

SAMSUNG TECHWIN

NETWORK CAMERA

User Manual

SNV-6012M



Network Camera

User Manual

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- ❖ Design and specifications are subject to change without prior notice.
- ❖ 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.

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/ accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lighting storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



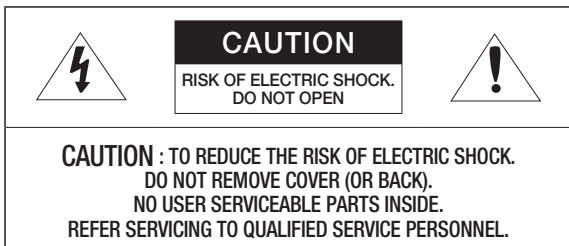
WARNING

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.

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

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

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

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

overview

Please read the following recommend safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not 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.

CONTENTS

OVERVIEW

3

- 3 Important Safety Instructions
- 9 Product Features
- 10 Recommended PC Specifications
- 10 Recommended Micro SD/SDHC/SDXC Memory Card Specifications
- 11 What's Included
- 12 At a Glance

INSTALLATION & CONNECTION

14

- 14 Installation
- 17 Inserting/Removing a Micro SD Memory Card
- 18 Memory Card Information (Not Included)
- 19 Connecting with other Device

NETWORK CONNECTION AND SETUP

21

- 21 Connecting the Camera Directly to Local Area Networking
- 22 Connecting the Camera Directly to a DHCP Based DSL/Cable Modem
- 23 Connecting the Camera Directly to a PPPoE Modem
- 24 Connecting the Camera to a Broadband Router with the PPPoE/Cable Modem
- 25 Buttons used in IP Installer
- 26 Static IP Setup
- 30 Dynamic IP Setup
- 31 Port Range Forward (Port Mapping) Setup
- 33 Connecting to the Camera from a Shared Local PC
- 33 Connecting to the Camera from a Remote PC via the Internet

WEB VIEWER

34

- 34 Connecting to the Camera
- 36 Login
- 37 Installing Silverlight Runtime
- 40 Installing STW WebViewer Plugin
- 42 Using the Live Screen
- 44 Playing the recorded video

SETUP SCREEN

50

- 50 Setup
- 50 Video Setup
- 63 Network Setup
- 74 Event Setup
- 88 System Setup

APPENDIX

95

- 95 Specification
- 100 Product Overview
- 101 Troubleshooting
- 103 Open Source Announcement

PRODUCT FEATURES

- **M12 Standard**

Use the M12 connectors to the camera cable to support vibration proof/waterproof (IP66).

- **Dustproof/Waterproof (IP66)**

The dustproof and waterproof design makes you feel at ease when installing the product outdoors or exposing it to rain.

- **Full HD Video Quality**

- **Multi-Streaming**

This network camera can display videos in different resolutions and qualities simultaneously using different CODECs.

- **Web Browser-based Monitoring**

Using the Internet web browser to display the image in a local network environment.

- **Tampering Detection**

Detects tempering attempts on video monitoring.

- **Motion Detection**

Detects motion from the camera's video input.

- **Intelligent Video Analysis**

Analyzes video to detect logical events of specified conditions from the camera's video input.

- **Face Detection**

Detects faces from the camera's video input.

- **Auto Detection of Disconnected Network**

Detects network disconnection before triggering an event.

- **ONVIF Compliance**

This product supports ONVIF Profile-S.
For more information, refer to www.onvif.org.



Driving network video through global standardization

RECOMMENDED PC SPECIFICATIONS








- CPU : Intel Core 2 Duo 2.4 GHz or higher (for using 1920x1080 30 fps)
Intel Core i7 2.8 GHz or higher (for using 1920x1080 60 fps)
 - Web Plug-in is optimized to SSE 4.1 Instruction Set.
- Operating System : Windows XP, VISTA, 7, 8, Mac OS X 10.7
- Resolution : 1280X1024 pixels or higher (32 bit color)
- RAM : 2GB or higher
- Web Browser : Microsoft Internet Explorer (Ver. 10, 9, 8, 7), Mozilla Firefox (Ver. 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9), Google Chrome (Ver. 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15), Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 Only), 5.1.7)
 - 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

- 4GB ~ 64GB
- For your camera, we recommend you use a memory card from the following manufacturers:
Micro SD/SDHC/SDXC Memory Card : Sandisk, Transcend
- For the framerate below 30 fps, it is recommended to use the specification memory card of Class 6 or higher.
- For the framerate over 31 fps, it is recommended to use the specification memory card of Class 10 UHS or higher.

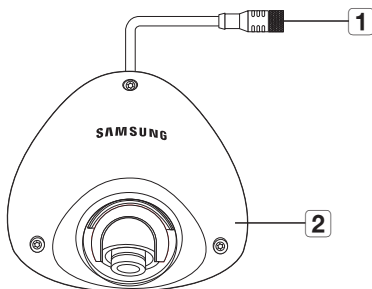
WHAT'S INCLUDED

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

Appearance	Item Name	Quantity	Description
	Camera	1	
	Instruction book, Installer S/W CD, CMS S/W DVD	2	
	Quick Guide (Optional)	1	
	Warranty card (Optional)	1	
	Cable for the testing monitor	1	Used to test the camera connection to a portable display device
	L Wrench	1	Used to remove/fix the dome cover
	M4 Tapping Screw	3	Used for securing the camera to the wall or ceiling

AT A GLANCE

Appearance



Item	Description
1 M12 Female connector cable	Connect to the M12 Male connector cable for power supply and network connections.
2 Dome Cover	Dome cover for the lens and unit protection.

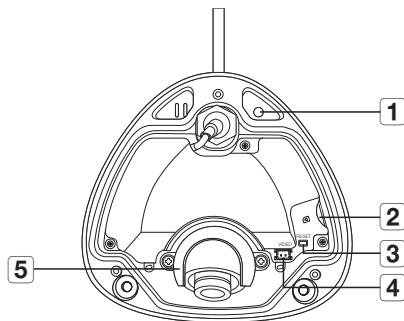


- Wipe out a dirty surface of the lens softly with a lens tissue or cloth to which you have applied ethanol.



- Ensure that you can find a dehumidifier of Silica gel inside the cover when removing the cover. Otherwise, the product may get moist inside.
- If you find that the product gets moist due to a deteriorated dehumidifier of silica gel, contact us at the service center for technical assistance.

Inside



Item	Description
1 Fixing Hole	Hole used for securing the camera on a ceiling.
2 Micro SD Memory Card Compartment	Compartment for the Micro SD memory card.
3 Reset Button	<p>Resets the camera settings to the default. Press and hold for about 5 seconds to reboot the system.</p> <p>1 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.</p>
4 Video Out Port	Analog video output port. (for installation)
5 Lens Cover	Used for protecting and fixing the lens.

installation & connection

INSTALLATION

Precautions before installation

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

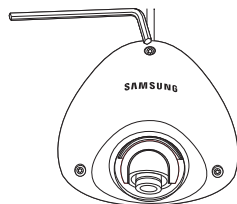
- When installing on a ceiling, desired spot must be capable of supporting at least 5 times of the camera's weight.
- Stuck-in or peeled-off cables can cause damage to the product or a fire.
- For safety purposes, keep anyone else away from the installation site.
And put aside personal belongings from the site, just in case.
- This camera 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.

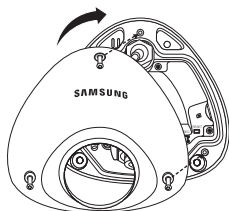
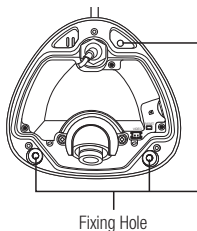


Installing the camera on the ceiling or a wall

1. Select a location where you want to install the camera.
2. Insert the provided screw into the camera hole and turn it clockwise.
3. Close the dome cover and turn it clockwise using the L-wrench.



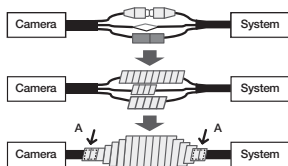
- If the cover is not fixed tightly, you may encounter a problem with waterproofing. (IP66)



Outdoor installation

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.

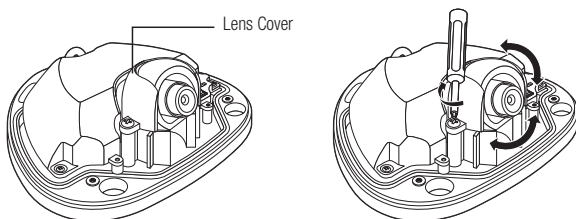
1. Connect the power, I/O, BNC, and LAN cables.
2. Wrap the black cable jacket (Area A) and the cable connection area with waterproof (butyl rubber) tape so that more than half of the butyl rubber tape is overlapped.



- 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.

installation & connection

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. Then, turning the camera to the left or right is referred to as “Panning”, while tilting the angle is “Tilting”. For panning, the panning limit is 10° for the clockwise, and 10° for the counterclockwise, a total of 20° enabled; further rotation is stopped by the stopper.

- Adjust the panning angle so that the camera settles in the right horizontal position. You can adjust the panning up to 10° in each one direction, and 10° in the other direction, a total of 20°.
- Adjust the tilting angle so that the camera settles in the right vertical position. You can adjust the tilting between 0° and 90°.

■ Methods of adjustment

1. Loosen the screws on either ends of the lens cover by turning them counter clockwise.
 - The case of wall installation
 - ① After mounting the camera on the wall, adjust the panning angle so that the camera faces a desired direction when tilting.
 - ② Then, adjust the tilting angle so that the camera faces the monitoring direction.
 - The case of ceiling installation
 - ① After mounting the camera on the ceiling, adjust the panning angle according to the monitoring direction. You should adjust the panning angle lest that the video be displayed upside down on the monitor.
 - ② Then, adjust the tilting angle so that the camera faces the monitoring direction.
2. When done, turn the screw clockwise to fix the tilted angle of the lens.



- For smoother Rotate adjustment, set the Tilt position between 60° ~ 80°.

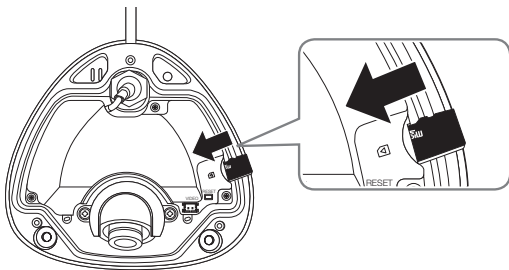
INSERTING/REMOVING A MICRO SD MEMORY CARD



- 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.

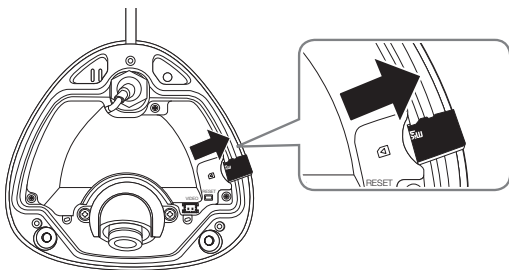
Inserting a Micro SD Memory Card

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.



installation & connection



- Pressing too hard on the Micro SD memory card can cause the card to shoot out uncontrollably from the slot when released.
- To pull out the micro SD memory card, turn off the camera power or set the device to <Off> of <Storage> and press the [Apply (- 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

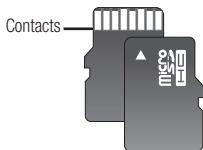
Memory cards of 4GB ~ 64GB is recommended for using with this camera.

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

For the framerate below 30 fps, it is recommended to use the specification memory card of Class 6 or higher.

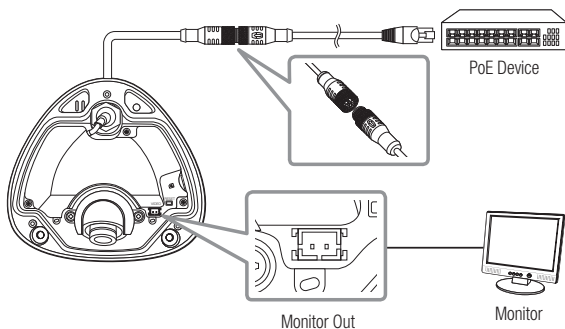
For the framerate over 31 fps, it is recommended to use the specification memory card of Class 10 UHS or higher.

Memory Card Components



Micro SD/SDHC/SDXC

CONNECTING WITH OTHER DEVICE



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

Connecting a connector cable

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

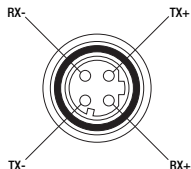


- This camera uses Female, D-coded types.
- PoE (Power over Ethernet) is supported.
- You are recommended to use a shielded network connector.

installation & connection



- 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.



Powering and networking

Connect your PoE device to the camera.



- 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.

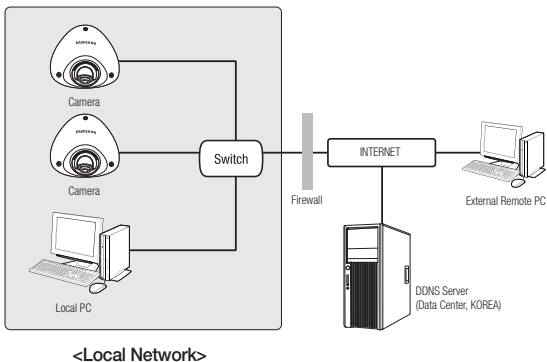
network connection and setup

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

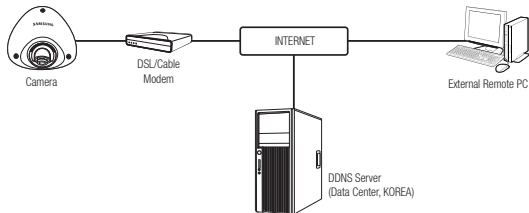
1. Launch an Internet browser on the local PC.
2. Enter the IP address of the camera in the address bar of the browser.



- 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.
- By factory default, the IP address will be assigned from the DHCP server automatically. If there is no DHCP server available, the IP address will be set to 192.168.1.100. To change the IP address, use the IP Installer. For further details on IP Installer use, refer to "**Static IP Setup**". (Page 26)

network connection and setup

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

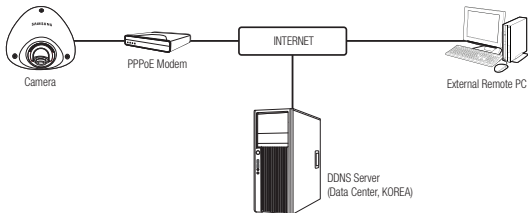


1. Connect the user PC directly with the network camera.
2. Run the IP Installer and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to **[Setup]** page.
5. Move to **[Network]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



- For registering the DDNS settings, refer to “**Registering with DDNS**”. (page 66)
- For configuring the DDNS settings, refer to “**DDNS**”. (page 65)
- For setting the network type, refer to “**Interface**”. (page 63)

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 **[Network] - [Interface]** Setup Page, set the network type to **[PPPoE]**, and enter the ID and password.
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

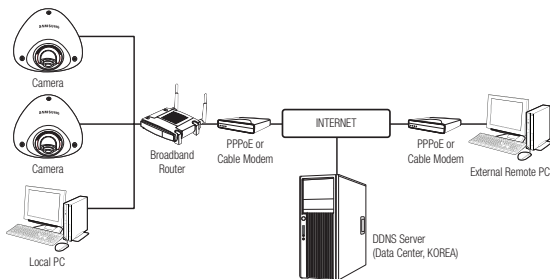


- For registering the DDNS settings, refer to **"Registering with DDNS"**. (page 66)
- For configuring the DDNS settings, refer to **"DDNS"**. (page 65)
- For setting the network type, refer to **"Interface"**. (page 63)

network connection and setup

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

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



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

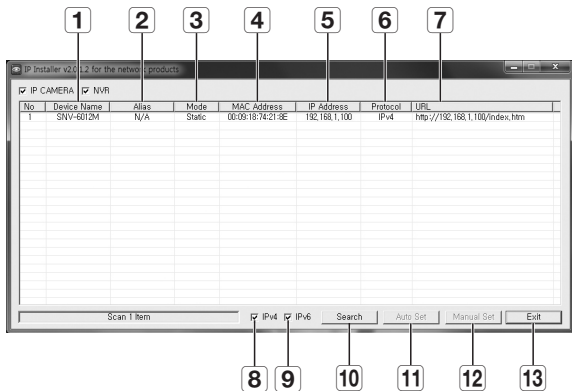
Configuring the network settings of the local PC connected to a Broadband Router, follow the instructions below.

- Select : <Network> → <Properties> → <Local Area Connection> → <General> → <Properties> → <Internet Protocol (TCP/IP)> → <Properties> → <Obtain an IP address automatically> or <Use the following IP address>.
- Follow the instructions below if you select <Use the following IP address>:
 - ex1) If the address (LAN IP) of the Broadband Router is 192.168.1.1
IP address : 192.168.1.100
Subnet Mask : 255.255.255.0
Default Gateway : 192.168.1.1
 - ex2) If the address (LAN IP) of the Broadband Router is 192.168.0.1
IP address : 192.168.0.100
Subnet Mask : 255.255.255.0
Default Gateway : 192.168.0.1
 - ex3) If the address (LAN IP) of the Broadband Router is 192.168.xxx.1
IP address : 192.168.xxx.100
Subnet Mask : 255.255.255.0
Default Gateway : 192.168.xxx.1



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

BUTTONS USED IN IP INSTALLER



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

network connection and setup

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



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

STATIC IP SETUP

Manual Network Setup

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

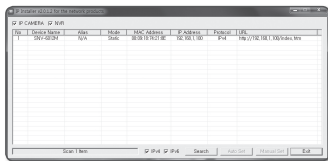
At the initial startup, both [Auto Set] and [Manual Set] will be grayed out.



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

1. Select a camera in the search list.
Check the MAC address of the camera on the camera's label.
Both the [Auto Set] and [Manual Set] buttons will be activated.

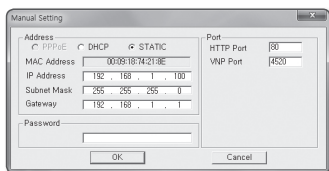
2. Click [Manual Set].
The Manual Setting dialog appears.
<IP Address>, <Subnet Mask>, <Gateway>, <HTTP Port>, and <VNP Port> of the camera are displayed in the preset values.



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.



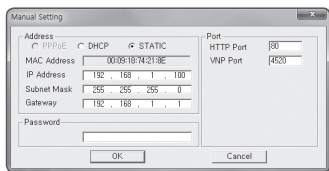
- IP related parameters can be set only when DHCP is not checked.



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. The default password is “**4321**”.



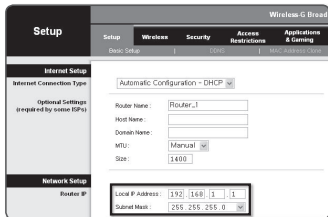
- The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.
Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
- If you want to change the password, refer to “**Administrator password change**” of the user setup. (page 90)

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

network connection and setup

If using a Broadband Router

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



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

If the Broadband Router has more than one camera connected

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

ex)

Category		Camera #1	Camera #2
IP related settings	IP Address	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

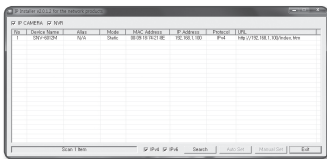
Run <IP Installer_v2.XX.exe> to display the camera search list.

At the initial startup, both [Auto Set] and [Manual Set] will be grayed out.



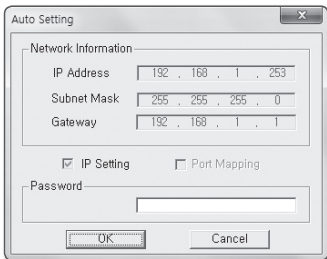
- For cameras found with the IPv6 setting, these buttons will be grayed out as the cameras do not support this function.

- 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.
- Click [Auto Set].
The Auto Setting dialog appears.
The <IP Address>, <Subnet Mask>, and <Gateway> will be set automatically.
- Enter the password.
Enter the password of "admin" account, which was used to access the camera.
The default password is "4321".



- 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.
- If you want to change the password, refer to "Administrator password change" of the user setup. (page 90)

- Click [OK].
Auto network setup will be completed.



network connection and setup

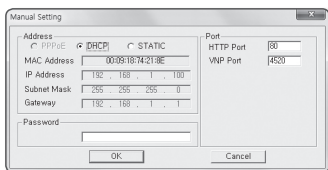
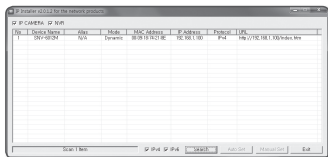
DYNAMIC IP SETUP

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>.

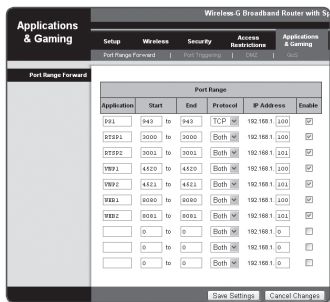


PORT RANGE FORWARD (PORT MAPPING) SETUP

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>** - **<Network>** - **<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.

network connection and setup

Setting up Port Range Forward for several network cameras

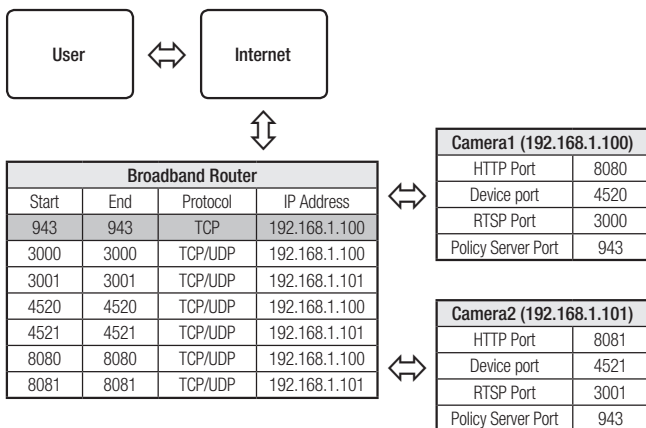
When several network cameras are connected to one Broadband Router device, you should forward the TCP 943 port of the router to the TCP 943 port of a connected camera.



- If you don't set properly the TCP 943 port of the router, you cannot get any video stream from the web page of the camera.

- TCP 943 port is a port for the Silverlight policy server of a camera.
- You can set a rule of Port Forwarding on the Broadband Router device through its configuration web page.
- You cannot change the Silverlight policy server port of a camera.
- You can change the ports of the camera except the policy server port through its configuration web pages.

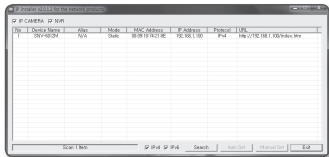
When Camera1 and Camera2 are connected to a router :



- 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 <Samsung DDNS> to <On> in the "Setup → Network → DDNS" menu.

CONNECTING TO THE CAMERA FROM A SHARED LOCAL PC

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



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

CONNECTING TO THE CAMERA FROM A REMOTE PC VIA THE INTERNET

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

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

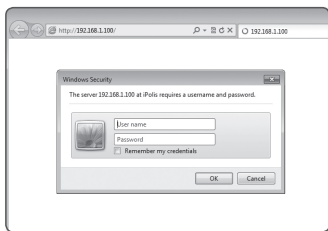


- For registering the DDNS settings, refer to "**Registering with DDNS**". (page 66)

CONNECTING TO THE CAMERA

Normally, you would

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



If the HTTP port is other than 80

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

Using URL

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



- 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.

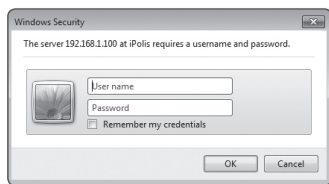
To register your device to the <DDNS> server, visit www.samsungipolis.com and register your device first, and then set the Web Viewer's <Network> - <DDNS> to <Samsung DDNS>, as well as providing <Product ID> that had been used for DDNS registration.

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 **"4321"** in the **<Password>** input box.
If the password is changed, enter the changed password instead.
3. Click **[OK]**.

If you have logged in successfully, you will the Live Viewer screen.



- The default user ID is **"admin"**, and the default password is **"4321"**.
- For security purposes, ensure that you change the password in **<System>** - **<User>**.
- 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.
- 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.



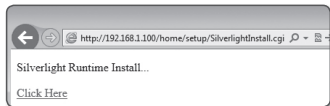
- You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.

INSTALLING SILVERLIGHT RUNTIME

If your PC has not installed Silverlight Runtime or has just installed an old runtime version, you will be redirected to the Silverlight Runtime installation page automatically when accessing the web viewer.

To install on Windows OS

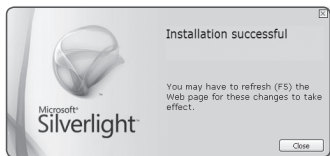
1. Click **<Click Here>**.



2. When the file download dialog pops up, click **<Run>**.
3. When the download is completed, click **<Yes>**.
4. The Silverlight Runtime installation page will be displayed. **<Install now>** to proceed with the installation.



5. When done, click **<Close>**.



web viewer

To install on MAC OS

1. Run the file trailing with “.dmg”.



2. Run the install package file automatically created, ending with “.pkg”.



3. Click <Continue>.



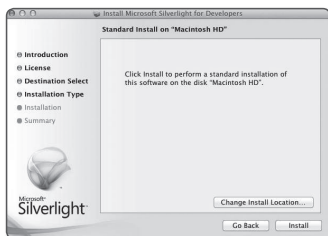
4. Select your language on the language selection screen, and click <Continue>.



5. Click <Agree>.



6. Click <Install>.



7. Enter the password of the account currently logged in, and click <Install Software> and continue.



8. Once completed, click <Close>.



INSTALLING STW WebViewer PLUGIN

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

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

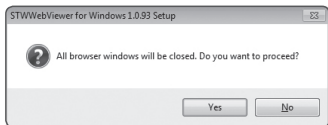


- If the plug-in installation file download status is suspended at 99% in the Internet Explorer browser, retry it after selecting "Release SmartScreen filter" in "Tool → SmartScreen filter".

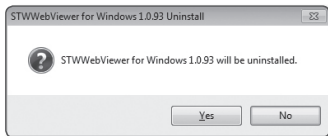
2. Click **[Run]** in the message window.



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



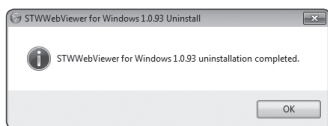
4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed. Click **[Yes]** when the notice window is displayed.



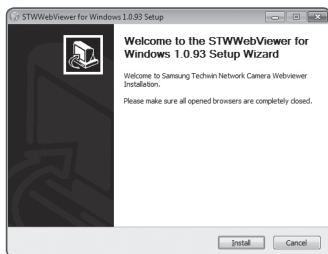
- Steps 4 and 5 will be skipped if no Web Viewer Plug-in is installed.



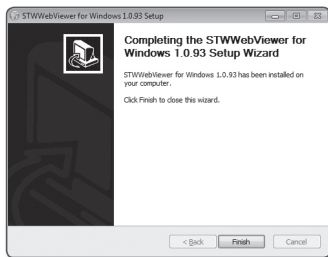
5. Click **[OK]**.
The old version of Web Viewer Plug-in is deleted.



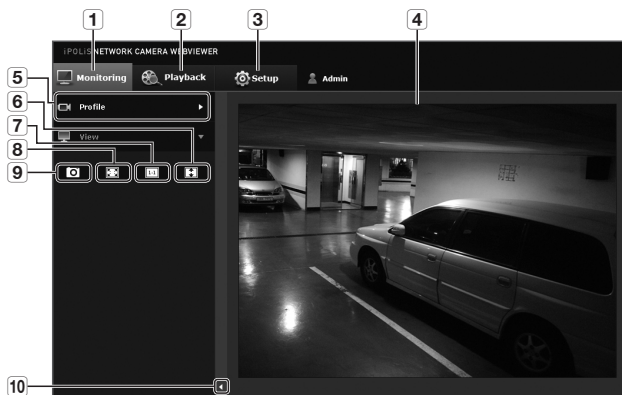
6. Click **[Install]** to begin installation of the Web Viewer Plug-in.



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




USING THE LIVE SCREEN

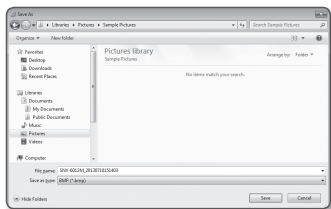



Item	Description
1 Monitoring	Move to the monitoring screen.
2 Playback	Switch to the monitoring screen that plays recording data in the Micro SD memory.
3 Setup	Move to the Setup screen.
4 Viewer Screen	Displays the Live video on the screen. <ul style="list-style-type: none">You can use the mouse wheel to activate the digital zooming in Viewer screen.
5 Profile type	You can select a profile type in <Video profile> under the <Video> setup menu. <ul style="list-style-type: none">When the Web Viewer is connected, the profile information currently using is displayed.
6 Screen Optimization	The video size of the camera will switch to as big as the Web browser.
7 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.

Item	Description
8 Full Screen	Switch the current video to the maximum size of the monitor.
9 Capture	Saves the snapshot as an image file in the .bmp or .jpg format.
10 Hide the context menu	The left-corner context menu will disappear but only the menu icon.


To capture the snapshot

1. Click [**Capture** ()] on the scene to capture.
The Capture dialog should appear.
2. Confirm the save path and click [**Save**] button.
The screenshot will be saved in the specified path.



-  ■ 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.

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.

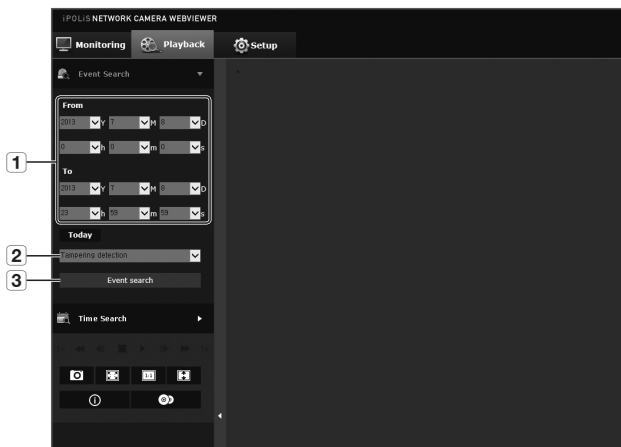
-  ■ For the Internet Explorer and Google Chrome browser, you can switch to the full screen.

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 75)

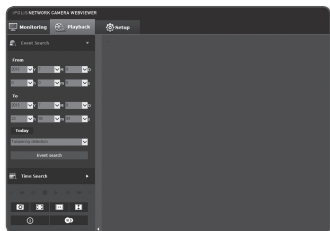
Name of event search screen and its function




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

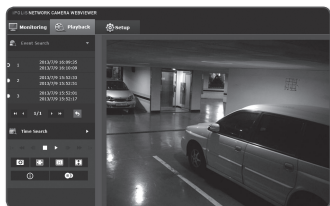
To play the content after searching by event

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 (⏮)]**.



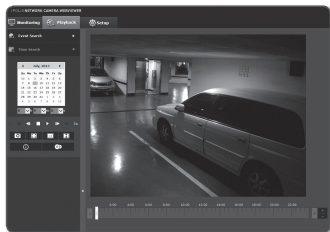
Name of time search screen and its function





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. <ul style="list-style-type: none"> Dates for which there is video in the Micro SD memory card are displayed within the boxes on the calendar.
3 Screen optimization	The camera image is converted to fit the Web browser window.
4 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.
5 Full screen	The current image is converted to cover the maximum size of the monitor.
6 Capture	The current image is saved as a .jpg or .bmp image file.
7 Video information	Time data of the replayed video is displayed on the screen.
8 Backup	Time zone is set to back up the video saved in the Micro SD memory card. <ul style="list-style-type: none"> Can be set as up to 5 minutes.

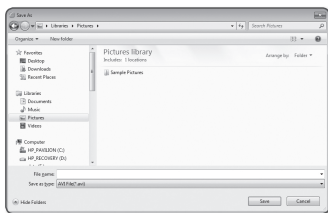
To play after searching by time

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



To back up the searched video

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



To play the backup video

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



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

To Play an AVI File



- The AVI file does not contain the recording time data.

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



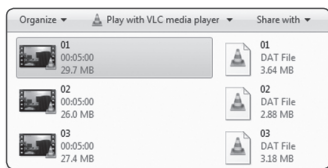
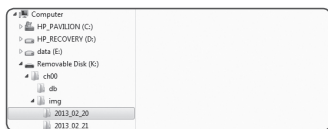
- Before separating the micro SD memory card, set the <Device> to <Off> in the “Setup → Event → Storage” menu.

2. Insert the micro SD memory card into the PC.

3. Play the AVI file in the “\ch00\img\YYYY_MM_DD” directory, using a media player.



- The file name begins with “01.avi” and the file number increments by 1.
- Once corrupted, the data in the micro SD memory card cannot be replayed in Web Viewer Playback.



setup screen

SETUP

You can configure the video, network, event and system settings of the camera in the network.

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

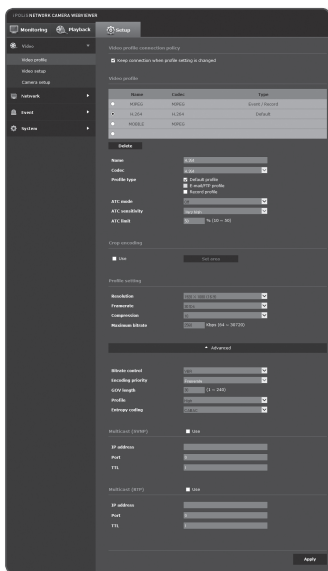


- Microsoft Silverlight 5.0 or higher is required to be installed on the PC for setup pages that provide preview video.
If not installed already, automatically moves to the Silverlight setup.

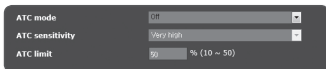
VIDEO SETUP

Video profile

1. From the Setup menu, select the **<Video (Video)>** tab.
2. Click **<Video profile>**.
3. Set the **<Video profile connection policy>**.
 - Keep connection when profile setting is changed : Changing profile properties that is used by existing connection does not affect such connection and remains with old profile setup.
If not selected, changing a profile used by an existing connection resets such connection.
4. Select each profile properties.
For more details, refer to **"To Add/Change the Video Profile"**. (Page 52)
5. Click the input box of each item and enter / select a desired value.
 - The context menu may differ depending on the selected codec type.
 - Default profile : If no profile is selected when using the Web Viewer, the default video profile is applied.



- E-mail/FTP profile : Video profile to be transferred to the specified email or FTP site.
 - Only the MJPEG codec can be set as the E-mail/FTP profile.
 - Record profile : This is the profile that is applied to video recording.
6. According to your situation, set ATC (Auto Transmit Control) mode.




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

Bitrate control / ATC mode	Control framerate	Control compression
CBR	Framerate	Compression

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



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

7. Select Able or Disable for the Crop Encoding function.
For more details, refer to **"To Use Crop Encoding"**. (Page 54)
- Crop encoding : It cuts only the selected area out of the full screen and outputs it at the resolution specified in **<Profile setting>**.
The resolution should be less than the Crop Encoding setting area.
8. When done, click **[Apply ()]**.

setup screen

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

- Compression : Specify the compression rate of the video.
- 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. Constant bit rate (CBR) varies the video quality and fixes network transfer bit rate, while variable bit rate emphasizes the quality by varying network transfer bit rate.



- If the bit-rate control is set to the Constant Bit Rate, the actual transmission frame rate may be less than the set frame rate because the Frame Rate First Mode is changed to the Compression Rate First Mode to ensure the highest image quality at a bit rate which is set depending on the complexity of the screen.

- Encoding priority : You can set the video transfer method to Framerate 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.

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.

setup screen

To Use Crop Encoding

1. Select **<Use>**.

2. Click **<Set area>**.

The Crop Encoding Area Setup window will pop up.

3. Select **<Ratio>**.

- Ratio: It sets up the aspect ratio of the user specified area.

- 16:9 : The aspect ratio shall be set to 16:9 as close as to the user specified area.

The supporting size ranges from 426X240 to 1280X1024 and supporting output resolutions are 320X180, 640X360, 800X450, and 1280X720.

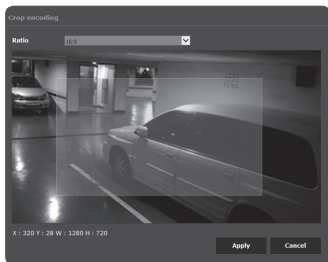
- 4:3 : The aspect ratio shall be set to 4:3 as close as to the user specified area. The supporting size ranges from 320X240 to 1280X960 and supporting output resolutions are 320X240, 640X480, 800X600, 1024X768, and 1280X960.

- Manual : It sets up the aspect ratio of the user specified area. The supporting size ranges from 320X240 to 1280X1024 and all supporting output resolutions are available except 1920X1080.



4. Drag the mouse on the screen to specify the Crop Encoding area at your discretion.

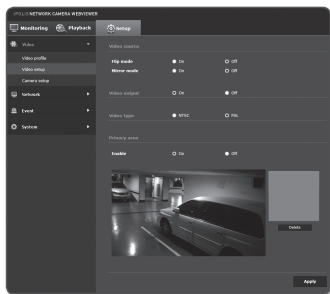


- If set to **<Manual>**, the output image may be different from the actual one because of the aspect ratio inconsistency between the Crop Encoding area and the output resolution.
- The Crop Encoding area setup can change depending on the DIS setup. Reset the Crop Encoding area when the DIS setup is changed.





Video setup

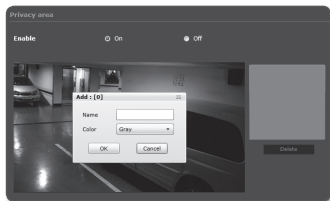
1. From the Setup menu, select the <Video ()> tab.
2. Click <Video setup>.
3. Select a <Video source> mode.
 - Flip mode : Turn upside down the image that is captured by the camera.
 - Mirror mode : Flip horizontal the image that is captured by the camera.
4. Select Able or Disable for the analog video output.
5. Select the video type.
6. Specify the privacy zone.
7. When done, click [Apply ()].



To set the privacy zone

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




1. Set it to <On>.
2. When done, click [Apply ()].
3. Select 4 vertices on the screen with your mouse to specify the area.
4. Enter the name and select the color, and then click [OK].
5. If you want to delete an area in the list, select one and click [Delete ()].

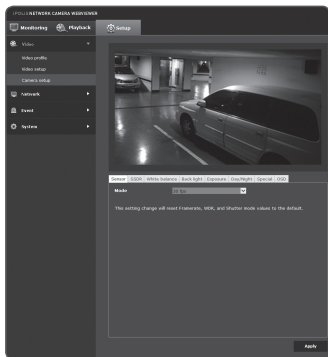


setup screen

Camera setup


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

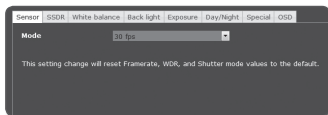
1. From the Setup menu, select the **<Video ()>** tab.
2. Click **<Camera setup>**.
3. Configure the settings as necessary of :
Sensor, SSDR, White balance, Back light, Exposure, Day/Night, Special, OSD
4. When done, click **[Apply ()]**.
 - If a certain time (timeout: 240s) is elapsed with your not 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 50)



- If the sensor mode is set to 50 fps or 60 fps, the **<Back light>** mode cannot be set to **<WDR>**.

To Set SSDR (Samsung Super Dynamic Range)

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 AWC]** 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 AWC]** button if you want to keep the white balance level of the current image.



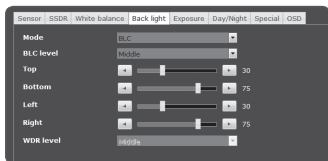
- The white balancing may not work properly in the following conditions:
If this is the case, switch to AWC mode.
 - If the surrounding condition of the object is out of the temperature correction range
ex) Clear sky, sunset
 - If the surrounding of the object is dark
 - If the focus of the camera directly faces the florescent lighting or if the camera is installed in a place of variable illumination, the white balancing operation may be unstable.

setup screen

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 WDR

It displays a sharp image of the objects in a scene where both bright and dark areas exist.

1. Select **<Back light>**.
2. Set **<Mode>** to **<WDR>**.
3. Specify the **<WDR level>**.



- ! It is recommended to use WDR in the indoor environment.
- Noise may exist between the dark area and the bright area in the WDR mode.
- If the **<Back light>** mode is set to **<WDR>**, the sensor mode cannot be set to 50 fps or 60 fps.
- The maximum and minimum shutter values are initialized whenever you turn on or off the WDR mode.

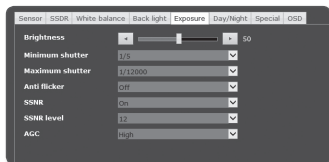
To Set Exposure

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.

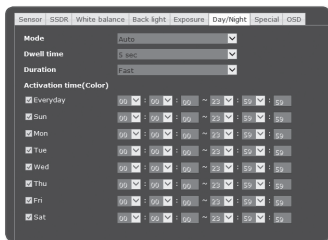


- The image exposure can be saturated depending on the Shutter setup range.

setup screen

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.

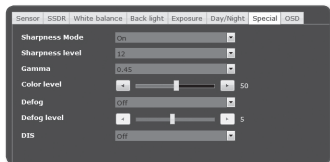


To Setup Special

1. Select <Special>.

2. Select each item and set it properly.

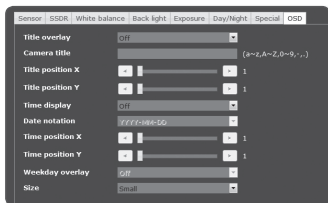
- Sharpness mode : Adjust the overall sharpness of the image.
If selecting <On>, you can adjust the sharpness of the image.
 - Sharpness level : The higher the level is, the sharper and clearer the outline of the image becomes.
 - Gamma : Adjust the contrast of the image.
 - Color level : Adjust the strength of video color.
 - Defog : Compensate the video in the foggy or cloudy weather.
It is set to <Off> as a default. Specials are used when the video looks blurry in the foggy weather.
 - Off : Disable the fog elimination function.
 - Auto : The image is automatically compensated according to the foggy level. Adjust <Defog level> to be more effective.
 - Manual : The user manually sets the amount of compensation for each image.
-  ■ If the defog mode is set to <Auto>, the performance is proportional to the fog level. To keep the set defog level without regard to the fog level, set the defog mode to <Manual>.
- If the manual defog level is high in a thin fog, the image may become too dark.
 - Defog level : Control the defog level.
 - DIS : Compensates the image automatically when it is seen to shake for stable image output.
-  ■ Mitigate the degree of image vibration when the camera vibrates due to the external factors such as wind.



setup screen

To Set OSD

1. Select <OSD>.
2. Select each item and set it properly.
 - Title overlay : It specifies if the camera name shall be displayed on the screen.
 - Camera title : It specifies the name of the camera to be displayed on the screen.
 - Title position X, Y : It specifies the position of the camera name on the screen.
 - Time display : Specify the use of time display on the screen.
 - Date notation : Specify the date format that will be displayed on the screen.
 - Time position X, Y : Specify the position of time display on the screen.
 - Weekday overlay : Specify the use of date display date on the screen.
 - Size : It specifies the size of the text displayed on the screen.

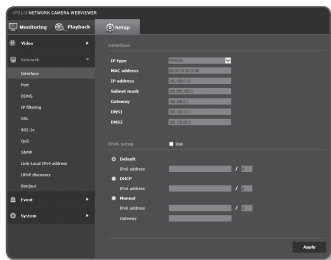


- The OSD size and position may be automatically adjusted to the video output resolution.

NETWORK SETUP

Interface

1. From the Setup menu, select the **<Network (🌐)>** tab.
2. Click **<Interface>**.
3. Set the **<Interface>** and **<IPv6 setup>** as necessary.
 - IP type : Select an IP connection type.
 - Manual : Specify the IP address, Subnet mask, Gateway, DNS1, and DNS2.
 - DHCP : Specify the DNS1 and DNS2.
 - PPPoE : Specify the DNS1, DNS2, ID and Password.
 - If you set it to **<Manual>**, you should specify the IP, Subnet mask, Gateway, DNS 1 & 2 manually.
 - MAC address : Shows the MAC address.
 - IP address : Displays the current IP address.
 - Subnet mask : Displays the **<Subnet mask>** for the set IP.
 - Gateway : Displays the **<Gateway>** for the set IP.
 - DNS1/DNS2 : Displays the DNS(Domain Name Service) server address.
4. Set the **<IPv6 setup>**.
 - Set to **<Use>** to use IPv6 address.
 - Default : Use the default IPv6 address.
 - DHCP : Display and use the IPv6 address obtained from the DHCP server.
 - Manual : Enter IP address and gateway manually and use it.
5. When done, click **[Apply (🔍)]**.
 - The IP addressing system will be defaulted to DHCP. If no DHCP server is found, the previous settings will be restored automatically.
 - Once completed with editing, click **[Apply (🔍)]** to apply changes and the browser exits. After a while, connect again with the changed IP.



setup screen

Port

1. From the Setup menu, select the <Network ()> tab.
2. Click <Port>.
3. Type in each item in the Port menu as necessary.

- When setting your ports, you cannot use port numbers such as 0~1023, 3702 or 49152.

- HTTP port : 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.
- Device port : Set a port used to transfer video signals with the Samsung protocols.
- RTSP port : Used to transfer videos in the RTSP mode; the default is 554.
- Web streaming port : Used to transfer videos to the Web Viewer; the default is 4520.
- Silverlight policy port : Silverlight is used to permit to acquire a network connection; the default is 943.



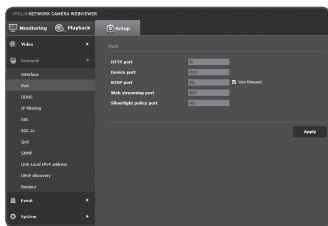
- If changed the HTTP port, the browser exits.

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)



- The port range of the Web Streaming is between 4502 and 4534. If the Device port is with this effective range, the Web Streaming port should be specified the same as the Device port.
- You cannot change the Web Streaming/Silverlight policy server port of a camera.

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



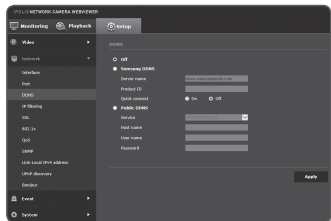
DDNS

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.

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



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

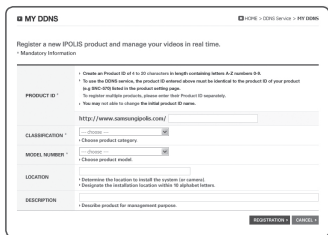
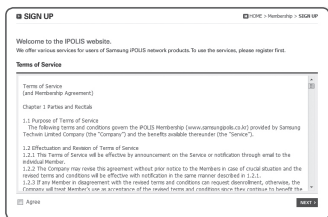


setup screen


Registering with DDNS

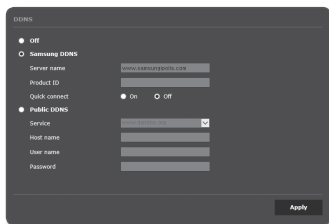
To register your product with the Samsung DDNS

1. Visit the iPOLiS web site (www.samsungipolis.com) and sign in with a registered account.
2. From the top menu bar, select **<DDNS SERVICE>** - **<MY DDNS>**.
3. Click **[PRODUCT REGISTRATION]**.
4. Enter the product ID.
 - You must perform the duplicate check for the ID that you entered.
5. Select a **<CLASSIFICATION>** and specify the **<MODEL NUMBER>**.
6. Specify the product location with a description if necessary.
7. Click **[REGISTRATION]**.
The product will be added to the product list that you can check.





To connect to the Samsung DDNS in camera setup

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



Configuring public DDNS in Camera Settings

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



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

setup screen

IP filtering

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

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

2. Click **<IP filtering>**.

3. Select **<Filtering type>**.

- Deny : If selecting this, access from those IPs that are added to the filtering will be restricted.
- Allow : If selecting this, access from only those IPs that are added to the filtering will be accepted.

4. Click the **[Add (Add)]** button.
The IP list will be created.

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

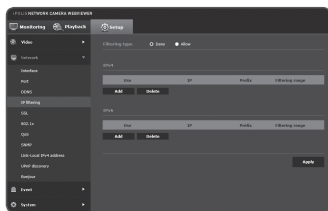


- If selected **<Allow>** for IP Filtering and **<IPv6 setup>** of **<Interface>** is set to **<Use>**, both IPv4 and IPv6 addresses of the computer currently configuring should be assigned.
- The IP address of the computer used for the current setup cannot be added to **<Deny>**, it should be added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

6. Select an IP to delete from the list.



Click the **[Delete (Delete)]** button.

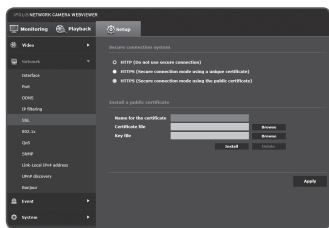
7. When done, click **[Apply (Apply)]**.




SSL

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


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



Installing the certificate

1. Enter the certificate name.
2. Select the certificate file to be installed and certificate key, and click **[Install ()]** button.


Deleting the certificate

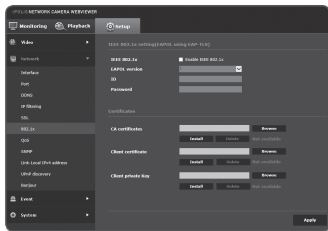
1. Click **[Delete ()]** button.
2. To delete a public certificate, you should access the network video decoder in the mode of **<HTTP (Do not use secure connection)>** or **<HTTPS (Secure connection mode using a unique certificate)>**.


setup screen


802.1x

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




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



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



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

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

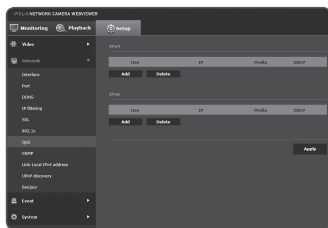
You can specify the priority to secure a stable transfer rate for a specific IP.

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.

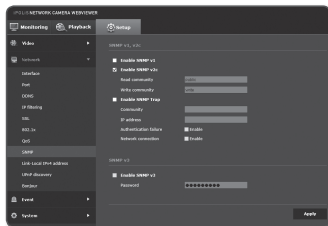
5. Select an IP to delete from the list.
Click the **[Delete ()]** button.
6. When done, click **[Apply ()]**.



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>**.



setup screen

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



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

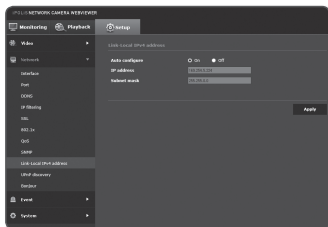


- SNMP v3 is only able to be set when the secure connection mode is HTTPS.
Refer to "SSL". (page 69)

Link-Local IPv4 address


An additional IP address may be assigned to access the camera from the Link-Local network.

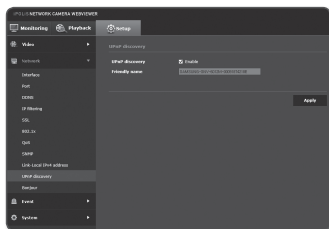
1. From the Setup menu, select the <Network ()> tab.
2. Click <Link-Local IPv4 address>.
3. Set the <Link-Local IPv4 address>.
 - Auto configure : It specifies Able or Disable for the Link-Local IPv4 address.
 - IP address : Display the assigned IP address.
 - Subnet mask : Display the subnet mask of the assigned IP.
4. When done, click **[Apply ()]**.




UPnP discovery

Cameras can be automatically searched in the client and operating system in support of the UPnP protocol.

1. From the Setup menu, select the <Network ()> tab.
2. Click <UPnP discovery>.
3. Set the <UPnP discovery>.
 - UPnP discovery : It specifies Able or Disable for UPnP Discovery.
 - Friendly name : Display the camera name.
Friendly name is displayed in the format of SAMSUNG-<Model Name>-<MAC Address>.




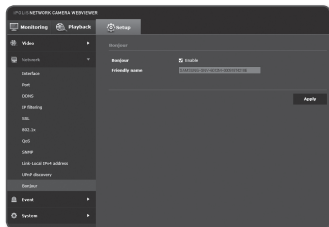
-  In the Windows operating system which basically supports UPnP, the cameras connected to the network are displayed.

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


Bonjour

Cameras can be automatically searched in the client and operating system in support of the Bonjour protocol.

1. From the Setup menu, select the <Network ()> tab.
2. Click <Bonjour>.
3. Set the <Bonjour>.
 - Bonjour : It specifies Able or Disable for Bonjour.
 - Friendly name : Display the camera name.
Friendly name is displayed in the format of SAMSUNG-<Model Name>-<MAC Address>.



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

-  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.

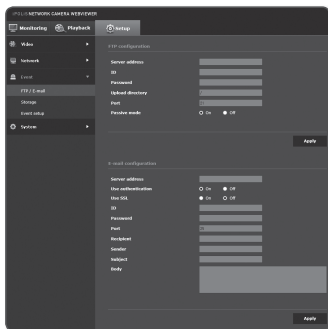
setup screen

EVENT SETUP

FTP / E-mail

When an event occurs, you can set the FTP/email server to send an image recorded by your camera.

1. From the Setup menu, select the **<Event (📷)>** tab.
2. Click **<FTP / E-mail>**.
3. Select **<FTP configuration>** or **<E-mail configuration>** and enter / select a desired value.
 - FTP configuration
 - Server address : Enter the IP address of the FTP server to send an event image.
 - 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 : Set the FTP account path to send an event image.
 - Port : The default port of the FTP server is 21; however, you can use a different port number according to the FTP server settings.
 - Passive mode : Select **<On>** if you need to connect in passive mode due to the firewall or the FTP server settings.



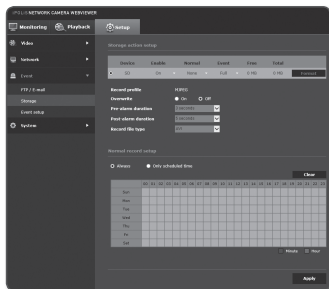
- E-mail configuration
 - Server address : Enter the IP address of the e-mail server to send an event image.
 - Use authentication : Select whether to use authorization.
 - Use SSL : Specify the use of SSL.
 - ID : Enter the user ID for logging into the email server.
 - Password : Enter the user account 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 an event image to your email.

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

Storage



You can set the record conditions or the use of recording for the Micro SD memory, check the size of stored data, or format the Micro SD memory itself.

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



setup screen

To make recording on the Micro SD memory

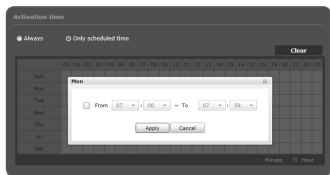
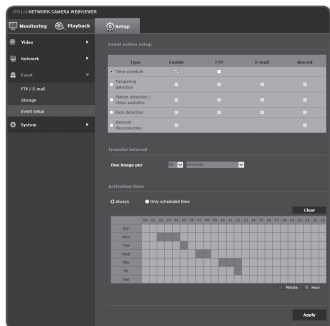
1. Check the memory card's <Free> size and <Total> size.
2. If there are sufficient free space, set the device to <On>.
Otherwise, check the stored data and if you find them not important, then click <Format> to format the Micro SD memory.
 - Some frames may be skipped if the micro SD memory card operates at the lower speed than recommended.
For more details, refer to "**Recommended Micro SD/SDHC/SDXC Memory Card Specifications**". (Page 10)
 - 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.
3. Specify the storage action.
 - Record profile : Shows recording profile's codec type.
 - Overwrite : If the Micro SD memory is full, this will delete old data and store new data in replacement.
 - Pre-alarm 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-alarm 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 Samsung Techwin's unique file format.
 - AVI : It is the conventional avi format.
 - Normal : Make recording at a certain frame rate.
 - Event : Set the recording type for a certain event that occurs.
4. Specify the <Normal record setup>.
 - Always : Always save recorded video in the Micro SD memory card.
 - If set to Always, the activation time cannot be changed.
 - Only scheduled time : Records only on the specified time of the specified day of week.
 - [Clear ()] : Reset all settings.
5. When done, click [Apply ()].

Time schedule

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

1. From the Setup menu, select the **<Event (📷)>** tab.
2. Click **<Event setup>**.
3. Select **<Time schedule>** from **<Event action setup>**.
4. Set whether or not to **<Enable>**.
5. Specify the **<Transfer interval>**.
6. Specify the **<Activation time>**.
 - Always : Runs the specified operation always.
 - If set to **<Always>**, the activation time cannot be changed.
 - Only scheduled time : Operation is executed periodically on the set days/time.
 - [Clear (Clear)] : Reset all settings.
 - Minute : Click an area in Activation Time and set the time by minutes.
 - Hour : Drag your mouse at Activation Time and set the time by hours.

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



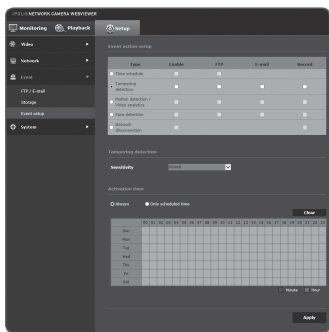
7. Set the operational conditions.
 - FTP : Set whether to perform FTP transmission at the designated time.
8. When done, click **[Apply (Apply)]**.

setup screen

Tampering detection

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

1. From the Setup menu, select the **<Event (📷)>** tab.
2. Click **<Event setup>**.
3. Select **<Tampering detection>** from **<Event action setup>**.
4. Set whether or not to **<Enable>**.
5. Set the tampering detection sensitivity. The higher the sensitivity, detects the minutest tampering attempts.
6. Specify the **<Activation time>**.
 - Always : Always check whether an event occurs. When an event occurs, the designated operation is executed.
 - Only scheduled time : On the designated date/time, periodically check whether an event occurs. When an event occurs, the set operation is executed.
 - [Clear (🗑️)] : Deselect the selected times.
7. Set the operation which will be executed when an event occurs.
 - FTP : Specify whether to perform FTP transmission when an event occurs.
 - E-mail : Specify whether to perform e-mail transmission when an event occurs.
 - Record : Specify whether to save in the SD memory card when an event occurs.
8. When done, click **[Apply (📌)]**.



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

Motion detection / Video analytics

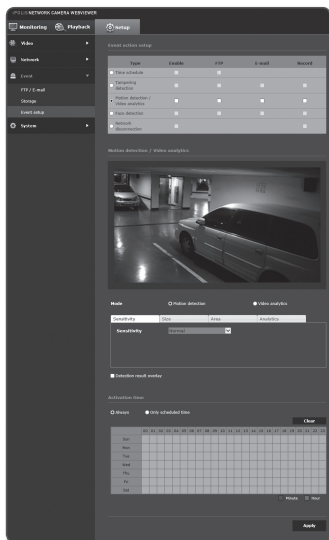
Events of motion detection and video analysis can be set to trigger event signal output.

1. From the Setup menu, select the **<Event (🔔)>** tab.
2. Click **<Event setup >**.
3. Select **<Motion detection / Video analytics>** from **<Event action setup>**.
4. Set whether or not to **<Enable>**.
5. According to your purpose, select from motion detection and intelligent video analysis.
6. Set **<Sensitivity>**, **<Size>** and **<Area>**.
When selected Intelligent Video Analysis, set **<Analytics>** too.
7. Set whether to use **<Detection result overlay>**.

When a motion is detected, its size and position is marked with a rectangle on the screen.

- Green : All targets detected as moving.
- Red : It is an object judged to have passed, entered or escaped (with the color maintained for 1 or 2 seconds) or to have appeared or disappeared (with the color maintained for 3 to 5 seconds).

8. Specify the activation time and activation condition.
 - For more information about **<Activation time>** and **<Action>**, refer to **"Tampering detection"**. (page 78)
9. When done, click **[Apply (Apply)]**.



setup screen



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

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.

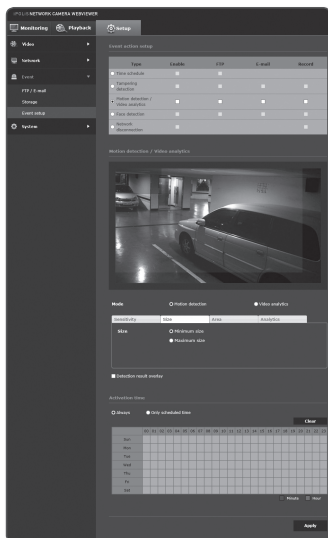
- ! ■ In a situation that definitely distinguishes objects out of backgrounds, set this to a low sensitivity level. For opposite case that is hard to distinguish objects like low illuminated situation, set this to a high level.

3. Select <Size> tab.

You can limit the minimum/maximum size of motion to be detected.


- Minimum Size : To set the minimum size of detected motions, select <Minimum Size> and then point and drag to the desired size on the screen using the mouse.
- Maximum Size : To set the maximum size of detected motions, select <Maximum Size> and then point and drag to the desired size on the screen with your mouse.

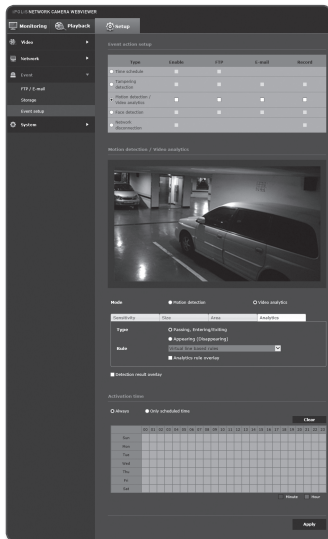
- ! ■ Motions smaller than the specified minimum size or bigger than the maximum size are not detected. To avoid unintended detections caused by great and small noises, set minimum/maximum motion sizes appropriately in accordance to your environments.
Note that same motions on the same location can be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



To use Video analytics

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

1. Select the video analysis mode.
2. Set <Sensitivity>, <Size> and <Area>.
For further details on settings, refer to **"To use Motion detection"**. (Page 81~82)
3. Select <Analytics> tab.
4. Select the video analysis type.
 - Passing, Entering/Exiting : Detects motions of passing, entering into or exiting from a virtual line specified by the user.
 - Appearing (Disappearing) : Detects motions of appearing on or disappearing from the user-defined area or the entire screen area.
5. Set the video analysis rules.
For further details on settings, refer to **"To set the video analysis rules"**. (page 84~85)
6. Set whether to use <Detection result overlay>.
Specified rules of virtual lines and areas are displayed on the monitoring page.
7. When done, click [Apply ()].

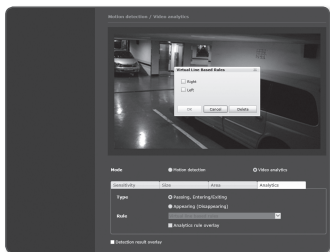


setup screen

To set the video analysis rules

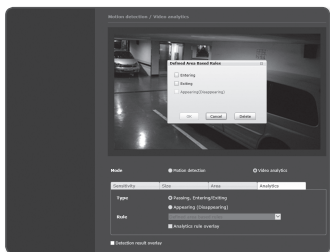
■ Passing

1. Set the type to **<Passing, Entering/Exiting>**.
2. Set the event rule to **<Virtual line based rules>**.
3. On the screen, click on preferred starting and ending point of the virtual line, then a popup window appears.
4. Select the desired rule:
 - Right: Detects motions of moving from the left to the right, over the virtual line.
 - Left: Detects motions of moving from the right to the left, over the virtual line.
5. Click **[OK]**.
6. To remove a defined rule, right click on the displayed virtual line to open popup context menu and select **[Delete]** button.



■ Entering/Exiting

1. Set the type to **<Passing, Entering/Exiting>**.
2. Set the event rule to **<Defined area based rules>**.
3. On the screen, click four vertices to define detection area and a popup window appears.
4. Select the desired rule:
 - Entering : Detects motions of moving object whose center point entering into the defined area, from outside of the area.
 - Exiting : Detects motions of moving object whose center point exiting from the defined area, from inside of the area to outside.
5. Click **[OK]**.
6. To remove a defined rule, right click on the displayed side lines of the area to open popup context menu and select **[Delete]** button.

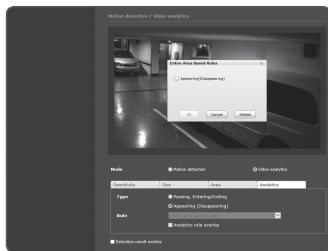
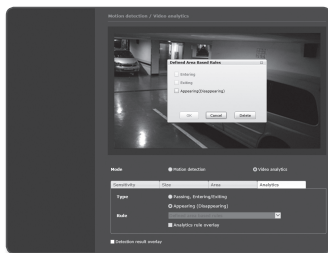


■ Appearing (Disappearing)

1. Set the analysis type to **<Appearing (Disappearing)>**.
2. Select the desired event rule:
 - Defined area based rules : It detects event of appearing object that appears in the area and remaining for a certain time period while not passing through the area borders, and opposite case of disappearing of objects existed in the area.
On the screen, click four vertices to define detection area.

Select the **<Appearing (Disappearing)>** from the popup.


- Entire area based rules : It detects event of appearing object that appears in the entire screen and remaining for a certain time period, and opposite case of disappearing of objects existed in the screen.
Right click on the screen to open the popup context menu and select **<Appearing(Disappearing)>**.
3. Click [OK].
 4. To remove a defined rule, right click on the displayed side lines of the area or on the screen to open popup context menu and select [Delete] button.



setup screen

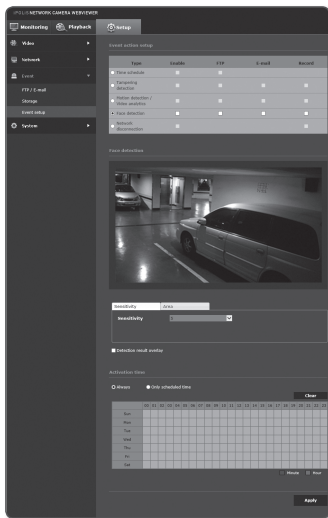
Face detection


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

1. From the Setup menu, select the **<Event ()>** tab.
2. Click **<Event setup>**.
3. Select **<Face detection>** from **<Event action setup>**.
4. Set whether or not to **<Enable>**.
5. Select **<Sensitivity>** tab to set the sensitivity level.
 - As the sensitivity grows, face detection becomes more close and detailed.
6. Select the **<Area>** tab and select 4 vertices in the image with your mouse to specify the detection area.



- You can detect max 35 faces on the screen at the same time.
- The minimum size of detectable face is 90x90 (horizontal x vertical) pixels for the given max resolution. But there may be some errors depending on the characteristics of your face or lighting.

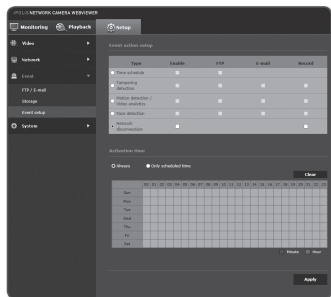


7. To delete the specified area, click the right button of your mouse and click **[OK]** in the popup window.
8. Set whether to use **<Detection result overlay>**.
When faces are detected, their positions and sizes are marked with rectangles on the screen.
9. Specify the activation time and activation condition.
 - For more information about **<Activation time>** and **<Action>**, refer to "Tampering detection". (page 78)
10. When done, click **[Apply ()]**.

Network disconnection


You can receive and save events of a physically disconnected network.

1. From the Setup menu, select the **<Event (🔔)>** tab.
2. Click **<Event setup>**.
3. Select **<Network disconnection>** from **<Event action setup>**.
4. Set whether or not to **<Enable>**.
5. Specify the activation time and activation condition.
 - For more information about **<Activation time>** and **<Action>**, refer to "Tampering detection". (page 78)
6. When done, click **[Apply (Apply)]**.



SYSTEM SETUP

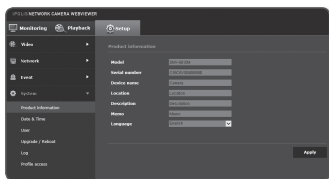
Product information

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.





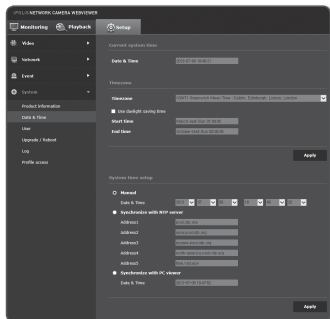
- The default language is set to **<English>**.

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



Date & Time



1. From the Setup menu, select the **<System ( >** 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 ()]**.

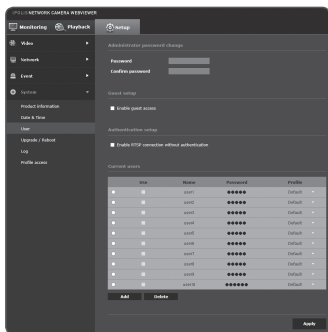


-  ■ If you select the **<Synchronize with PC viewer>**, the standard timezone should be set the same as the current timezone in PC.

setup screen


User

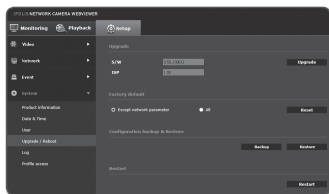
1. From the Setup menu, select the <System ()> tab.
2. Click <User>.
3. Provide the necessary user information.
 - Administrator password change :
Change the password for the administrator.
 - The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.
Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
 - 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.
4. When done, click [Apply ()].



- ONVIF functions available to a registered user allowed to use ONVIF functions are limited to those of granted with permission.
- Video Transfer and Changing Video Information: Set the profile to <All>.

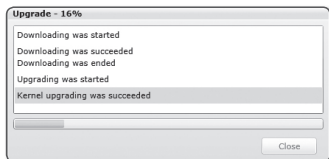
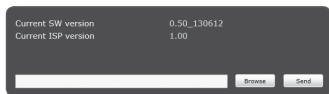
Upgrade / Reboot

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 : Initialize all setup parameters except for network or lens setup.
 - 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.



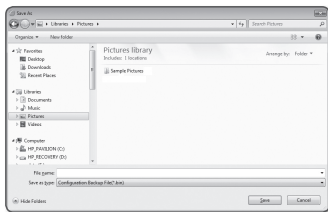
setup screen



- It may take a max of 20 minutes for the upgrade process.
If you forcibly terminate the upgrade process, upgrade will not be completed properly.
- During restarting the system, accessing with web viewer will not be made.
- You can download the latest version from the Samsung web site (www.samsungcctv.com).

To back up the current settings

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

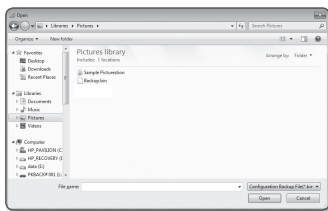


To restore the backup settings

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




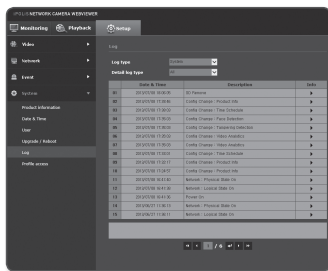
- If you perform the backup or restoration, the web browser will be closed and the camera will reboot.



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.




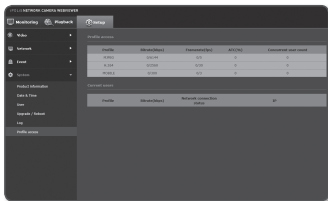
- If you want to view the details of a log, click **[Info ()]** in the right column of the log; the log information will be shown in the bottom pane.
- Each page displays 15 logs with the latest one displayed at the top.
- The event/system log list can contain up to 1000 logs; after that, the existing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

setup screen

Profile access

You can check the profile information.

1. From the Setup menu, select the **<System ()>** tab.
2. Click **<Profile access>**.
 - 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 : You can check the network connection status.
 - IP : Show the IP address of the current user.



- To check information on the profile currently used, click **<Profile access>** again to refresh it.

SPECIFICATION

	Items	Description
Video	Imaging Device	1/2.8" PS Exmor 2.38M CMOS (IMX136)
	Total Pixels	1952(H) x 1116(V)
	Effective Pixels	1944(H) x 1104(V)
	Scanning System	Progressive
	Min. Illumination	Color : 0.3 Lux (1/30sec, F2.0, 50IRE), 0.005 Lux (2sec, F2.0, 50IRE)
	S / N Ratio	50dB
	Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - DIP connector type
Lens	Focal Length (Zoom Ratio)	3.0mm
	Max. Aperture Ratio	F2.0
	Angular Field of View	H : 103.1°, V : 53.9°, D : 124.5°
	Lens Type	Fixed Iris
	Mount Type	Board-in type
Pan / Tilt / Rotate	Pan Range	10 degrees horizontally
	Tilt Range	0° ~ 90°
	Rotate Range	-
Operational	Camera Title	Off / On (Displayed up to 45 characters)
	Day & Night	Auto (SW) / Color / B/W / Schedule
	Backlight Compensation	Off / BLC
	Wide Dynamic Range	120dB†
	Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)

appendix

Items		Description
Operational	Digital Noise Reduction	SSNRlll (2D+3D Noise Filter) (Off / On)
	Digital Image Stabilization	Off / On
	Defog	Auto/Manual/Off
	Motion Detection	Off / On (4ea 4 Points Polygonal zones)
	Privacy Masking	Off / On (32 Zones with 4 Points of Polygonal)
	Gain Control	Off / Low / Middle / High
	White Balance	ATW / AWC / Manual / Indoor / Outdoor
	Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
	Digital PTZ	-
	Flip / Mirror	Off / On
	Intelligent Video Analytics	Face Detection, Tampering, Virtual Line, Enter/Exit, Appear / Disappear,
	Audio In	-
	Audio out	-
	Alarm Triggers	Motion detection, Tampering, Face Detection, Video Analytics, Network Disconnection
	Alarm events	<ul style="list-style-type: none"> • File upload via FTP, E-Mail • Notification via E-Mail • local storage(SD/SDHC/SDXC) recording at Event (Alarm Triggers)

		Items	Description
Network		Ethernet	10Base-T / 100Base-TX, M12 connector (4 poles, female, D-coding)
		Video Compression Format	H.264(MPEG-4 Part 10/AVC), Motion JPEG
		Resolution	1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180
		Max. Framerate	H.264 : Max 60fps at all resolutions Motion JPEG : 1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : Max. 15 fps 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180 : Max. 30fps
		Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
		Bitrate Control Method	H.264 : CBR or VBR Motion JPEG : VBR
		Streaming Capability	Multiple Streaming (Up to 10 Profiles)
		Audio Compression Format	-
		Audio Communication	-
		IP	IPv4, IPv6
		Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour

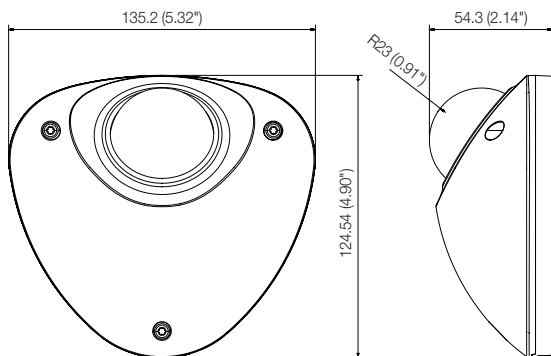
appendix

Items		Description
Network	Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication
	Streaming Method	Unicast / Multicast
	Max. User Access	15 users at Unicast Mode
	Memory Slot	Micro SD/SDHC/SDXC - Recorded data in the SD/SDHC/SDXC memory card can be downloaded
	Application Programming Interface	ONVIF Profile S HTTP API v2.0 SVNP 1.2
	Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatian, Hungarian, Greek, Norway, Finland
	Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7 Supported Browser : Microsoft Internet Explorer (Ver. 10, 9, 8, 7), Mozilla Firefox (Ver. 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9), Google Chrome (Ver. 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15), Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 Only), 5.1.7 * Mac OS X Only)
	Central Management Software	SmartViewer
	Mobile Viewer	iPOLiS mobile

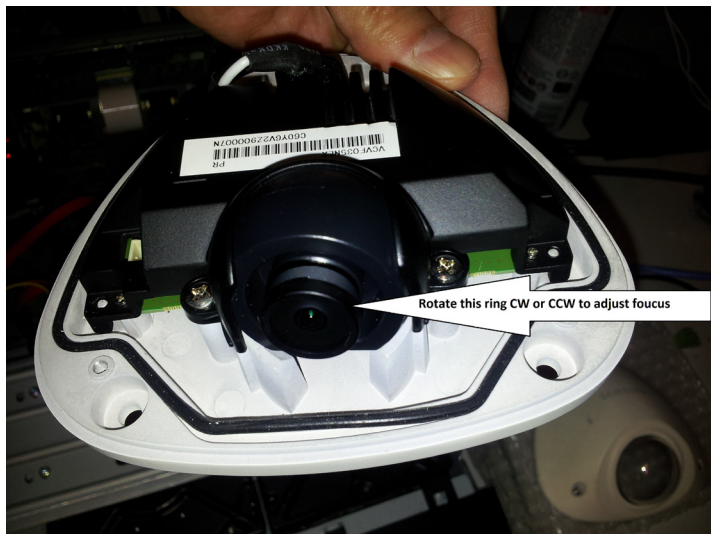
Items		Description
Environmental	Operating Temperature / Humidity	-30°C ~ +55°C (-22°F ~ +131°F) / Less than 90% RH
	Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
	Ingress Protection	IEC 60529 IP66, NEMA 250 Type 4X
	Vibration Resistance	EN 50155 Class T3 (vibration, shock, bump, temperature) EN 50121, ISO 16750-3 (vibration)
	Vandal Resistance	IEC 62262 Class IK10 (20J)
	UL	UL60590-1
Electrical	Input Voltage / Current	PoE (Mode A only - Data pair 1, 2, 3, 6 Pin are used to supply power.)
	Power Consumption	Max. 7.5W
Mechanical	Color / Material	IVORY/Aluminium
	Dimension (WxHxD)	W135.2 x H124.5 x D54.3mm
	Weight	530g

PRODUCT OVERVIEW

Unit : mm (inch)



PRODUCT OVERVIEW



TROUBLESHOOTING

PROBLEM	SOLUTION
I can't access the camera from a web browser.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Turn off the firewall settings on your PC and then search the camera again.
Images overlap.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • 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.

appendix

PROBLEM	SOLUTION
<Motion detection / Video analytics> of <Event setup> is set to <Enable>, but no notification e-mail reaches me even when an analysis event had occurred.	<ul style="list-style-type: none">• Verify the settings in the following sequence:<ul style="list-style-type: none">A. Check <Data & Time> settings.B. The <Motion detection / Video analytics> should be set to <Enable>.C. Check if the <E-mail> option of <Event action setup> menu is checked to use.
Can I define event rules even when I don't use <Motion detection / Video analytics>?	<ul style="list-style-type: none">• Yes, it can be. You can set rules for events despite of the intelligent video analysis setting.
Cannot record into the Micro SD memory card.	<ul style="list-style-type: none">• Check if the memory card is defective.
Micro SD memory card is inserted but the camera does not operate properly.	<ul style="list-style-type: none">• 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.

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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
dosfstools	GPL 2.0	http://www.daniel-baumann.ch/software/dosfstools
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	
mtid-1.4.1	GPL 2.0	ftp://ftp.infradead.org/pub/mtid-utils
mii-diag-2.11	GPL 2.0	
rp-pppoe-3.10	GPL 2.0	http://www.roaringpenguin.com/pppoe/
wpa_supplicant-0.7.3	GPL 2.0	
bash-4.2	GPL 3.0	
zeroconf	GPL 2.0	

LGPL SW

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

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The Unix configuration script "configure" was produced with GNU Autoconf. It is copyright by the Free Software Foundation but is freely distributable. The same holds for its supporting scripts (`config.guess`, `config.sub`, `ltconfig`, `ltmain.sh`). Another support script, `install-sh`, is copyright by M.I.T. but is also freely distributable.

It appears that the arithmetic coding option of the JPEG spec is covered by patents owned by IBM, AT&T, and Mitsubishi. Hence arithmetic coding cannot legally be used without obtaining one or more licenses. For this reason, support for arithmetic coding has been removed from the free JPEG software. (Since arithmetic coding provides only a marginal gain over the unpatented Huffman mode, it is unlikely that very many implementations will support it.) So far as we are aware, there are no patent restrictions on the remaining code.

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

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

Article 1. Scope of License Agreement

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

Article 2. Definition

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

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

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

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

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

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

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

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

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

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

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

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

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

14. "System Developer" means any person who develops the Embedded Product by itself or has a third party develop the same, and provides, whether with or without payment, the End User with the Embedded Product.

15. "Distributor of Modification" means any person who produces the Modified Source Code and, whether with or without payment, distributes the same to any third party.

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

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

18. "Source Code User" means a person who uses the Source Code.

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1. to transmit a work to a large number of specific persons through the Internet communication, broadcasting, and the like;
2. to transmit a work to the general public through the Internet communication, broadcasting, and the like automatically in response to a request from the public; and
3. to distribute a copy of a work to the general public or a large number of specific persons.

Article 3. Copyright

1. The copyrights of the Source Code shall be owned by Ken Sakamura.

Article 4. License of Source Code

1. As provided for in this Article, T-Engine Forum shall provide, and grant a license to use, the Source Code free of charge to any person who has taken the necessary procedure for registration as prescribed by T-Engine Forum and agreed to the T-License.

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1. to copy and/or modify the Source Code provided by T-Engine Forum hereunder for its own research, development and the like.
2. to run the Source Code provided by T-Engine Forum hereunder for its own research, development and the like.
3. to run the Source Code modified in accordance with the provision of Article 4.3 (1) above for its own research, development and the like.
4. to distribute the Binary Code created from the Source Code provided by T-Engine Forum hereunder or from the Source Code modified in accordance with the provision of Article 4.3 (1) above.

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

1. to perform any and all acts set forth in the Article 4.3 above.
 2. to develop and manufacture the Embedded Product containing the Binary Code, and, whether with or without payment, provide the End User with the same and make the Binary Code available to the End User on the Embedded Product.
5. The Source Code User and the System Developer shall be obligated to give a notice that the Source Code is used, in such a way as separately specified by T-Engine Forum, when they use the Source Code or the Binary Code, or make the Binary Code available for the End User on the Embedded Product.

Article 5. Distribution of Modified Source Code

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

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

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

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

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

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

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

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

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

Article 6. Distribution and Registration of the Ported Source Code

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

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

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

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

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

1. The member shall confirm that the object hardware is the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.
2. The member shall provide T-Engine Forum with a complete set of operational environment for the object hardware and T-Kernel free of charge when requesting the distribution.
3. The member shall submit test results of the Ported Source Code to T-Engine Forum when requesting the distribution.
4. In the event that T-Engine Forum accepts the request mentioned in Article 6.2, T-Engine Forum shall register and distribute the Ported Source Code as the Source Code for

T-Kernel. Provided, however, that the Ported Source Code may be treated in the same way as the Modified Source Code until the time of registration hereunder.

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

Article 7. Use for Other Purpose

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

Article 8. Limited Warranty

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

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

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

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

Article 11. Governing Law and Language

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2. This License Agreement is executed in both Japanese text and English text provided that the Japanese text shall govern the interpretation and performance of this License Agreement.

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