SAMSUNG TECHWIN

NETWORK CAMERA
User Manual

SNB-5001/SNB-7001

CE

SAMSUNG

Network Camera
User Manual

Copyright

©2014 Samsung Techwin Co., Ltd. All rights reserved.

Trademark

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

❖ **The initial administrator ID is "admin" and the password should be set when logging in for the first time.**
  Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.
  Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

overview

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.
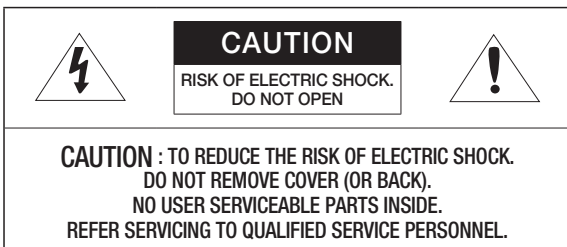
overview

WARNING

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

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

CAUTION

⚡	**CAUTION** RISK OF ELECTRIC SHOCK. DO NOT OPEN	⚠
CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.		

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

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

overview

PRODUCT FEATURES

- **Multi-Streaming**

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

- **Web Browser-based Monitoring**

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

- **Alarm**

  If an event occurs, the event-related video will be transferred to the email or FTP server specified by the user.

- **Video Motion Detection**

  Detects a motion from the video before triggering an event.

- **Screen change detection feature**

  If the monitoring is interrupted in any way, the camera will trigger the event alarm.

- **ONVIF Compliance**

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

  Onvif
  Driving network video through global standardization

RECOMENDED PC SPECIFICATIONS

- CPU : Intel(R) Core(TM)2 2.4 GHz or higher
- Operating System : Windows XP, VISTA, 7, Mac OS
- Resolution : 1280X1024 pixels or higher (32 bit color)
- RAM : 2GB or higher
- Web Browser : Internet Explorer 7 or later, Firefox 9 or later, Chrome 15 or later, Safari 5.1 or later

  ▪ Neither a beta test version unlike the version released in the company website nor the developer version will be supported.

  ▪ It is recommended to connect to IPv6 in Windows 7.

- 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.

overview

WHAT'S INCLUDED

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

Appearance	Item Name	Quantity	Description
	Camera	1	
	Instruction book, Installer S/W CD	1	
	Quick Guide (Optional)	1	
	Warranty card (Optional)	1	
	Cable for the testing monitor	1	Used to test the camera connection to a portable display device
	Alarm Cable	1	Used to connect to Alarm input
	C Mount Adapter	1	Used to install the C Mount camera lens
Lens Options (not included)			
	CS/C Lens		Optional lens to be inserted in a camera

AT A GLANCE

Front Side
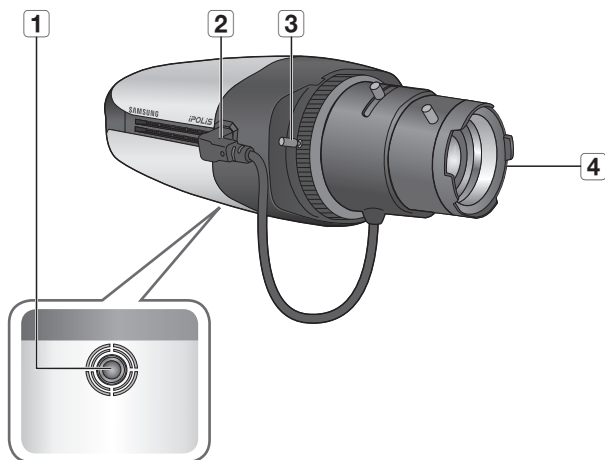
Item	Description
1 Mounting Bracket Screw Hole	Used to fix the camera on a mounting bracket. ▪ The screw size : use this screw to fix the mounting bracket. 1/4" - 20UNC (20THREAD/1") L : 4.5mm±0.2mm (ISO Standard), or 0.197" (ASA Standard)
2 Auto Iris Lens Connector	Used to supply power and output signal to control the iris of the lens.

overview

Item	Description
3 **FBL Lever**	Adjust the FBL (Flange-Back Length) value according to the lens.
4 **Auto Iris Lens (Optional)**	Installed on the lens adaptor.

🖉
- Wipe out a dirty surface of the lens softly with a lens tissue or cloth to which you have applied ethanol.
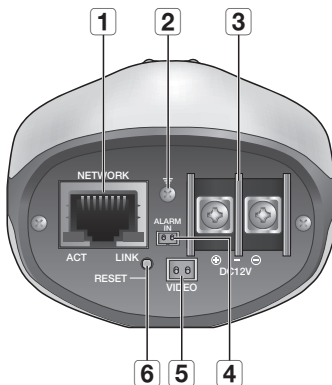
- Mounting Bracket is not included.
  For more information to use mounting bracket, refer to the product's documentation.

Rear Side

Item	Description
1 **Network Port**	Used to connect a PoE or LAN cable.
2 **Lightning protective grounding port**	Used to discharge the lightning current safely outside in order to protect the camera.
3 **Power Port**	Used to plug the power cable.
4 **Alarm Input Port**	Used to connect the alarm input signal.
5 **Video Out Port**	Analog video output port. (for installation)
6 **Reset Button**	Resets the camera settings to the default. Press and hold for about 5 seconds to reboot the system. ■ If you reset the camera, the network settings will be adjusted so that DHCP can be enabled. If there is no DHCP server in the network, you must run the IP Installer program to change the basic network settings such as IP address, Subnet mask, Gateway, etc., before you can connect to the network.

installation & connection

MOUNTING THE LENS

Disconnect the power before proceeding.

📝 ▪ The C lens and CS lens are not included in the product package.

Mounting the lens onto the C/CS mount camera

1. Fit the lens into the mounting screw hole and turn it clockwise. Tighten the screw.
   Then, it rotates in SLIP mode.

C/CS Lens
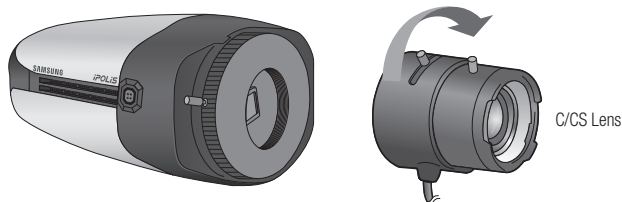
2. Turn it clockwise until it contacts on the stopper and stops.
3. As you can turn it counter clockwise from the stop point to rotate it in Slip mode, adjust the angle to your preference within the range.
4. Connect the lens cable to the camera connector.
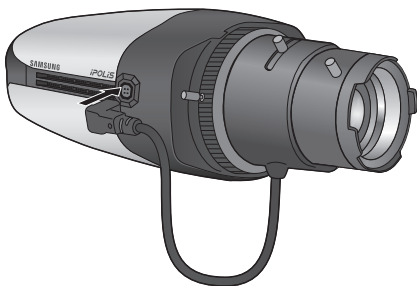
5. Use the focus lever and zoom lever to fit the zoom factor and focus. Then, fix the lens with the camera.
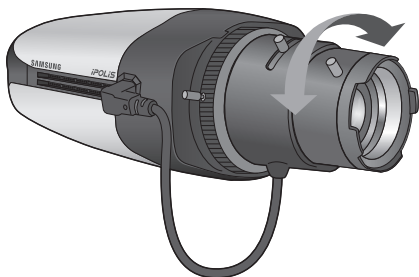
Using a lens with hood

The round hood is mounted on the camera lens, which is designed to prevent flare/ghost/light spreading. If it is installed improperly, it may cause shading on the screen.
Install the hood so that the wider side is placed vertically; and the narrower side is put horizontally.

installation & connection

CONNECTING WITH OTHER DEVICE
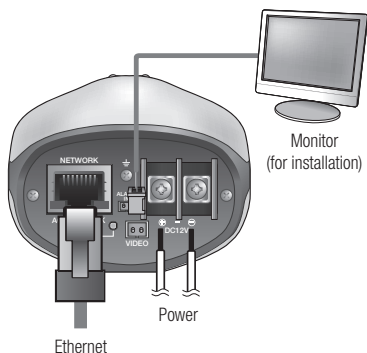
Monitor
(for installation)

Power

Ethernet

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

Ethernet Connection

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

Power Supply

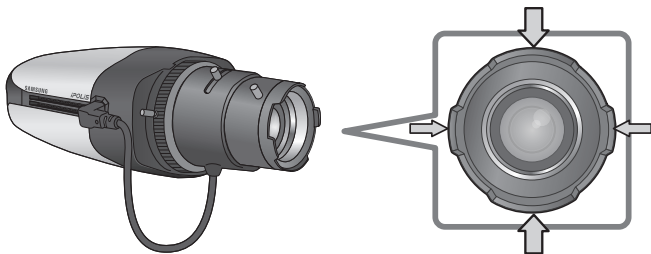Use the screwdriver to connect each line (+, –) of the power cable to the corresponding
power port of the camera.

> ⚠ ■ If both PoE and DC12V are applied simultaneously, the product will be supplied with power from
> PoE.
>
> - You can also use a router featuring PoE (Power over Ethernet) to supply power to the camera.
> - Use PoE (Power over Ethernet) that is compliant with the IEEE802.3af protocols.
> - It is advisable to use only one power source from PoE and DC12V.

- Be careful not to reverse the polarity when you connect the power cable.
  - Please connect the power adapter when the installation is completed.
  - As shown in the table below, you may encounter a voltage-sag depending on the wire length.
    If you use an excessively long wire for camera connection, the camera may not work properly.

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

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

Alarm input Wiring Diagram
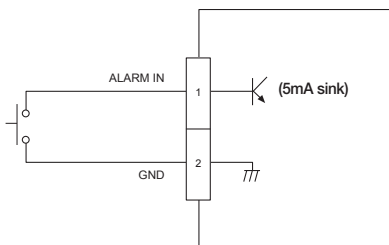
installation & connection

To connect to the alarm input port

Connect the alarm cable to the ALARM IN port in the rear panel.
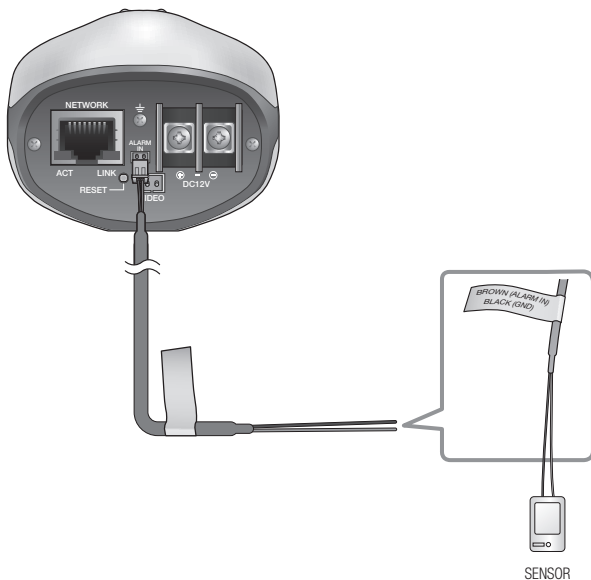
SENSOR

Port	Description	Port	Description
ALARM IN	Alarm Input Sensor Port	**GND**	GND port for the sensor

To connect the external sensor

Connect one strand of each signal line (2-strand) of the sensors to the [**ALARM IN**] port, and connect the other strand to the [**GND**] port.

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.

<Local Network>
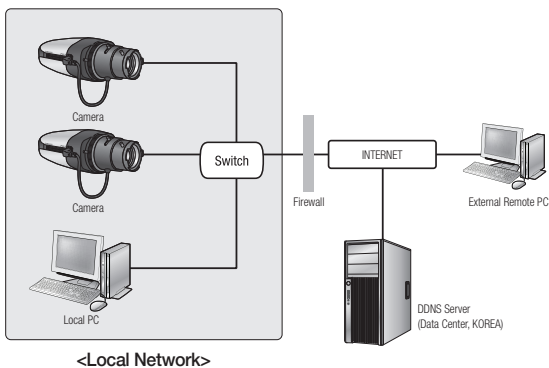
- A remote PC in an external Internet out of the LAN network may not be able to connect to the camera installed in the intranet if the port-forwarding is not properly set or a firewall is set. In this case, to resolve the problem, contact your network administrator.

- In the IP installer, you can use the initial password, "**4321**" to set IP Address, Subnet Mask, Gateway, HTTP Port, VNP Port, IP type. After changing the network interface, for better security, access the web viewer and change the password.

- By factory default, the IP address will be assigned from the DHCP server automatically. If there is no DHCP server available, the IP address will be set to 192.168.1.100. To change the IP address, use the IP Installer. For further details on IP Installer use, refer to "**Static IP Setup**". (Page 24)

network connection and setup

CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM
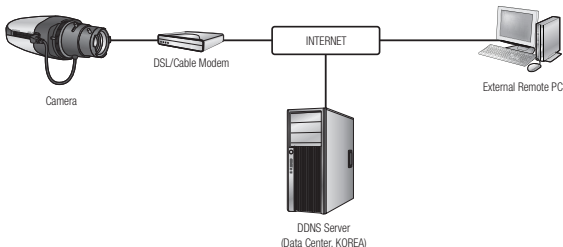
Camera — DSL/Cable Modem — INTERNET — External Remote PC

DDNS Server
(Data Center, KOREA)

1. Use the cross LAN cable to connect the network cable directly to your PC.
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 camera.
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 52)
>
> ◉ For configuring the DDNS settings, refer to "**DDNS**". (page 51)
>
> ◉ For setting the network type, refer to "**Interface**". (page 49)

CONNECTING THE CAMERA DIRECTLY TO A PPPoE MODEM

Camera

PPPoE Modem

INTERNET
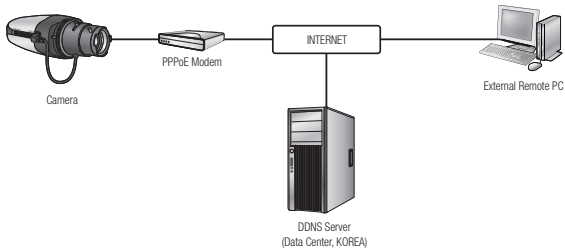
External Remote PC

DDNS Server
(Data Center, KOREA)

1. Use the cross LAN cable to connect the network cable directly to your PC.
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 camera.
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 [**PPPoE**].
7. Connect the camera, which was removed from your PC, directly to the modem.
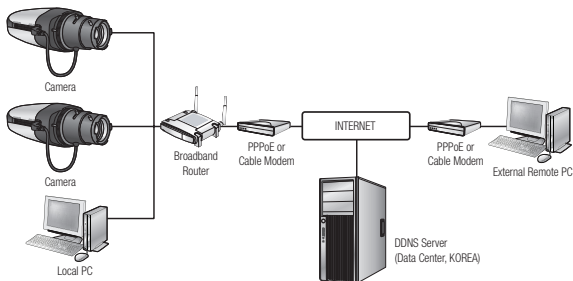8. Restart the camera.

> ■ For registering the DDNS settings, refer to "**Registering with DDNS**". (page 52)
>
> ■ For configuring the DDNS settings, refer to "**DDNS**". (page 51)
>
> ■ For setting the network type, refer to "**Interface**". (page 49)

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.

Camera

Camera

Local PC

Broadband Router

PPPoE or Cable Modem

INTERNET

PPPoE or Cable Modem

External Remote PC

DDNS Server
(Data Center, KOREA)

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 Neighborhood**> ➜ <**Properties**> ➜ <**Local Area Connection**> ➜ <**Properties**> ➜ <**General**> ➜ <**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.

  ▪ Refer to the "**Port Range Forward (Port Mapping) Setup**" section of the Broadband Router's documentation. (Page 29)

BUTTONS USED IN IP INSTALLER
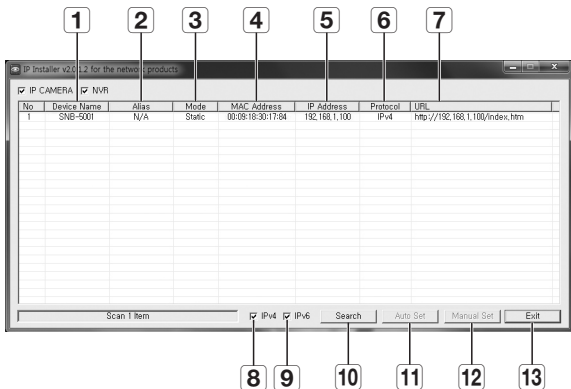
	Item	Description
1	Device Name	Model name of the connected camera. Click the column to sort the list by model name. However, search will be stopped if clicked during the search.
2	Alias	This function is not currently implemented.
3	Mode	Displays either <**Static**>, <**Dynamic**> or <**PPPoE**> for the 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

English _**23**

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.
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. Find the MAC (Ethernet) address labeled on the rear of the camera. Both the [**Auto Set**] and [**Manual Set**] buttons will be activated.

2. Click [**Manual Set**]. The Manual Setting dialog appears. The default values of <**IP Address**>, <**Subnet Mask**>, <**Gateway**>, <**HTTP Port**> and <**VNP Port**> of the camera will be displayed.
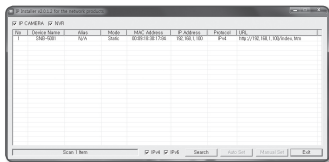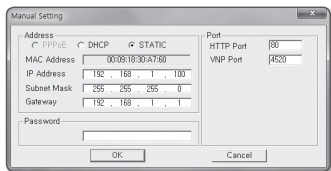
3. In the <**Address**> pane, provide the necessary information.

- MAC (Ethernet) Address : The MAC (Ethernet) address of the applicable camera will be set automatically so you don't need to input it manually.

📝 ▪ You can configure the static IP settings only if the DHCP checkbox is unchecked.
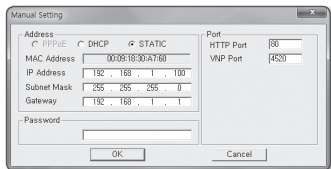
If not using a Broadband Router

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

4. In the <**Port**> pane, provide necessary information.

- HTTP Port : Used to access the camera using the Internet browser, defaulted to 80. Use the spin button to change the HTTP Port value.

- VNP Port : Used to control the video signal transfer, defaulted to 4520.

5. Enter the password.
This is the login password for the "**admin**" user who accesses the camera.

⚠ ▪ For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.

▪ If you want to change the password, refer to "**Administrator Password Change**" of the user setup. (page 69)

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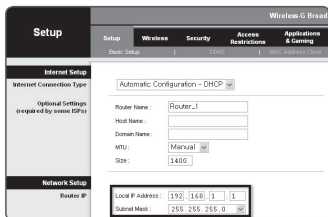
network connection and setup

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.
>
> ▪ Refer to the "**Port Range Forward (Port Mapping) Setup**" section of the Broadband Router's documentation. (Page 29)

If the Broadband Router has more than one camera connected

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

ex)

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

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

Auto Network Setup

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

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

1. Select a camera in the search list.
   Find the MAC (Ethernet) address
   labeled on the rear of the camera.
   Both the [**Auto Set**] and [**Manual Set**]
   buttons will be activated.

2. Click [**Auto Set**].
   The Auto Setting dialog appears.
   The <**IP Address**>, <**Subnet Mask**>,
   and <**Gateway**> will be set automatically.

3. Enter the password.
   This is the login password for the
   "**admin**" user who accesses the camera.
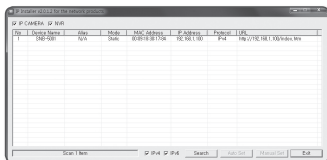
   ! ■ For the security purposes, you are
   recommended to use a combination
   of numbers, alphabets uppercase and
   lowercase and special characters for your
   password.

   ■ If you want to change the password, refer
   to "**Administrator Password Change**" of
   the user setup. (page 69)

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

● NETWORK CONNECTION AND SETUP

English _**27**
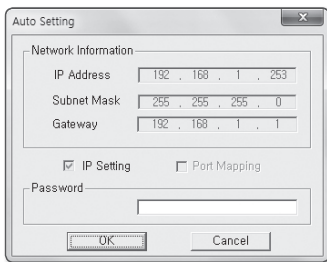
network connection and setup

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 machine to display cameras allocated with <**Dynamic IP**> addresses in the list.

2. Select a camera in the list, and click [**Manual Set**] to check the <**Dynamic IP**> of the camera.
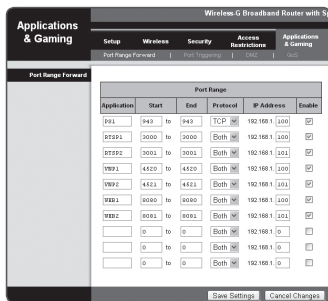   If you uncheck <**DHCP**>, you can change IP to <**Static**>.
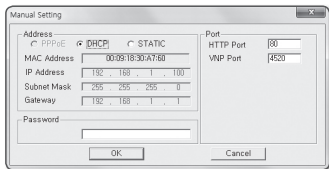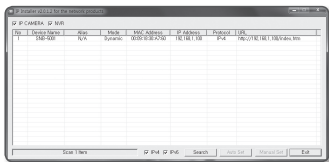
PORT RANGE FORWARD (PORT MAPPING) SETUP

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.

Applications & Gaming	Setup	Wireless	Security	Access Restrictions	Applications & Gaming	
	Port Range Forward	Port Triggering				
Port Range Forward						

		Port Range				
Application	Start	End	Protocol	IP Address	Enable	
PS1	943	to 943	TCP	192.168.1. 100	☑	
RTSP1	3000	to 3000	Both	192.168.1. 100	☑	
RTSP2	3001	to 3001	Both	192.168.1. 101	☑	
VNP1	4520	to 4520	Both	192.168.1. 100	☑	
VNP2	4521	to 4521	Both	192.168.1. 101	☑	
WEB1	8080	to 8080	Both	192.168.1. 100	☑	
WEB2	8081	to 8081	Both	192.168.1. 101	☑	
	0	to 0	Both	192.168.1. 0	☐	
	0	to 0	Both	192.168.1. 0	☐	
	0	to 0	Both	192.168.1. 0	☐	

Save Settings   Cancel Changes

> - 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
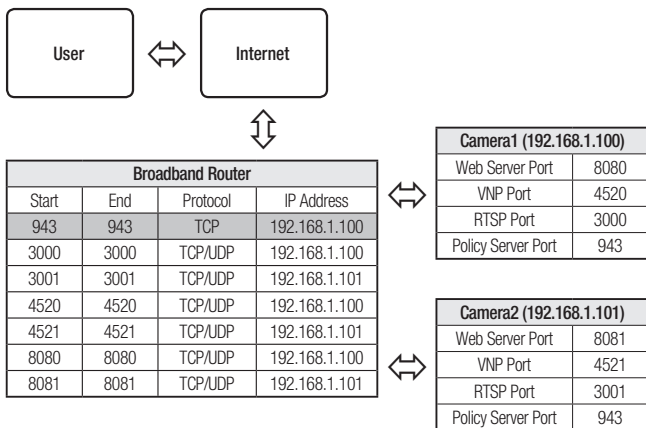
network connection and setup

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 :

User	⇔	Internet

⇕

Broadband Router			
Start	End	Protocol	IP Address
943	943	TCP	192.168.1.100
3000	3000	TCP/UDP	192.168.1.100
3001	3001	TCP/UDP	192.168.1.101
4520	4520	TCP/UDP	192.168.1.100
4521	4521	TCP/UDP	192.168.1.101
8080	8080	TCP/UDP	192.168.1.100
8081	8081	TCP/UDP	192.168.1.101

⇔

Camera1 (192.168.1.100)	
Web Server Port	8080
VNP Port	4520
RTSP Port	3000
Policy Server Port	943

Camera2 (192.168.1.101)	
Web Server Port	8081
VNP Port	4521
RTSP Port	3001
Policy Server Port	943

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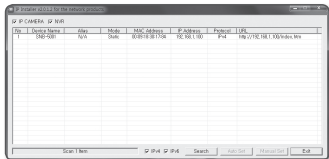
> ■ Access to the camera can also be gained by typing the camera's IP address in the address bar of the Internet browser.

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 52)

web viewer

CONNECTING TO THE CAMERA

Normally, you would

1. Launch the Internet browser.

2. Type the IP address of the camera in the address bar.
   ex) • IP address (IPv4) : 192.168.1.100
   → http://192.168.1.100
   - the Login dialog should appear.
   • IP address (IPv6) : 2001:230:abcd:
   ffff:0000:0000:ffff:1111
   → http://[2001:230:abcd:ffff:0000
   :0000:ffff:1111] - the Login dialog
   should appear.
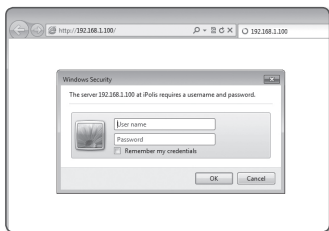
If the HTTP port is other than 80

1. Launch the Internet browser.

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

Using URL

1. Launch the Internet browser.

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

To check the DDNS address

If the camera is connected directly to the DHCP cable modem, DSL modem, or PPPoE modem, the IP address of your network will be changed each time you try to connect to the ISP (Internet Service Provider) server.

If this is the case, you will not be informed of the IP address changed by DDNS.

Once you register a dynamic IP-based device with the DDNS server, you can easily check the changed IP when you try to access the device.

To add the IP address to the <**DDNS**> server, visit www.samsungipolis.com and register your device, and set the DDNS option to <**Samsung DDNS**> before providing the product ID for the DDNS server.

PASSWORD SETTING

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

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

Administrator password change

New password
Confirm new password

. If the password is 8 to 9 letters long, then it should be a combination of at least three types upper/lower case alphabets, numbers and special characters.
. If the password is 10 to 15 letters long, then it should be a combination of at least two types upper/lower case alphabets, numbers and special characters.
. User name should be different from password.
. The following special characters are available for use. ~`!@#$%^*()_-+=|{}[].?/
. Refrain from using the password which uses consecutive or repeated text string since it has vulnerable security. (Ex:abcde123456, aaaaa11111, qwerty!@#$)

web viewer

LOGIN

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

1. Enter "**admin**" in the <**User name**>
   input box.
   The administrator ID, "**admin**", is fixed
   and can not be changed.

2. Enter the password in the <**Password**>
   input field.

3. Click [**OK**].
   If you have logged in successfully, you
   will the Live Viewer screen.
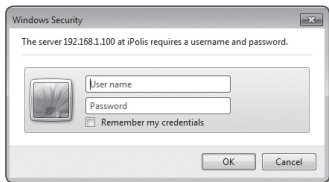
⚠ ▪ When you access the camera web viewer, pay special attention to the security by checking
   whether the image data is encrypted.

✎ ▪ If you check the "**Remember my credentials**" option when your input is done, in future you will
   be logged in automatically without being prompted to enter the login information.

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

INSTALLING STW WebViewer PLUGIN

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

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

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

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

3. Click [**Yes**] when the notice window saying that all browser windows will be closed.
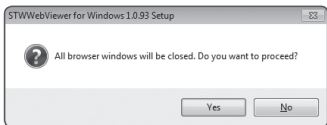
4. When the old version of the Web Viewer Plug-in is installed, a notice window saying the old version will be deleted is displayed.
   Click [**Yes**] when the notice window is displayed.
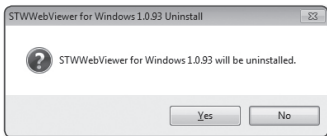
☑ ■ Steps 4 and 5 will be skipped if no Web Viewer Plug-in is installed.

web viewer

5. Click [**OK**].
   The old version of Web Viewer Plug-in is deleted.
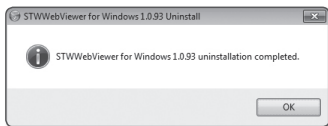
6. Click [**Install**] to begin installation of the Web Viewer Plug-in.
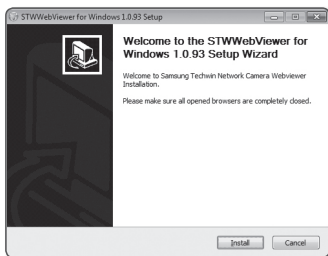
7. Click [**Finish**].
   STW Web Viewer Plug-in installation is completed.

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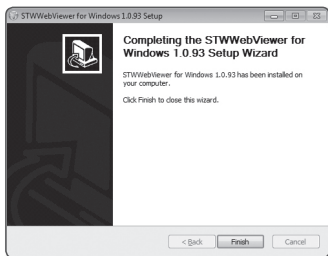
USING THE LIVE SCREEN

	Item	Description
1	Monitoring	Move to the monitoring screen.
2	Setup	Move to the Setup screen.
3	Viewer Screen	Displays the Live video on the screen.
4	Profile type	You can select a profile type in <**Video profile**> under the <**Video**> setup menu.
5	Capture	Saves the snapshot as an image file in the .bmp or .jpg format.
6	Full Screen	Switch the current video to the maximum size of the monitor.
7	Fix the resolution	The camera video will be set to a resolution of 640 x 480. Press it again to switch back to the default resolution.

web viewer

Item	Description
8 Screen Optimization	The video size of the camera will switch to as big as the Web browser.
9 Hide the context menu	The left-corner context menu will disappear but only the menu icon.

> ■ Use the mouse wheel to control the digital zooming.

To capture the snapshot

1. Click [■○] on the scene to capture. The Capture dialog should appear.

2. 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**".
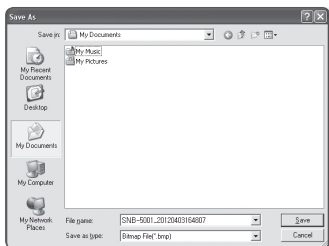
To fit the full screen

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.

setup screen

SETUP

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

1. In the Live screen, click [**Setup (⚙ Setup)**].

2. The Setup screen appears.

    ⚠ ■ The setting page for preview video requires the STW web viewer plug-in to be installed on the PC.
    If not installed already, automatically moves to the Sliverlight setup.

## VIDEO SETUP

Video profile

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

2. Click <**Video profile**>.

3. Select a <**Video profile**> option.

4. 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 : This is the default video profile.

    • 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.
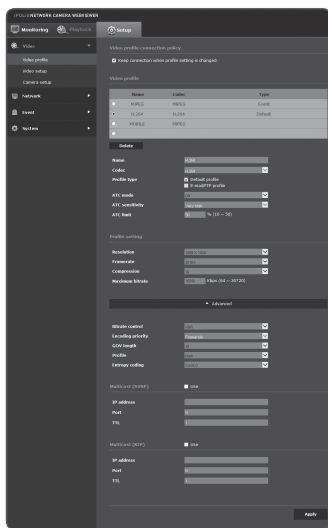
setup screen

5. Configure the ATC mode settings.

- 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.

ATC mode	Off
ATC sensitivity	Very high
ATC limit	90 % (10 ~ 50)
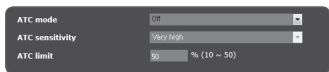
  - Control framerate : Reduce the frame rate if the network bandwidth drops down.
  - Control compression : Control the compression rate if the network bandwidth drops down.
    Compression adjustment can cause deterioration of the image quality.

  ■ 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 enable ATC in a network system equipping ATC compliant cameras.
>
> ■ 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.

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

> ■ For SNB-7001, select and set <**Megapixel Mode**>.
> You can choose from <**2-Megapixel**> and <**3-Megapixel**>. If you change the mode, the confirmation message appears before the change is applied.

To add a video profile

You can add as many codecs as necessary so that a variety of profiles can be applied according to the recording condition.

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 : Specify the frame rate.
   - Compression : Specify the compression rate of the video.
   - Maximum bitrate : Specify the maximum bit rate of the video.

   > ▪ 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.

   - 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.
   - Encoding priority : You can set the video transfer method to Framerate or Compression.
   - GOV length : You can determine the length of GOV.
     (SNB-5001 : 1~150, SNB-7001 : 2Mega Mode - 1~150, 3Mega mode : 1-100)
   - Profile : You can select the H.264 profiling method.
   - Entropy coding : Reduce the possible compression loss due to encoding.
   - Smart codec : Specify the use of Smart codec.

   > ▪ This is available only with SNB-7001.
   > The Smart Codec will be active only if the codec is of H.264 and the compression system is CBR.

   - Multicast (SVNP) : Specify the use of the SVNP protocol.
     - IPv4 : 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.

setup screen

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

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

What is GOV length?

GOV(Group of Video object planes) is a set of video frames for MPEG-4 and 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.
(SNB-5001 : 1~150, SNB-7001 : 2Mega Mode - 1~150, 3Mega mode : 1-100)

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. Set the <**Video output**>.
   - If you select <**Off**>, the video signal will not be output via the VIDEO OUT port.

5. Select the video type.

6. Specify the privacy zone.

7. When done, click [**Apply (Apply)**].
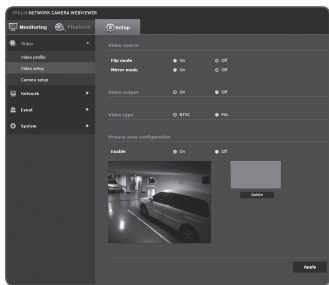
To set the privacy zone

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

1. Set it to <**On**>.

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

3. Place the cursor at a point in the video and drag it to whatever you need.

4. Provide a name and press [**OK**].

5. If you want to delete an area in the list, select one and click [**Delete (Delete)**].
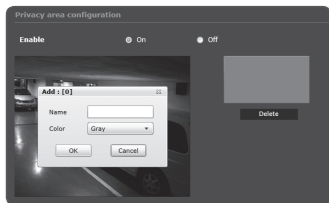
Camera setup

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 : White balance, Backlight, Exposure, Special, OSD, Time OSD

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

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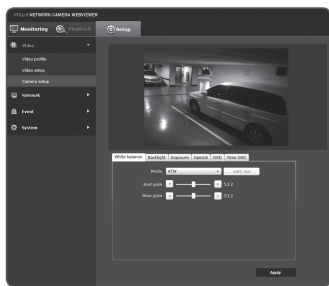
● SETUP SCREEN

setup screen

White balance Setup

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

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

2. Select <**Mode**>.

   • ATW : Corrects the colors of the
     camera video automatically.
     It is available in the color temperature
     of between 1,800°K and 10,500°K.

   • 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 [**AWC Set**] button. If the lighting environment is
     changed, you should readjust the settings accordingly.

   • Outdoor : Automatically corrects the video colors of the camera to be optimized
     to the outdoor environment.
     It is available in the color temperature of between 1,800°K and 10,500°K. (including
     natrium lamp)

   • Indoor : Automatically corrects the video colors of the camera to be optimized to
     the indoor environment.
     It is available in the color temperature of between 4,500°K and 8,500°K.

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

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

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

BLC Setup

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

1. Select <**Backlight**>.

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.
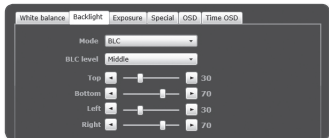
Exposure Setup

You can adjust the exposure level of the camera.

1. Select <**Exposure**>.

2. Select each item and set it properly.
   - Brightness : Adjust the screen brightness.
   - Iris : Adjust the iris of the camera manually or automatically.
     - Auto : Depending on the settings, such as brightness and shutter speed, the iris will be adjusted.
     - Manual : Fix to Full Open.
       ▪ For a camera with the shutter type of AUTO, the iris will operate properly only if it is set to <**Manual**>.
   - Shutter mode : Adjust the electronic shutter of the camera.
     - Auto : Adjust the shutter speed automatically according to the ambient brightness.
     - Manual : Adjust the shutter speed of the camera manually.
     - A.FLK (Anti flicker) : Select this feature if you encounter a flickering screen due to a frequency mismatch with the ambient lighting.
   - Shutter speed : Control the shutter speed manually.
   - SSNR : Specify the reduction level of background noise for a low contrast scene.
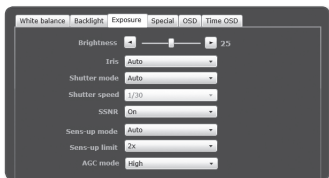
setup screen

- Sens-up mode : Automatically senses the darkness level at night or in a low contrast scene and extends the accumulation time accordingly for a bright and sharp image.
  - If you set the shutter mode to Manual/A.FLK, SENS-UP mode will be deactivated.
  - The greater the Sens-Up factor is, the brighter the screen becomes but it may result in an afterimage or video delay.
  - Sens-up is limited to x30 in maximum if two or more users of different profiles are accessing at the same time.
- Sens-up limit : Set the work condition to Auto mode in a low contrast scene.
- AGC mode : Select AGC Control mode.
  Adjust the gain value of the video (that, in particular, was recorded at a low contrast scene and had a lower brightness level than normal) to control the video brightness.

Special Setup

1. Select <**Special**>.

2. Select each item and set it properly.
   - Day & night : You can switch the mode to adjust the black and white level as well as the colors.
     - Color : Always displays the video in colors.
     - B/W : Always displays the video in black and white.
     - Auto : Displays in color mode during normal daytime and switches to black and white mode in a low contrast scene at night.
       - If you set the AGC mode to OFF from <**Exposure**>, the AUTO DAY/NIGHT mode will be disabled accordingly.
   - Dwell time : This is the time while each applicable lighting condition is kept in order to enable the switch between day and night modes.
   - Duration : Specify the time interval of lighting at which the sequence operation is triggered.
   - Sharpness 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 color level of the image.

OSD Setup

1. Select <**OSD**>.

2. Select each item and set it properly.
   - Camera title : Specify whether or not to display the camera title on the screen.
     - You can enter up to 15 characters for the title.
   - Camera title position X, Y : Specify the coordinates where the camera title is displayed on the screen.

Time OSD Setup

1. Select <**Time OSD**>.

2. Select each item and set it properly.
   - Time display : Specify the use of time display on the screen.
   - Date format : Specify the date format that will be displayed on the screen.
   - Time position display X, Y : Specify the position of time display on the screen.
   - Display weekday : Specify the use of date display date on the screen.
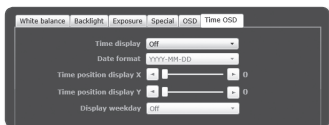
setup screen

Smart codec setup (SNB-7001)

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

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

2. Click <**Smart codec setup**>.

3. Set the image quality.
   The ROI area will be displayed in the specified quality.

4. Select a desired area with the mouse pointer and drag it as much as you want.
   - You can specify up to 5 distinct areas.

5. To cancel all the settings for the area, click the [**Clear (Clear)**] button.

6. When done, click [**Apply (Apply)**].
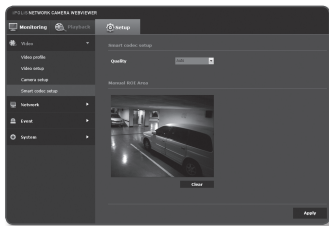
   ▮ ▪ The Smart codec will not be active if it is set to <**Off**> in <**Video profile**>. (page 37)

NETWORK SETUP

Interface

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

2. Click <**Interface**>.

3. Set the <**Interface**>.
   - 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 (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 (Apply)**] to apply changes and the browser exits. After a while, connect again with the changed IP.
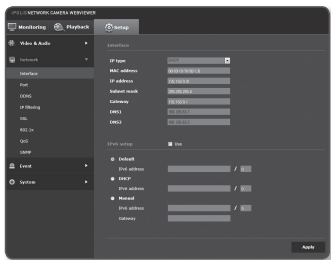
setup screen

Port

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

2. Click <**Port**>.

3. Type in each item in the Port menu as necessary.
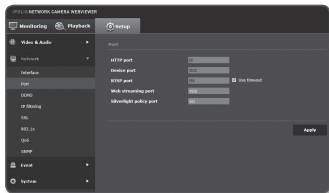
   - Neither the port range between 0 and 1023 nor port 3702 is available.

   - 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.

   ∎ Using RTSP and HTTPS is recommended in order to prevent the image information from being restored.

4. When done, click [**Apply (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 (Apply)**].
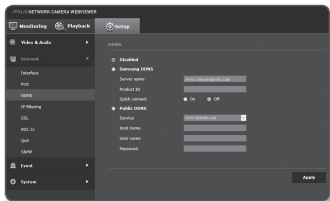
   ■ If selected <**Quick connect**>, be sure to select Samsung DDNS service.

● SETUP SCREEN

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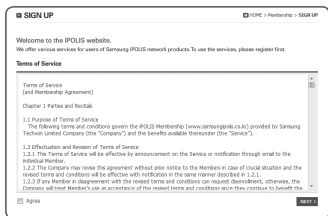
2. From the top menu bar, select <**DDNS
   SERVICE**> - <**MY DDNS**>.

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**>.
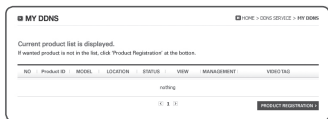
6. Specify the product location with a
   description if necessary.

7. Click [**REGISTRATION**].
   The product will be added to the
   product list that you can check.
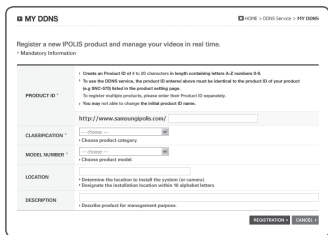
To connect to the Samsung DDNS in camera setup

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 (Apply)**].
   When the connection is successfully made, you will see the message of <**(Success)**> on the screen.
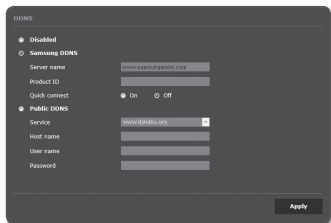
Configuring public DDNS in Camera Settings

1. Open the DDNS settings page and select <**Public DDNS**> for <**DDNS**>.

2. Enter the corresponding site's host name, user name and password.

3. Click [**Apply (Apply)**] button.
   If the connection properly establishes, <**(Success)**> appears.

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

━ To use DDNS service properly, both DDNS setup and the router's port forwarding setup are required.
For port forwarding setup, refer to "**Port Range Forward (Port Mapping) Setup**". (page 29)

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)**].

54_ setup screen
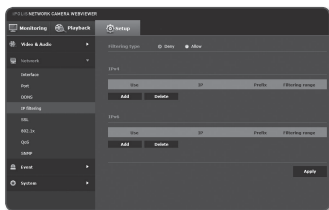
SSL

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

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

2. Click <**SSL**>.

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

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

5. When done, click [**Apply (Apply)**].
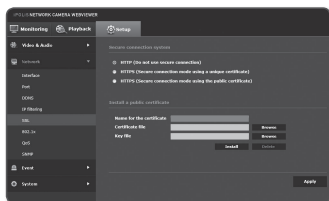
Installing the certificate

1. Enter the certificate name.

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

Deleting the certificate

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

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

● SETUP SCREEN

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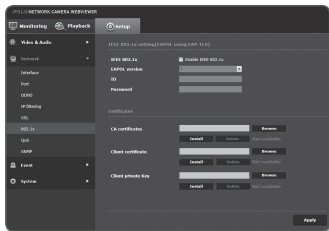
> ■ If the connected network device does not support the 802.1x protocol, the protocol will not operate properly even if you set it.

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 (Apply)**].

To install/remove 802.1x related certificates

1. Press the [**Browse (Browse)**] button for each item and select a certificate to install.

2. If no certificate is installed, you will see "Not Available" appearing next to the selected item.

3. Press the [**Install (Install)**] button to start installation with a message of "Installed" next to the item.

4. Press the [**Delete (Delete)**] button to remove the certificate.

QoS

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

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

2. Click <**QoS**>.

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

4. Enter an IP address to which you will apply QoS.

📝
- The default prefix for IPv4 is 32;
  For DSCP, the default is set to 63.

 - Only the IP addresses that are set to <**Use**> can be prioritized.

5. Select an IP to delete from the list. Click the [**Delete (Delete)**] button.

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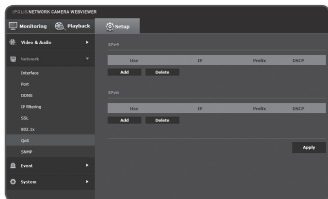
SNMP

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

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

2. Click <**SNMP**>.

3. Specify the <**SNMP**>.

   • Enable SNMP v1 : SNMP version 1 will be active.

   • Enable SNMP v2c : SNMP version 2 will be active.

   - Read community : Provide the name of the read community where you can access to the SNMP information. The default name is <**public**>.

   - Write community : Provide the name of the write community where you can access to the SNMP information. The default name is <**write**>.

English _**57**
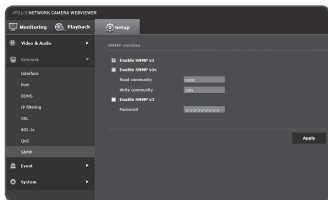
setup screen

- Enable SNMP v3 : SNMP version 3 will be active.
  - Password : Specify the default password for SNMP version 3. The default password is <**admin4321**>.
    - The default password can be exposed to a hacking thread so it is recommended to change the password after installing the product.
      Note that the security and other related issues caused by the unchanged password shall be responsible for the user.
    - Password should be longer than 8 characters, no more than 16 characters.

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

- SNMP v3 is only able to be set when the secure connection mode is HTTPS.
  Refer to "**SSL**". (page 55)

  - If you don't use SNMP v3, there may be a security issue.

EVENT SETUP

FTP / E-mail

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

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

2. Click <**FTP / E-mail**>.

3. Select <**FTP configuration**> or <**E-mail configuration**> and enter / select a desired value.
   - FTP configuration
     - Server address : Enter the IP address of the FTP server that you transfer the alarm or event images to.
     - ID : Enter the user ID with which you will log in to the FTP server.
     - Password : Enter the user account password for logging into the FTP server.
     - Upload directory : Specify the FTP path where you will transfer the alarm or event images.

- Port : The default port of the FTP server is 21; however, you can use a different port number according to the FTP server settings.
- Passive mode : Select <**On**> if you need to connect in passive mode due to the firewall or the FTP server settings.
• E-mail configuration
  - Server address : Enter the IP address of the email server that you transfer the alarm or event images to.
  - Use authentication : Select whether to use authorization.
  - Use SSL : Specify the use of SSL.
  - ID : Enter the user ID for logging into the email server.
  - Password : Enter the user account password for logging into the email server.
  - Port : The default port of the email server is 25; however, you can use a different port number according to the email server settings.
  - Recipient : Enter the address of the email recipient.
  - Sender : Enter the address of the email sender. If the sender address is incorrect, the email from the sender may be classified as SPAM by the email server and thus may not be sent.
  - Subject : Enter a subject for your email.
  - Body : Provide the text for the massage. Attach the alarm or event images to the email that you are preparing.
4. When done, click [**Apply** (Apply)].

● SETUP SCREEN

English _**59**

setup screen

Alarm input

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

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

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

3. Select <**Alarm input**> from <**Event action setup**>.

4. Set whether or not to <**Enable**>.

5. Specify an input device.
   • Type
     - Normal open : It is normally open, but if it is closed, an alarm will be triggered.
     - Normal close : It is normally closed, but if it is open, an alarm will be triggered.

6. Specify the <**Activation time**>.
   • Always : Always check if an alarm occurs. It activates in operated mode when the alarm occurs.
     ▪ If set to Always, the activation time cannot be changed.
   • Only scheduled time : Check if an alarm occurs at a specified day of the week for a specified time period. It activates in operated mode when the alarm occurs.
   • [Clear (**Clear**)] : Deselect the selected times.

7. Specify an operation that will perform if an alarm occurs.
   • FTP : Specify the use of FTP transfer in the alarm input setup.
   • E-mail : Specify the use of email transfer in the alarm input setup.

8. When done, click [**Apply (Apply)**].
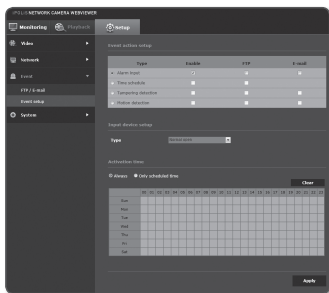
Time schedule

You can configure so that an event will occur at a scheduled time 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 : Always activates in operated mode at the set interval.
   • Only scheduled time : Periodically activates in operated mode at a specified time and date.
7. Specify the activation conditions.
   • FTP : Specify the use of the FTP transfer if an event occurs.
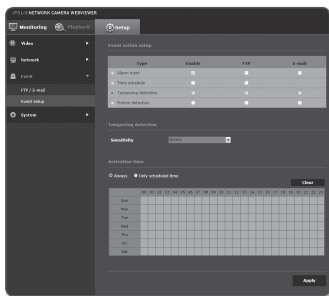8. When done, click [Apply (Apply)].
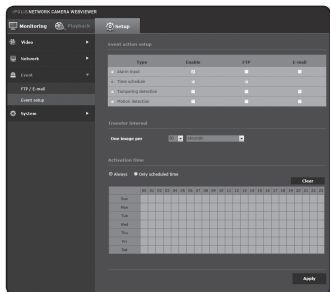
setup screen

Tampering detection

You can set to trigger an event when a scene is changed on the video screen.

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. Specify the detection sensitivity of the scene change.
   The higher the sensitivity is, the lesser change can be detected.

6. Specify the activation time and activation condition.
   - For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 60)

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

> [!] ■ The default change detection function may not work properly in the following cases:
>   - A monotonous background or a night/low-contrast scene may deteriorate the detection performance.
>   - A severe shaking of the camera or a drastic change to the illumination can be considered a scene change by mistake.
>   - Detection of the scene change may take some time (maximum 3 seconds) right after the change was made.
>   - Once a scene change is detected, the network camera will resume a normal operating after a certain stability time (approx. 3 seconds) during which no detection will be performed.

Motion detection

Events of motion detection 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**> from <**Event action setup**>.
4. Set whether or not to <**Enable**>.
5. Set <**Sensitivity**>, <**Size**> and <**Area**>.
6. Set whether to use <**Detection result overlay**>.
   When a motion is detected, its size and position is marked with a rectangle on the screen.
7. Specify the activation time and activation condition.
   ■ For more information about <**Activation time**> and <**Action**>, refer to "**Alarm input**". (page 60)
8. When done, click [**Apply (Apply)**].
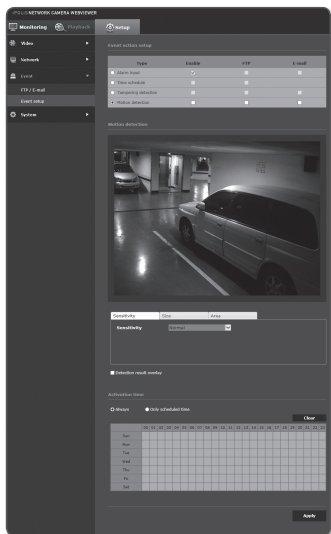
● SETUP SCREEN

setup screen

- 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.
- In the following cases, motion detection function may be degraded or cause improper detection.
  - The object color or brightness is similar to the background.
  - Small activities around the border area of the camera's field of view.
  - Multiple movements continue occurring at random due to a scene change, rapid lighting changes or other reasons.
  - A fixed object continues moving in the same position.
  - Motions of less position changing such as approaching to the camera or fading away from the camera.
  - Moving object approaches to the camera too close
  - An object hides other objects behind.
  - Two or more objects overlap or one object divides in multiple portions.
  - Too fast object (for a proper detection, one object should be found overlapping between contiguous frames).
  - Reflection / blur / shadow due to a strong light such as direct sunlight, illumination, or headlamp.
  - In severe snow, rain, wind or in dawn / dusk.
- If the MJPEG resolution of <**Video profile**> is set to 1280X720, the upper and lower parts of the image in the mask area will be truncated. Further, the already set mask area may appear to be cut off as well.

To use Motion detection

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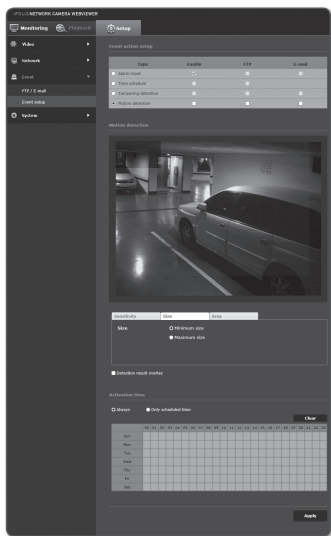
1. Select a motion detection mode.

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.

   - 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.

English _**65**

setup screen

4. Select <**Area**> tab.
   You can specify an area on the screen to include or exclude the area to/from detection.
   You can specify up to 4 areas.
   • Detection area : Sets the entire screen as excluded from detection, and adds specified area as motion detection area. Use your mouse to drag to specify preferred area as the motion detection area.
   • Non detection area : Sets the entire screen as motion detection area, and excludes specified area as not to be detected. Use your mouse to drag to specify preferred area as the non detection area.

5. To delete an area, right click on the screen to open popup context menu and select Delete, and [**OK**] button.
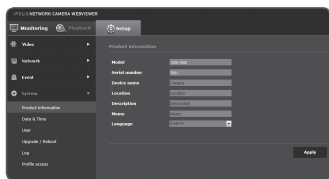
   ■ All areas defined are deleted.

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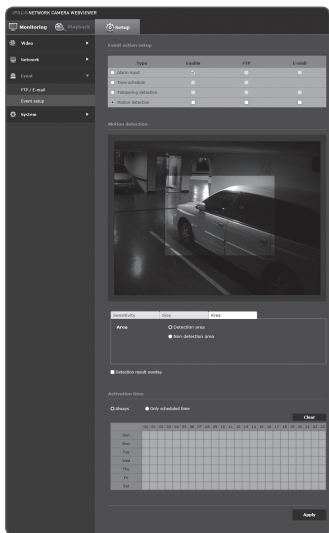
SYSTEM SETUP

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 (Apply)**].

● SETUP SCREEN

English _**67**

setup screen

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 : Synchronize the time with the connected PC.

4. When done, click [**Apply (Apply)**].
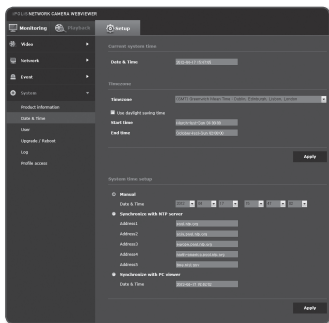
> ■ If you select the <**Synchronize with PC viewer**>, the standard timezone should be set the same as the current timezone in PC.

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.

> ⚠ ■ For the security purposes, you are recommended to use a combination of numbers, alphabets uppercase and lowercase and special characters for your password.
>
> ■ It is recommended to change your password once every three months.
>
> ■ The password length and limits are shown as follows.

  - A combination of at least three types of upper case, lower case, numeric, and special characters: 8 to 9 characters.
  - A combination of at least two types of upper case, lower case, numeric, and special characters: 10 to 15 characters.
  - Should be different from the ID.
  - For higher security, you are not recommended to repeat the same characters or consecutive keyboard inputs for your passwords.
  - Special characters that are allowed. : ~`!@#$%^*()_-+=|{}[].?/
  - When you access the camera web page for the first time or access it after the initialization, you will be moved to the admin password setting menu.
  - In this menu, you need to login again with the new password before using the camera web page menus.
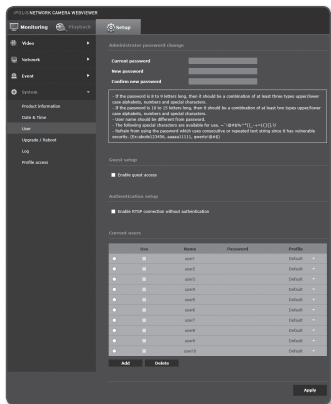
● SETUP SCREEN

setup screen

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

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

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

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

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

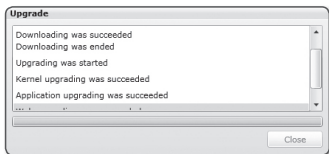## Upgrade / Reboot

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

2. Click <**Upgrade / Reboot**>.

3. Select a desired item and set it appropriately.
   - Upgrade : Performs upgrading the system.
   - Factory default : Resets the system to the factory default.
     - Except network parameter : Reset the other settings except for Network settings.
     - All : Resets all settings including the camera settings. (however, the log information will not be reset)
       ▪ The IP addressing system will be defaulted to DHCP if you reset the camera. If no DHCP server is found, the previous settings will be restored automatically.
   - Configuration backup & Restore : Backs up the current system settings before performing the restoration process. The system is automatically restarts after backup or restoration.
   - Restart : Restarts the system.
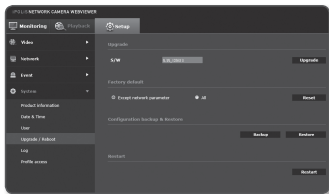
To perform the upgrade

1. Click [**Upgrade**].

2. Click [**Browse**] and specify a file to upgrade.

3. Click [**Send**].

4. The "**Upgrade**" dialog appears where the progression will be shown in the bottom.

5. Once completed upgrading, the browser exits and the camera restarts.

Current SW Version   0.35_120413

Browse   Send

Upgrade
Downloading was succeeded
Downloading was ended
Upgrading was started
Kernel upgrading was succeeded
Application upgrading was succeeded

Close

☑ ▪ 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).

● SETUP SCREEN

setup screen

To back up the current settings

1. Click [**Backup**].
   The Save As dialog should appear.

2. Specify the backup path with a proper
   file name, and click [**Save**].
   The backup file will be saved to the
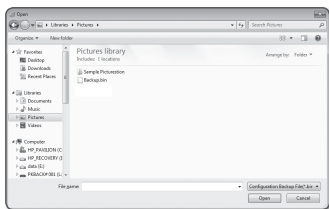   specified path in the format of "**.bin**".
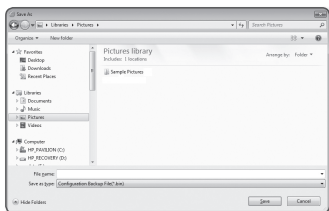
To restore the backup settings

1. To restore the backup settings, click
   [**Restore**].

2. Select a backup file and click [**Open**].

📎 ▪ If you perform the backup or restoration,
   the web browser will be closed and the
   camera will reboots.

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.
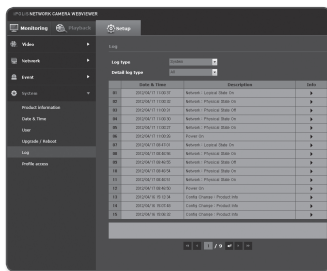
📝 ■ If you want to view the details of a log, click [**Info (▶)**] in the right column of the log; the log information will be shown in the bottom pane.

■ 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 : Show the information of all users who access the camera.

     - Profile : Show the name of the profile accessed by the user.

     - IP address : Show the IP address of the current user.

     - Bitrate(kbps) : Show the current bit rate.

     - Network connection status : You can check the network connection status.

appendix
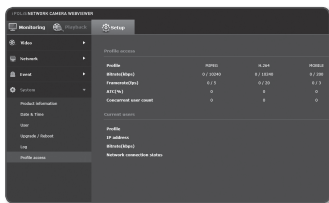
SPECIFICATION

Items		Description	
		SNB-5001	SNB-7001
Video	Imaging Device	1/3" 1.3M PS CMOS	1/2.8" 3M PS CMOS
	Total Pixels	1,384(H) x 1,076(V)	2,144(H) X 1,588(V)
	Effective Pixels	1,329(H) x 1,049(V)	2,096(H) X 1,561(V)
	Scanning System	Progressive	
	Min. Illumination	Color/B/W : 0.7 Lux (F1.2, 50IRE)	Color/ B/W : 0.4 Lux (F1.2, 50IRE)
	S / N Ratio	-	
	Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 704x480(N), 704x576(P), for installation	
Lens	Focal Length (Zoom Ratio)	-	
	Max. Aperture Ratio	-	
	Angular Field of View	-	
	Min. Object Distance	-	
	Focus Cotrol	-	
	Zoom Movement Speed	-	
	Lens Type	Manual / DC Auto Iris	
	Mount Type	C/CS	

appendix

Items		Description	
		SNB-5001	**SNB-7001**
Operational	Camera Title	Off / On (Displayed up to 15 characters)	
	Day & Night	Auto (S/W) / Color / B/W	
	Backlight Compensation	Off / BLC	
	Wide Dynamic Range	-	
	Contrast Enhancement	-	
	Digital Noise Reduction	SSNR (Off / On)	
	Digital Image Stabilization	-	
	Motion Detection	Off / On (4 programmable zones, 20fps)	Off / On (4 programmable zones, 2Mega 20fps, 3Mega 15fps)
	Privacy Masking	Off / On (12 Rectanggular zones)	
	Sens-up (Frame Integration)	Off / Auto (2X ~ 60X) (Sens-up is limited to x30 in maximum if two or more users of different profiles are accessing at the same time.)	
	Gain Control	Off / Low / Middle / High	
	White Balance	ATW / AWC / Manual / Indoor / Outdoor	
	Electronic Shutter Speed	Auto / A.FLK / Manual (1/30 ~ 12,000sec)	
	Digital Zoom	-	
	Flip / Mirror	Off / On	
	Intelligent Video Analytics	Tampering (20fps)	Tampering (3M 15fps, 2M 20fps)
	Alarm I/O	Input 1ea	
	Remote Control Interface	-	
	RS-485 Protocol	-	

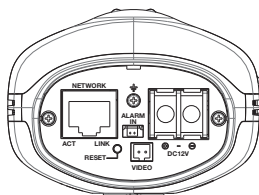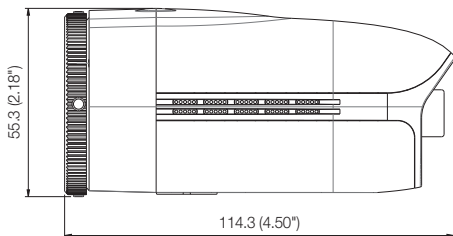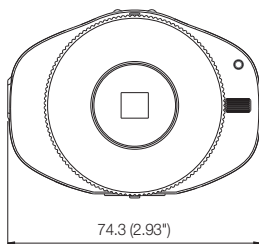| Items		Description	
		SNB-5001	SNB-7001
Network	Ethernet	RJ-45 (10/100BASE-T)	
	Video Compression Format	H.264, MJPEG	
	Resolution	1280x1024, 1280x720P(HD), 1024x768, 800x600, 640x480, 320x240	<3M Mode> 2048x1536, 1920x1080P(Full HD), 1600x1200, 1280x1024, 1280x960, 1280x720P(HD), 1024x768, 800x600, 800x450, 640x480, 640x360, 320x240, 320x180 <2M Mode> 1920x1080P(Full HD), 1280x1024, 1280x960, 1280x720P(HD), 1024x768, 800x600, 800x450, 640x480, 640x360, 320x240, 320x180
	Max. Framerate	H.264 : 30fps MJPEG : 30fps(1280x1024), 30fps (720P HD)	<3M Mode> * H.264 : Max 20fps at all resolutions * MJPEG : 800x600 ~ 320x180 - 20 fps, 1280x1024 ~ 1920x1080 - 15 fps, 2048x1536 - 10 fps <2M Mode> * H.264 : Max 30fps at all resolutions * MJPEG : 800x600 ~ 320x180 - 30 fps, 1280x1024 ~ 1920x1080 : 15 fps
	Smart Codec	-	Yes (Area Based Method)
	Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control	
	Bitrate Control Method	H.264 : CBR or VBR MJPEG : VBR	

appendix

Items		Description	
		SNB-5001	**SNB-7001**
Network	Streaming Capability	Multiple Streaming (Up to 10 Profiles)	Multiple Streaming (Up to 5 Profiles)
	Audio I/O	-	
	Audio Compression Format	-	
	Audio Communication	-	
	IP	IPv4, IPv6	
	Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, ONVIF	
	QoS	On/Off	
	Security	HTTPS(SSL) Login Authentication	
		Digest Login Authentication	
		IP Address Filtering	
		User access Log	
		802.1x Authentication	
	Streaming Method	Unicast / Multicast	
	Max. User Access	10 users at Unicast Mode	
	ONVIF Conformance	Yes	
	Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Denish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatian, Hungarian, Greek, Norway, Finland	
	Web Viewer	Supported OS : Windows XP SP3, Vista, 7, Mac OS X 10.7 or higher	
		Supported Browser : Internet Explorer 7.0 or Higher, Chrome 15 or higher, Firefox 9 or higher, Safari 5.1 or higher	
	Central Management Software	NET-i viewer	

Items		Description	
		SNB-5001	SNB-7001
Environmental	Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / ~ 90%RH	
	Storage Temperature / Humidity	-30°C ~ +60°C / ~ 90%RH	
	Ingress Protection	-	
Electrical	Input Voltage / Current	12V DC, PoE(IEEE802.3af, Class2)	
	Power Consumption	Max. 3.7W (DC 12V), Max. 4.3W (PoE)	
Mechanical	Color / Material	Black, Silver / Aluminium, Plastic	
	Dimension (W x H x D)	W74.3 x H55.3 x D114.3mm (W2.93" x H2.18" x D4.50")	
	Weight	170g (0.37lb)	

● APPENDIX

appendix

PRODUCT OVERVIEW

Unit : mm (inch)

74.3 (2.93")

55.3 (2.18")

114.3 (4.50")

NETWORK

ALARM IN

ACT   LINK

RESET

VIDEO

DC12V

TROUBLESHOOTING

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

Open Source Announcement

Some software components of this product incorporate source code covered under the BSD license as follows.

Component Name	License	License URL
lighttpd 1.4.25	BSD 2.0	http://www.opensource.org/licenses/bsd-license.html
librtp 1.20	BSD 1.0	
net-snmp-5.4	BSD	http://www.net-snmp.org/about/license.html

lighttpd is a secure, fast, compliant, and very flexible web-server that has been optimized for high-performance environments. It has a very low memory footprint compared to other webservers and takes care of cpu-load. Its advanced feature-set (FastCGI, CGI, Auth, Output-Compression, URL-Rewriting and many more) make lighttpd the perfect webserver-software for every server that suffers load problems.

Simple Network Management Protocol (SNMP) is an Internet-standard protocol for managing devices on IP networks. It is used mostly in network management systems to monitor the devices attached to the network for conditions that need administrative attention. Net-SNMP is a suite of applications used to implement SNMP v1, SNMP v2c and SNMP v3 using both IPv4 and IPv6.

For more additional information, send email to help.cctv@samsung.com.

Copyright (C) 2004, Kneschke, incremental

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met :

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

- Neither the name of the 'incremental' nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright (c) 1998-2001 University College London

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, is permitted provided that the following conditions are met :

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. All advertising materials mentioning features or use of this software must display the following acknowledgement: This product includes software developed by the Computer Science Department at University College London.

4. Neither the name of the University nor of the Department may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHORS AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHORS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

License

Various copyrights apply to this package, listed in various separate parts below. Please make sure that you read all the parts.

Part 1: CMU/UCD copyright notice: (BSD like)

Part 2: Networks Associates Technology, Inc copyright notice (BSD)

Part 3: Cambridge Broadband Ltd. copyright notice (BSD)

Part 4: Sun Microsystems, Inc. copyright notice (BSD)

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of Apple Inc. ("Apple") nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY APPLE AND ITS CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL APPLE OR ITSCONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Part 9: ScienceLogic, LLC copyright notice (BSD)

Copyright (c) 2009, ScienceLogic, LLC

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions aremet:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of ScienceLogic, LLC nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

GPL/LGPL SOFTWARE LICENSE

The software included in this product contains copyrighted software that is licensed under the GPL/LGPL. You may obtain the complete Corresponding Source code from us for a period of three years after our last shipment of this product by sending email to help.cctv@samsung.com

If you want to obtain the complete Corresponding Source code in the physical medium such as CD-ROM, the cost of physically performing source distribution might be charged.

- GPL S/W
  - Base Kernel, Busybox, Sysvinit, dosfstools
- LGPL S/W
  - gLibc, Inetutils

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991
Copyright (C)1989, 1991 Free Software Foundation, Inc.
51 Franklin Street,Fifth Floor, Boston, MA 02110-1301, USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software-- to make sure the software is free for all its users.

This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price.

Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs ; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have.

You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps :

(1)copyright the software, and (2)offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

Version 2, June 1991 Copyright (C) 1989, 1991 Free Software Foundation, Inc. 51 Franklin S

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License.
The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law : that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".
Activities other than copying, distribution and modification are not covered by this License ; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty ; and give any other recipients of the Program a copy of this License along with the Program.
You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions :

   a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

c) If the modified program normally reads commands interactively when run,you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception:if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you ; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program. In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program)on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2)in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following :

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange ; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machinereadable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange ; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form)with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License.Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise)that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances. It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system ; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice. This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries,so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation,write to the Free Software Foundation ; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "ASIS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAMPROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty ; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

one line to give the program's name and an idea of what it does.

Copyright (C)yyyy name of author

This program is free software ; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation ; either version 2 of the License, or (at your option)any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY ; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program ; if not, write to the Free Software Foundation, Inc.,51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.

Also add information on how to contact you by electronic and paper mail. If the program is interactive, make it output a short notice like this when it starts in an interactive mode :

Gnomovision version 69,

Copyright (C) year name of author

Gnomovision comes with ABSOLUTELY NO

WARRANTY ; for details type 'show w'. This is free software, and you are welcome to redistribute it under certain conditions ; type 'show c' for details.

The hypothetical commands 'show w' and 'show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than 'show w' and 'show c' ; they could even be mouse-clicks or menu items-- whatever suits your program.

You should also get your employer (if you work as a programmer)or your school, if any, to sign a "copyright disclaimer" for the program,if necessary. Here is a sample ; alter the names:

Yoyodyne, Inc.,hereby disclaims all copyright interest in the program 'Gnomovision' (which makes passes at compilers) written by James Hacker.

signature of Ty Coon, 1 April 1989 Ty Coon, President of Vice This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the **GNU Lesser General Public License** instead of this License.

GNU GENERAL PUBLIC LICENSE

Version 3, 29 June 2007

Copyright © 2007 Free Software Foundation, Inc. <http://fsf.org/>

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The GNU General Public License is a free, copyleft

license for software and other kinds of works. The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change all versions of a program--to make sure it remains free software for all its users.

We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors.
You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for them if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs, and that you know you can do these things.

To protect your rights, we need to prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it.

For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions.

Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS

0. Definitions.

"This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To "convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided

the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From Anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

a) The work must carry prominent notices stating that you modified it, and giving a relevant date.

b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices".

c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.

d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product,

doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms.

"Additional permissions" are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or

b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or

c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or

d) Limiting the use for publicity purposes of names of licensors or authors of the material; or

e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or

f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors.

All other non-permissive additional terms are considered "further restrictions" within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

An "entity transaction" is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents.

A "contributor" is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's "contributor version".

A contributor's "essential patent claims" are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, "control" includes the right to grant patent sublicenses in a manner consistent with the requirements of this License.

Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a "patent license" is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To "grant" such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party.

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. "Knowingly relying" means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it.

A patent license is "discriminatory" if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license

(a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or

(b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007.

Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License.

The Free Software Foundation may publish revised and/ or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License "or any later version" applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation.

If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program.

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. Disclaimer of Warranty.

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. Limitation of Liability.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

END OF TERMS AND CONDITIONS

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc. 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages-typically libraries-of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/ Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) The modified work must itself be a software library. b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change. c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License. d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful. (For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.) These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library".
The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that

(1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients'
exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether

by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/ or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found. one line to give the library's name and an idea of what it does.

Copyright (C) year name of author

This library is free software; you can redistribute it and/ or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the library 'Frob' (a library for tweaking knobs) written by James Random Hacker.

signature of Ty Coon, 1 April 1990 Ty Coon, President of Vice.

OpenSSL LICENSE

Original SSLeay License

MEMO

SAMSUNG