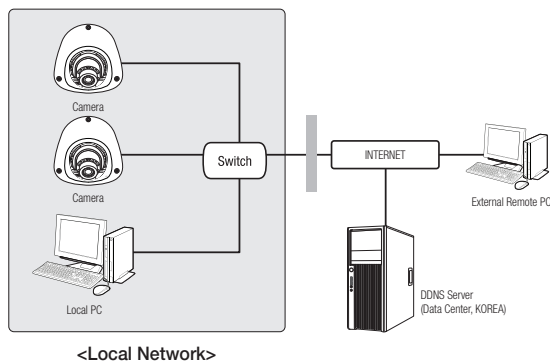
network connection and setup

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

CONNECTING THE CAMERA DIRECTLY TO LOCAL AREA NETWORKING

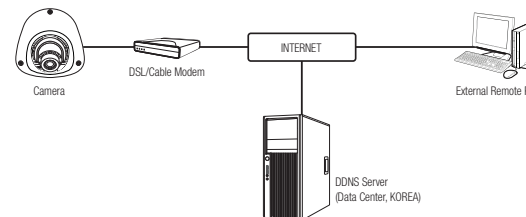
Connecting to the camera from a local PC in the LAN

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



- 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 16)

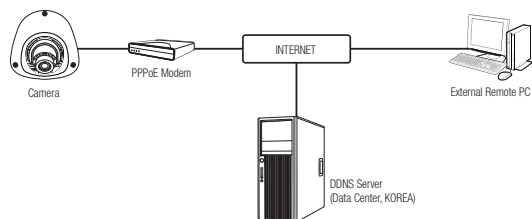
CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM



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 34)
- For registering the DDNS settings, refer to "Registering with DDNS". (page 35)
- Refer to "IP & Port" for how to setup IP. (page 30)

CONNECTING THE CAMERA DIRECTLY TO A PPPoE MODEM



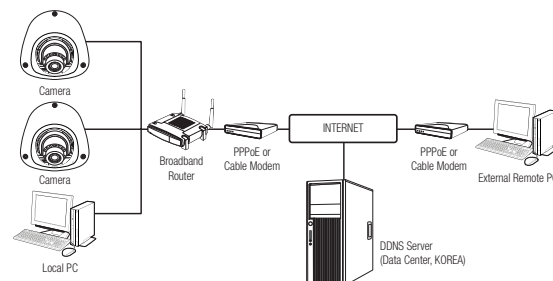
1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to **[Setup]** page.
5. Move to **[Network]** – **[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 34)
- For registering the DDNS settings, refer to "Registering with DDNS". (page 35)
- Refer to "IP & Port" for how to setup IP. (page 30)

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

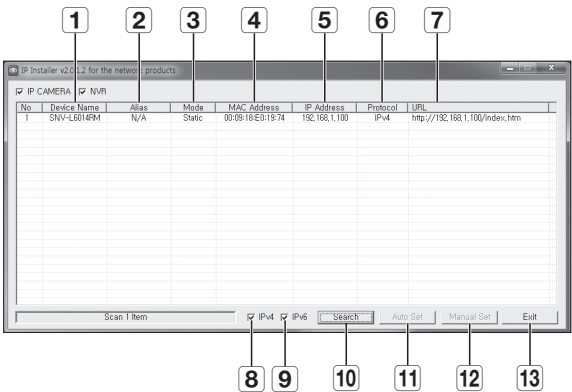
Configuring the network settings of the local PC connected to a Broadband Router, follow the instructions below.

- 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 18)

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.

Item	Description
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

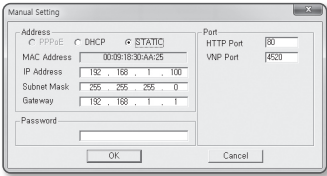
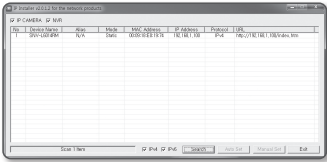
Run <IP Installer_v2.XX.exe> to display the camera search list.
At the initial startup, both [Auto Set] and [Manual Set] will be grayed out.

■ 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

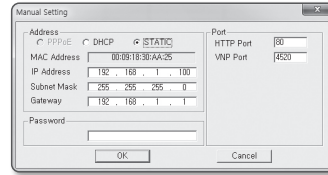
For setting <IP Address>, <Subnet Mask>, and <Gateway>, contact your network administrator.

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 29)

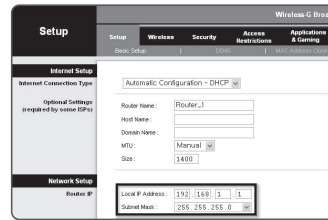
6. Click [OK].

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 18)



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	192.168.1.100	192.168.1.101
	Subnet Mask	255.255.255.0	255.255.255.0
	Gateway	192.168.1.1	192.168.1.1
Port related settings	HTTP Port	8080	8081
	VNP Port	4520	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

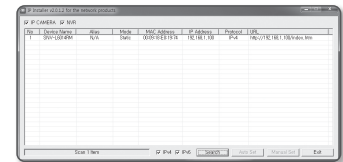
Run <IP Installer_v2.XX.exe> to display the camera search list.

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].

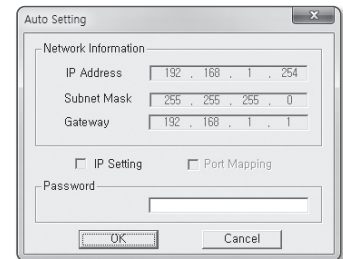
The Auto Setting dialog appears.

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 29)



4. Click [OK].

Auto network setup will be completed.

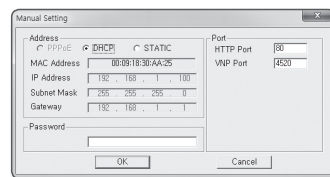
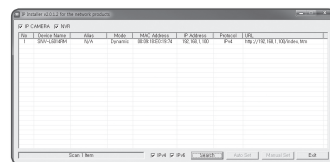
DYNAMIC IP SETUP

Dynamic IP Environment Setup

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

Checking the Dynamic IP

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

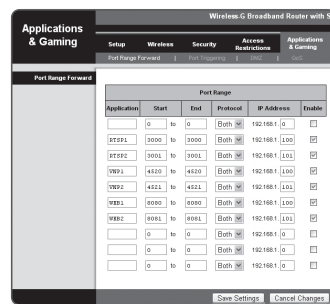


PORT RANGE FORWARD (PORT MAPPING) SETUP

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

Manual Port Range Forwarding

1. From the Setup menu of the Broadband Router, select <Applications & Gaming> - <Port Range Forward>.
For setting the port range forward for a third-party Broadband Router, refer to the user guide of that Broadband Router.
2. Select <TCP> and <UDP Port> for each connected camera to the Broadband Router.
Each port number for the Broadband Router should match that specified in <Setup> - <Basic> - <IP & Port> from the camera's web viewer menu.



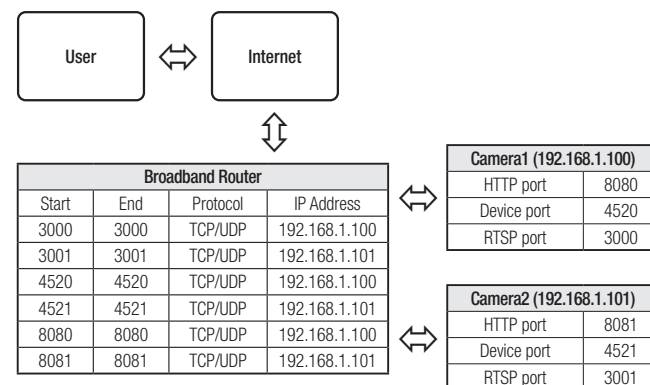
3. When done, click [Save Settings].
Your settings will be saved.

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

Setting up Port Range Forward for several network cameras

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

When Camera1 and Camera2 are connected to a router :

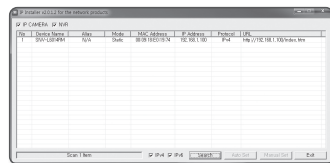


- Port forwarding can be done without additional router setup if the router supports the UPnP (Universal Plug and Play) function.
After connecting the network camera, set <Quick connect> of <Wisenet DDNS> to <On> in the "Setup → Network → DDNS" menu.

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.

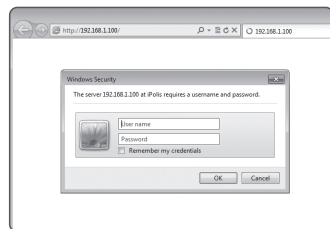
1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.
2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar.
ex) <http://ddns.hanwha-security.com/ID>

- For registering the DDNS settings, refer to "Registering with DDNS". (page 35)

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.

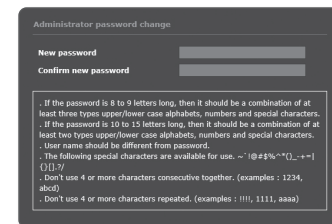


- For a new password with 8 to 9 digits, you must use at least 3 of the following: uppercase/lowercase letters, numbers and special characters. For a password with 10 to 15 digits, you must use at least 2 types of those mentioned.
- Special characters that are allowed: `~!@#$%^&*()_+=[]{}|?/`
- For higher 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.
- If the password is 10 to 15 letters long, then it should be a combination of at least two types upper/lower case alphabets, numbers and special characters. User name should be different from password.

The following special characters are available for use. `!@#$%^&*()_+=[]{}|?/`

Don't use 4 or more characters consecutive together. (examples : 1234, abcd)

Don't use 4 or more characters repeated. (examples : !!!!, 1111, aaaa)

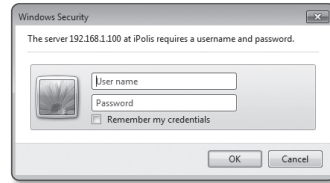


LOGIN

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

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

- ! When you access the camera web viewer, pay special attention to the security by checking whether the image data is encrypted.
- 🔑 If you check the **"Remember my credentials"** option when your input is done, in future you will be logged in automatically without being prompted to enter the login information.
- You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.



INSTALLING WebViewer PLUGIN

Live screen will be shown when the camera is connected for the first time. Use of the features will be restricted if plug-in is not installed.

1. If you choose the restricted feature in the browser that allows plug-in installation, you will be prompted to install it on the Install page and the installation will begin when you click on **[Click Here]** on the Install page.

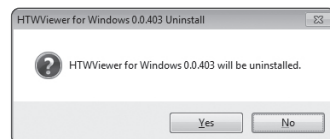
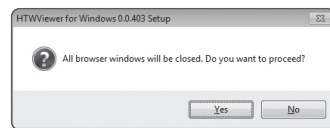
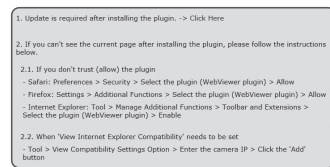
- ! ■ If the plug-in installation file download status is suspended at 99% in the Internet Explorer browser, retry it after selecting "Release SmartScreen filter" in "Tool → SmartScreen filter".

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

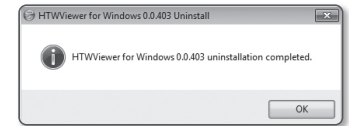
3. Click **[Yes]** when the notice window saying that all browser windows will be closed.

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

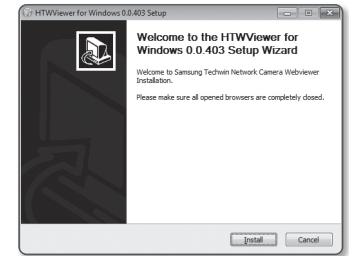
4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed.
Click **[Yes]** when the notice window is displayed.



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

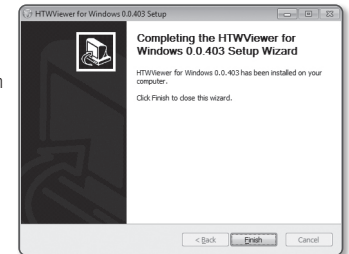


6. Click **[Install]** to begin installation of the Web Viewer Plug-in.



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_activeplugin_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.
If the problem persists, please register the IP or Domain of your camera in "Tools → Internet Options → Security → Trusted sites".



USING THE LIVE SCREEN



Item	Description
1 Monitoring	Move to the monitoring screen.
2 Playback	Move to the screen where you can search for the video recording saved in your Micro SD memory card or NAS.
3 Setup	Move to the Setup screen.
4 Profile access information	You can read the profile information.
5 Viewer Screen	Displays the Live video on the screen. ■ You can use the mouse wheel to activate the digital zooming in Viewer screen.
6 Installing the web viewer plug-in	You can play a live or recorded video by installing the web viewer plug-in. It can be used only in browsers that allow plug-in installation (IE/Firefox/Safari). You can select a profile type in <Video profile> under the <Basic> setup menu. ■ When the Web Viewer is connected, the profile information currently using is displayed.
7 Profile type	! 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	Users can store videos to a PC by themselves.
13 Audio/Microphone Control	Enable Audio and Microphone are control the Audio volume. ■ Only the Audio volume can be controlled. ■ Microphone only applies to SNV-L6014RM.
14 Hide the context menu	The left-corner context menu will disappear but only the menu icon.

To capture the snapshot

- Click [**Capture** ()] on the scene to capture.
- When a captured video is saved, a notification message appears.
When using Internet Explorer, the captured video is saved in My Computer / My Documents / Pictures.
In Mac OS, it is saved in "~/Pictures" or "/Users/{user account}/Pictures/".
The basic path for IE, Firefox, and Chrome without the installed plug-in is "C:\Users\{Users}\Downloads", and the file is saved directly in "Downloads" for Safari.

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

How to record videos manually

- Press [**Manual recording** ()].
 - To end the recording, press [**Manual recording** ()] again.
-  ■ Can store manually recorded videos to the user's PC in .avi file format. Specify a path and store your videos.

To fit the full screen

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

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

To Use 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.

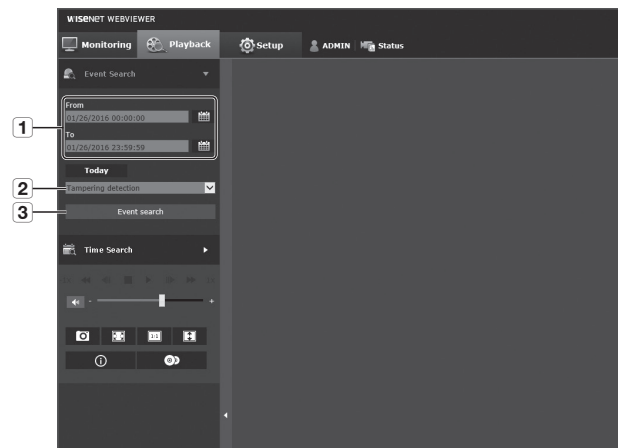
To Use Microphone (SNV-L6014RM)

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

PLAYING THE RECORDED VIDEO

 ■ Before you can play the video, you must configure the record settings. For details on record settings, refer to "Storage". (page 38)

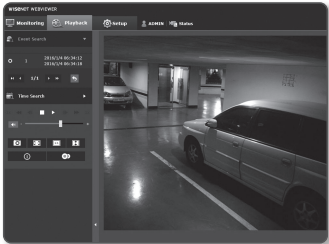
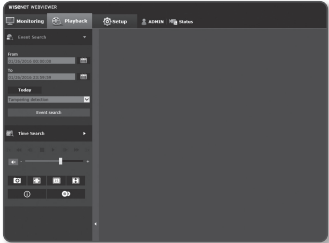
Name of event search screen and its function



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

To play the content after searching by event

1. Click the **[Playback (🔍)]** button.
 2. Specify the start time and end time of your search.
 3. Select an event type for your search within the specified period.
 4. Click the **[Event search]** button.
The search results will be displayed in the list.
- If more than 800 events are recorded within the search period, your search will be limited up to the date when the 800th event is recorded.
For instance, if the search period is between 10th and 15th day of the month, and more than 800 events were recorded 10th through 11th, your search will be limited up to 11th day with a total of 800 events, and events after then (from 12th) will not be found.
5. Select a data item to play in the search list.
 6. Click the **[Play (▶)]** button.
 7. To stop playing the video, click **[Stop (■)]**.
 8. To return to the search screen, click **[Exit (↶)]**.



Name of time search screen and its function



Item	Description
1 Time bar	The section in the specific period is played by moving the time bar.
2 Search date setting	Set the search date using the calendar. ■ If there is data saved in your Micro SD memory card or NAS on the day, it is marked as a box on the calendar.
3 Speaker	To listen to a voice signal (if present) in the recorded video, then activate the voice signal icon when you play it.
4 Screen optimization	The camera image is converted to fit the Web browser window.
5 Fix the resolution	Regardless of the resolution setup configured in the camera, it sets the resolution to 800x600. Press it again to switch back to the default resolution.
6 Capture	The current image is saved as a .jpg image file.
7 Full screen	The current image is converted to cover the maximum size of the monitor.
8 Video information	Time data of the replayed video is displayed on the screen.
9 Backup	Set the desired date to make a backup copy of video data saved in your Micro SD memory card or NAS. ■ It can be set as up to 5 minutes for Micro SD memory card or up to 30 minutes for NAS.

To play after searching by time

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



To play the backup video

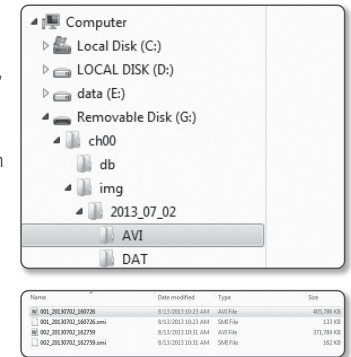
The backed up images are saved in an .avi format. Gom Player, VLC Player, and Window Media Player are recommended as the media player compatible with this format.

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

To Play an AVI File

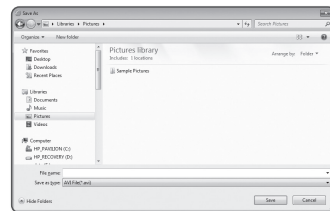
(1) Micro SD memory card

1. Separate the Micro SD memory card from the camera.
2. Insert the Micro SD memory card into the PC.
3. Play the AVI file in the "ch00\img\YYYY_mm_DD\AVI" directory, using a media player.
 - Before separating the Micro SD memory card, set the <Device> to <Off> in the "Setup → Event → Storage" menu.
 - A filename starts with the format "001_YYYYMMDD_HHMMSS.avi" and the file number is incremented by one. YYYYMMDD_HHMMSS indicates the start time of data saving.
 - "001_YYYYMMDD_HHMMSS.smi" file is a caption file, and you can view it if it exists in the same directory as its related AVI file.
 - The max recording time per AVI file is 5 minutes.
 - Once corrupted, the data in the Micro SD memory card cannot be replayed in the Web Viewer's [Playback].



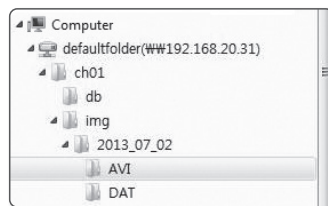
To back up the searched video

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.



(2) NAS (Network-Attached Storage)

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



- A filename starts with the format "001_YYYYMMDD_HHMMSS.avi" and the file number is incremented by one. YYYYMMDD_HHMMSS indicates the start time of data saving.

Name	Date modified	Type	Size
001_20130702_200726	8/13/2013 10:20 AM	AVI File	405,789 KB
001_20130702_200726.smi	8/13/2013 10:20 AM	SMI File	113 KB
002_20130702_200729	8/13/2013 10:20 AM	AVI File	371,394 KB
002_20130702_200729.smi	8/13/2013 10:20 AM	SMI File	162 KB

- "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.

To Add/Change the Video Profile

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

1. Select one from the <Video profile> options.
2. Provide the name and select a codec.
3. Specify the conditions under which the codec will be applied.
4. Specify the details of the selected codec including resolution and frame rate.

Click <Advanced> to display the context menu.

- Resolution : Set the video size of the H.264 and MJPEG files.
- Framerate : Set the max number of video frames per sec.



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

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 codec was selected. (One I-Frame + 0~Several P-Frames)
- Profile : You can select the H.264 profiling method.
- Entropy coding : Reduce the possible compression loss due to encoding.

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



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

What is GOV length?

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

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

For H.264 codec, you can determine the GOV length.

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

User

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

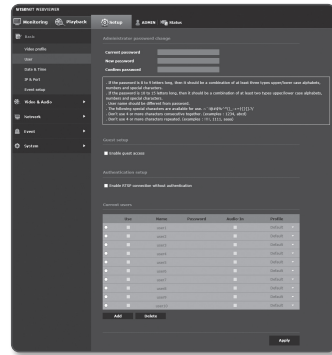
2. Click **<User>**.

3. Provide the necessary user information.

- Administrator password change : Change the password for the administrator.



- For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
- It is recommended to change your password once every three months.
- The password length and limits are shown as follows.
 - A combination of at least three types of upper case, lower case, numeric, and special characters: 8 to 9 characters.
 - A combination of at least two types of upper case, lower case, numeric, and special characters: 10 to 15 characters.
 - Should be different from the ID.
 - Cannot repeat the same letter, number of special characters more than 4 times.
 - Don't use 4 or more characters consecutive together. (examples : 1234, abcd)
 - Don't use 4 or more characters repeated. (examples : !!!!, 1111, aaaa)
 - Special characters that are allowed. : ~!@#\$%^&*()_+=|[];.,/?
 - After the factory setting, the admin and user passwords are initialized. You need to reset the password.
 - When you access the camera web page for the first time or access it after the initialization, you will be moved to the admin password setting menu.
 - In this menu, you need to login again with the new password before using the camera web page menus.
 - If the existing password is not matched, when you change the admin password, you cannot change the password.
 - After changing your password, if there is a camera connected to a CMS or NVR client, then you need to re-register it with the newly changed password. If the camera is still connected with the same password, then the account may be locked because a client uses the previous password.
- If you try to login with the registered account, 5 or more consecutive password authentication has failed, and then the account may be locked for thirty seconds.
- When the password is changed while multiple connections are active from a PC, the browser may malfunction. In that case, reconnect to the server.



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

- Current users : If you select **<Use>**, you can set or change the user permissions.

- Profile : If you select **<Default>**, you can only see the default profile video; if selecting **<All>**, you can see the full profile videos.



- ONVIF functions available to a registered user allowed to use ONVIF functions are limited to those of granted with permission.
- Image transmission and image information change: Set the profile to **<All>** and enable the rest of the authorizations.

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

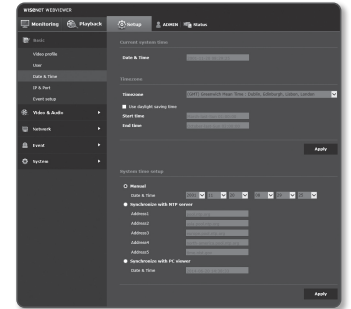
Date & Time

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 : Specify the time manually.
 - Synchronize with NTP server : Sync with the time of the specified server address.
 - Synchronize with PC viewer : Sets to the time of the computer connected.



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



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

IP & Port

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

2. Click **<IP & Port>**.

3. Set the **<IPv4 setup>**.

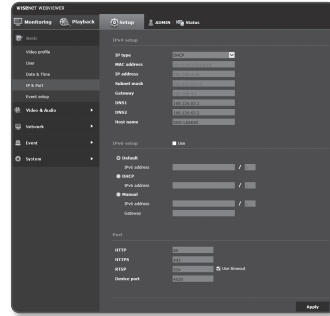
- IP type : Select an IP connection type.
 - Manual : Specify the IP address, Subnet mask, Gateway, host name, DNS1, and DNS2.
 - DHCP : Specify the DNS1 and DNS2.
 - PPPoE : Specify the DNS1, DNS2, ID and Password.
- If you set it to **<Manual>**, you should specify the IP, Subnet mask, Gateway, DNS 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.
- Host name : Displays the host name.

4. Set the **<IPv6 setup>**.

- Set to **<Use>** to use IPv6 address.
- Default : Use the default IPv6 address.
- DHCP : Display and use the IPv6 address obtained from the DHCP server.
- Manual : Enter IP address and gateway manually and use it.



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



5. Type in each item in the Port menu as necessary.

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



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

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

Event setup

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

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

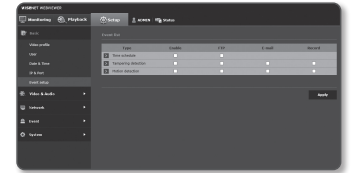
2. Click **<Event setup>**.

3. Activate desired items on the Event list.

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



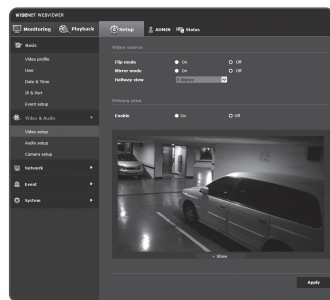
- To make detailed event settings, click on your desired settings. Go to detailed **<Event>** setting.



VIDEO & AUDIO SETUP

Video setup

1. From the Setup menu, select the <Video & Audio ()> tab.
2. Click <Video setup>.
3. Select a <Video source> mode.
 - Flip mode : Turn upside down the image that is captured by the camera.
 - Mirror mode : Flip horizontal the image that is captured by the camera.
 - Hallway view : Rotates a video that was taken from a camera by a specified angle.
Possible to rotate 0, 90, and 270 degrees.
 - If the setting is changed, the browser window will be closed. Try to connect again after a while.



 ■ Video output is not supported for the hallway view by SPD-100/400.

4. Specify the privacy zone.
5. 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. Click [Apply ()].
3. Click and drag the desired region on the video.
4. Enter the name and select the color, and then click [OK].
5. If you want to delete a name in the list, select it and click [Delete ()].

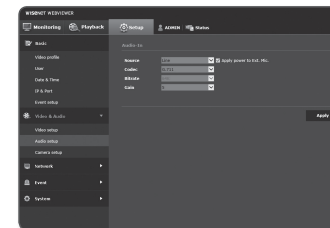


Audio setup (SNV-L6013R)

You can configure the input settings of the audio source from the camera.

1. From the Setup menu, select the <Video & Audio ()> tab.
2. Click <Audio setup>.
3. Set the audio input value.

- Source : Sets the audio input.
 - Line : Connect the cable to the audio device.
 - External microphone : 3.5 pi(φ) jack type external MIC.
- Apply power to Ext. Mic. : If the external microphone connected has no separate power supply, check this option to set camera to supply power to the connected external microphone. The option is enabled if <External microphone> is selected.
- Codec : Specify the audio codec.
 - G.711 : A audio codec standard, it uses 64 Kbps PCM (Pulse Code Modulation) encoding. ITU standard audio codec that is adequate for digital voice transfer in PSTN network or through a PBX.
 - G.726 : ITU standard audio codec applying ADPCM (Adaptive Differential Pulse Code Modulation) for variable bit rates of 40/32/24/16 Kbps to 64 Kbps PCM encoding.
- Bitrate : Set the bit rate to differentiate compression ratio if using G.726 codec.
- Gain : Specify the audio input amplification.



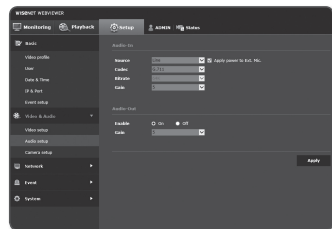
 ■ Sound quality deterioration or howling may occur if the loudness of the sound source or gain value were set excessively.

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

Audio setup (SNV-L6014RM)

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

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



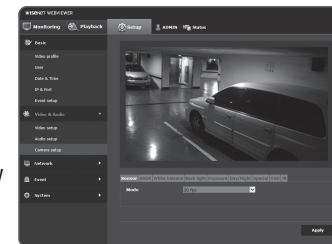
! ■ Sound quality deterioration or howling may occur if the loudness of the sound source or gain value were set excessively.

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.

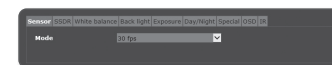
1. From the Setup menu, select the **<Video & Audio ()>** tab.
2. Click **<Camera setup>**.
3. Configure the settings as necessary of : Sensor, SSDR, White balance, Back light, Exposure, Day/Night, Special, OSD, IR
4. When done, click **[Apply ()]**.
 - If a certain time (timeout: 240s) is elapsed with your not pressing the **[Apply ()]** button after changing the settings, your changes will not be applied.



To Set the Sensor

It specifies how many frames the camera CMOS sensor will capture per second.

1. Select **<Sensor>**.
2. Select **<Mode>**.

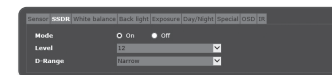


✍ ■ Refer to "Video profile" for the framerate setup range of the **<Video profile>** according to mode setup. (Page 27)

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 **<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.



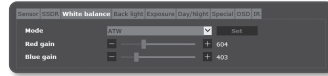
To Set White Balance

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.
- Manual : You can adjust the red and blue gains of the camera video manually.
- AWC : Corrects the colors of the camera video to be optimized to the current lighting condition and screen mode.
To obtain the optimal condition for the current lighting, put the focus of the camera to a white paper and press the [Set] button. If the lighting environment is changed, you should readjust the settings accordingly.
- Outdoor : Automatically corrects the video colors of the camera to be optimized to the outdoor environment.
- Indoor : Automatically corrects the video colors of the camera to be optimized to the indoor environment.



- 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

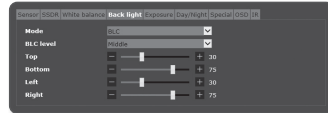
You can specify a desired area on the video manually and set the area to be displayed more clearly.

1. Select <Back light>.

2. Set <Mode> to <BLC>.

3. Set <BLC level>.

You can change the level to adjust the brightness of the monitoring area.



4. Set the <Top, Bottom, Left, Right> levels to specify the target area.

- ! When BLC is set, the green box is displayed on the screen for 15 seconds.
- To prevent malfunction at the time of BLC setup, the vertical space of the BLC area should be over 40 and below 60 while the horizontal space over 30 and below 60.

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 : Select Able or Disable for the video noise elimination function.
- SSNR level : Adjust the noise reduction level.
- 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.



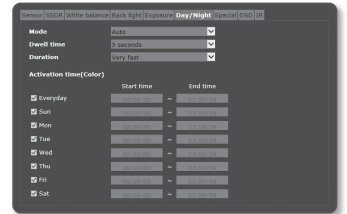
- ! The image exposure can be saturated depending on the Shutter setup range.

To Set Day/Night

1. Select <Day/Night>.

2. Select each item and set it properly.

- Mode : Mode is used to adjust the color of Color or Black and White.
 - Color : The video is always output in color.
 - B/W : The video is always output in black and white.
 - Auto : Normally, it is set to Color but to B&W under low luminance at night.
 - If AGC of the <Exposure> menu is set to <Off>, the day/night mode cannot be set to <Auto>.
- Schedule : Set the time during which the camera is operated in the color mode.
- Dwell Time : It specifies the period for which the selected brightness condition must be maintained to switch the lighting mode from Day to Night or vice versa.
- Duration : It specifies the interval of lighting mode conversion.
- Activation time(Color) : It specifies the schedule for color mode operation.
 - If it is set, the Color mode is maintained from 00 second of the starting time to 59 second of the ending time.



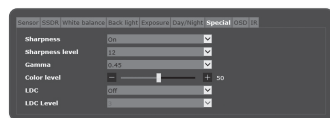
- ! If you switch the day/night mode, the motion detection event cannot be detected.

To Setup Special

1. Select <Special>.

2. Select each item and set it properly.

- 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.
- LDC : To determine whether or not to use the image distortion correction.
- LDC Level : To adjust the level of the distortion correction factor.

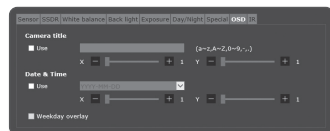


To Set OSD

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.
- 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.



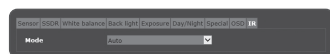
- ! A position-adjustable item (Camera title, Date & Time) may not be displayed normally if it overlaps with another fixed OSD item.

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 : IR mode will be disabled.
 - Auto : Adjust the IR brightness according to the brightness of the object on the center 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.

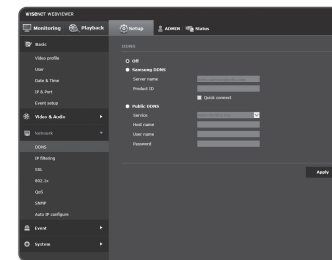
1. From the Setup menu, select the <Network ()> tab.

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 DDNS server provided by Hanwha Techwin.
 - Product ID : Enter the product ID that is registered with the Wisenet 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 18)

- 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.

No.	Product ID	Model	Connection Status	Video Tagging
1	HDD-100	EXT	OK Status	On
2	HDD-200	EXT	OK Status	On

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 (Apply)].
When the connection is successfully made, you will see the message of <(Success)> on the screen.

Configuring public DDNS in Camera Settings

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

■ To use DDNS service properly, both DDNS setup and the router's port forwarding setup are required.
For port forwarding setup, refer to "Port Range Forward (Port Mapping) Setup", (page 18)

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 (Network)> tab.
2. Click <IP filtering>.
3. Select <Filtering type>.
 - Deny : If selecting this, access from those IPs that are added to the filtering will be restricted.
 - Allow : If selecting this, access from only those IPs that are added to the filtering will be accepted.
4. Click the [Add (Add)] button.
The IP list will be created.
5. Provide the IP that you want to grant or deny access from.
When you enter an IP address and a Prefix, the list of IP addresses available will appear in the right-side filter range column.

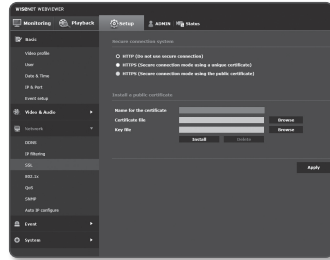


- If selected <Allow> for IP Filtering and <IPv6 setup> of <IP & Port> is set to <Use>, both IPv4 and IPv6 addresses of the computer currently configuring should be assigned.
 - The IP address of the computer used for the current setup cannot be added to <Deny>, it should be added to <Allow>.
 - Only the IP addresses that are set to <Use> will be displayed in the filter column.
6. Select an IP to delete from the list.
Click the **Delete** () button.
 7. When done, click **Apply** ().

SSL

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

1. From the Setup menu, select the <Network ()> tab.
2. Click <SSL>.
3. Select a secure connection system.
 - To access the camera using HTTPS mode, you have to type the IP address for the camera in the form of "https://<Camera_IP>".
If you failed to configure the Web viewer settings in HTTPS mode with Internet Explorer, edit the Internet options as follows: <Menu → Tools → Internet Options → Advanced → Security → Uncheck TLS 1.0, and check TLS 1.1, TLS 1.2>
4. Search for the public certificate that you want to install on the camera.
To install the certificate on the camera, you need to provide a certificate name (it can be arbitrarily assigned by the user), certificate file issued from the certification authority and a key file.
 - The <HTTPS (Secure connection mode using the public certificate)> item will be active only if there exists a public certificate installed.
5. When done, click **Apply** ().



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.

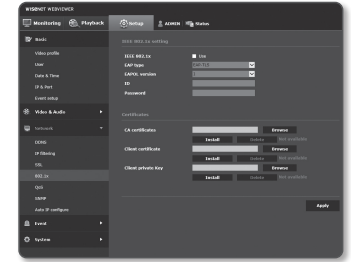
Deleting the certificate

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** ().

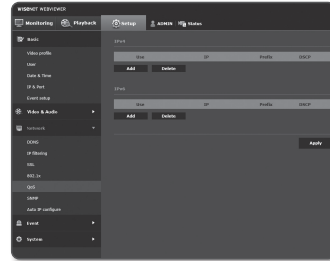
To install/remove 802.1x related certificates

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.

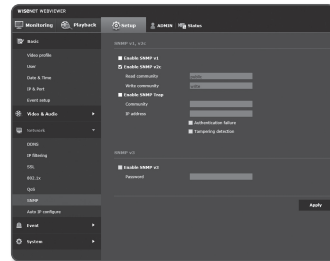
1. From the Setup menu, select the **<Network ()>** tab.
 2. Click **<QoS>**.
 3. Click the **[Add ()]** button.
The IP list will be created.
 4. Enter an IP address to which you will apply QoS.
- The default prefix for IPv4 is 32;
For DSCP, the default is set to 63.
 - Only the IP addresses that are 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 Trap : SNMP trap is used to send important events and conditions to the Admin.
 - Community : Enter the trap community name to receive messages.
 - IP address : Enter the IP address to which messages will be sent.
 - Authentication failure : It specifies whether an event shall be generated when the community information is invalid.
 - Network connection : It specifies whether an event shall be generated when the network disconnection is restored.



- Enable SNMP v3 : SNMP version 3 will be active.
 - Password : Specify the default password for SNMP version 3.
 - The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.
Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
 - Password should be longer than 8 characters, no more than 16 characters.

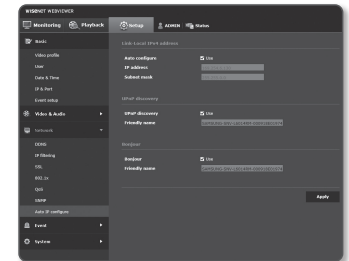
4. When done, click **[Apply ()]**.

- SNMP v3 is only able to be set when the secure connection mode is HTTPS.
Refer to "SSL". (page 36)
- 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.

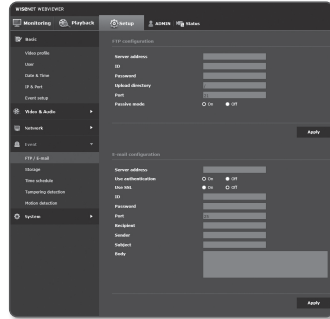
6. When done, click **[Apply ()]**.

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.

- From the Setup menu, select the **<Event (👤)>** tab.
- Click **<FTP / E-mail>**.
- 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 SSL : Specify the use of SSL.
 - ID : Enter the user ID for logging into the email server.
 - Password : Enter the user account password for logging into the email server.
 - Port : The default port of the email server is 25; however, you can use a different port number according to the email server settings.
 - Recipient : Enter the address of the email recipient.
 - Sender : Enter the address of the email sender. If the sender address is incorrect, the email from the sender may be classified as SPAM by the email server and thus may not be sent.
 - Subject : Enter a subject for your email.
 - Body : Provide the text for the message. Attach the alarm or event images to the email that you are preparing.
- When done, click **[Apply (👉)]**.

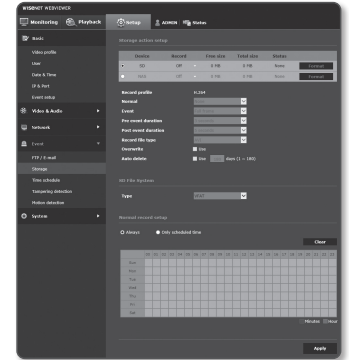


Storage

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

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

-  If your device is properly recording data, it will display **"Recording"**.
 - If you see an "Error" message, check the following:
 - Check the storage to see if it is connected to the device.
 - Check the files in the storage to see if they are damaged.
 - Check the storage to see if they are physically damaged.
 - If the "Error" message does not disappear after following the instructions, format the Micro SD card. After formatting, if the error message still remains, replace the Micro SD card.
 - If you remove the Micro SD card without changing a button to 'off' position in settings or if you connect a camera to an unstable power source, the Micro SD card may be damaged.
-  After operation in record mode, you are limited to 2 simultaneously accessible profiles, and to 3 connected users. However, existing users will be sustained.



To make recording on the Micro SD memory

- Set the SD card unit to **<On>**.
- Click the **[Apply (👉)]** button.
- Check the memory card's **<Free size>** and **<Total size>**.
You can format the Micro SD card by clicking the **<Format>** button.
 - Some frames may be skipped if the Micro SD memory card operates at the lower speed than recommended. For more details, refer to **"Recommended Micro SD/SDHC/SDXC Memory Card Specifications"**. (Page 6)
 - For a Micro SD memory card with a large capacity, the formatting will be slowed down accordingly.
 - The data traffic will increase when the camera is set to higher resolution, higher bit rate, and/or higher framerate. If there is too much data traffic, some frame may be skipped although it is stored in a full frame.
 - When a frame skip occurs, images are saved at the rate of min. one image per sec.
- Specify the storage action.
 - Record profile : Shows recording profile's codec type.
 - 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 Micro SD memory is full, this will delete old data and store new data in replacement.
- Auto delete : Data for a certain period is deleted, while other data is not deleted. This can be set within the range of one day to 180 days.

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

5. Set <SD File System>.

- Type : The camera supports VFAT and EXT4 for the SD card file system, which can be set by the user. (However, a separate application is required that allows the EXT4 file system to interact with the Windows OS.)

! ■ If the setting is changed, the existing data will be formatted.
 ■ It takes up to 10 minutes to format the SD card in the ext4 file system.

6. Specify the <Normal record setup>.

- Always : Always save recorded video in the Micro SD memory card.
 - If set to Always, the activation time cannot be changed.
- Only scheduled time : Records only on the specified time of the specified day of week.
- [Clear ()] : 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.

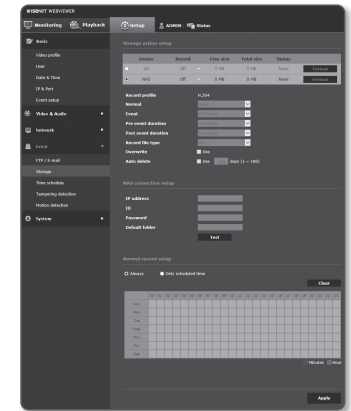
4. After the settings are completed, set the NAS unit to <On>.

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 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.

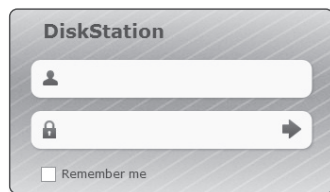


NAS (Network Attached Storage) guide

- Since data may not be saved after a temporary network interruption when using NAS, it is recommended that you use SD at the same time to prevent loss of recorded images.
- If the setting allows a Micro SD memory card and the NAS to be simultaneously connected for use, the higher priority for recording goes to the NAS.
- If you activate Overwrite to the NAS by setting it to <Off> and the available capacity is below 1%, it will be saved in the Micro SD card.
- If you are saving data in the NAS, you might be unable to save it when you insert a Micro SD memory card used by another camera.
- NAS recommended specs : Refer to "NAS recommended specs". (Page 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.

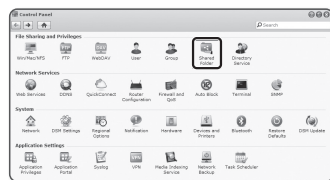
1. Access the Synology NAS as an admin.
In this example, the NAS IP Address is set to [192.168.20.253].



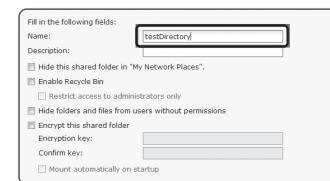
2. If you access it as an admin, the following screen will be displayed. Click the [Control Panel].



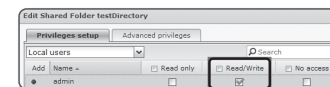
3. Click the <Shared Folder> in the file sharing and privilege menu.



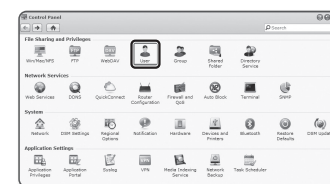
4. Click the [Create] button.
5. After entering the shared folder name(ID), click the [OK] button to create a shared folder.
In this example, the shared folder name is [testDirectory].



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

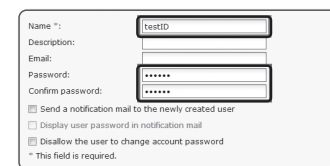


7. Click on the <User> in the file sharing and privilege menu.

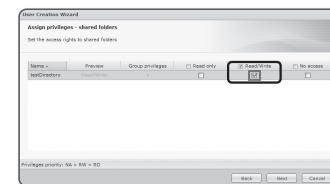


8. After clicking the [Create] button, enter name(ID) and password.
In this example, name(ID) is set to [testID] and password is also set to [testID].

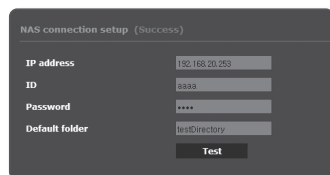
- Models that have been discontinued by the manufacturer are not supported.
- According to the NAS recommendations, when you use Netgear's NAS equipment, do not allocate the capacity for use.



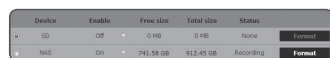
9. In Windows, set the privilege for NAS access.
For the shared folder created in step 4 called "testDirectory" check [Read/Write].



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



- After entering item 10, check <On>.
- Click the [Apply (Apply)] button.
Finish saving by using the NAS.



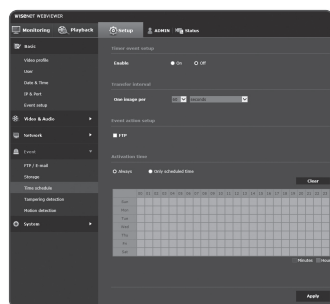
Time schedule

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

- From the Setup menu, select the <Event (Event icon)> tab.
- Click <Time schedule>.
- Set whether or not to <Enable>.
- Specify the <Transfer interval>.
- 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.

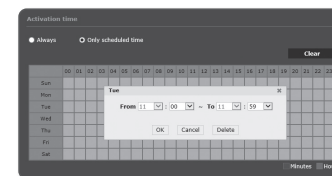
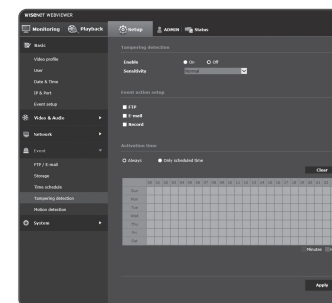
- Specify the activation conditions.
 - FTP : Sets whether to enable FTP transmission when using a time schedule.
 - Refer to "FTP / E-mail" for more details. (page 38)
- When done, click [Apply (Apply)].



Tampering detection

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

- From the Setup menu, select the <Event (Event icon)> tab.
- Click <Tampering detection>.
- Set whether or not to <Enable>.
- Set the tampering detection sensitivity. The higher the sensitivity, detects the minutest tampering attempts.
- Specify the <Activation time>.
 - Always : To continuously check whether or not an event has occurred. If an event is detected, a preset operation is executed.
 - If set to <Always>, the activation time cannot be changed.
 - Only scheduled time : To check whether or not an event has occurred, at a specified time on a specified date. If an event is detected, a preset operation is executed.
 - [Clear (Clear)] : Reset time setting.
 - Hour : Drag your mouse at Activation Time and set the time by hours.
 - Minute : Click an area in Activation Time and set the time by minutes.
- Configure the operations to be executed when an event is detected.
 - FTP : To set whether or not to send FTP when an event is detected.
 - Refer to "FTP / E-mail" for more details. (page 38)
 - E-mail : To set whether or not to execute transmission when an event is detected.
 - Refer to "FTP / E-mail" for more details. (page 38)
 - Record : To set whether or not to record to a NAS or Micro SD card when an event is detected.
 - Set <Device> to <On> in <Storage>. (page 38)
- When done, click [Apply (Apply)].



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

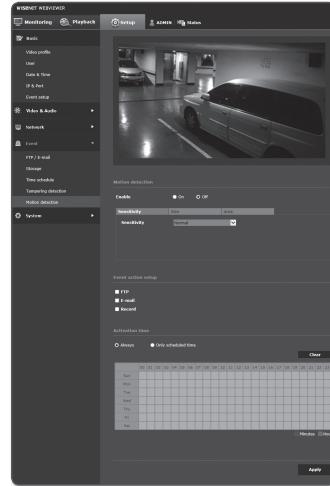
Motion detection

You can configure the settings so that an event signal is generated when a motion detection event is observed.

1. From the Setup menu, select the <Event (👤)> tab.
2. Click <Motion detection>.
3. Set whether or not to <Enable>.
4. Set <Sensitivity>, <Size> and <Area>.
5. Specify the activation time and activation condition.
 - For more information about <Activation time> and <Action>, refer to "Tampering detection". (page 41)
6. When done, click [Apply (👉 Apply)].

- 

 - 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.
 - When the camera shoots an object from a short range, the motion detection function may be compromised.
 - In the following cases, motion detection 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.

- 

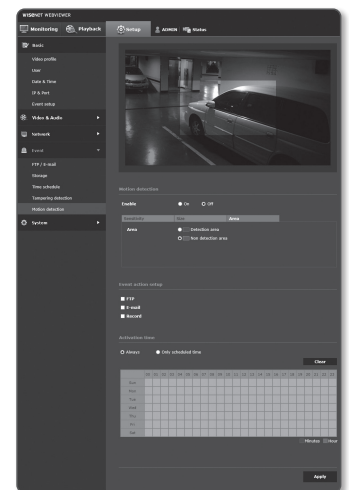
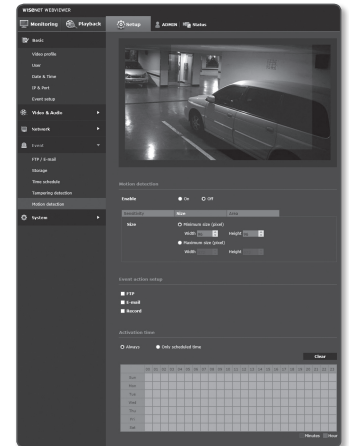
 - In a situation that definitely distinguishes objects out of backgrounds, set this to a low sensitivity level. For opposite case that is hard to distinguish objects like low illuminated situation, set this to a high level.

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.

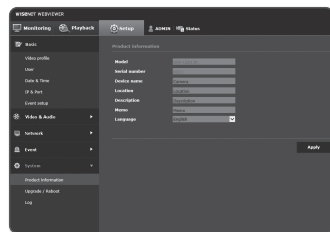
4. Select <Area> tab.
You can specify an area on the screen to include or exclude the area to/from detection.
You can specify up to 4 areas.
 - Detection area : Sets the entire screen as excluded from detection, and adds specified area as motion detection area. Select 4 vertices in the image with your 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 an area, right click on the screen to open popup context menu and select Delete, and [OK] button.
6. When done, click [Apply (👉 Apply)].



SYSTEM SETUP

Product information

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

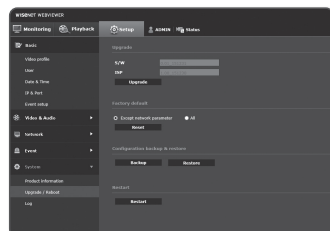


-  The default language is set to <English>.

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

Upgrade / Reboot

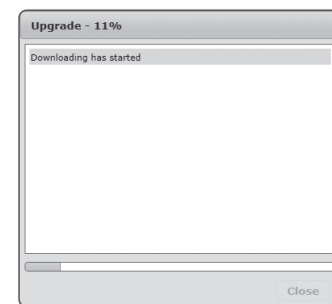
1. From the Setup menu, select the <System ()> tab.
2. Click <Upgrade / Reboot>.
3. Select a desired item and set it appropriately.
 - Upgrade : Performs upgrading the system.
 - Factory default : Resets the system to the factory default.
 - Except network parameter : To initialize all settings except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



To perform the upgrade

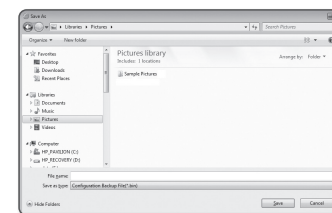
1. Click [Upgrade].
2. Click [Browse] and specify a file to upgrade.
3. Click [Send].
4. The "Upgrade" dialog appears where the progression will be shown in the bottom.
5. Once completed upgrading, the browser exits and the camera restarts.

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



To back up the current settings

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

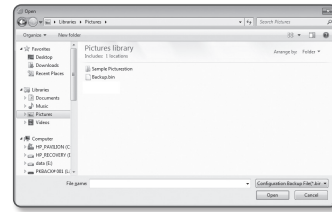


To restore the backup settings

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



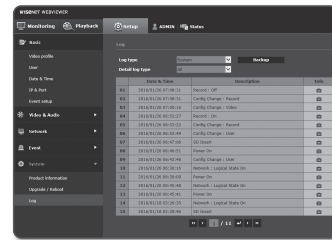
- If you perform the backup or restoration, the web browser will be closed and the camera will reboot.
- If you try to recover the config file backed up in other model, some functions may malfunction and you need to change the setting manually.



Log

You can check the system log or event log.

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



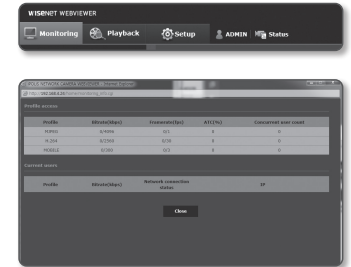
- If you want to view the details of a log, click [Info ()] in the right column of the log; the log information will be shown in the bottom pane.
- Each page displays 15 logs with the latest one displayed at the top.
- The event/system log list can contain up to 1000 logs; after that, the existing logs will be deleted from the oldest one each time a new log is created.

VIEWING PROFILE INFORMATION

Profile access

You can check the profile information.

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



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

TROUBLESHOOTING

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

PROBLEM	SOLUTION
Cannot record into the Micro SD memory card.	• Check if the memory card is defective.
Micro SD memory card is inserted but the camera does not operate properly.	• Check if the memory card is inserted in the proper direction. Operation of memory card that is formatted by other devices is not guaranteed with this camera unit • Format the memory card again in <Setup> → <Event> → <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 3.0	
Busybox	GPL 2.0	http://www.busybox.net/downloads/snapshots
iproute2-3.1.0	GPL 2.0	
alsa-utils-1.0.24.2	GPL 2.0	
alsa-lib-1.0.24.1	GPL 2.0	
iptables-1.4.12.2	GPL 2.0	http://ftp.netfilter.org/pub/iptables
ethtool-3.2	GPL 2.0	
mt-d-1.4.1	GPL 2.0	ftp://ftp.infradead.org/pub/mt-d-utils
mi-diag-2.11	GPL 2.0	
rp-pppoe-3.10	GPL 2.0	http://www.roaringpenguin.com/pppoe/
wpa_supplicant-0.7.3	GPL 2.0	
bash-4.2	GPL 3.0	
zeroconf	GPL 2.0	

LGPL SW

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

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Version 2, June 1991

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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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iperf performance test

Mark Gates

Ajay Tirumala

Jim Ferguson

Jon Dugan

Feng Qin

Kevin Gibbs

John Estabrook

National Laboratory for Applied Network Research

National Center for Supercomputing Applications

University of Illinois at Urbana-Champaign

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jloup@gzip.org madler@alummi.caltech.edu

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](http://www.ietf.org/rfc/rfc1951.txt) (deflate format) and [rfc1952.txt](http://www.ietf.org/rfc/rfc1952.txt) (gzip format).



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