



FCS-1040



WCS-2040

IP Camera User's Manual

V3.0

Table of Contents

<i>Overview</i>	3
Read Before Use.....	3
Package Contents	3
Physical Description	4
<i>Installation</i>	7
Hardware Installation.....	7
Network Deployment.....	8
Software Installation	12
Network Setting	17
PPPoE Setting.....	17
<i>Accessing the Network Camera</i>	24
Using Web Browsers	24
Using RTSP Players.....	26
Using 3GPP-compatible Mobile Devices.....	27
Using LevelOne Recording Software	28
<i>Main Page</i>	29
<i>Client Settings</i>	33
<i>Configuration</i>	35
System	36
Security	38
HTTPS (Hypertext Transfer Protocol over SSL)	39
Network	44
Wireless LAN (WCS-2040v3 only)	55
DDNS	58
Access List	60
Audio and Video	63
Motion Detection	69
Camera Control	71
Homepage Layout	74
Application	77
Recording	90
System Log	93
View Parameters	94
Maintenance	95
<i>Appendix</i>	99
URL Commands for the Network Camera.....	99

Overview

LevelOne's FCS-1040v3(PoE)/WCS-2040v3(WLAN) is a high-performance network camera featuring 10x zoom and pan/tilt functionality. The camera is designed for indoor surveillance applications such as retail stores, offices, and banks.

The built-in 10x motorized optical zoom module provides excellent depth of field when zoomed in, displaying clear-cut images of near or distant objects. With 300-degree pan and 135-degree tilt, the camera can achieve a wide range of view, giving users more comprehensive control over the monitored site. The FCS-1040v3/WCS-2040v3 is incorporated with LevelOne's self-developed Bach SoC; therefore, users can benefit from the advantages of dual-codec video and two-way audio. With support for simultaneous dual streaming, the camera allows users to view MJPEG or MPEG-4 videos on multiple platforms such as web browsers or 3G cell phones.

LevelOne's WCS-2040v3 supports wireless and FCS-1040v3 supports Power-over-Ethernet connection, making installation easier and more cost-efficient. The free, standard, multi-lingual 16-channel recording software helps users to seamlessly set up an easy-to-use IP surveillance system.

Read Before Use

The use of surveillance devices may be prohibited by law in your country. The Network Camera is not only a high-performance web-ready camera but can also be part of a flexible surveillance system. It is the user's responsibility to ensure that the operation of such devices is legal and complies with all privacy laws before installing this unit for its intended use.

It is important to first verify that all contents received are complete according to the Package Contents listed below. Take note of the warnings in the Quick Installation Guide before the Network Camera is installed; then carefully read and follow the instructions in the Installation chapter to avoid damage due to faulty assembly and installation. This also ensures the product is used properly as intended.

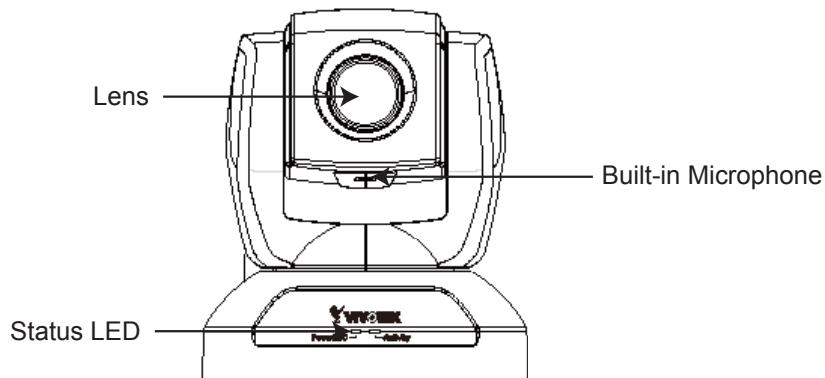
The Network Camera is a network device and its use should be straightforward for those who have basic networking knowledge. It is designed for various applications including video sharing, general security/surveillance, etc. The Configuration chapter suggests ways to best utilize the Network Camera and ensure proper operations. For more creative and professional developers, the URL Commands of the Network Camera section serves as a helpful reference to customizing existing homepages or integrating with the current web server.

Package Contents

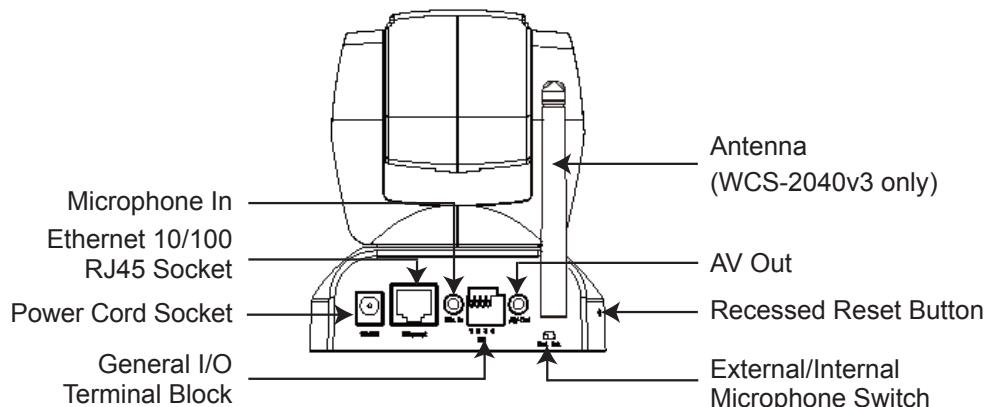
- IP Camera
- Power Adapter
- Antenna (WCS-2040v3 only)
- Ceiling Mount Brackets
- Quick Installation Guide
- CD Manual / Utility
- A/V Cable

Physical Description

Front panel

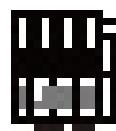


Rear panel



General I/O Terminal Block

This Network Camera provides a general I/O terminal block which is used to connect external input / output devices. The pin definitions are described below.

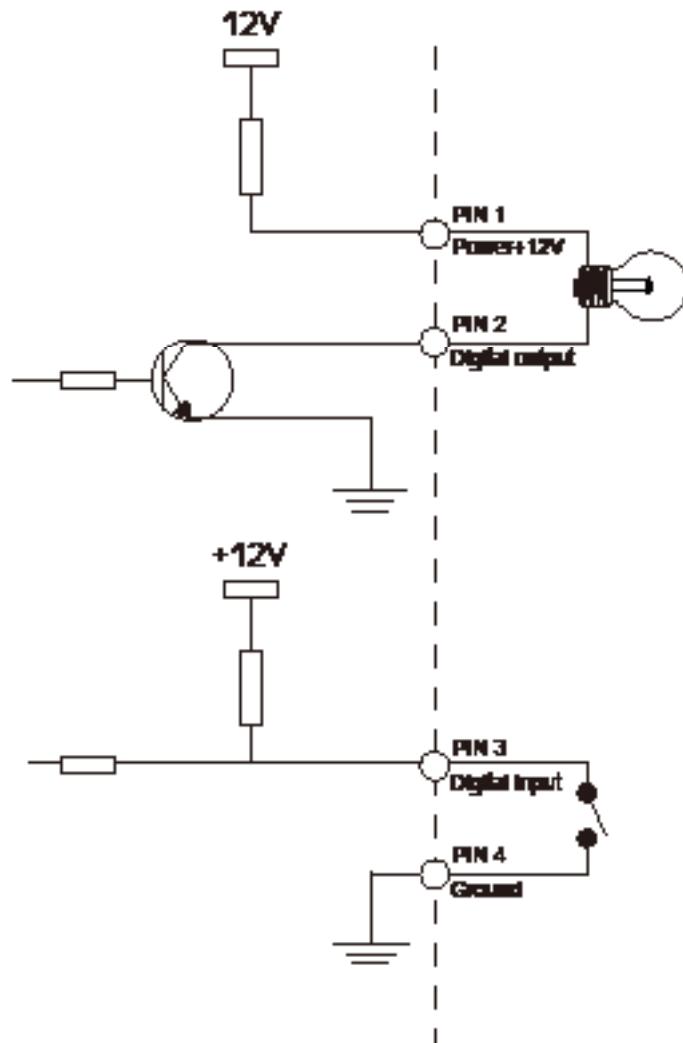


- 1: Power
- 2: Digital output
- 3: Digital input
- 4: Ground

Pin	Name	Specification	Remarks
1	Power	12VDC ± 5%, max. 1.5A	Max. rating 2A
2	Digital output	Max. 40VDC, max. 400mA, isolation 2kV	
3	Digital input	OPEN/Short-to-GND, isolation 2kV	Internal pull-up
4	Ground		

DI/DO Diagram

Please refer to the following illustration for the connection method.

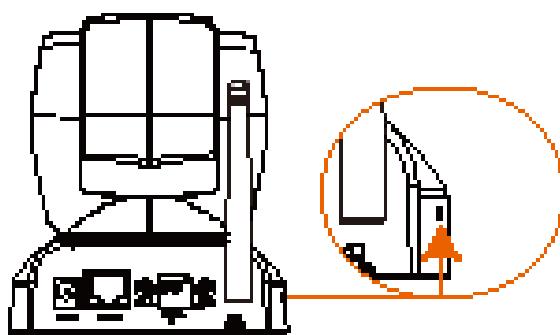


Status LED

The color of LED indicates the status of the Network Camera.

Status LED Color	Description
Blinking red	Power is being supplied to the Network Camera.
Solid green	The Network Camera is booting up.
Steady green with blinking red	The Network Camera is trying to obtain an IP address.
Steady green and red	An IP address is successfully assigned to the Network Camera.
Steady red with blinking green	The Network Camera is working.
Blinking red and green	During firmware upgrade.

Hardware Reset



The reset button is used to reset the system or restore the factory default settings. Sometimes resetting the system can return the camera to normal operation. If the system problems remain after rebooting, restore the factory settings and install again.

Reset: Press and release the recessed reset button with a paper clip or thin object. Wait for the Network Camera to reboot.

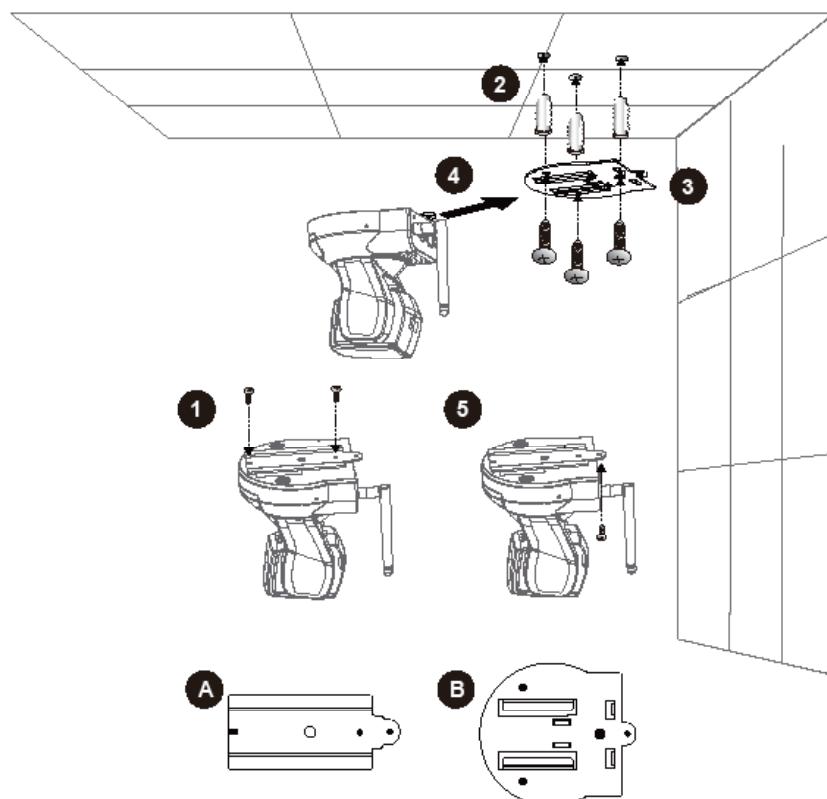
Restore: Press and hold the recessed reset button until the status LED rapidly blinks red and green simultaneously. Note that all settings will be restored to factory default.

Installation

Hardware Installation

Follow the steps below to install the Network Camera to the ceiling:

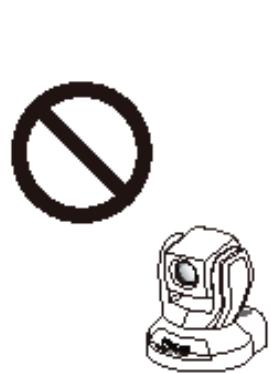
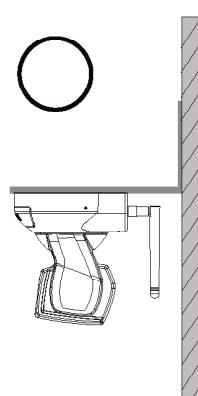
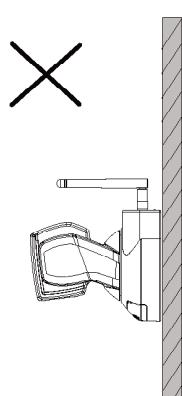
1. Attach ceiling mount bracket A to the Network Camera and secure it with two small screws.
2. Drill three pilot holes into the ceiling; hammer the plastic anchors into the holes.
3. Fasten ceiling mount bracket B to the ceiling with three screws.
4. Slide the Network Camera into ceiling mount bracket B.
5. Secure the ceiling mount bracket A and B with a small screw.



NOTE

► If you want to intall the Network Camera on the wall, please use the wall mount bracket (optional, not included in the package).

► Keep away from interference source to make sure performance integrate, and avoid snow or moiré patterning.

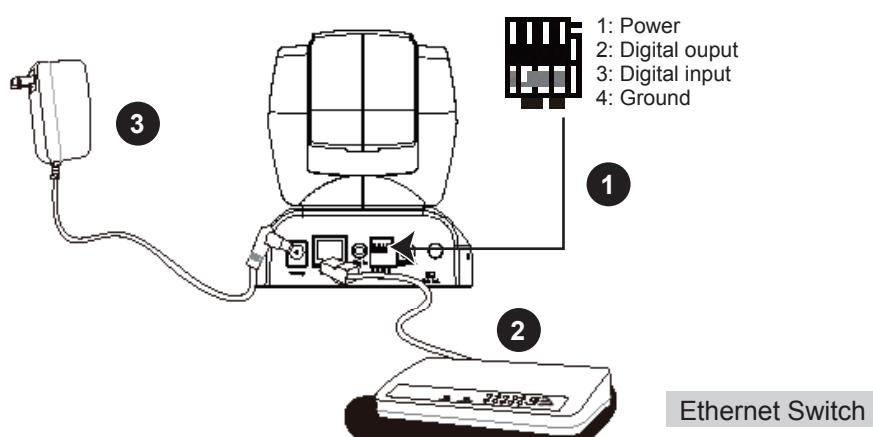


Network Deployment

Setup the Network Camera over the Internet

This section explains how to configure the Network Camera over an Internet connection.

1. If you have external devices such as sensors and alarms, connect them to the general I/O terminal block.
2. Connect the camera to a switch via Ethernet cable.
3. Connect the supplied power cable from the Network Camera to a power outlet.

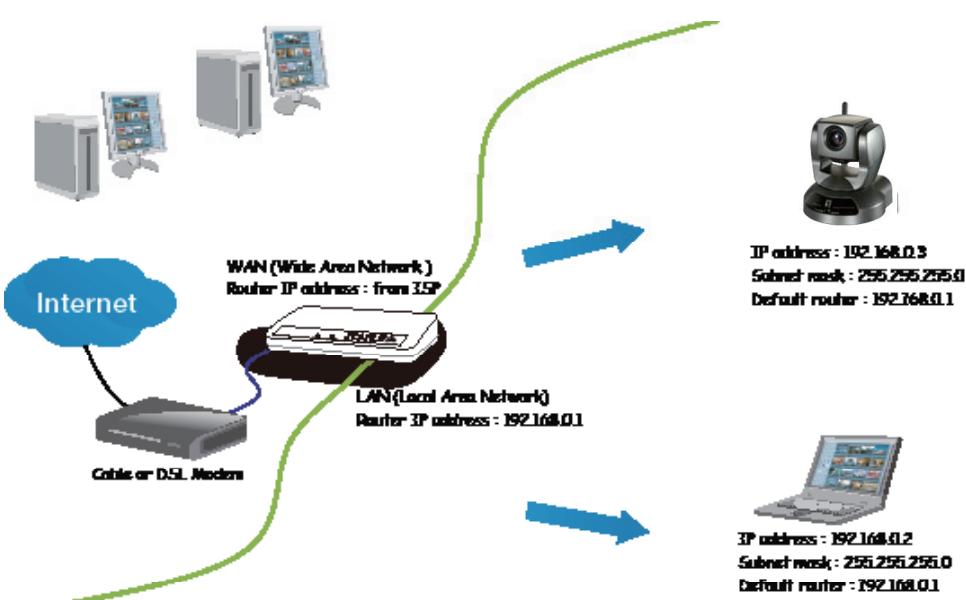


There are several ways to set up the Network Camera over the Internet. The first way is to set up the Network Camera behind a router. The second way is to utilize a static IP. The third way is to use PPPoE.

Internet connection via a router

Before setting up the Network Camera over the Internet, make sure you have a router and follow the steps below.

1. Connect your Network Camera behind a router, the Internet environment is illustrated below. Regarding how to obtain your IP address, please refer to Software Installation on page 11 for details.



2. In this case, if the Local Area Network (LAN) IP address of your Network Camera is 192.168.0.3, please forward the following ports for the Network Camera on the router.

- HTTP port
- RTSP port
- RTP port for audio
- RTCP port for audio
- RTP port for video
- RTCP port for video

If you have changed the port numbers on the Network page, please open the ports accordingly on your router. For information on how to forward ports on the router, please refer to your router's user's manual.

3. Find out the public IP address of your router provided by your ISP (Internet Service Provider). Use the public IP and the secondary HTTP port to access the Network Camera from the Internet. Please refer to Network Type on page 32 for details.

Internet connection with static IP

Choose this connection type if you are required to use a static IP for the Network Camera. Please refer to LAN on page 32 for details.

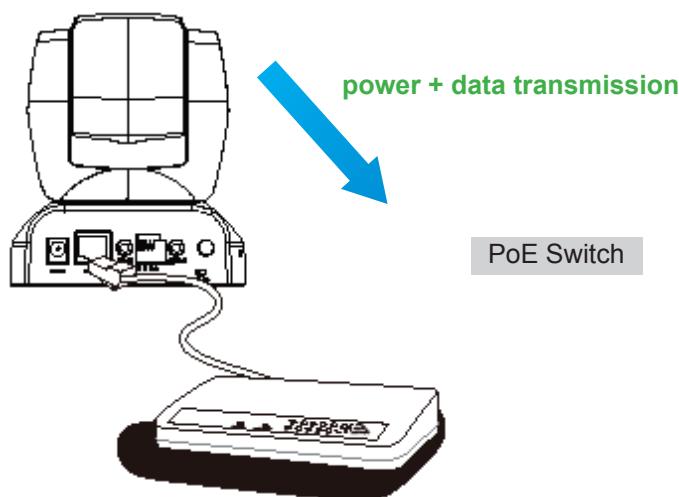
Internet connection via PPPoE (Point-to-Point over Ethernet)

Choose this connection type if you are connected to the Internet via a DSL Line. Please refer to PPPoE on page 33 for details.

Set up the Network Camera through Power over Ethernet (PoE) (FCS-1040v3 only)

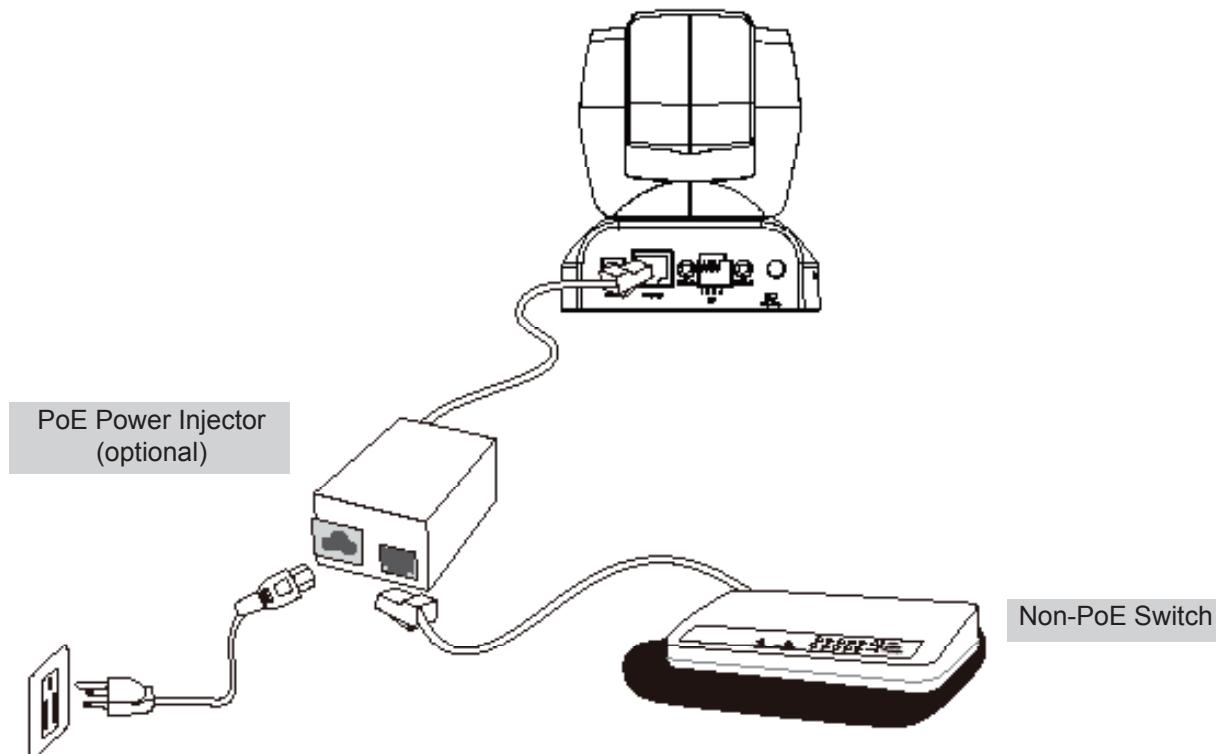
When using a PoE-enabled switch

The Network Camera is PoE-compliant, which allows it to be powered via a single Ethernet cable. If your switch/router supports PoE, refer to the following illustration to connect the Network Camera to a PoE-enabled switch/router.



When using a non-PoE switch

If your switch/router does not support PoE, use a PoE power injector (optional) to connect between the Network Camera and a non-PoE switch/router.



Software Installation

The following are steps for the software installation.

Note: The default user name is root and the password is blank

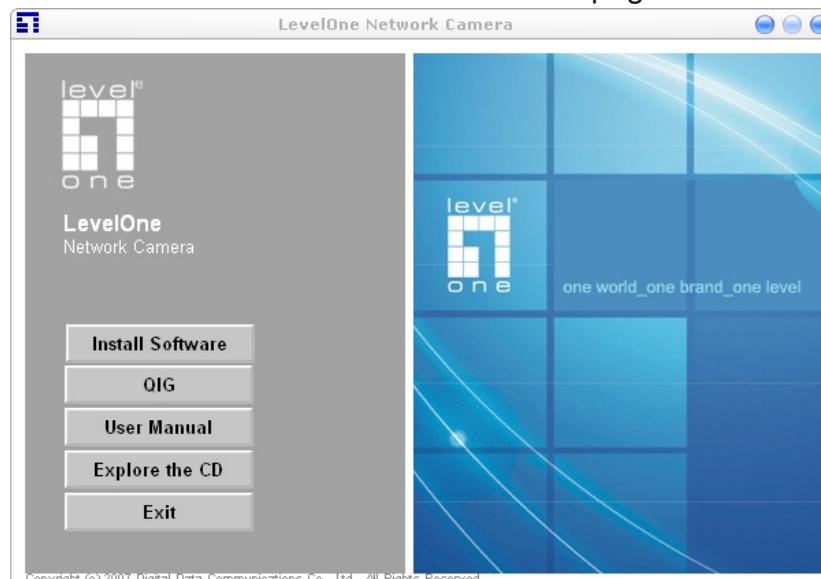
How to Use Installation Wizard

Installation

The following are steps for the software installation.

STEP. 1 Put the Installation disk into the CD-ROM drive, and the installation should start automatically. If the installation does not start, click on “Start” on the lower left corner of your screen, open “My Computer” and double click on the CD-ROM icon. The Installation Wizard Installation Window will appear.

STEP. 2 There are links on this page, including Install Software, User’s Manual and Customer Homepage. Click on “Install Software” to enter Install Software page.

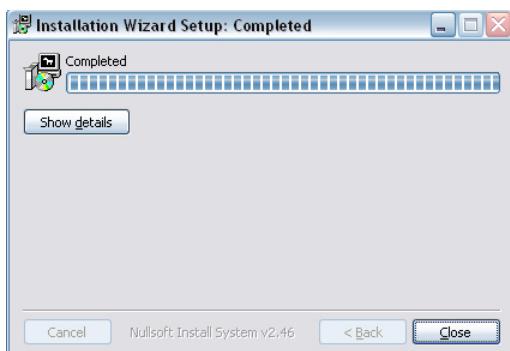


STEP. 3 There are links on this page, including Installation Wizard, User’s Manual and Surveillance Software. Click on “Installation Wizard” to launch the setup program.



Destination Location for Installation

STEP 4: After clicking “Install” button, the install system will install the Installation Wizard to your computer, and a progress bar will display on the dialog. After completed the installation, please click on the “Close” button.



Completed

Using Installation Wizard

User Interface

Once you run the Installation Wizard, after a short searching time, you will see the user interface as below. “**Manual Setup**” button, a “**Refresh Devices**” button and an arrow button on the left panel of your user interface. When you click on the arrow button, you will see more advanced functional buttons: “**Firmware Upgrade**”, “**Restore Default**” and “**About IW**”. You can select your device by double-clicking it in the device list. The left three buttons (“**Manual Setup**”, “**Firmware Upgrade**”, and “**Restore Default**”) won’t be enabled until you select at least one device.



Installation Wizard allows you to setup one device at one time and upgrade multiple devices (of the same model) at the same time. If you selected different models, then the “**Firmware Upgrade**” button would be disabled.

Installation wizard allows you to setup or upgrade multiple devices (of the same model) at the same time. If you selected different models, then the buttons will be disabled. There are five buttons on the bottom of the main page, and five buttons on the left panel of the main page.

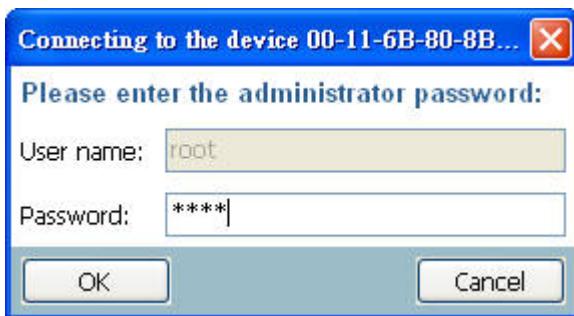
Buttons

- | | |
|---|--|
|  | Click on this button to clean up the device list and search all devices on the within the same subnet again. It will take about 5 seconds. |
|  | Click on this button to modify the settings of the selected devices. For more detail, please refer to 0 Setup. |
|  | Click on this button to upgrade the firmware of the selected devices. For more detail, please refer to 0 Upgrade. |
|  | Click on this button to reset the selected devices to default settings. |
|  | Click on this button to get information about the Installation Wizard. |

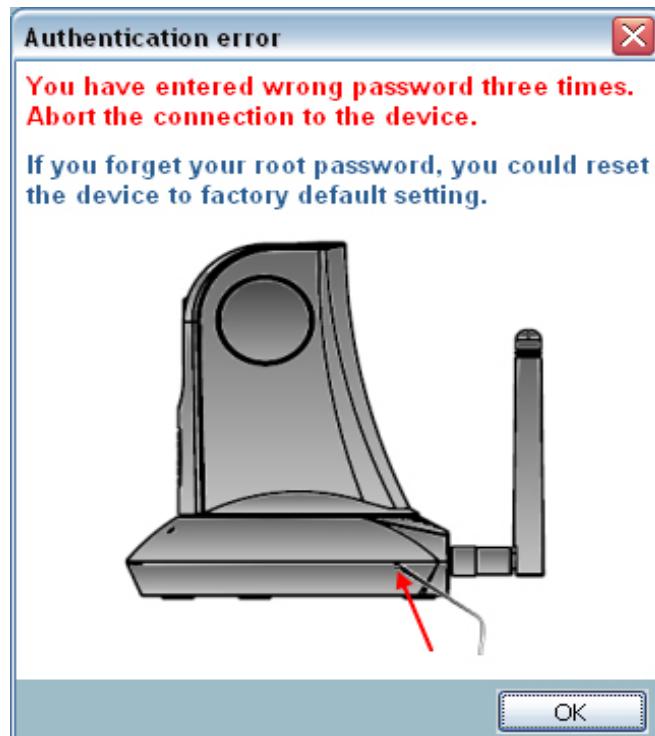
Manual Setup

When you select one device in the selection list, the “Manual Setup” button will be enabled. Click on it to modify the settings of the selected device. After clicked on the “Manual Setup” button, Installation Wizard would try to connect to the selected device.

The default Administrator's password is blank and the Network Camera initially will not ask for any password. If the authentication is failed, there would be a pop-up dialog window to ask for correct password. If you failed three times, the Installation Wizard would show you a warning dialog window and abort the connecting to the selected device.



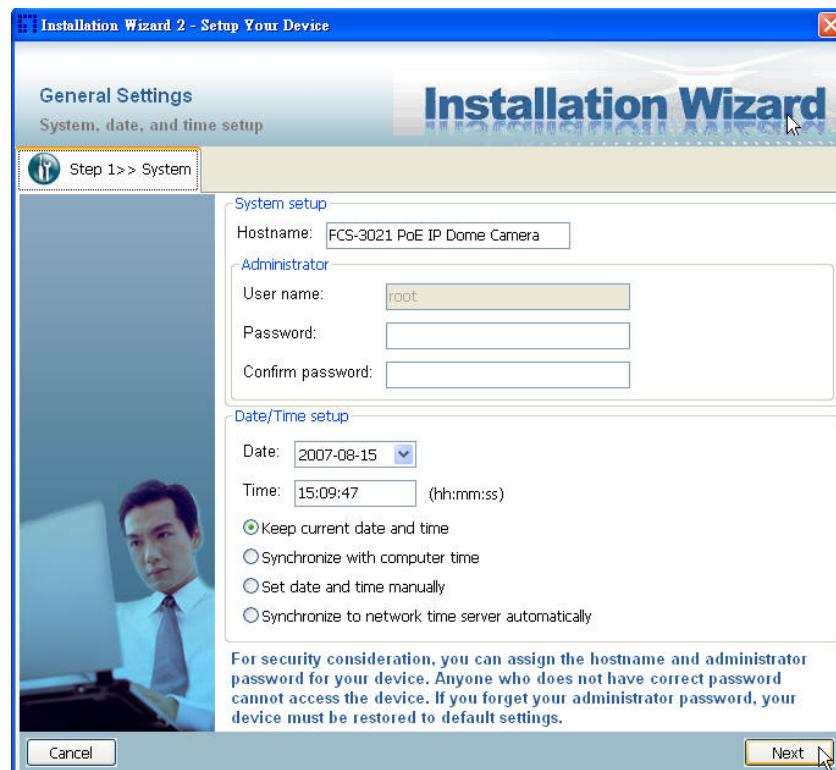
Authentication Dialog Window



Authentication error

System Setting

After connected to the selected device, the Installation Wizard will switch to system setting page as below.



System setting page

Cancel

Click on this button to cancel the setup progress.

Next

Click on this button to keep the present setting and go to the next page.

Change Host Name

The “**Hostname**” is used for the homepage title of main page and is displayed as the title in the video window of the main page. The maximum string length is 40 characters or 20 characters in double-byte-character-systems like Chinese or Japanese. But for some models supported Unicode, the maximum string length depends on the characters you input, and it may less than 20 characters.

Change root password

To change the administrator’s password, type the new password in both “**Password**” and “**Confirm Password**” text boxes identically. What is typed will be displayed as asterisks for security purposes. The maximum password depends on the server you connected.

Adjust date and time

Date/Time setup

Date: 2010/ 6/23

Time: 17:27:56 (hh:mm:ss)

- Keep current date and time
- Synchronize with computer time
- Set date and time manually
- Synchronize to network time server automatically

Date/Time setup

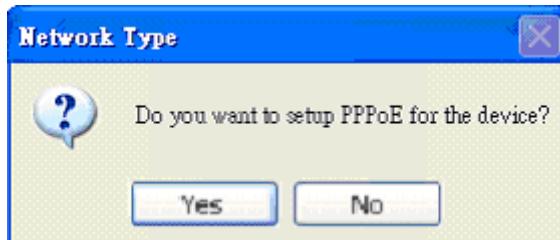
There are three ways to adjust system date and time:

1. “**Synchronize with computer time**”: The easiest way is to make device synchronized with your computer time.
2. “**Set date and time manually**”: Set the date and time manually by entering new values. Notice the format in the related field while typing.
3. “**Synchronize to network time server automatically**”: Make device automatically synchronize with timeservers over the Internet every hour.

If you want to keep the current date and time, please choose “**Keep current date and time**”.

Network Setting

The Installation Wizard can help you to setup the network connection with LAN or PPPoE. After you clicked on the “**Next**” button on the System page, the Installation Wizard would lead you to the PPPoE setting page. If you want to connect your server to Internet via PPPoE, please click on “**Yes**” to start the PPPoE setting process, or click on “**No**” to invoke the LAN setting.



Choosing the network type

PPPoE Setting

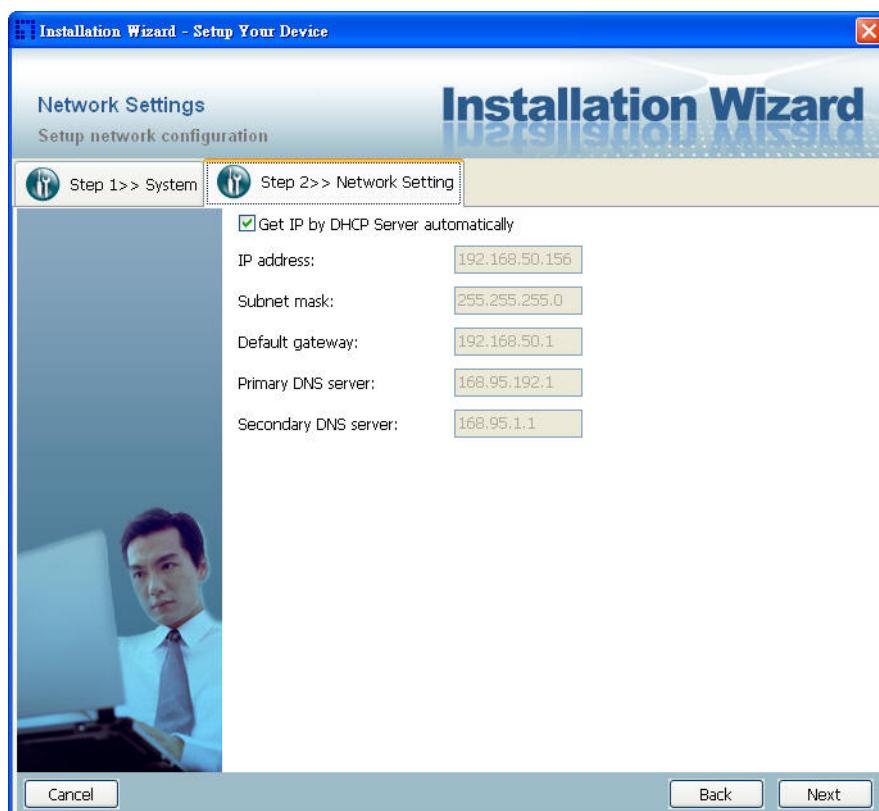


Network setting for PPPoE

If you click on “**Yes**” in the “Network Type” dialog window, you will be led to the PPPoE setting page. In this page, you can input the “**PPPoE username**” and “**PPPoE password**” provided by your ISP, and then the server will be set to PPPoE mode rather than LAN mode when the setup is completed. If you don’t know the account information, please contact your ISP. After inputting the account information, please click on the “**Next**” button to continue your next step.

LAN Setting

If you click on “No” in the “Network Type” dialog window, you will be led to the Network setting page. In this page, you can change the server’s IP address, subnet mask, default gateway, primary DNS server, secondary DNS and DHCP server. Please refer to the below page.



Network Setting for LAN

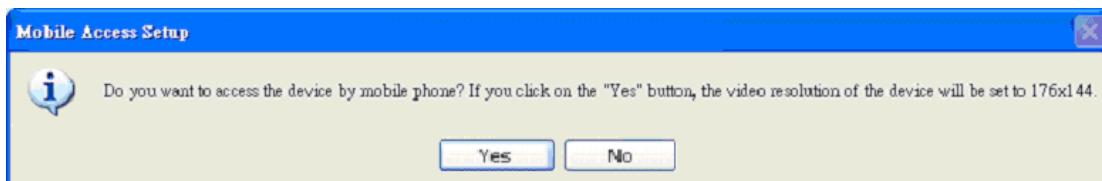
You could set up the network with DHCP or fixed IP:

- 1.DHCP: Check the “**Get IP by DHCP Server automatically**” will force the device to renew its IP address whenever it reboots, and the related network configuration is provided by the DHCP server.
- 2.Fixed IP: If you want the device to use a fixed IP, please uncheck the “**Get IP by DHCP Server automatically**” checkbox and assign a valid IP address, subnet mask, default gateway and DNS server for the device.

Mobile Access

After finished the DDNS setting and click on the Next button. If your device supports mobile viewer and you want to access the device by mobile phone, you can enable the “Mobile Access” by clicking on the Yes button. The Installation Wizard will do some setting for mobile viewing toward the device:

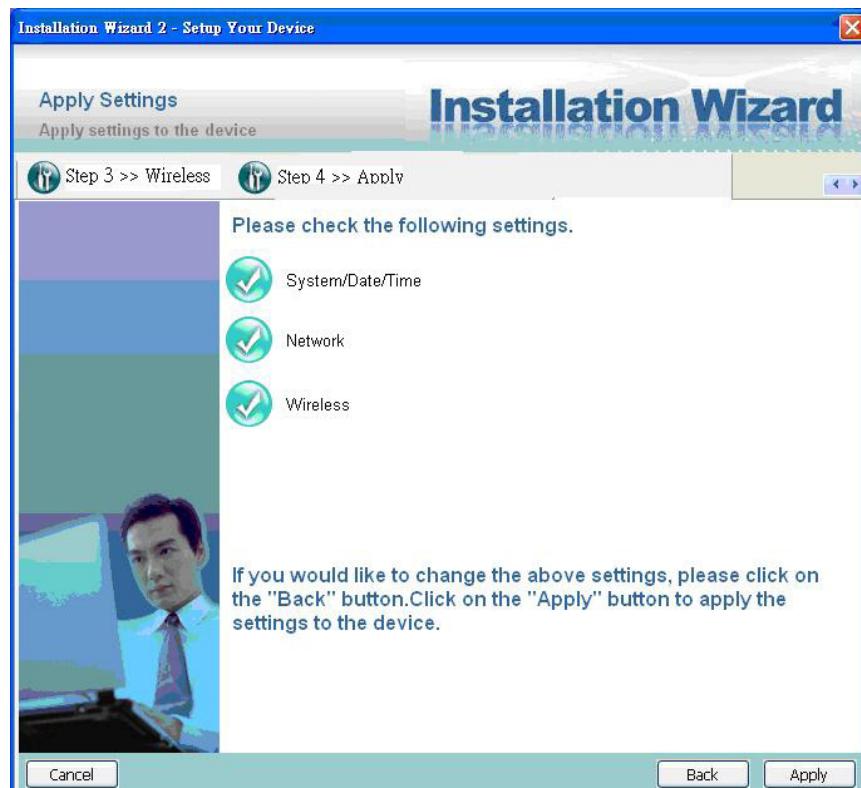
- 1.Video: The video codec will be set to MPEG-4, and the resolution will be set to 176x144 pixels.
- 2.Audio: The audio codec will be set to AAC.



Mobile Access

Apply to selected device

After configuring all the settings, the apply page will show up. Click on “Apply” button to apply the changes to the selected device or click on “Back” button to go back to the previous page and modify the setting again.



Apply page

When you click on the “Apply”, it will start to update your settings to server.

Upgrade

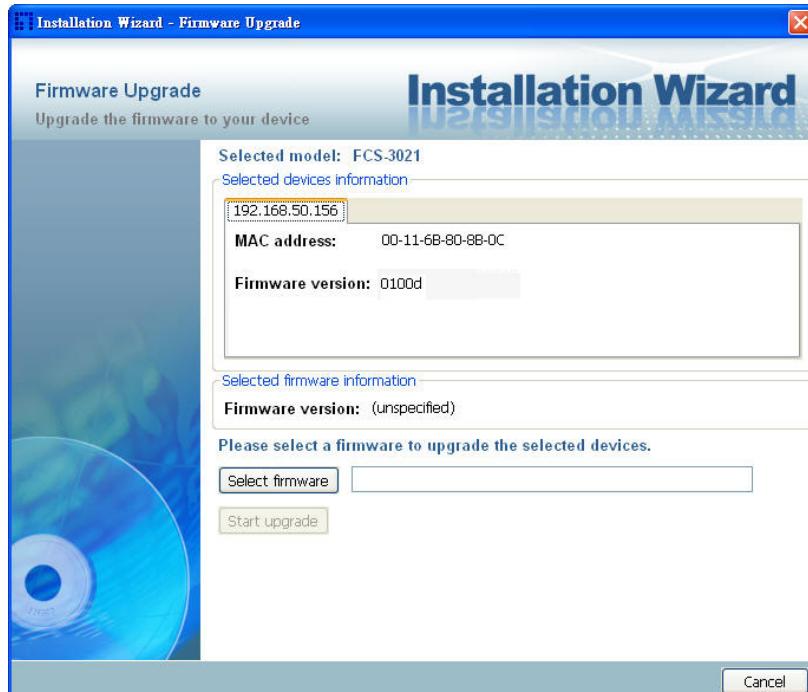
When you select one device or multiple devices (of the same model), the “**Firmware Upgrade**” button will be enabled. Click on it to upgrade the firmware of the selected device(s). After click on the “**Firmware Upgrade**” button, Installation Wizard will try to connect the selected device(s) and lead you to the firmware upgrade page.



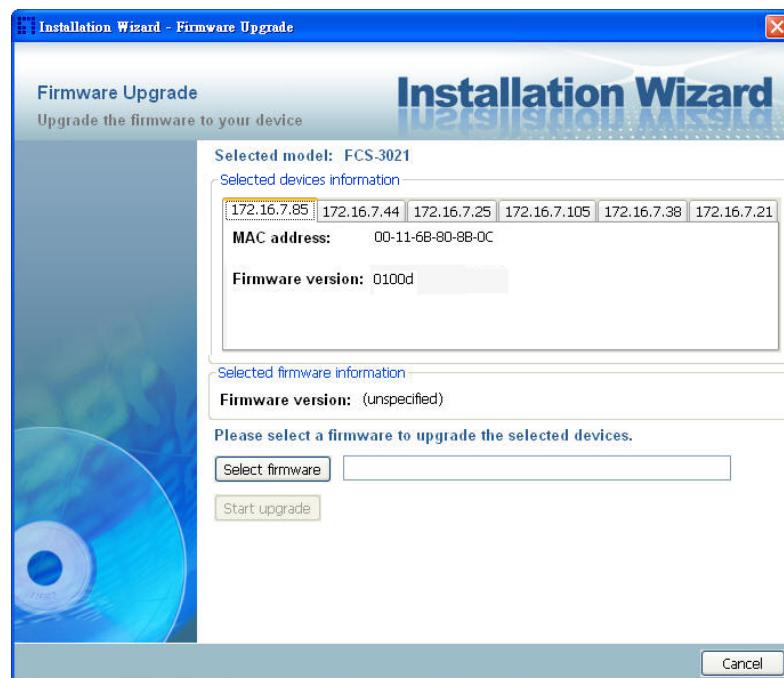
Click on the “Firmware Upgrade”

Device Information

After connected to the selected device(s), it would display as below. If you select more than one device, then the device information will show all the selected devices. You can switch to the server info by click on the tab control.



Device information



Multiple devices information

Firmware Information

The selected firmware information will show the information about the file that you selected.

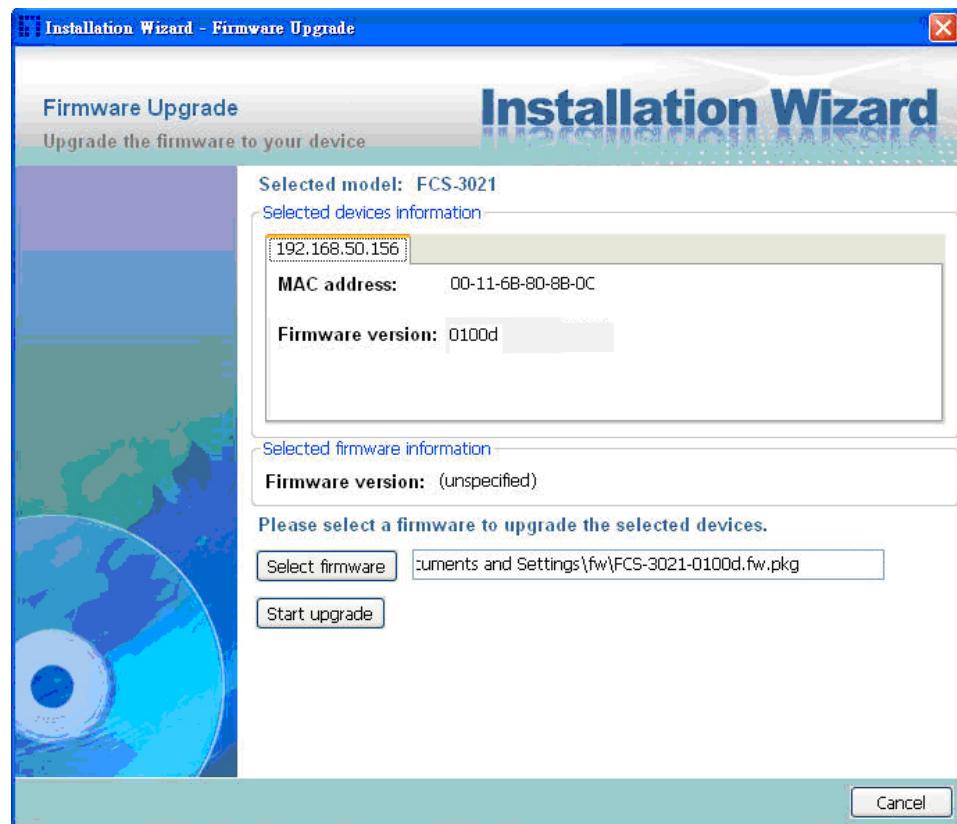
Firmware version: The version number of the selected firmware.

Select Firmware

You can use the “Select firmware” button to browse the file that you want upgrade onto the selected device(s). After selected the file, Installation Wizard will check whether the file you selected is correct. If it’s the correct version, then the package information will display the information about the file and enable the “Start Upgrade” button. Therefore you can click on the button to upgrade the firmware. If not, then it will be a pop-up warning message.



Select firmware



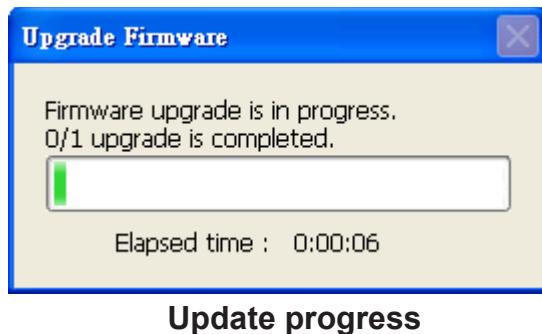
Firmware Information



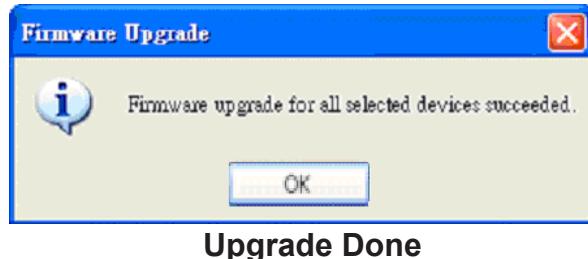
Warning message for unmatched firmware

Start Upgrade

Clicking on the “Start Upgrade” button to upgrade the firmware of the selected device(s), and it will be a pop-up dialog window to show the progress of the upgrading process. Usually, it will take about 5 to 10 minutes to finish the firmware upgrading. It depends on your server model and network bandwidth. We recommend you do the upgrade process in wired LAN environment rather than PPPoE or wireless environment.



**After the upgrade process had been done, you could see the dialog window as below.
Please click on the button “OK” to finish it.**



Accessing the Network Camera

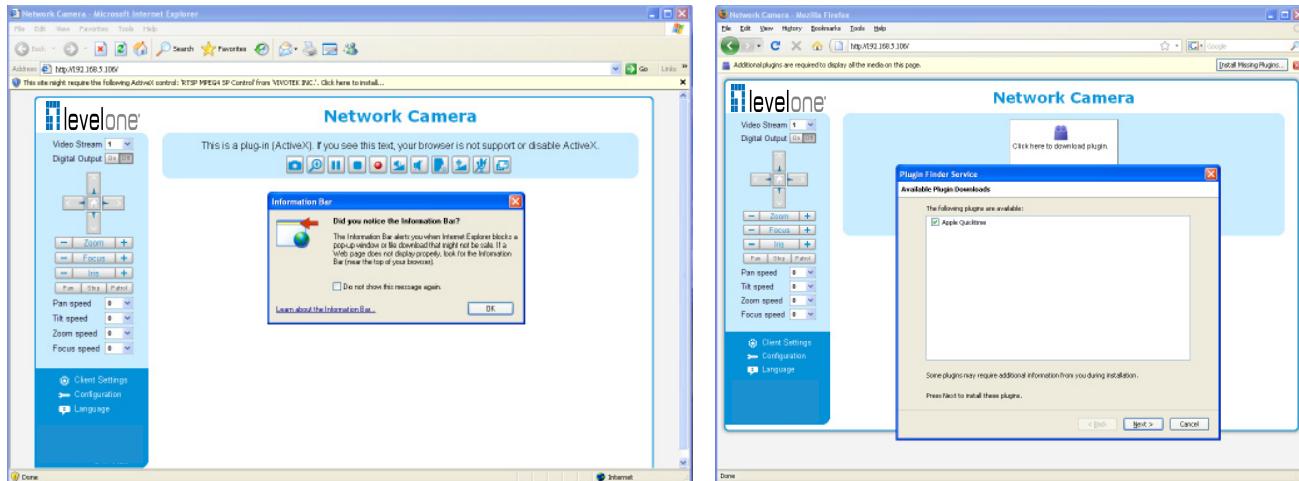
This chapter explains how to access the Network Camera through web browsers, RTSP players, 3GPP-compatible mobile devices, and LevelOne recording software.

Using Web Browsers

Use Installation Wizard 2 (IW2) to access to the Network Cameras installed on the LAN.

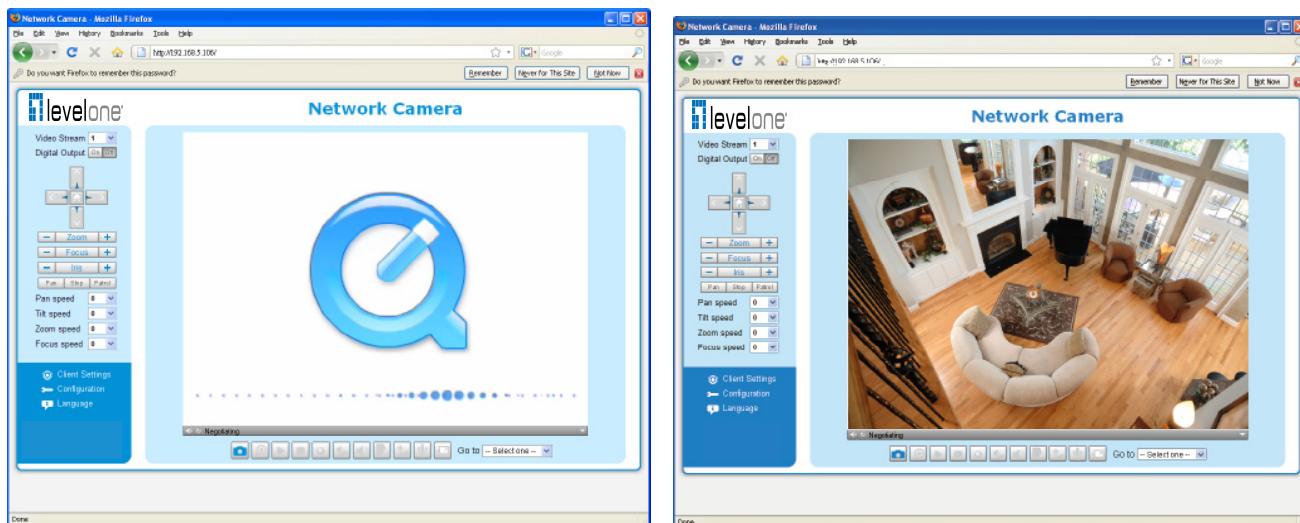
If your network environment is not the LAN, follow these steps to access the Network Camera:

1. Launch your web browser (eg. Microsoft® Internet Explorer, Mozilla Firefox, or Netscape).
2. Enter the IP address of the Network Camera in the address field. Press **Enter**.
3. The live video will be displayed in your web browser.
4. If this is the first time installing the LevelOne network camera, an information bar will pop up as shown below. Follow the instructions to install the required plug-in on your computer.



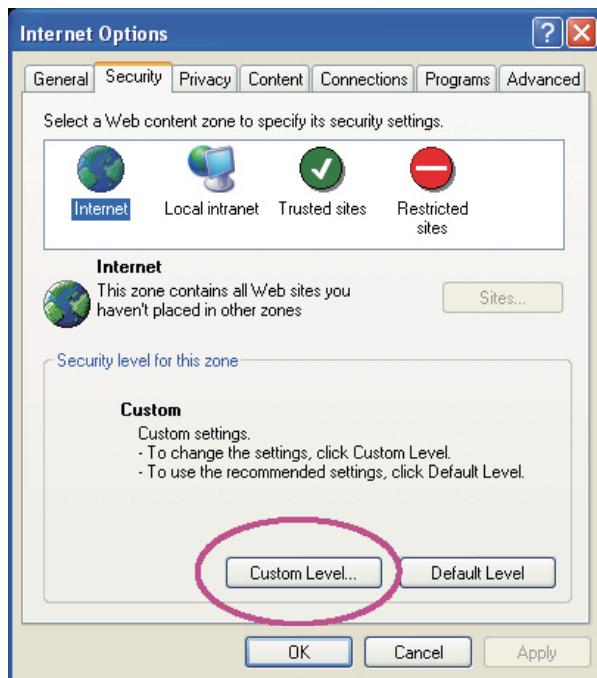
NOTE

- For Mozilla Firefox or Netscape users, your browser will use Quick Time to stream the live video. If you do not have Quick Time on your computer, please install it first, then launch the web browser.

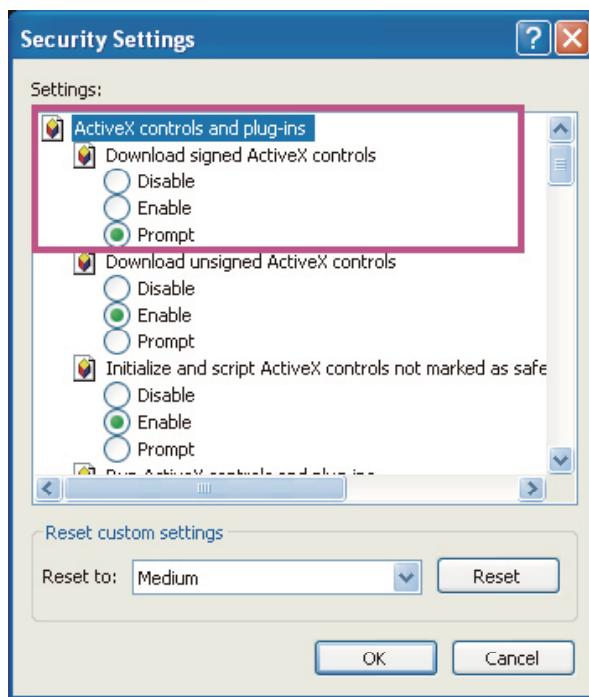


- By default, the Network Camera is not password-protected. To prevent unauthorized access, it is highly recommended to set a password for the Network Camera. For more information about how to enable password protection, please refer to Security on page 26.
- If you see a dialog box indicating that your security settings prohibit running ActiveX® Controls, please enable the ActiveX® Controls for your browser.

1. Choose Tools > Internet Options > Security > Custom Level.



2. Look for Download signed ActiveX® controls; select Enable or Prompt. Click OK.



3. Refresh your web browser, then install the Active X® control. Follow the instructions to complete installation.

Using RTSP Players

To view the MPEG-4 streaming media using RTSP players, you can use one of the following applications that support RTSP streaming.



Quick Time Player

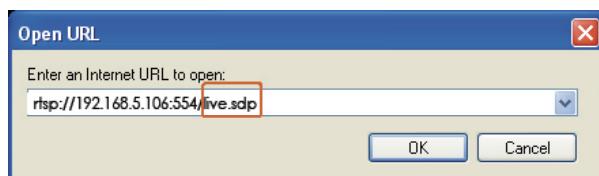


Real Player

1. Launch the RTSP player.
2. Choose File > Open URL. A URL dialog box will pop up.
3. The address format is rtsp://<ip address>:<rtsp port>/<RTSP streaming access name for stream1 or stream2>

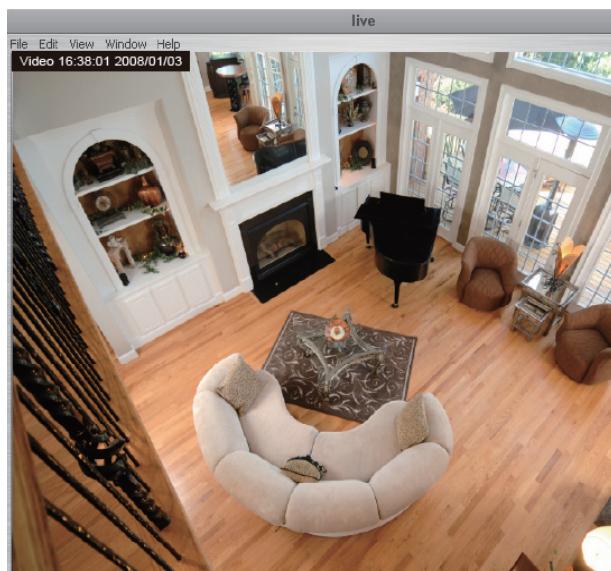
As most ISPs and players only allow RTSP streaming through port number 554, please set the RTSP port to 554. For more information, please refer to RTSP Streaming on page 41.

For example:



4. The live video will be displayed in your player.

For more information on how to configure the RTSP access name, please refer to RTSP Streaming on page 41 for details.



Using 3GPP-compatible Mobile Devices

To view the streaming media through 3GPP-compatible mobile devices, make sure the Network Camera can be accessed over the Internet. For more information on how to set up the Network Camera over the Internet, please refer to Setup the Network Camera over the Internet on page 8.

To utilize this feature, please check the following settings on your Network Camera:

1. Because most players on 3GPP mobile phones do not support RTSP authentication, make sure the authentication mode of RTSP streaming is set to disable.
For more information, please refer to RTSP Streaming on page 41.
2. As the bandwidth on 3G networks is limited, larger video sizes are not available. Please set the video and audio streaming parameters as listed below.
For more information, please refer to Audio and Video on page 51.

Video Mode	MPEG-4
Frame size	176 x 144
Maximum frame rate	5 fps
Intra frame period	1S
Video quality (Constant bit rate)	40kbps
Audio type (GSM-AMR)	12.2kbps

3. As most ISPs and players only allow RTSP streaming through port number 554, please set the RTSP port to 554. For more information, please refer to RTSP Streaming on page 41.
4. Launch the players on 3GPP-compatible mobile devices (ex. Real Player).
5. Type the following URL commands in the player.
The address format is rtsp://<public ip address of your camera>:<rtsp port>/<RTSP streaming access name for stream1 or stream2>.
For example:



Using LevelOne Recording Software

The product software CD also contains LevelOne's recording software, allowing simultaneous monitoring and video recording for multiple Network Cameras. Please install the recording software, then launch the program to add the Network Camera to the Channel list. For detailed information about how to use the recording software, please refer to the user's manual of the software or download the manual from <http://www.LevelOne.com>.



Main Page

This chapter explains the layout of the main page. It is composed of the following sections: LevelOne INC. Logo, Host Name, Camera Control Area, PTZ Control Panel, Configuration Area, and Live video window.



LevelOne INC. Logo

Click this logo to visit the LevelOne website.

Host Name

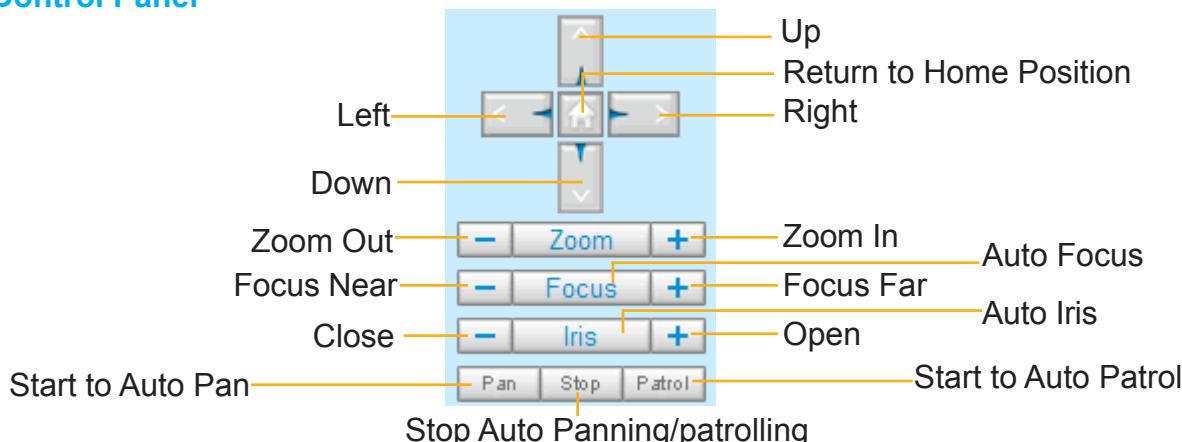
The host name can be customized to fit your needs. For more information, please refer to System on page 24.

Camera Control Area

Video Stream: This Network Camera supports MJPEG or MPEG-4 dual streams simultaneously. You can select either one for live viewing.

Digital Output: Click to turn the digital output device on or off.

PTZ Control Panel



Pan: Click this button to start the auto pan. When the current position is Home or on the left side of Home, the camera starts panning from the current position to the left-most position, then to the right-most position, and finally backward to the original position. When the current position is on the right side of Home, the camera starts panning from the current position to the right-most position, then to the left-most position, and finally backward to the original position.

Stop: Click this button to stop the Auto Pan and Auto Patrol functions.

Patrol: Once the Administrator has determined the list of preset positions, click this button to command the camera to patrol among those positions on the Patrol List. For more information, please refer to Camera Control on page 59.

Pan /Tilt /Zoom /Focus speed: Adjust the speed of pan/ tilt/ zoom/ focus.

Pan speed	Tilt speed	Zoom speed	Focus speed	
-5	-5	-5	-5	Slower ↑ ↓ Faster
-4	-4	-4	-4	
-3	-3	-3	-3	
-2	-2	-2	-2	
-1	-1	-1	-1	
0	0	0	0	
1	1	1	1	
2	2	2	2	
3	3	3	3	
4	4	4	4	
5	5	5	5	

Configuration Area

Client Settings: Click this button to access the client settings page. For more information, please refer to Client Settings on page 21.

Configuration: Click this button to access the configuration page of the Network Camera. It is suggested that a password be applied to the Network Camera so that only the administrator can configure the Network Camera. For more information, please refer to Configuration on page 23.

Language: Click this button to choose a language for the user interface. Language options are available in: English, Deutsch, Español, Français, Italiano, 日本語, Português, 簡體中文, and 繁體中文.

Live Video Window

- The following window is displayed when the video mode is set to MPEG-4:



Video Title: The video title can be configured. For more information, please refer to Video Settings on page 51.

MPEG-4 Protocol and Media Options: The transmission protocol and media options for MPEG-4 video streaming. For further configuration, please refer to Client Settings on page 21.

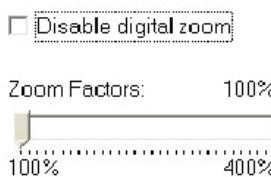
Time: Display the current time. For further configuration, please refer to Video Settings on page 51.

Title and Time: The video title and time can be stamped on the streaming video. For further configuration, please refer to Video Settings on page 51.

Video and Audio Control Buttons: Depending on the Network Camera model and Network Camera configuration, some buttons may not be available.

 Snapshot: Click this button to capture and save still images. The captured images will be displayed in a pop-up window. Right-click the image and choose **Save Picture As** to save it in JPEG (*.jpg) or BMP (*.bmp) format.

 Digital Zoom: Click and uncheck “Disable digital zoom” to enable the zoom operation. The navigation screen indicates the part of the image being magnified. To control the zoom level, drag the slider bar. To move to a different area you want to magnify, drag the navigation screen image.



 Pause: Pause the transmission of the streaming media. The button becomes the  Resume button after clicking the Pause button.

 Stop: Stop the transmission of the streaming media. Click the  Resume button to continue transmission.

 Start MP4 Recording: Click this button to record video clips in MP4 file format. Press the  Stop MP4 Recording button to end recording. When you exit the web browser, video recording stops accordingly. To specify the storage destination and the file name, please refer to MP4 Saving Options on page 22 for details.

 Volume: If the  Mute function is not activated, move the slider bar to adjust the volume on the local computer.

 Mute: Turn off the volume on the local computer. The button becomes the  Audio On button after clicking the Mute button.

 Talk: Click this button to talk to people around the Network Camera. Audio will project from the external speaker connected to the Network Camera. Click this button  again to end talking transmission.

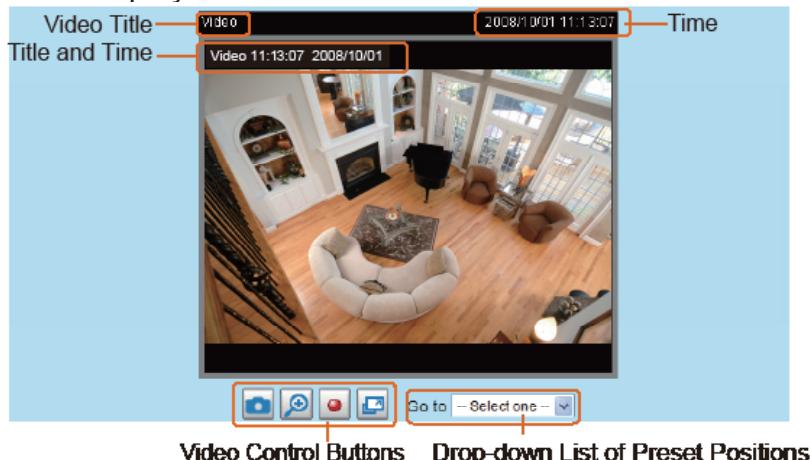
 Mic Volume: When the  Mute function is not activated, move the slider bar to adjust the microphone volume on the local computer.

 Mute: Turn off the  Mic volume at local computer. The button becomes the  Mic On button after clicking the Mute button.

 Full Screen: Click this button to switch to full screen mode. Press the “Esc” key to switch back to normal mode.

Go to: Once the Administrator has determined the list of preset positions, you can aim the camera using this command. For more information, please refer to Camera Control on page 59.

- The following window is displayed when the video mode is set to MJPEG:



Video Title: The video title can be configured. For more information, please refer to Video Settings on page 51.

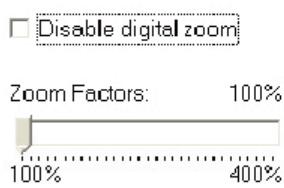
Time: Display the current time. For more information, please refer to Video Settings on page 51.

Title and Time: The video title and time can be stamped on the streaming video. For more information, please refer to Video Settings on page 51.

Video and Audio Control Buttons: Depending on the Network Camera model and Network Camera configuration, some buttons may not be available.

Snapshot: Click this button to capture and save still images. The captured images will be displayed in a pop-up window. Right-click the image and choose **Save Picture As** to save it in JPEG (*.jpg) or BMP (*.bmp) format.

Digital Zoom: Click and uncheck “Disable digital zoom” to enable the zoom operation. The navigation screen indicates the part of the image being magnified. To control the zoom level, drag the slider bar. To move to a different area you want to magnify, drag the navigation screen image.



Start MP4 Recording: Click this button to record video clips in MP4 file format. Press the Stop MP4 recording button to end recording. When you exit the web browser, video recording stops accordingly. To specify the storage destination and file name, please refer to MP4 Saving Options on page 22 for details.

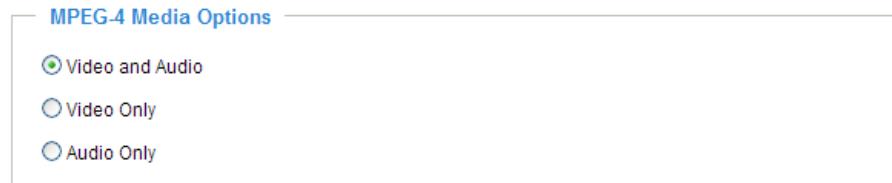
Full Screen: Click this button to switch to full screen mode. Press the “Esc” key to switch back to normal mode.

Go to: Once the Administrator has determined the list of preset positions; you can aim the camera using this command. For more information, please refer to Camera Control on page 59.

Client Settings

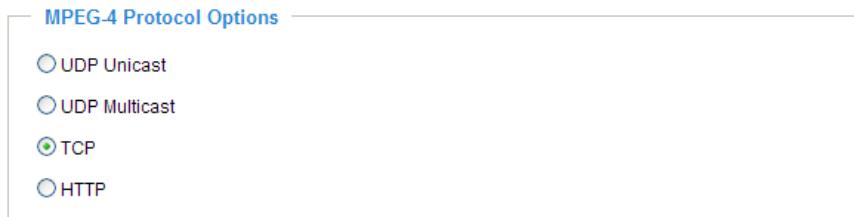
This chapter explains how to select the stream transmission mode and saving options on the local computer. When finished with the settings on this page, click **Save** on the bottom of the page to enable the settings.

MPEG-4 Media Options



Select whether to stream video or audio data or both. This is enabled only when the video mode is set to MPEG-4.

MPEG-4 Protocol Options



Depending on your network environment, there are four transmission modes for MPEG-4 streaming:

UDP unicast: This protocol allows for better real-time audio and video streams. However, network packets may be lost due to network burst traffic and images may be broken. Activate the UDP connection when occasions require time-sensitive responses and the video quality is less important. Note that each unicast client connecting to the server takes up additional bandwidth and the Network Camera allows up to ten simultaneous accesses.

UDP multicast: This protocol allows multicast-enabled routers to forward network packets to all clients requesting streaming media. This helps to reduce the network transmission load of the Network Camera while serving multiple clients at the same time. Note that to utilize this feature, the Network Camera must be configured to enable multicast streaming at the same time. For more information, please refer to RTSP Streaming on page 41.

TCP: This protocol guarantees the complete delivery of streaming data and thus provides better video quality. However, the real-time effect is not as good as that of the UDP protocol.

HTTP: This protocol allows for the same transmission quality as the TCP protocol without needing to open specific ports for streaming under some network environments. Users inside a firewall can utilize this protocol to allow streaming data through.

MP4 Saving Options

MP4 Saving Options

Folder:

File name prefix:

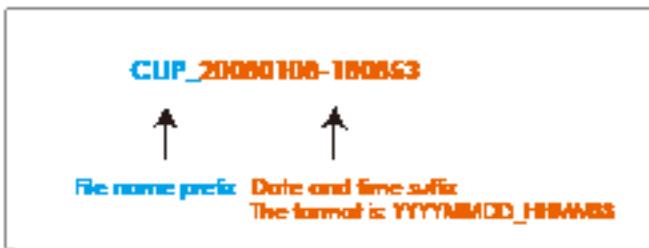
Add date and time suffix to file name

Users can record live video as they are watching by clicking  Start MP4 Recording on the main page. Here, you can specify the storage destination and file name.

Folder: Specify the storage destination for the recorded video files.

File name prefix: Enter the text that will be appended to the front of the video file name.

Add date and time suffix to the file name: Select this option to append the date and time to the end of the file name.



Configuration

Click **Configuration** on the main page to enter the camera setting pages. Note that only Administrators can access the configuration page.

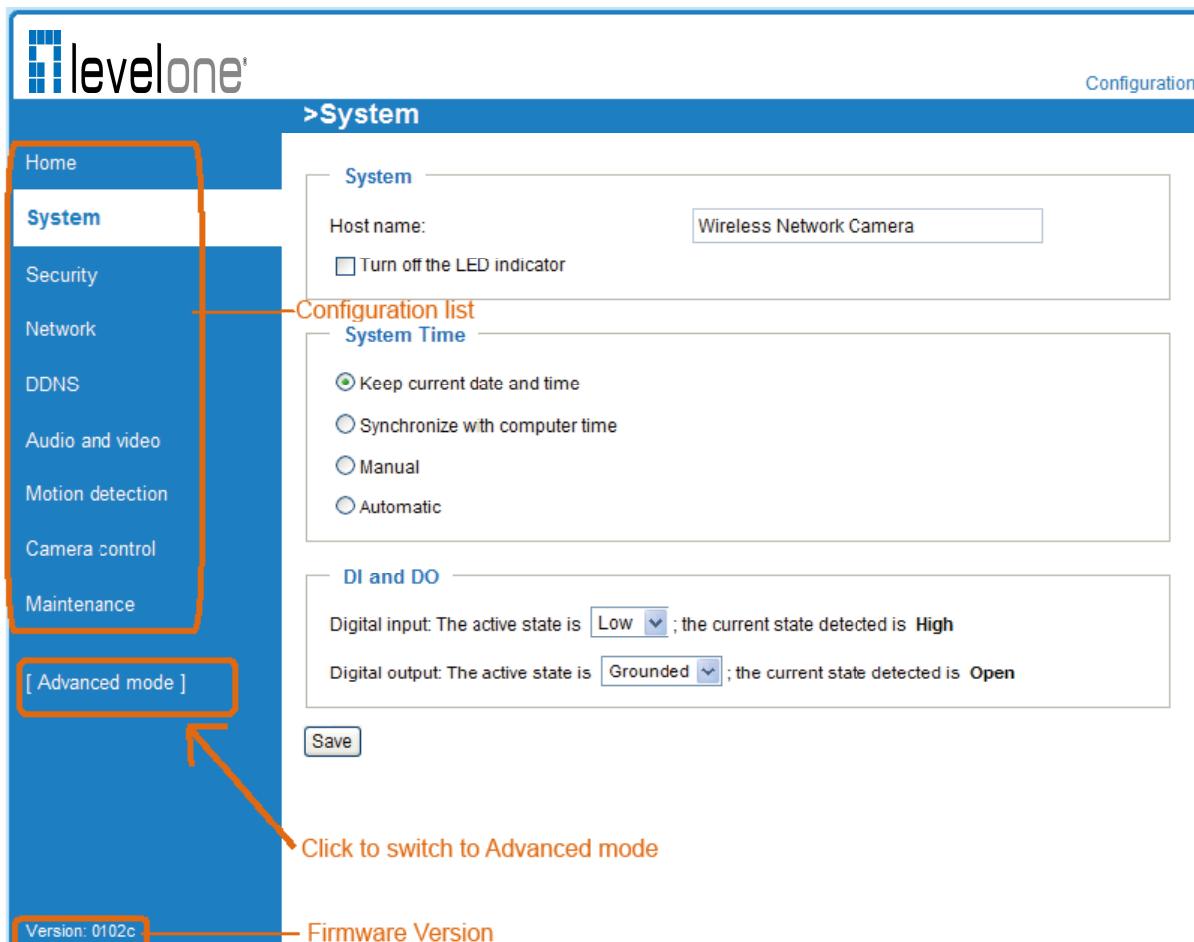
LevelOne offers an easy-to-use user interface that helps you set up your network camera with minimal effort. To simplify the setting procedure, two types of user interfaces are available: Advanced Mode for professional users and Basic Mode for entry-level users. Some advanced functions (HTTPS/ Access list/ Homepage layout/ Application/ Recording/ System log/ View parameters) are not displayed in Basic Mode.

If you want to set up advanced functions, please click **[Advanced Mode]** on the bottom of the configuration list to quickly switch to Advanced Mode.

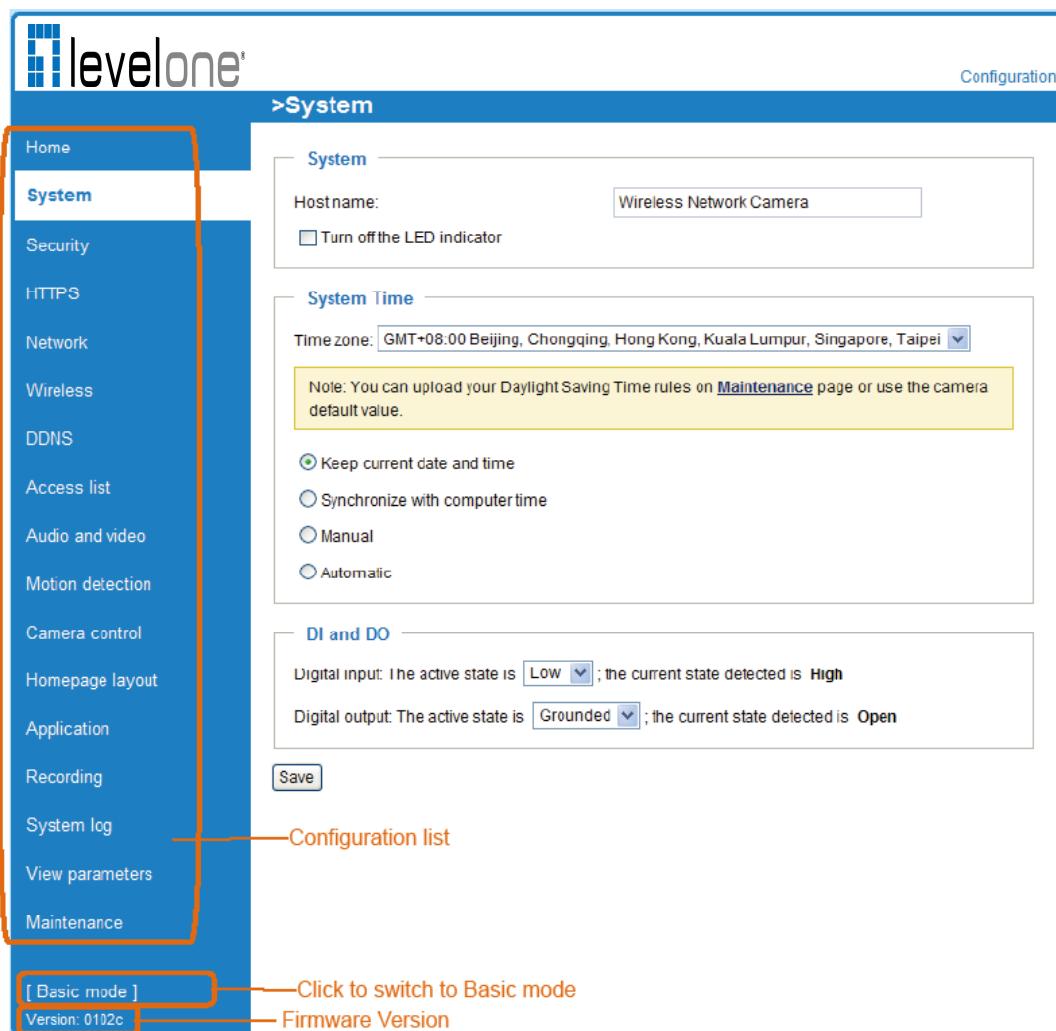
In order to simplify the user interface, the detailed information will be hidden unless you click on the function item. When you click on the first sub-item, the detailed information for the first sub-item will be displayed; when you click on the second sub-item, the detailed information for the second sub-item will be displayed and that of the first sub-item will be hidden.

The following is the interface of the Basic Mode and the Advanced Mode:

Basic Mode



Advanced Mode



Each function on the configuration list will be explained in the following sections. Those functions that are displayed only in Advanced Mode are marked with **Advanced Mode**. If you want to set up the advanced functions, please click **[Advanced Mode]** on the bottom of the configuration list to quickly switch over.

System

This section explains how to configure the basic settings for the Network Camera, including System, System Time, and DI/DO. When completed with the settings on this page, click **Save** at the bottom of the page to enable the settings.

System

System

Host name:	Network Camera
<input type="checkbox"/> Turn off the LED indicator	

Host name: Enter the desired name for the Network Camera. The text will be displayed at the top of the main page.

Turn off the LED indicators: If you do not want to let others know that the network camera is in operation, you can select this option to turn off the LED indicators.

System Time

System Time

Time zone:

Note: You can upload your Daylight Saving Time rules on [Maintenance](#) page or use the camera default value.

Keep current date and time
 Sync with computer time:
 Manual:
 Automatic:

Keep current date and time: Select this option to preserve the current date and time of the Network Camera. The Network Camera's internal real-time clock maintains the date and time even when the system power is turned off.

Sync with computer time: Select this option to synchronize the date and time of the Network Camera with the local computer. The read-only date and time of the PC is displayed when updated.

Manual: The administrator can enter the date and time manually. Note that the date and time format is [yyyy/mm/dd] and [hh:mm:ss].

Automatic: The Network Time Protocol is a protocol which synchronizes computer clocks by periodically querying an NTP Server.

NTP server: Assign the IP address or domain name of the time-server. Leaving the text box blank connects the Network Camera to the default time servers.

Update interval: Select to update the time using the NTP server on an hourly, daily, weekly, or monthly basis.

Time zone **Advanced Mode**: Select the appropriate time zone from the list. If you want to upload Daylight Savings Time rules on the Maintenance page, please refer to Upload / Export Daylight Saving Time Configuration File on page 84 for details.

DI and DO

DI and DO

Digital input: The active state is ; the current state detected is

Digital output: The active state is ; the current state detected is

Digital input: Select **High** or **Low** to define the normal status for the digital input. The Network Camera will report the current status.

Digital output: Select **Grounded** or **Open** to define normal status for the digital output. The Network Camera will show whether the trigger is activated or not.

Security

This section explains how to enable password protection and create multiple accounts.

Root Password

Root Password

Note: Leaving the root password field empty means the camera will not be protected by password.

Root Password: Confirm root password: Save

The administrator account name is “root”, which is permanent and can not be deleted. If you want to add more accounts in the Manage User column, please set a password for the “root” account first.

1. Type the password in both text boxes, then click **Save** to enable password protection.
2. A window will be prompted for authentication; type the correct user’s name and password in their respective fields to access the Network Camera.

Manage Privilege Advanced Mode

Manage Privilege

	Operator	Viewer
Digital Output:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PTZ control:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Allow anonymous viewing	Save	

Digital Output & PTZ control: You can modify the manage privilege of operators or viewers. Check or uncheck the item, then click **Save** to enable the settings. If you give Viewers the privilege, Operators will also have the ability to control the Network Camera through the main page. (Please refer to Main Page on page 17.)

Allow anonymous viewing: If you check this item, any client can access the live stream without entering a User ID and Password.

Manage User

Manage User

Existing user name:	<input type="text"/> --Add new user--
User name:	<input type="text"/>
User password:	<input type="password"/>
Confirm user password:	<input type="password"/>
Privilege:	<input type="button" value="Administrator"/> <input type="button" value="Administrator"/> <input type="button" value="Operator"/> <input type="button" value="Viewer"/>

Delete Add Update

Administrators can add up to 20 user accounts.

1. Input the new user’s name and password.
2. Select the privilege level for the new user account. Click **Add** to enable the setting.

Access rights are sorted by user privilege (Administrator, Operator, and Viewer). Only administrators can access the Configuration page. Operators cannot access the Configuration page but can use the URL Commands to get and set the value of parameters. For more information, please refer to URL Commands for the Network Camera on page 87. Viewers access only the main page for live viewing.

Here you also can change a user’s access rights or delete user accounts.

1. Select an existing account to modify.
2. Make necessary changes and click **Update** or **Delete** to enable the setting.

HTTPS (Hypertext Transfer Protocol over SSL)

Advanced Mode

This section explains how to enable authentication and encrypted communication over SSL (Secure Socket Layer). It helps protect streaming data transmission over the Internet on higher security level.

Enable HTTPS

Check this item to enable HTTPS communication, then select a connection option: "HTTP & HTTPS" or "HTTPS only". Note that you have to create and install a certificate first in the second column before clicking the **Save** button.

Enable HTTPS

*To enable HTTPS, you have to create and install certificate first.

Enable HTTPS secure connection:

HTTP & HTTPS HTTPS only

Save

Create and install certificate method

Create self-signed certificate automatically

Create self-signed certificate manually:

Create certificate request and install:

Create and Install Certificate Method

Before using HTTPS for communication with the Network Camera, a **Certificate** must be created first. There are three ways to create and install a certificate:

Create self-signed certificate automatically

1. Select this option.
2. In the first column, check **Enable HTTPS secure connection**, then select a connection option: "HTTP & HTTPS" or "HTTPS only".
3. Click **Save** to generate a certificate.

Enable HTTPS

*To enable HTTPS, you have to create and install certificate first.

Enable HTTPS secure connection:

HTTP & HTTPS HTTPS only

Save

Please wait while the certificate is being generated...

Create

Create self-signed certificate automatically

Create self-signed certificate manually:

Create certificate request and install:

Certificate Information

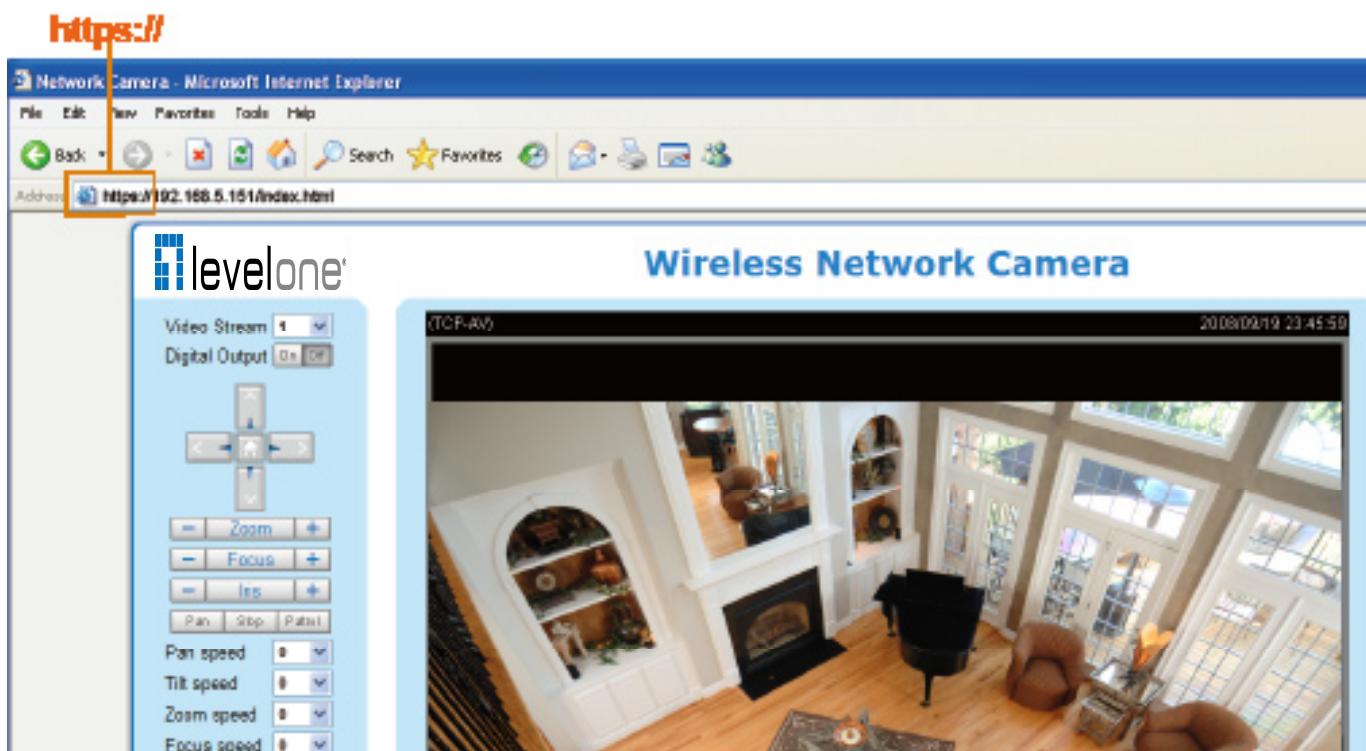
Status: Not installed

Property Remove

4. The Certificate Information will automatically be displayed in the third column as shown below. You can click **Property** to view detailed information about the certificate.

Certificate Information	
Status:	Active
Country:	TW
State or province:	Province
Locality:	City Name
Organization:	Organization Name
Organization Unit:	Unit Name
Common Name:	IP Address
Property Remove	

5. Click **Home** to return to the main page. Change the address from "<http://>" to "<https://>" in the address bar and press **Enter** on your keyboard. Some Security Alert dialogs will pop up. Click **OK** or **Yes** to enable HTTPS.



The screenshot shows a Microsoft Internet Explorer window displaying a wireless network camera interface. The address bar shows "https://192.168.5.151/index.html". The main content area displays a live video feed from the camera, showing a living room interior with a fireplace, bookshelves, and large windows. On the left, there is a control panel with buttons for Video Stream, Digital Output, and various camera controls like Pan, Tilt, Zoom, Focus, and Iris.

Security Alert

Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.

- !** The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.
- ✓** The security certificate date is valid.
- !** The name on the security certificate is invalid or does not match the name of the site

Do you want to proceed?

Yes **No** **View Certificate**

Security Information

This page contains both secure and nonsecure items.

Do you want to display the nonsecure items?

Yes **No** **More Info**

Create self-signed certificate manually

1. Select this option.
2. Click **Create** to open a Create Certificate page, then click **Save** to generate the certificate.

Create and install certificate method

Create self-signed certificate automatically
 Create self-signed certificate manually:
Self-signed certificate:

Create certificate request and install:

Create Certificate

Country:
State or province:
Locality:
Organization:
Organization Unit:
Common Name:
Validity: days

Please wait while the certificate is being generated...

3. The Certificate Information will automatically be displayed in the third column as shown below. You can click **Property** to see detailed information about the certificate.

Certificate Information

Status:	<input type="button" value="Active"/>
Country:	TW
State or province:	Province
Locality:	City Name
Organization:	Organization Name
Organization Unit:	Unit Name
Common Name:	IP Address

Create certificate and install : Select this option if you want to create an official certificate issued by a CA (Certificate Authority).

1. Select this option.
2. Click **Create** to open the Create Certificate page, then click **Save** to generate the certificate.

Create and install certificate method

Create self-signed certificate automatically
 Create self-signed certificate manually:
 Create certificate request and install:
Certificate request:
Select certificate file:

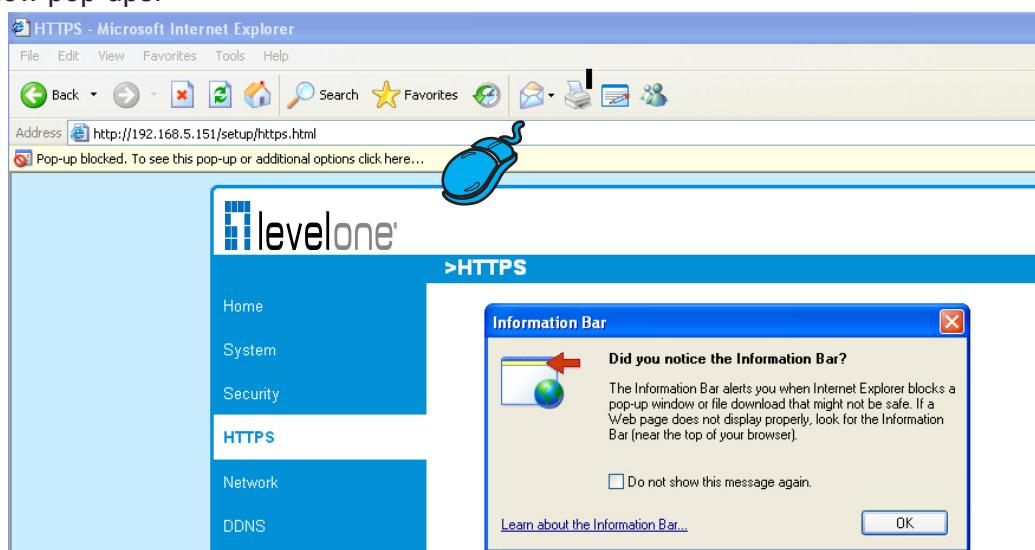
Create Certificate

Country:	<input type="text"/>
State or province:	<input type="text"/>
Locality:	<input type="text"/>
Organization:	<input type="text"/>
Organization Unit:	<input type="text"/>
Common Name:	<input type="text"/>
Validity:	9999 <input type="text"/> days

Save **Close**

Please wait while the certificate is being generated...

3. If you see the following Information bar, click **OK** and click on the Information bar on the top of the page to allow pop-ups.



4. The pop-up window shows an example of a certificate request.

Create Certificate Request Completed

Copy the PEM format request below and send it to a CA for identify validation. After that, you have to install it by clicking the "Upload" button on HTTPS page.

Certificate Request (PEM format)

```
-----BEGIN CERTIFICATE REQUEST-----
MIIBuDCCASECABE5MQswCQYDVQQGEwJUVzERMA8GA1UECBMIUHJvdmluY2UxEjAQ
BgNVBAcTCUNpdHkgTmFtZTEaMBgGA1UEChMRT3JnYW5pemFOaw9uIE5hbWUxEjAQ
BgNVBAstCVVuaXQgTmFtZTETMBEGA1UEAxMKSVAgQWRkcmVzczCBnzANBgkqhkiG
9wOBAQEFAAOBJQAwgYkCgYEAuOT75EY52gsSyPFMxZ7wHdQ1obPescsXLUX9DFw6
OMRheukFaXFDrkM+5xk+K5oEPBPqj77yhH+zdUHS27fFSLG57bw9SoxrWuLhSvRZw
mCD//AijX864dJ/mjh7Wc55GFaxgMybALcxT+hCIeDCWYnRqh/fpKNj+BxvVoN
UrcCAwEAAaAAMAOGCSqGSIb3DQEBBQUAA4GBAAVazWOAttfU9dyFgTxOV01D/zO
FOTkbmDOQG18e4ftJ3rROD1TvIIMjg3K8zsAS8Gd3pME1ejqLYoBrtasQdCQgGiX
5ObLG1subWsXr88PngaBwjYoTpG3qlzvUPJZLAVmndL3ne5urTbABXOScCHOQGtH+
PX9dw4OJWkIC8QhV
-----END CERTIFICATE REQUEST-----
```

5. Look for a trusted certificate authority that issues digital certificates. Enroll the Network Camera. Wait for the certificate authority to issue a SSL certificate; click Browse... to search for the issued certificate, then click **Upload** in the second column.

Create and install certificate method

- Create self-signed certificate automatically
- Create self-signed certificate manually:
- Create certificate request and install:

Certificate request:

Select certificate file:

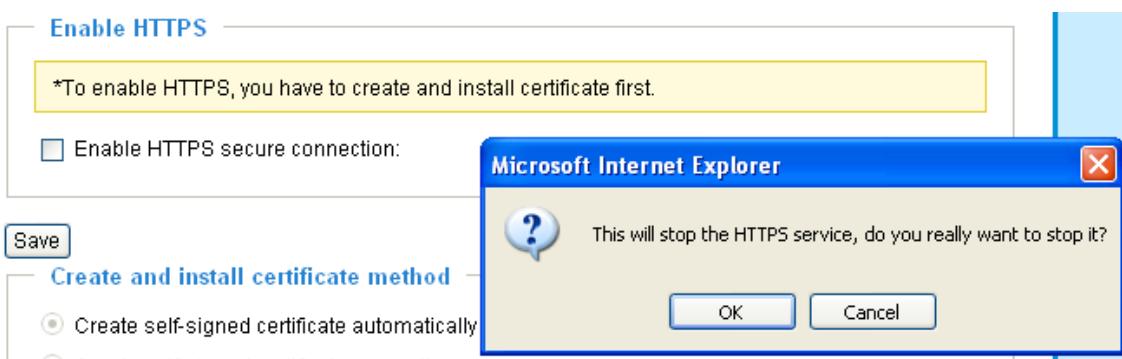
Certificate Information

Status: Waiting for certificate

NOTE

► How do I cancel the HTTPS settings?

1. Uncheck **Enable HTTPS secure connection** in the first column and click **Save**; a warning dialog will pop up.
2. Click **OK** to disable HTTPS.



3. The webpage will redirect to a non-HTTPS page automatically.

► If you want to create and install other certificates, please remove the existing one. To remove the signed certificate, uncheck **Enable HTTPS secure connection** in the first column and click **Save**. Then click **Remove** to erase the certificate.

Certificate Information

Status: Active

Country:

State or province:

Locality:

Organization:

Organization Unit:

Common Name: IP Address:

Microsoft Internet Explorer
Are you sure you want to delete the certificate?

Network

This section explains how to configure a wired network connection for the Network Camera.

Network Type

Network Type

LAN:

- Get IP address automatically
- Use fixed IP address:
- Enable UPnP presentation
- Enable UPnP port forwarding

PPPoE:

- Enable IPv6

Save

LAN

Select this option when the Network Camera is deployed on a local area network (LAN) and is intended to be accessed by local computers. The default setting for the Network Type is LAN. Remember to click **Save** when you complete the Network setting.

Get IP address automatically: Select this option to obtain an available dynamic IP address assigned by the DHCP server each time the camera is connected to the LAN.

Use fixed IP address: Select this option to manually assign a static IP address to the Network Camera.

Network Type

LAN:

- Get IP address automatically
- Use fixed IP address:

IP address:	192.168.5.109
Subnet mask:	255.255.255.0
Default router:	192.168.5.1
Primary DNS:	192.168.0.10
Secondary DNS:	192.168.0.20
Primary WINS server:	
Secondary WINS server:	
- Enable UPnP presentation
- Enable UPnP port forwarding

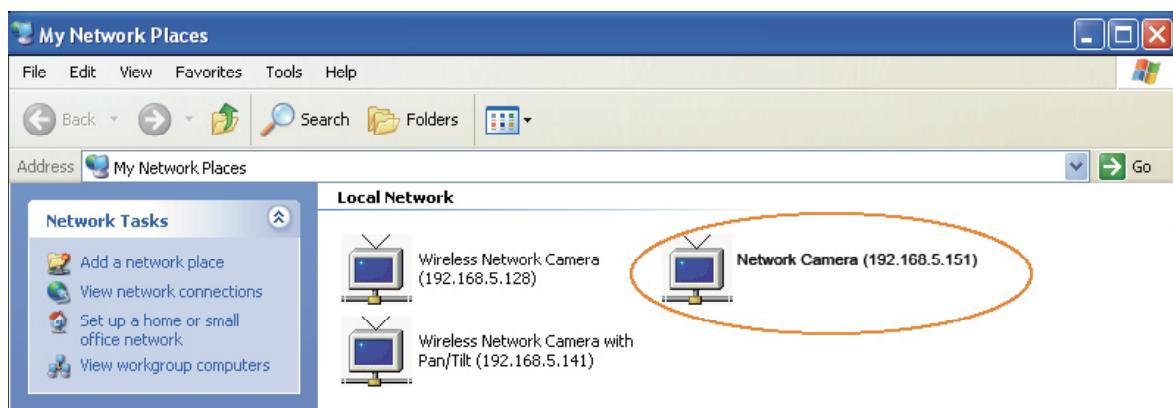
PPPoE:

- Enable IPv6

Save

1. You can make use of LevelOne Installation Wizard 2 on the software CD to easily set up the Network Camera on LAN. Please refer to Software Installation on page 11 for details.
2. Enter the static IP, Subnet mask, Default router, and Primary DNS provided by your ISP.

Enable UPnP presentation: Select this option to enable UPnP™ presentation for your Network Camera so that whenever a Network Camera is presented to the LAN, shortcuts of connected Network Cameras will be listed in My Network Places. You can click the shortcut to link to the web browser. Currently, UPnP™ is supported by Windows XP or later. Note that to utilize this feature, please make sure the UPnP™ component is installed on your computer.



Enable UPnP port forwarding: To access the Network Camera from the Internet, select this option to allow the Network Camera to open ports on the router automatically so that video streams can be sent out from a LAN. To utilize of this feature, make sure that your router supports UPnP™ and it is activated.

PPPoE (Point-to-point over Ethernet)

Select this option to configure your Network Camera to make it accessible from anywhere as long as there is an Internet connection. Note that to utilize this feature, it requires an account provided by your ISP.

Follow the steps below to acquire your Network Camera's public IP address.

1. Set up the Network Camera on the LAN.
2. Go to Home > Configuration > Application > Server Settings (please refer to Server Settings on page 71) to add a new email or FTP server.
3. Go to Configuration > Application > Media Settings (please refer to Media Settings on page 74). Select System log so that you will receive the system log in TXT file format which contains the Network Camera's public IP address in your email or on the FTP server.
4. Go to Configuration > Network > Network Type. Select PPPoE and enter the user name and password provided by your ISP. Click **Save** to enable the setting.

Network Type	
<input type="radio"/> LAN:	
<input checked="" type="radio"/> PPPoE:	
User name:	<input type="text"/>
Password:	<input type="password"/>
Confirm password:	<input type="password"/>

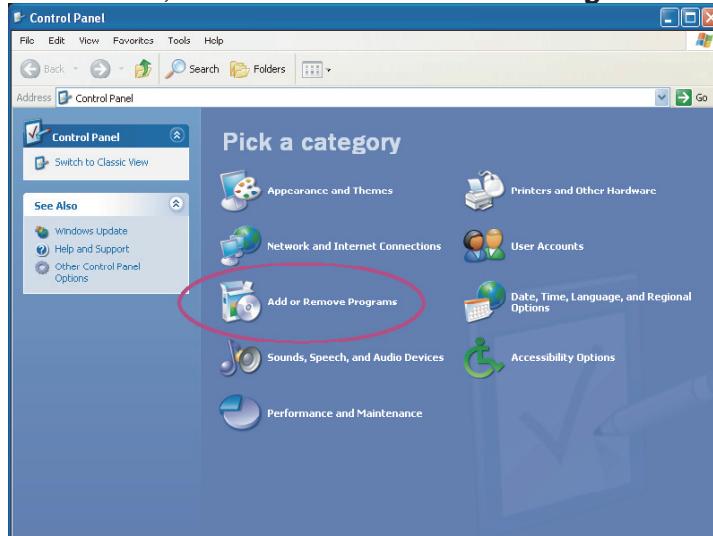
5. The Network Camera will reboot.
6. Disconnect the power to the Network Camera; remove it from the LAN environment.

NOTE

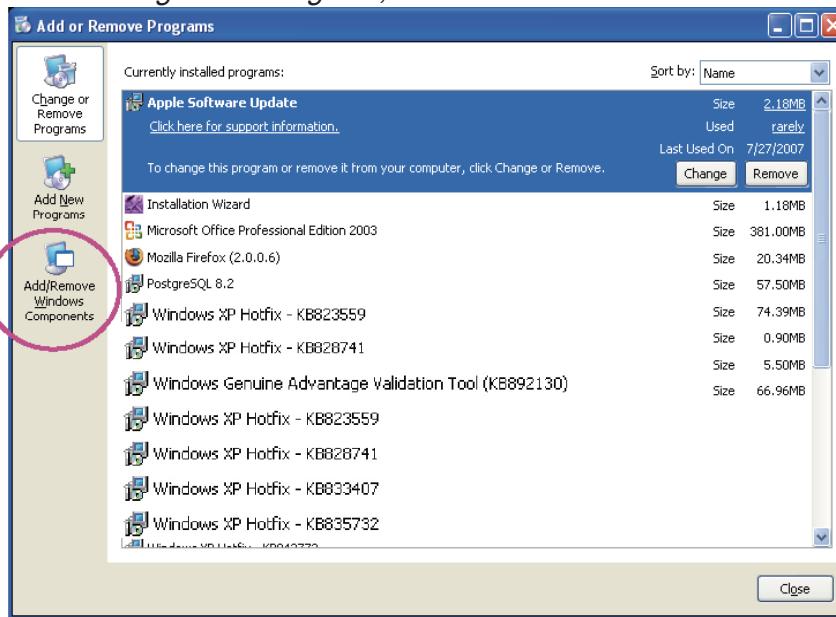
- If the default ports are already used by other devices connected to the same router, the Network Camera will select other ports for the Network Camera.
- If UPnP™ is not supported by your router, you will see the following message:
Error: Router does not support UPnP port forwarding.

- Steps to enable the UPnP™ user interface on your computer:
 Note that you must log on to the computer as a system administrator to install the UPnP™ components.

1. Go to Start, click **Control Panel**, then click **Add or Remove Programs**.



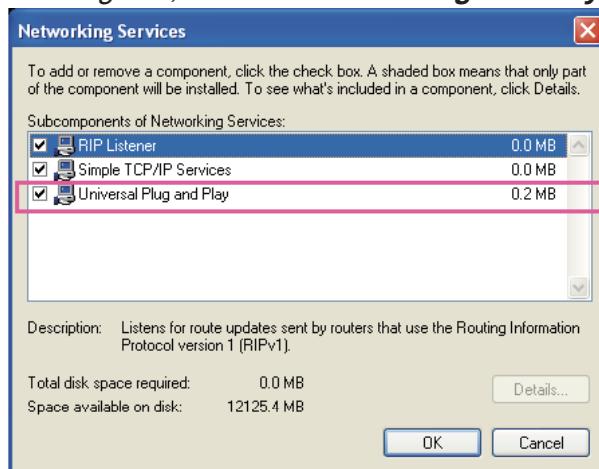
2. In the Add or Remove Programs dialog box, click **Add/Remove Windows Components**.



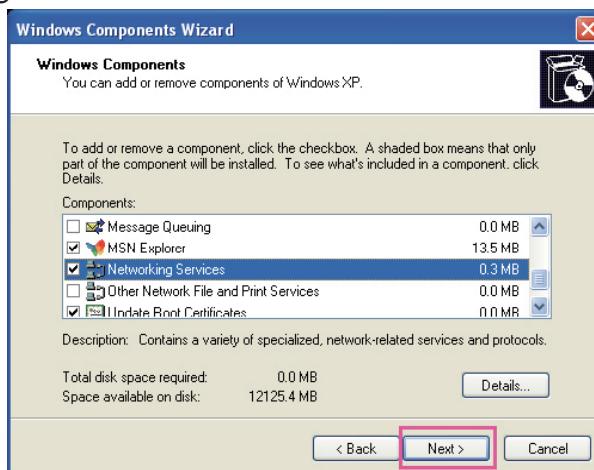
3. In the Windows Components Wizard dialog box, select **Networking Services** and click **Details**.



4. In the Networking Services dialog box, select **Universal Plug and Play** and click **OK**.



5. Click **Next** in the following window.



6. Click **Finish**. UPnP™ is enabled.

► **How does UPnP™ work?**

UPnP™ networking technology provides automatic IP configuration and dynamic discovery of devices added to a network. Services and capabilities offered by networked devices, such as printing and file sharing, are available among each other without the need for cumbersome network configuration. In the case of Network Cameras, you will see Network Camera shortcuts under My Network Places.

► **Enabling UPnP port forwarding allows the Network Camera to open a secondary HTTP port on the router-not HTTP port-meaning that you have to add the secondary HTTP port number to the Network Camera's public address in order to access the Network Camera from the Internet. For example, when the HTTP port is set to 80 and the secondary HTTP port is set to 8080, refer to the list below for the Network Camera's IP address.**

From the Internet	In LAN
http://203.67.124.123:8080	http://192.168.4.160 or http://192.168.4.160:8080

► **If the PPPoE settings are incorrectly configured or the Internet access is not working, restore the Network Camera to factory default; please refer to Restore on page 83 for details. After the Network Camera is reset to factory default, it will be accessible on the LAN.**

Enable IPv6

Select this option and click **Save** to enable IPv6 settings.

Please note that this only works if your network environment and hardware equipment support IPv6. The browser should be Microsoft® Internet Explorer 6.5, Mozilla Firefox 3.0 or above.

Network Type

LAN:
 Get IP address automatically
 Use fixed IP address:
 Enable UPnP presentation
 Enable UPnP port forwarding

PPPoE:
 Enable IPv6

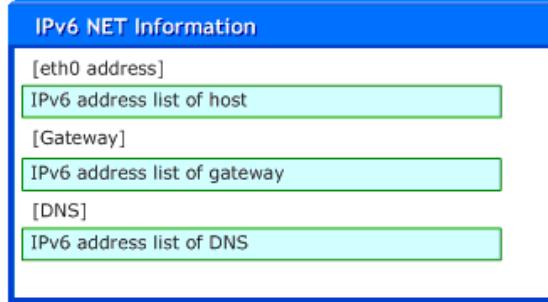
IPv6 Information

Manually setup the IP address

Save

When IPv6 is enabled, by default, the network camera will listen to router advertisements and be assigned with a link-local IPv6 address accordingly.

IPv6 Information: Click this button to obtain the IPv6 information as shown below.



If your IPv6 settings are successful, the IPv6 address list will listed in the pop-up window. The IPv6 address will be displayed as follows:

Refers to Ethernet

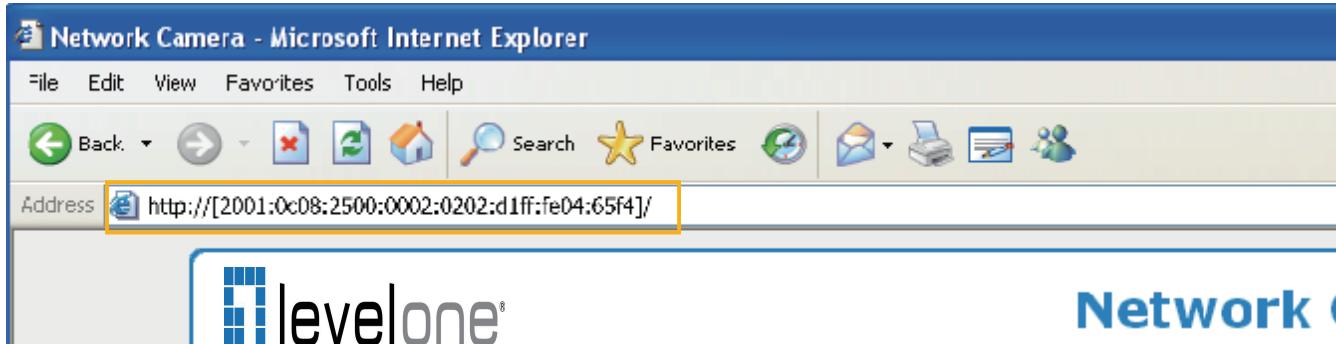
[eth0 address]	2001:0c08:2500:0002:0202:d1ff:fe04:65f4/64@Global	Link-global IPv6 address/network mask
[Gateway]	fe80::211:d8ff:fea2:1a2b	Link-local IPv6 address/network mask
[DNS]	2010:05c0:978d::	

Please follow the steps below to link to an IPv6 address:

1. Open your web browser.
2. Enter the link-global or link-local IPv6 address in the address bar of your web browser.
3. The format should be:



4. Press **Enter** on the keyboard or click **Refresh** button to refresh the webpage.
For example:



NOTE

- If you have a Secondary HTTP port (the default value is 8080), you can also link to the webpage in the following address format: (Please refer to **HTTP** on page 38 for detailed information.)



- If you choose PPPoE as the Network Type, the [PPPoE address] will show up in the IPv6 information column as below.

[eth0 address]	fe80::0000:0000:0202:d1ff:fe11:2299/64@Link
[ppp0 address]	fe80::0000:0000:0202:d1ff:fe11:2299/10@Link
	2001:b100:01d0:0002:0202:d1ff:fe11:2299/64@Global
[Gateway]	fe80::90:a00:4142:8:cd
[DNS]	2001:b000::1

Manually setup the IP address: Select this option to manually set up IPv6 settings if your network environment does not have DHCPv6 server and router advertisements-enabled routers.

If you check this item, the following blanks will be displayed for you to enter the corresponding information:

Enable IPv6

IPv6 Information

Manually setup the IP address

Optional IP address / Prefix length /

Optional default router

Optional primary DNS

HTTP Advanced Mode

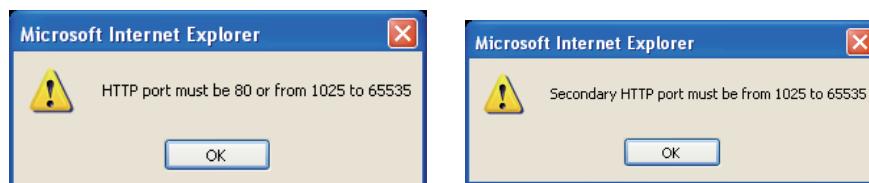
To utilize HTTP authentication, make sure that your have set a password for the Network Camera first; please refer to Security on page 26 for details.

Authentication:	basic
HTTP port:	80
Secondary HTTP port:	8080
Access name for stream 1:	video.mjpg
Access name for stream 2:	video2.mjpg

Authentication: Depending on your network security requirements, the Network Camera provides two types of security settings for an HTTP transaction: basic and digest.

If **basic** authentication is selected, the password is sent in plain text format and there can be potential risks of being intercepted. If **digest** authentication is selected, user credentials are encrypted using MD5 algorithm and thus provide better protection against unauthorized accesses.

HTTP port / Secondary HTTP port: By default, the HTTP port is set to 80 and the secondary HTTP port is set to 8080. They can also be assigned to another port number between 1025 and 65535. If the ports are incorrectly assigned, the following warning messages will be displayed:



To access the Network Camera on the LAN, both the HTTP port and secondary HTTP port can be used to access the Network Camera. For example, when the HTTP port is set to 80 and the secondary HTTP port is set to 8080, refer to the list below for the Network Camera's IP address.

In LAN
http://192.168.4.180 or
http://192.168.4.180:8080

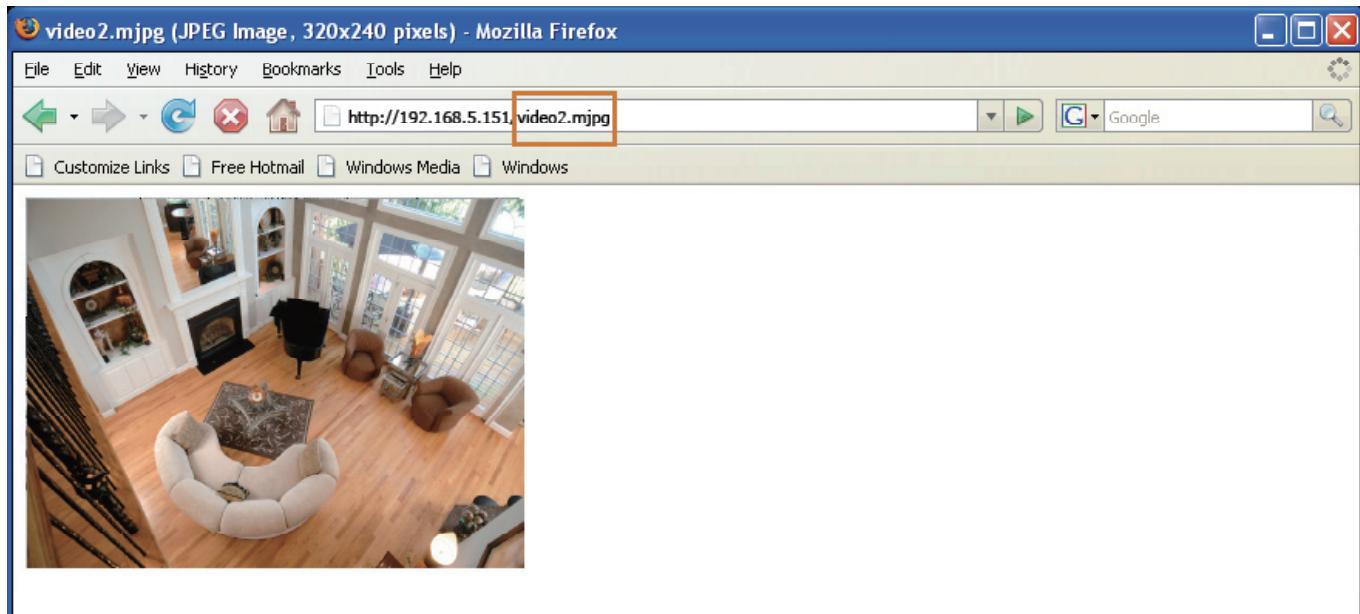
Access name for stream 1 / Access name for stream 2: The access name is used to differentiate the streaming source.

When using Mozilla Firefox or Netscape to access the Network Camera and the video mode is set to JPEG, users will receive video comprised of continuous JPEG images. This technology, known as "server push", allows the Network Camera to feed live pictures to Mozilla Firefox and Netscape.

URL command -- <http://<ip address>:<http port>/<access name for stream1 or stream2>>

For example, when the Access name for stream 2 is set to `video2.jpg`:

1. Launch Mozilla Firefox or Netscape.
2. Type the URL command in the address bar. Press **Enter**.
3. The JPEG images will be displayed in your web browser.



NOTE

- Microsoft® Internet Explorer does not support server push technology; therefore, using <http://<ip address>:<http port>/<access name for stream1 or stream2>> will fail to access the Network Camera.

HTTPS

HTTPS

HTTPS port:	443
-------------	-----

By default, the HTTPS port is set to 443. It can also be assigned to another port number between 1025 and 65535.

Two way audio

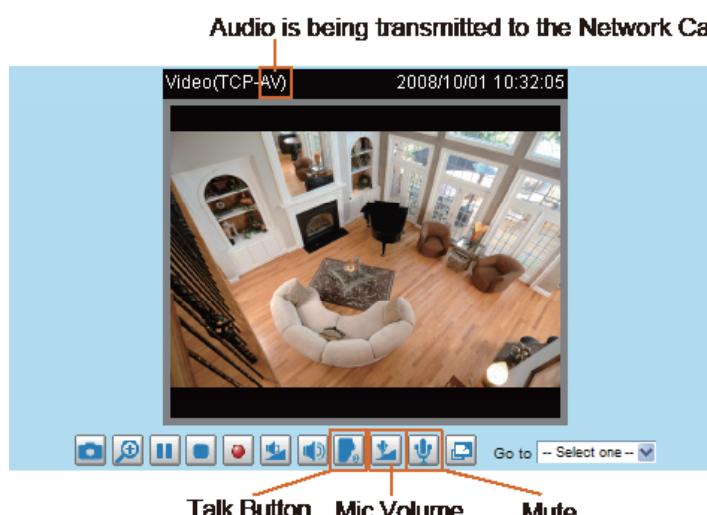
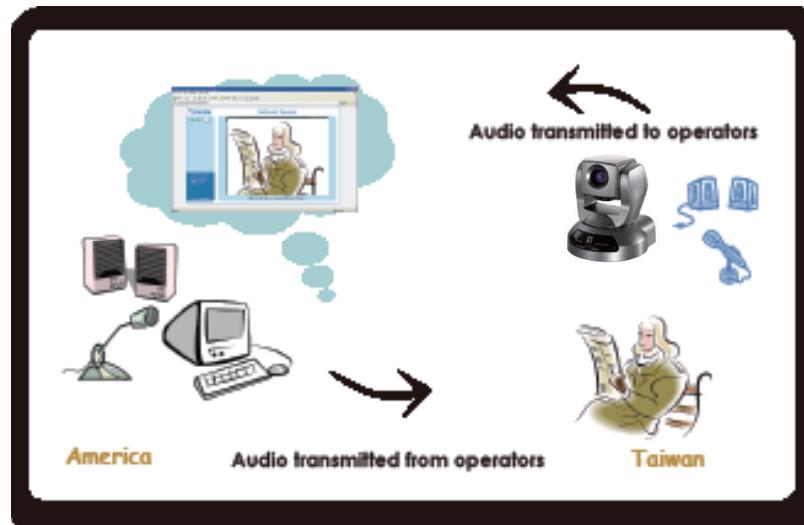
Two way audio

Two way audio port:	5060
---------------------	------

By default, the two way audio port is set to 5060. Also, it can also be assigned to another port number between 1025 and 65535.

The Network Camera supports two way audio communication so that operators can transmit and receive audio simultaneously. By using the Network Camera's built-in or external microphone and an external speaker, you can communicate with people around the Network Camera.

Note that as JPEG only transmits a series of JPEG images to the client, to enable the two-way audio function, make sure the video mode is set to “MPEG-4” on the Audio and Video Settings page and the media option is set to “Video and Audio” on the Client Settings page. Please refer to Client Settings on page 21 and Audio and Video Settings on page 51.



Click to enable audio transmission to the Network Camera; click to adjust the volume of microphone; click to turn off the audio. To stop talking, click again.

FTP

FTP	
FTP port:	21

The FTP server allows the user to save recorded video clips. You can utilize LevelOne Installation Wizard 2 to upgrade the firmware via FTP server. By default, the FTP port is set to 21. It also can be assigned to another port number between 1025 and 65535.

RTSP Streaming

To utilize RTSP streaming authentication, make sure that you have set a password for the Network Camera first; please refer to Security on page 26 for details.

RTSP Streaming

Authentication:	disable
Access name for stream 1:	live.sdp
Access name for stream 2:	live2.sdp
RTSP port:	554
RTP port for video:	5556
RTCP port for video:	5557
RTP port for audio:	5558
RTCP port for audio:	5559
↳ Multicast settings for stream 1:	
↳ Multicast settings for stream 2:	

Save

Authentication: Depending on your network security requirements, the Network Camera provides three types of security settings for streaming via RTSP protocol: disable, basic, and digest.

If **basic** authentication is selected, the password is sent in plain text format, but there can be potential risks of it being intercepted. If **digest** authentication is selected, user credentials are encrypted using MD5 algorithm, thus providing better protection against unauthorized access.

The availability of the RTSP streaming for the three authentication modes is listed in the following table:

	Quick Time player	Real Player
Disable	O	O
Basic	O	O
Digest	O	X

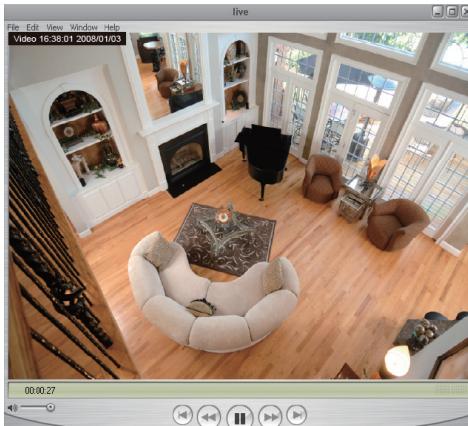
Access name for stream 1 / Access name for stream 2: This Network camera supports dual streams simultaneously. The access name is used to differentiate the streaming source.

If you want to use an **RTSP player** to access the Network Camera, you have to set the video mode to **MPEG-4** and use the following RTSP URL command to request transmission of the streaming data.

rtsp://<ip address>:<rtsp port>/<access name for stream1 or stream2>

For example, when the access name for **stream 1** is set to **live.sdp**:

1. Launch an RTSP player.
2. Choose File > Open URL. A URL dialog box will pop up.
3. Type the URL command in the text box. For example:
4. The live video will be displayed in your player as shown below.

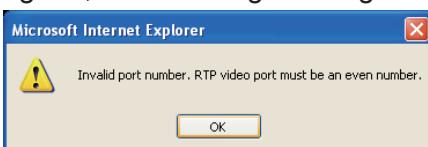


RTSP port /RTP port for video, audio/ RTCP port for video, audio

- RTSP (Real-Time Streaming Protocol) controls the delivery of streaming media. By default, the port number is set to 554.
- The RTP (Real-time Transport Protocol) is used to deliver video and audio data to the clients. By default, the RTP port for video is set to 5556 and the RTP port for audio is set to 5558.
- The RTCP (Real-time Transport Control Protocol) allows the Network Camera to transmit the data by monitoring Internet traffic volume. By default, the RTCP port for video is set to 5557 and the RTCP port for audio is set to 5559.

The ports can be changed to values between 1025 and 65535. The RTP port must be an even number and the RTCP port is the RTP port number plus one, and thus is always odd. When the RTP port changes, the RTCP port will change accordingly.

If the RTP ports are incorrectly assigned, the following warning message will be displayed:



Multicast settings for stream 1 / Multicast settings for stream 2: Click the items to display the detailed configuration information. Select the Always multicast option to enable multicast for stream 1 or stream 2.

▼ Multicast settings for stream 1:

Always multicast

Multicast group address:	239.128.1.99
Multicast video port:	5560
Multicast RTCP video port:	5561
Multicast audio port:	5562
Multicast RTCP audio port:	5563
Multicast TTL [1~255]:	15

▼ Multicast settings for stream 2:

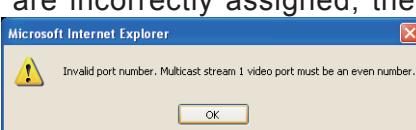
Always multicast

Multicast group address:	239.128.1.100
Multicast video port:	5564
Multicast RTCP video port:	5565
Multicast audio port:	5566
Multicast RTCP audio port:	5567
Multicast TTL [1~255]:	15

Unicast video transmission delivers a stream through point-to-point transmission; multicast, on the other hand, sends a stream to the multicast group address and allows multiple clients to acquire the stream at the same time by requesting a copy from the multicast group address. Therefore, enabling multicast can effectively save Internet bandwidth.

The ports can be changed to values between 1025 and 65535. The multicast RTP port must be an even number and the multicast RTCP port number is the multicast RTP port number plus one, and is thus always odd. When the multicast RTP port changes, the multicast RTCP port will change accordingly.

If the multicast RTP video ports are incorrectly assigned, the following warning message will be displayed:



Multicast TTL [1~255]: The multicast TTL (Time To Live) is the value that tells the router the range a packet can be forwarded.

Wireless LAN (WCS-2040v3 only)

WLAN configuration

SSID	default
Wireless mode	infrastructure
Channel	6
TX rate	Auto
Security	None

Save

SSID (Service Set Identifier): This is the name that identifies a wireless network. Access Points and wireless clients attempting to connect to a specific WLAN (Wireless Local Area Network) must use the same SSID. The default setting is “default”. Note: The maximum length for an SSID is 32 single-byte characters and cannot consist of “<”, “>”, or blank spaces.

Wireless mode: Click on the pull-down menu to select from the following options:

- **Infrastructure:** Connect the Network Camera to the WLAN via an Access Point. (default setting)
- **Ad-Hoc:** Connect the Network Camera directly to a host equipped with a wireless adapter in a peer-to-peer environment.

WLAN configuration

SSID	default
Wireless mode	ad-hoc
Channel	6
TX rate	Auto
Security	None

Save

Channel: While in infrastructure mode, the channel is selected automatically to match the channel setting of the selected Access Point. In Ad-Hoc mode, the channel must be manually set to the same channel for each wireless adapter. The default channel setting depends on the installed region.

TX rate: This field is for selecting the maximum transmission rate over the network. The default setting is “auto”, that is, the Network Camera will try to connect to other wireless devices with highest transmission rate.

Security: Select the data encrypt method. There are four types, including: none, WEP, WPA-PSK, and WPA2-PSK.

WLAN configuration

SSID	default
Wireless mode	infrastructure
Channel	6
TX rate	Auto
Security	None

Save

The Security dropdown menu is expanded, showing the following options:

- None
- WEP
- WPA-PSK
- WPA2-PSK

1. None: No data encryption.

2. WEP (Wired Equivalent Privacy): This allows communication only with other devices with identical WEP settings.

WLAN configuration

SSID	default
Wireless mode	infrastructure
Channel	6
TX rate	Auto
Security	WEP
Authentication mode	Open
Key length	64 bits
Key format	HEX
Default key	<input checked="" type="radio"/> Network key <input type="radio"/> <input type="radio"/> <input type="radio"/>
Network key	0000000000 0000000000 0000000000 0000000000

Save

- Authentication Mode: Choose one of the following modes. The default setting is “Open”.
 - Open – Communicates the key across the network.
 - Shared – Allows communication only with other devices with identical WEP settings.
- Key length: The administrator can set the key length to 64 or 128 bits. The default setting is “64 bits”.
- Key format: Hexadecimal or ASCII. The fault setting is “HEX”.
 - HEX digits consist of the numbers 0~9 and the letters A-F.
 - ASCII is a code for representing English letters as numbers from 0-127 except “, <, > , and the space character which are reserved.
- Network Key: Enter a key in either hexadecimal or ASCII format.

You can select different key lengths, the acceptable input lengths are as follows:

 - 64-bit key length: 10 Hex digits or 5 characters.
 - 128-bit key length: 26 Hex digits or 13 characters.

NOTE

- When 22("), 3C(<), or 3E(>) are input as network keys, the key format cannot be changed to ASCII format.

3. WPA-PSK: Use WPA (Wi-Fi Protected Access) pre-shared key.

WLAN configuration

SSID	default
Wireless mode	infrastructure
Channel	6
TX rate	Auto
Security	WPA-PSK
algorithm	TKIP
pre-shared key	0000000000

Save

More secure than WEP, the Wi-Fi Alliance developed WPA (Wi-Fi Protected Access) in 2003 to address WEP's weaknesses. Improvements included TKIP, which changes the encryption key for each data transmission.

- Algorithm: Choose one of the following algorithms for WPA-PSK and WPA2-PSK modes.

TKIP (Temporal Key Integrity Protocol): A security protocol used in IEEE 802.11 wireless networks.

TKIP is a “wrapper” that goes around the existing WEP encryption. TKIP is comprised of the same encryption engine and RC4 algorithm defined for WEP; however, the key used for encryption in TKIP is 128 bits long. This solves the first problem of WEP: a short key length. (From Wikipedia)

AES (Advanced Encryption Standard): In cryptography, the Advanced Encryption Standard (AES), also known as Rijndael, is a block cipher adopted as an encryption standard by the U.S. government. As of 2006, AES is one of the most popular algorithms used in symmetric key cryptography. (From Wikipedia)

- Pre-shared Key: Enter a key in ASCII format. The length of the key can be between 8 to 63 characters.

4. WPA2-PSK: Use WPA2 pre-shared key.

This advanced protocol, certified through Wi-Fi Alliance’s WPA2 program, implements the mandatory elements of 802.11i. In particular, it introduces a new AES-based algorithm, CCMP, that is considered fully secure. From March 13, 2006, WPA2 certification is mandatory for all new devices wishing to be certified by the Wi-Fi Alliance as “Wi-Fi CERTIFIED.” (From Wikipedia)

NOTE

- After wireless configurations are completed, click **Save** and the camera will reboot. Wait for the live image to be reloaded to your browser. For LevelOne 7000-series cameras, you have to unplug the power and Ethernet cables from the camera; then re-plug the power cable to the camera. The camera will switch to wireless mode.
- Some invalid settings may cause the system to fail to respond. Change the configuration settings only if necessary and consult with your network supervisor or experienced users for correct settings. Once the system has lost contact, please refer to Maintenance on page 83 for reset and restore procedures.

DDNS

This section explains how to configure the dynamic domain name service for the Network Camera. DDNS is a service that allows your Network Camera, especially when assigned with a dynamic IP address, to have a fixed host and domain name.

DDNS: Dynamic domain name service

The screenshot shows a configuration interface for DDNS. At the top, there is a checkbox labeled "Enable DDNS". Below it, a dropdown menu is set to "Dyndns.org(Dynamic)". There are four input fields: "Host name", "User name", and "Password", each with a corresponding text input box. A "Save" button is located at the bottom left of the form.

Enable DDNS: Select this option to enable the DDNS setting.

Provider: Select a DDNS provider from the provider drop-down list.

LevelOne offers **Safe100.net**, a free dynamic domain name service, to LevelOne customers. It is recommended that you register **Safe100.net** to access LevelOne's Network Cameras from the Internet. Additionally, we offer other DDNS providers, such as Dyndns.org(Dynamic), Dyndns.org(Custom), TZO.com, DHS.org, CustomSafe100, dyn-interfree.it.

Note that before utilizing this function, please apply for a dynamic domain account first.

■ **Safe100.net**

1. In the DDNS column, select **Safe100.net** from the drop-down list. Click **I accept** after reviewing the terms of the Service Agreement.
2. In the Register column, fill in the Host name (xxxx.safe100.net), Email, Key, and Confirm Key, then click **Register**. After a host name has been successfully created, a success message will be displayed in the DDNS Registration Result column.

The screenshot shows a registration form for Safe100.net. It includes fields for "Host name" (WTKsafe100.net), "Email", "Key", and "Confirm key". Below the form, instructions say to fill in the fields and click "Register". A "Register" button is present. The "DDNS Registration Result" section contains a message: "[Register] Successfully Your account information has been mailed to registered e-mail address". At the bottom, there is a note about copying information to the DDNS form.

3. Click **Copy** and all the registered information will automatically be uploaded to the corresponding fields in the DDNS column at the top of the page as seen in the picture.

DDNS: Dynamic domain name service

Enable DDNS:

Provider:	Safe100.net
Host name:	VVTK.safe100.net
Email:	wtk@level1.com
Key:	*****

Save

Register

Host name:	VVTK.safe100.net
Email:	wtk@level1.com
Key:	*****
Confirm key:	*****

To apply for a domain name for the camera, or to modify the previously registered information, fill in the following fields and then click "Register".

Register

DDNS Registration Result:

[Register] Successfully Your account information has been mailed to registered e-mail address

Upon successful registration, you can click [copy](#) to automatically upload relevant information to the DDNS form or you can manually fill it in. Then, click "Save" to save new settings.

4. Select Enable DDNS and click **Save** to enable the setting.

■ CustomSafe100

LevelOne offers documents to establish a CustomSafe100 DDNS server for distributors and system integrators. You can use CustomSafe100 to register a dynamic domain name if your distributor or system integrators offer such services.

1. In the DDNS column, select CustomSafe100 from the drop-down list.
2. In the Register column, fill in the Host name, Email, Key, and Confirm Key; then click **Register**. After a host name has been successfully created, you will see a success message in the DDNS Registration Result column.
3. Click **Copy** and all for the registered information will be uploaded to the corresponding fields in the DDNS column.
4. Select Enable DDNS and click **Save** to enable the setting.

Forget key: Click this button if you have forgotten the key to Safe100.net or CustomSafe100. Your account information will be sent to your email address.

Refer to the following links to apply a dynamic domain account when selecting other DDNS providers:

- [Dyndns.org\(Dynamic\) / Dyndns.org\(Custom\)](http://www.dyndns.com/): visit <http://www.dyndns.com/>
- [TZO.com](http://www.tzo.com/): visit <http://www.tzo.com/>
- [DHS.org](http://www.dhs.org/): visit <http://www.dhs.org/>
- dyn-interfree.it: visit <http://dyn-interfree.it/>

Access List

This section explains how to control access permission by verifying the client PC's IP address.

General Settings

General Settings

Maximum number of concurrent streaming connection(s) limited to: [View Information](#)

Enable access list filtering

[Save](#)

Maximum number of concurrent streaming connection(s) limited to: Simultaneous live viewing for 1~10 clients (including stream 1 and stream 2). The default value is 10. If you modify the value and click **Save**, all current connections will be disconnected and automatically attempt to re-link (IE Explore or Quick Time Player).

[View Information](#): Click this button to display the connection status window showing a list of the current connections. For example:

- IP address: Current connections to the Network Camera.
 - Elapsed time: How much time the client has been at the webpage.
 - User ID: If the administrator has set a password for the webpage, the clients have to enter a user name and password to access the live video. The user name will be displayed in the User ID column. If the administrator allows clients to link to the webpage without a user name and password, the User ID column will be empty.

There are some situations which allow clients access to the live video without a user name and password:

- password.

 1. The administrator does not set up a root password. For more information about how to set up a root password and manage user accounts, please refer to Security on page 26.
 2. The administrator has set up a root password, but set **RTSP Authentication** to “disable”. For more information about **RTSP Authentication**, please refer to RTSP Streaming on page 41.
 3. The administrator has set up a root password, but allows anonymous viewing. For more information about **Allow Anonymous Viewing**, please refer to Security on page 26.

- Refresh: Click this button to refresh all current connections.
- Add to deny list: You can select entries from the Connection Status list and add them to the Deny List to deny access. Please note that those checked connections will only be disconnected temporarily and will automatically try to re-link again (IE Explore or Quick Time Player). If you want to enable the denied list, please check **Enable access list filtering** and click **Save** in the first column.
- Disconnect: If you want to break off the current connections, please select them and click this button. Please note that those checked connections will only be disconnected temporarily and will automatically try to re-link again (IE Explore or Quick Time Player).

Enable access list filtering: Check this item and click **Save** if you want to enable the access list filtering function.

Filter

There are two lists for permission control: Allowed list and Denied list. Only those clients whose IP addresses are on the Allowed list and not on the Denied list can access the Network Camera. Please note that the IPv6 access list column will not be displayed unless you enable IPv6 on the Network page. For more information about **IPv6 Settings**, please refer to page 36 for detailed information.

The screenshot shows the 'Filter' configuration interface. At the top is the 'General Settings' section, which includes a dropdown for 'Maximum number of concurrent streaming connection(s) limited to' set to 10, and a checkbox for 'Enable access list filtering'. Below this is a large 'Save' button. The main area is titled 'Filter' and contains two sections: 'IPv4 access list' and 'IPv6 access list'. Each section has 'Allowed list' and 'Denied list' sub-sections. In the 'IPv4 access list' section, the 'Allowed list' contains the IP address '1.0.0.0-255.255.255.255'. In the 'IPv6 access list' section, the 'Allowed list' contains the IP address '::/0'. Each list has 'Add' and 'Delete' buttons.

- Add a rule to Allowed/Denied list: Click **Add** to add a rule to Allowed/Denied list.

There are three types of rules for user to set up:

Single: This rule allows the user to add an IP address to the Allowed/Denied list.

For example:

The screenshot shows the 'filter address' dialog box. It has a dropdown menu labeled 'Rule' with 'Single' selected. Below it is a text input field labeled 'IP address' containing '192.168.2.1'. At the bottom are 'OK' and 'Cancel' buttons.

Network: This rule allows the user to assign a network address and corresponding subnet mask to the Allow/Deny List.

For example:

filter address

Rule: Network

Network address / Network mask: 192.168.2.0 / 24

OK Cancel

IP address 192.168.2.x will be blocked.

Range: This rule allows the user to assign a range of IP addresses to the Allow/Deny List. This rule is only applied to IPv4.

For example:

filter address

Rule: Range

IP address - IP address: 192.168.2.0 - 192.168.2.255

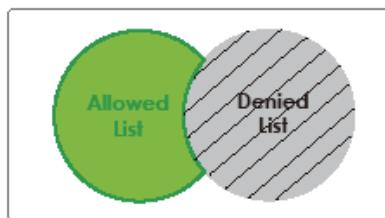
OK Cancel

■ Delete Allowed/Denied list:

In the Delete Allowed List or Delete Denied List column, make a selection and click **Delete**.

NOTE

► For example, when the range of IP addresses in the allowed list is set from 1.1.1.0 to 192.255.255.255 and the range in the denied list is set from 1.1.1.0 to 170.255.255.255, only users' IP located between 171.0.0.0 and 192.255.255.255 can access the Network Camera.



Administrator IP address

Always allow the IP address to access this device: You can check this item and add the Administrator's IP address in this field to make sure the Administrator can always connect to the device.

Administrator IP address

Always allow the IP address to access this device

Save

Audio and Video

This section explains how to configure the audio and video settings of the Network Camera. It is composed of the following two columns: Video Settings and Audio Settings.

Video Settings

Video settings

Video title:

Color:

Video orientation: Flip Mirror

Overlay title and time stamp on video and snapshot.

Enable time shift caching stream

[▶ Video quality settings for stream 1:](#)

[▶ Video quality settings for stream 2:](#)

Video title: Enter a name that will be displayed on the title bar of the live video.



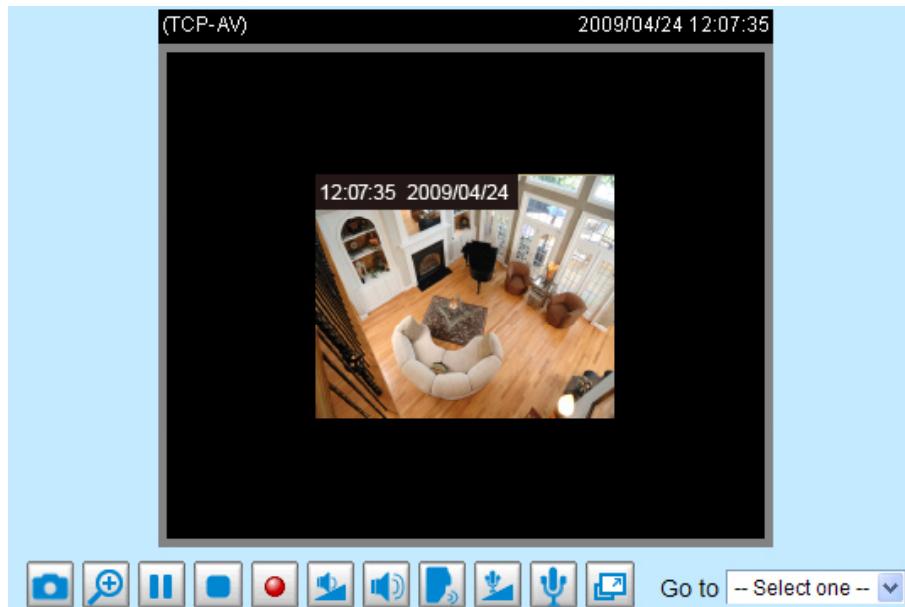
Color: Select to display color or black/white video streams.

Power line frequency: Set the power line frequency consistent with local utility settings to eliminate image flickering associated with fluorescent lights. Note that after the power line frequency is changed, you must disconnect and reconnect the power cord of the Network Camera in order for the new setting to take effect.

Video orientation: Flip--vertically reflect the display of the live video; Mirror--horizontally reflect the display of the live video. Select both options if the Network Camera is installed upside-down (ex. on the ceiling) to correct the image orientation.

Overlay title and time stamp on video: Select this option to place the video title and time on the video streams.

Note that when the frame size is set to 176 x 144 as shown in the picture below, only the time will be stamped on the video streams.



Enable time shift caching stream **Advanced Mode**: Check this item to enable the time shift cache stream on the Network Camera, which will stores video in the camera's embedded memory for a period of time depending on the cache memory of each Network Camera. This function can work seamlessly with LevelOne's IP CamSecure recording software. When an event occurs, the recording software can request time shift cache stream from the camera, which allows the user to get an earlier video data.

Image Settings **Advanced Mode**

Click **Image Settings** to open the Image Settings page. On this page, you can tune the Brightness, Saturation, Contrast, and Sharpness for the video.

Image Adjustment			
Brightness:	+0	Saturation:	+0
Contrast:	+0	Sharpness:	+0
Preview		Restore	Save
Close			

Image Adjustment

- Brightness: Adjust the image brightness level, which ranges from -5 to +5. The default value is set to 0.

- Saturation: Adjust the image saturation level, which ranges from -5 to +5. The default value is set to 0.
- Contrast: Adjust the image contrast level, which ranges from -5 to +5. The default value is set to 0.
- Sharpness: Adjust the image sharpness level, which ranges from -3 to +3. The default value is set to +3.

You can click **Preview** to fine-tune the image, or click **Restore** to recall the original settings without incorporating the changes. When completed with the settings on this page, click **Save** to enable the setting and click **Close** to exit the page.

[CCD Adjustment](#) Advanced Mode

Click **CCD settings** to open the CCD Adjustment page. On this page, you can set the Auto electronic shutter (AES), Auto tracking white balance, White balance control, Low lux mode, and BLC settings.



CCD Adjustment	
Auto electronic shutter (AES)	<input type="button" value="Auto"/>
<input type="radio"/> Auto tracking white balance	<input type="button" value="4"/>
<input checked="" type="radio"/> White balance control	<input type="button" value="6400k"/>
<input type="checkbox"/> Low lux mode	<input type="checkbox"/> Auto switch to B/W in low lux mode
<input type="checkbox"/> Enable BLC	BLC sens level <input type="button" value="3"/>
	<input type="button" value="BLC area selection"/>
<input type="button" value="Preview"/> <input type="button" value="Restore"/> <input type="button" value="Save"/> <input type="button" value="Close"/>	

Auto electronic shutter (AES): The default iris setting of the CCD is fixed mode, and the AES option will be **1/50 (1/60)**. There are several options for AES: 1/50 (1/60), 1/100 (1/120), 1/250, 1/500, 1/1000, 1/200, and 1/4000. Faster electronic shutter would enable the Network Camera to capture fast-moving objects more clearly. Once the shutter is selected as Auto, the iris of the CCD will become fixed.

Auto tracking white balance: This option is usually selected when the Network Camera is placed in outdoor environments. Adjusting the 0~8 level would help the Network Camera capturing video with correct colors. The default value is set to 4.

White balance control: Select this option will disable Auto tracking white balance. This option is usually selected when the Network Camera is placed in indoor environments. The administrator can adjust the value for best color temperature: 3200k, 4000k, 4800k, 5600k, 6400k, 7200k, 8000k.

Low lux mode: Select this option would enable the Network Camera to capture clear images in poor illuminative environments.

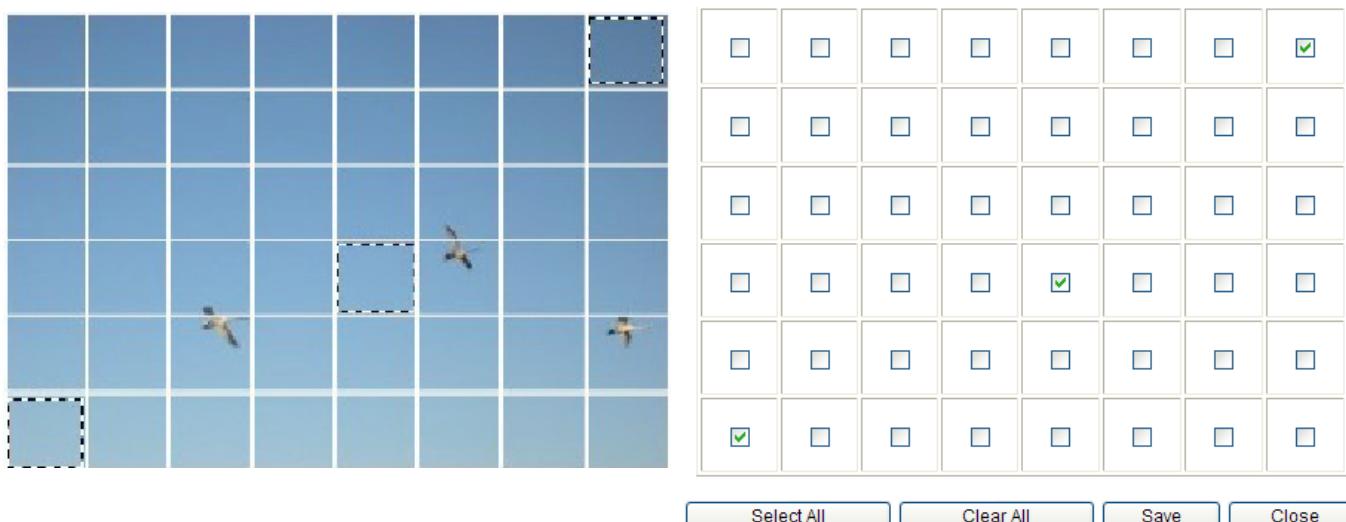
Auto switch to B/W in low lux mode: Select it to enable the Network Camera to automatically switch to B/W in low lux mode.

Enable BLC (Back Light Compensation): Select it when the object is too dark or too bright to be recognized. It will give the captured images the necessary light compensation.

BLC sens level: Select 0~7 level to adjust the sensitivity of BLC detection. Select a higher level will raise the sensitivity. The default value is set to 3.

BLC area selection: Click this button to open an area selection window. As the window shown below, the video will be divided into 48 rectangle areas equally. Check some of the areas to enable BLC. Note that if no area is selected, the Enable BLC option would be of no use.

The picture below illustrates the corresponding areas of the selection window. You can click **Select All** to check all the areas in the window, or click **Clear All** to do vice versa. When completed with the settings on this page, click **Save** to take effect and click **Close** to exit the page.



Back to the CCD Settings page, you can click **Preview** to fine-tune the image, or click **Restore** to recall the original settings without incorporating the changes. When completed with the settings on this page, click **Save** to take effect and click **Close** to exit the page.

Video quality settings for stream 1 / stream 2 Advanced Mode

The Network Camera offers two choices of video compression standards for real-time viewing: MPEG-4 and MJPEG.

Click the items to display the detailed configuration settings. You can set up two separate streams for the Network Camera for different viewing devices. For example, set a smaller frame size and lower bit rate for remote viewing on mobile phones and a larger video size and a higher bit rate for live viewing on web browsers.

If **MPEG-4** mode is selected, it is streamed in RTSP protocol.

<p>▼ Video quality settings for stream 1:</p> <p><input checked="" type="radio"/> MPEG-4:</p> <p>Frame size: 704x480/704x576</p> <p>Maximum frame rate: 30 fps</p> <p>Intra frame period: 1 S</p> <p>Video quality:</p> <p><input type="radio"/> Constant bit rate: 512 Kbps</p> <p><input checked="" type="radio"/> Fixed quality: Excellent</p> <p><input type="radio"/> JPEG:</p>	<p>▼ Video quality settings for stream 2:</p> <p><input checked="" type="radio"/> MPEG-4:</p> <p>Frame size: 176x120/176x144</p> <p>Maximum frame rate: 30 fps</p> <p>Intra frame period: 1 S</p> <p>Video quality:</p> <p><input checked="" type="radio"/> Constant bit rate: 40 Kbps</p> <p><input type="radio"/> Fixed quality: Good</p> <p><input type="radio"/> JPEG:</p>
---	---

There are four parameters provided in MPEG-4 mode which allow you to adjust the video performance:

■ Frame size

Select the video size. Note that a larger frame size takes up more bandwidth. The frame sizes are selectable in the following resolutions:

	NTSC	PAL
	704 x 480	704 x 576
CIF	352 x 240	352 x 288
QCIF	176 x 120	176 x 144

■ Maximum frame rate

This limits the maximal refresh frame rate per second. Set the frame rate higher for a smoother video quality. The frame rates are selectable at 1fps, 2fps, 3fps, 5fps, 8fps, 10fps, 15fps, 20fps, 25fps, and 30fps. You can also select **Customize** and manually enter a value.

■ Intra frame period

Determine how often to plant an I frame. The shorter the duration, the more likely you will get better video quality, but at the cost of higher network bandwidth consumption. Select the intra frame period from the following durations: 1/4 second, 1/2 second, 1 second, 2 seconds, 3 seconds, and 4 seconds.

■ Video quality

A complex scene generally produces a larger file size, meaning that higher bandwidth will be needed for data transmission. Therefore, if **Constant bit rate** is selected, the bandwidth utilization is fixed at a selected level, resulting in mutable video quality performance. The bit rates are selectable at the following rates: 20Kbps, 30Kbps, 40Kbps, 50Kbps, 64Kbps, 128Kbps, 256Kbps, 512Kbps, 768Kbps, 1Mbps, 2Mbps, 3Mbps, and 4Mbps. You can also select **Customize** and manually enter a value.

On the other hand, if **Fixed quality** is selected, all frames are transmitted with the same quality; bandwidth utilization is therefore unpredictable. The video quality can be adjusted to the following settings: Medium, Standard, Good, Detailed, and Excellent. You can also select **Customize** and manually enter a value.

If **JPEG** mode is selected, the Network Camera continuously sends JPEG images to the client, producing a moving effect similar to a filmstrip. Every single JPEG image transmitted guarantees the same image quality, which in turn comes at the expense of variable bandwidth usage. Because the media contents are a combination of JPEG images, no audio data is transmitted to the client.

<p>▼ Video quality settings for stream 1:</p> <p><input type="radio"/> MPEG-4: <input checked="" type="radio"/> JPEG:</p> <p>Frame size: <input type="button" value="704x480/704x576"/></p> <p>Maximum frame rate: <input type="button" value="30 fps"/></p> <p>Video quality: <input type="button" value="Excellent"/></p>	<p>▼ Video quality settings for stream 2:</p> <p><input type="radio"/> MPEG-4: <input checked="" type="radio"/> JPEG:</p> <p>Frame size: <input type="button" value="176x120/176x144"/></p> <p>Maximum frame rate: <input type="button" value="30 fps"/></p> <p>Video quality: <input type="button" value="Excellent"/></p>
---	---

There are three parameters provided in MJPEG mode to control the video performance:

■ Frame size

Select the video size. Note that a larger frame size takes up more bandwidth. The frame sizes are selectable in the following resolutions:

	NTSC	PAL
	704 x 480	704 x 576
CIF	352 x 240	352 x 288
QCIF	176 x 120	176 x 144

- Maximum frame rate

This limits the maximum refresh frame rate per second. Set the frame rate higher for smoother video quality. The frame rates are selectable at 1fps, 2fps, 3fps, 5fps, 8fps, 10fps, 15fps, 20fps, 25fps, and 30fps. You can also select **Customize** and manually enter a value.

- Video quality

The video quality can be adjusted to the following settings: Medium, Standard, Good, Detailed, and Excellent. You can also select **Customize** and manually enter a value.

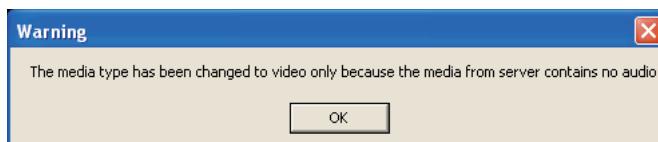
NOTE

- *Video quality and fixed quality refers to the **compression rate**, so a lower value will produce higher quality.*

Audio Settings

The screenshot shows the 'Audio Settings' configuration page. It includes fields for 'Mute' (checkbox), 'Internal microphone input gain' (dropdown set to 0 dB), 'External microphone input' (dropdown set to 0 dB), 'Audio type' (radio buttons for AAC and GSM-AMR, with GSM-AMR selected), and 'GSM-AMR bit rate' (dropdown set to 12.2 Kbps). A 'Save' button is located below the form.

Mute: Select this option to disable audio transmission from the Network Camera to all clients. Note that if mute mode is turned on, no audio data will be transmitted even if audio transmission is enabled on the Client Settings page. In that case, the following message is displayed:



Internal microphone input gain: Select the gain of the internal audio input according to ambient conditions. Adjust the gain from +21 db (most sensitive) ~ -33 db (least sensitive).

External microphone input: Select the gain of the external audio input according to ambient conditions. Adjust the gain from +21 db (most sensitive) ~ -33 db (least sensitive).

AAudio type: Select audio codec AAC or GSM-AMR and the bit rate.

- AAC provides good sound quality at the cost of higher bandwidth consumption. The bit rates are selectable from: 16Kbps, 32Kbps, 48Kbps, 64Kbps, 96Kbps, and 128Kbps.
- GSM-ARM is designed to optimize speech quality and requires less bandwidth. The bit rates are selectable from: 4.75Kbps, 5.15Kbps, 5.90Kbps, 6.7Kbps, 7.4Kbps, 7.95Kbps, 10.2Kbps, and 12.2Kbps.

When completed with the settings on this page, click **Save** to enable the settings.

NOTE

- *The Network Camera offers two inputs to capture audio - internal microphone or external microphone. The internal/external microphone switch is located on the back panel of the Network Camera.*

Motion Detection

This section explains how to configure the Network Camera to enable motion detection. A total of three motion detection windows can be configured.



Follow the steps below to enable motion detection:

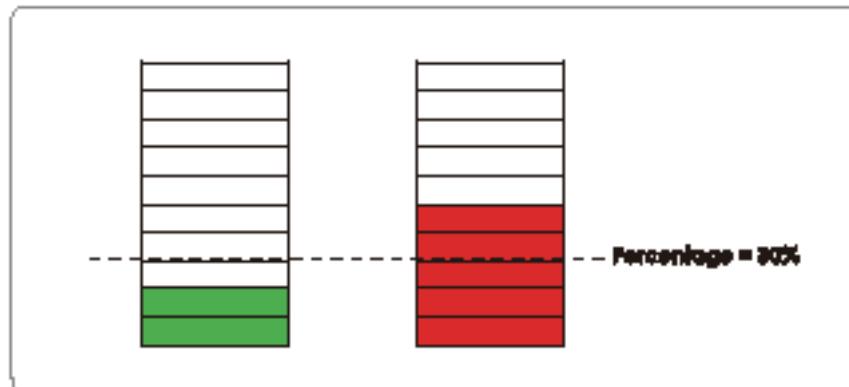
1. Click **New** to add a new motion detection window.
2. In the Window Name text box, enter a name for the motion detection window.
 - To move and resize the window, drag and drop your mouse on the window.
 - To delete window, click X on the top right corner of the window.
3. Define the sensitivity to moving objects and the space ratio of all alerted pixels by moving the Sensitivity and Percentage slider bar.
4. Click **Save** to enable the settings.
5. Select **Enable motion detection** to enable this function.

For example:



The Percentage Indicator will rise or fall depending on the variation between sequential images. When motions are detected by the Network Camera and are judged to exceed the defined threshold, the red bar rises. Meanwhile, the motion detection window will be outlined in red. Photos or videos can be captured instantly and configured to be sent to a remote server (Email, FTP) by utilizing this feature as a trigger source. For more information on how to set an event, please refer to Application on page 65.

A green bar indicates that even though motions have been detected, the event has not been triggered because the image variations still fall under the defined threshold.



NOTE

► How does motion detection work?



There are two motion detection parameters: *Sensitivity* and *Percentage*. In the illustration above, frame A and frame B are two sequential images. Pixel differences between the two frames are detected and highlighted in gray (frame C) and will be compared with the sensitivity setting. *Sensitivity* is a value that expresses the sensitivity to moving objects. Higher sensitivity settings are expected to detect slight movements while smaller sensitivity settings will neglect them. When the sensitivity is set to 70%, the Network Camera defines the pixels in the purple areas as "alerted pixels" (frame D).

Percentage is a value that expresses the proportion of "alerted pixels" to all pixels in the motion detection window. In this case, 50% of pixels are identified as "alerted pixels". When the percentage is set to 30%, the motions are judged to exceed the defined threshold; therefore, the motion window will be outlined in red.

For applications that require a high level of security management, it is suggested to use higher sensitivity settings and smaller percentage values.

Camera Control

This section explains how to control the Network Camera's Pan/Tilt/Zoom/Focus operation via the control panel and how to preset positions.

Preset Locations

On this page, you can preset positions for the Network Camerato go to directly or patrol. A total of 128 preset positions can be configured.

Please follow the steps below to preset a position:

1. Adjust the shooting area to a desired position using the buttons on the right side of the window.
2. Click **Set as home** or **Default home** to define your home position.
3. Enter a name for the preset position, which allows for up to forty characters. Click **Add** to enable the settings. The preset positions will be displayed under the Preset Location list on the left-hand side.
4. To add additional preset positions, please repeat step 1~3.
5. To remove a preset position from the list, select it from the drop-down list and click **Delete**.
6. Click **Save** to enable the settings.

The screenshot shows the camera control interface. On the left is a live video feed of a living room. To the right are various control buttons and dropdown menus. A yellow box highlights the control buttons: Up, Left, Home, Right, Down, Zoom (+/-), Focus (+/-), and Iris (+/-). Below these are dropdown menus for Pan speed (0), Tilt speed (0), Zoom speed (0), Focus speed (0), and Auto pan/patrol speed (1). At the bottom left are three checkboxes: Digital zoom (checked), Zoom times display (unchecked), and Return to home position while idle (unchecked). A circled number 1 points to the control buttons.

1 functions are the same as the control panel on home page

The screenshot shows the Patrol settings page. It features a grid with two columns: 'Preset locations' and 'Selected locations'. Under 'Preset locations', there is a large empty box. Under 'Selected locations', there are two smaller boxes labeled 'Source' and 'Dwelling time'. Below the grid are buttons for 'Select', 'Remove', 'Up', 'Down', and 'Update'. A circled number 3 points to the 'Preset locations' column. A circled number 6 points to the 'Save' button at the bottom left.

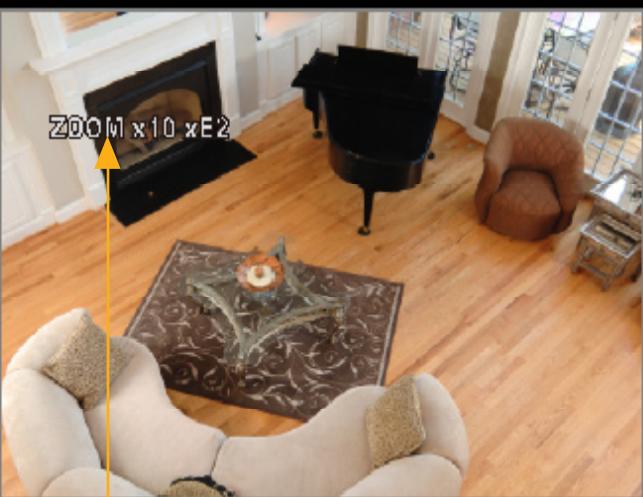
The screenshot shows the Preset position configuration page. It includes fields for 'Home definition' (with 'Set as home' and 'Default home' buttons), 'Preset position name' (with an input field and 'Add' button), and 'Preset Position' (with a dropdown menu and 'Delete' button). A circled number 2 points to the 'Home definition' buttons. A circled number 3 points to the 'Preset position name' input field. A circled number 5 points to the 'Delete' button.

Patrol Settings

You can select preset locations for the Network Camera to patrol.

Please follow the steps below to set up a patrol schedule:

1. Click a preset location on the list and click **Select**.
2. The selected preset locations will be displayed on the **Selected locations** list.
3. Set the **Dwelling time** for the preset location during auto patrol. The default value is 10 seconds. You can also manually set a value and click **Update**.
4. Repeat step 1 and 3 to select additional preset locations.
5. If you want to delete a selected location, select it from the list and click **Remove**.
6. Select a location and click **Up** or **Down** to rearrange the patrol order.
7. Adjust the **Auto pan/patrol speed**. (1~5 seconds)
8. Click **Save** to enable the settings.

(TCP-AW) 2009/06/18 15:29:47


Digital zoom

Zoom times display

Return to home position while idle

Time span for idle duration: (1~999) seconds

Patrol settings			
Preset locations		Selected locations	
		Source	Dwelling time
1	Up Right Down Left	Right Left	10 3
	<input type="button" value="Select"/>	<input type="button" value="Remove"/>	<input type="button" value="3"/>
		<input type="button" value="Up"/>	<input type="button" value="Down"/>
			<input type="button" value="Update"/>

8

Up Left Home Right

- Zoom +

- Focus +

- Iris +

Pan speed 0

Tilt speed 0

Zoom speed 0

Focus speed 0

Auto pan/patrol speed 1
7

Home definition:

Preset position name:

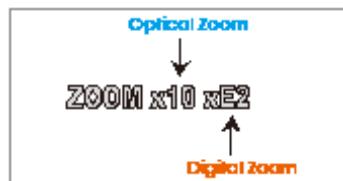
Preset Position:

Digital Zoom

If you check this option and click the **Save** button, the digital zoom function of CCD module will be enabled.

Zoom Times Display

If you check this item and click the **Save** button, the zoom indicator will be displayed on the screen when you zoom in/out as shown in the illustration above. Please remember to click **Save** to enable the settings.



Return to Home Position while Idle

If you select this option, the Network Camera will automatically return to the home position after idling for a specific time span. Please remember to click **Save** to enable the settings.

- The Preset Locations will be displayed on the Home page:



- Click **GO TO**. The network camera will move to the preset location.
- Click **Patrol**: The Network Camera will patrol among the selected preset positions (from right to left) for once.

Homepage Layout Advanced Mode

This section explains how to set up your own customized homepage layout.

Preview

This column shows the settings of your homepage layout. You can manually select the background and font colors in Theme Options, the third column on this page. The settings will automatically show up in this Preview field. The following shows the homepage using the default settings:



- Hide Powered by LevelOne: If you check this item, it will be removed from the homepage.

Logo

Here you can change the logo at the top of your homepage.

The screenshot shows a configuration panel for a logo. At the top, a heading "Logo graph" is followed by a yellow-bordered note: "You can upload a small logo(Gif, JPG or PNG), which will be resized to 160x50 pixels (if it is not already that size) and which will be visible on the main page. Upload a new logo will replace the old custom logo (if there was one uploaded)". Below this are two radio buttons: "Default" (unchecked) and "Custom" (checked). Under "Custom", there is a preview image of the LevelOne logo, a "Browse..." button, and an "Upload" button. At the bottom is a "Logo link:" input field.

Follow the steps below to upload a new logo:

1. Click **Custom** and the Browse field will appear.
2. Select a logo from your files.
3. Click **Upload** to replace the existing logo with a new one.
4. Enter a website link if necessary.
5. Click **Save** to enable the settings.

Theme Options

Here you can change the color of your homepage layout. There are three types of preset patterns for you to choose from. The new layout will simultaneously appear in the **Preview** field. Click **Save** to enable the settings.

Preset Patterns

Theme Options

Themes

- Preset Patterns
-
-
- Custom

Color:

Font color:	#000000
Font color of configuration area:	#ffff
Font color of video title:	#098bd6
Bk color of control area:	#c4eaff
Bk color of configuration area:	#0186D1
Bk color of video area:	#c4eaff
Frame color:	#0186D1

Save

Preview

Font color

Background Color of the Configuration Area

Background Color of the Control Area

Font Color of the Video Title

Background Color of the Video Area

Frame Color

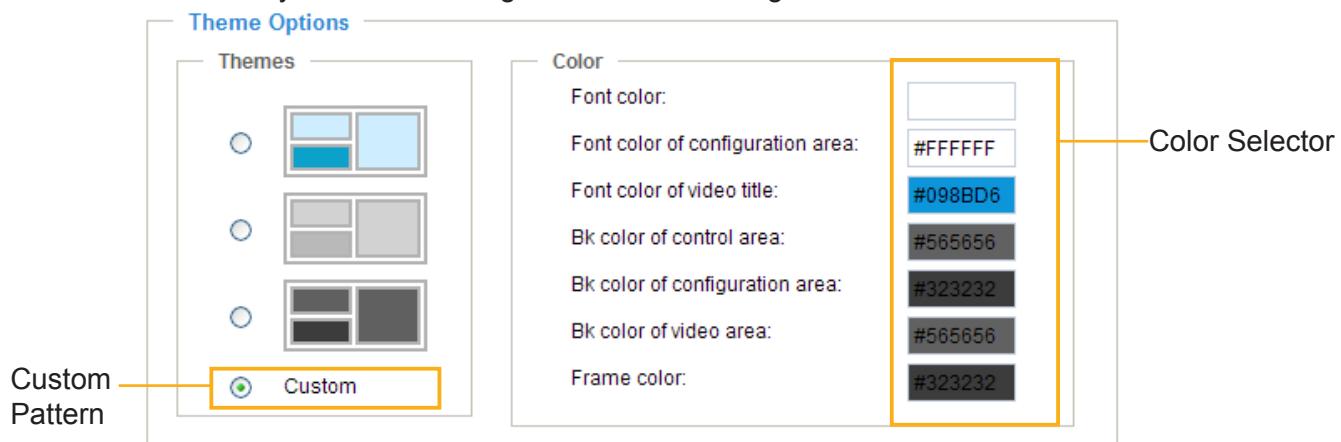
Preview

Preview

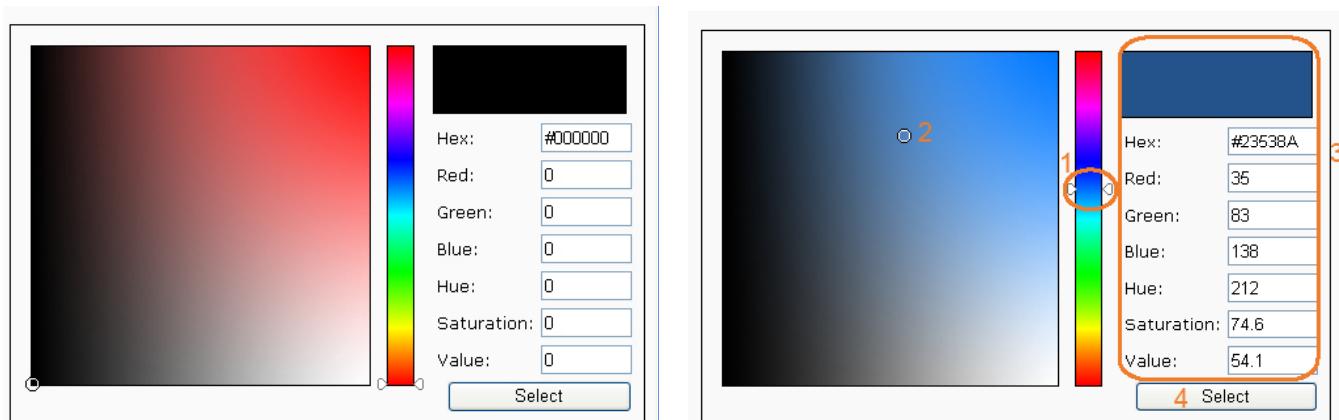
Preview

■ Follow the steps below to set up the customized homepage:

1. Click **Custom** on the left column.
2. Click the field where you want to change the color on the right column.



3. The palette window will pop up as shown below.



4. Drag the slider bar and click on the left square to select a desired color.

5. The selected color will show up in the corresponding fields and in the **Preview** column.

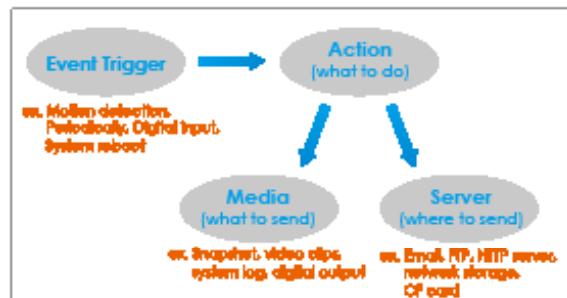
6. Click **Save** to enable the settings.

Application

Advanced Mode

This section explains how to configure the Network Camera to react in response to particular situations (event). A typical application is that when a motion is detected, the Network Camera sends buffered images to a FTP server or e-mail address as notifications.

In the illustration on the right, an event can be triggered by many sources, such as motion detection or external digital input devices. When an event is triggered, you can specify what type of action that will be performed. You can configure the Network Camera to send snapshots or videos to your email address or FTP site.



Event Settings

Name	Status	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time	Trigger

Add Help

Customized Script

Name	Date	Time

Add Delete

Customized Script

This function allows you to upload a sample script (.xml file) to the webpage, which will save your time on configuring the settings. Please note that there is a limited number of customized scripts you can upload; if the current amount of customized scripts has reached the limit, an alert message will pop up. If you need more information, please ask for LevelOne's technical support.

Customized Script

Name	Date	Time
User1	20081113	18:13:46
User2	20081113	18:11:32

Click to upload a file Add User1 Delete

Click to modify the script online

```
<?xml version="1.0" encoding="UTF-8"?>
<eventmgr version="0102">
<maxprocess>1</maxprocess>
<!-- from 08:30:00-20:30:00 on Monday to Friday every week -->
<schedule id="0">
<duration>
<weekday>1-5</weekday>
<time>08:30:00-20:30:00</time>
</duration>
</schedule>
<!-- Motion -->
<motion condition="0">
<status id="0">trigger</status>
<status id="1">trigger</status>
</motion>
<event id="0">
<description>Mail system log to email address</description>
<condition>c0</condition>
<scheduleno>0</scheduleno>
<delay>10</delay>

```

Upload

Event Settings

In the **Event Settings** column, click **Add** to open the **Event Settings** page. On this page, you can arrange three elements -- Trigger, Schedule, and Action to set an event. A total of 3 event settings can be configured.

Priority:

Detect next event after second(s).

Note: This can only applied to motion detection and digital input

Trigger

- Video motion detection
- Periodically
- Digital input
- System boot
- Recording notify

Event Schedule

Sun Mon Tue Wed Thu Fri Sat

Time

- Always
- From to [hh:mm]

Action

Trigger digital output for seconds

Move to preset location:

Note: Please configure [Preset location](#) first

Event name: Enter a name for the event setting.

Enable this event: Select this option to enable the event setting.

Priority: Select the relative importance of this event (High, Normal, or Low). Events with a higher priority setting will be executed first.

Detect next event after □ seconds: Enter the duration in seconds to pause motion detection after a motion is detected.

An event is an action initiated by a user-defined trigger source; it is the causal arrangement of the following three elements: Trigger, Event Schedule, and Action.

Trigger

This is the cause or stimulus which defines when to trigger the Network Camera. The trigger source can be configured to use the Network Camera's built-in motion detection mechanism or external digital input devices.

There are several choices of trigger sources as shown below. Select the items to display the detailed configuration options.

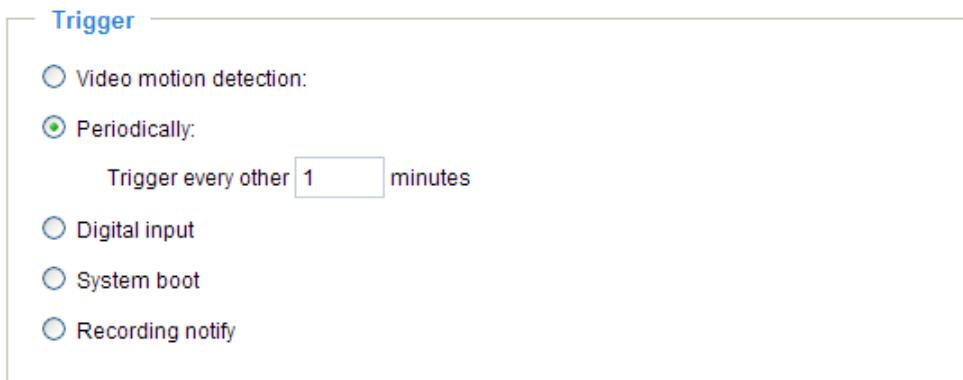
■ Video motion detection

This option makes use of the built-in motion detection mechanism as a trigger source. To enable this function, you need to configure a Motion Detection Window first. For more information, please refer to Motion Detection on page 57 for details.



■ Periodically

This option allows the Network Camera to trigger periodically for every other defined minute. Up to 999 minutes are allowed.



■ Digital input

This option allows the Network Camera to use an external digital input device or sensor as a trigger source. Depending on your application, there are many choices of digital input devices on the market which helps to detect changes in temperature, vibration, sound and light, etc.

■ System boot

This option triggers the Network Camera when the power to the Network Camera is disconnected.

■ Recording notify

This option allows the Network Camera to trigger when the recording disk is full or when recording starts to rewrite older data. If you want receive **Recording notify message**, please refer to page 76 for detailed information.

Event Schedule

Specify the period for the event.

Event Schedule

Sun Mon Tue Wed Thu Fri Sat

Time

Always
 From to [hh:mm]

- Select the days of the week.
- Select the recording schedule in 24-hr time format.

Action

Define the actions to be performed by the Network Camera when a trigger is activated.

Action

Trigger digital output for seconds
 Move to preset location:

Note: Please configure [Preset location](#) first

- Trigger digital output for □ seconds
Select this option to turn on the external digital output device when a trigger is activated. Specify the length of the trigger interval in the text box.
- Move to preset location
Select this option, the Network Camera will move to the preset location when a trigger is activated. Please setup the preset locations first. Please refer to Preset Locations on page 59 for detailed information.

To set an event with recorded video or snapshots, it is necessary to configure the server and media settings so that the Network Camera will know what action to take (such as which server to send the media files to) when a trigger is activated.

- Add Server / Add Media
Click **Add Server** to configure [Server Settings](#). For more information, please refer to Server Settings on page 71.
Click **Add Media** to configure [Media Settings](#). For more information, please refer to Media Settings on page 74.

Here is an example of Event Settings page:

Event name:

Enable this event

Priority:

Detect next event after second(s).

Note: This can only applied to motion detection and digital input

Trigger

Video motion detection
 Periodically
 Digital input
 System boot
 Recording notify

Event Schedule

Sun Mon Tue Wed Thu Fri Sat

Time

Always
 From to [hh:mm]

Action

Trigger digital output for seconds

Move to preset location:

Note: Please configure [Preset locations](#) first

Server	Media	Extra parameter
<input type="checkbox"/> FTP <input type="button" value="----None----"/>	<input type="checkbox"/> Create folders by date time and hour automatically	
<input type="checkbox"/> NAS <input type="button" value="----None----"/>	<input type="button" value="View"/>	
<input type="checkbox"/> Email <input type="button" value="----None----"/>		
<input type="checkbox"/> HTTP <input type="button" value="----None----"/>		

When completed, click **Save** to enable the settings and click **Close** to exit Event Settings page. The new event settings / server settings / media settings will appear in the event drop-down list on the Application page.

Here is an example of Application page with an event setting:

The screenshot shows the Application page with four main sections:

- Event Settings**: A table showing an event named "Event1" with status "ON". The table includes columns for Name, Status, Sun, Mon, Tue, Wed, Thu, Fri, Sat, Time, and Trigger. The trigger is set to "motion". Buttons for Add, Event1 (dropdown), Delete, and Help are at the bottom.
- Server Settings**: A table listing servers with their types and addresses. The servers are: NAS (ns, \\192.168.5.122\nas), FTP (ftp), Email (email), and HTTP (http, http://192.168.3.10/cgi-bin/upload.cgi). Buttons for Add, FTP (dropdown), and Delete are at the bottom.
- Media Settings**: A table listing media types. The media types are: Snapshot (snapshot), Video Clip (videoclip), Recording notify (recordmsg), and System log (systemlog). Buttons for Add, Snapshot (dropdown), and Delete are at the bottom.
- Customized Script**: A table with columns for Name, Date, and Time. Buttons for Add, (dropdown), and Delete are at the bottom.

When the Event Status is **ON**, once an event is triggered by motion detection, the Network Camera will automatically send snapshots via e-mail.

If you want to stop the event trigger, you can click **ON** to turn it to **OFF** status or click **Delete** to remove the event setting.

To remove a server setting from the list, select a server name from the drop-down list and click **Delete**. Note that only when the server setting is not being applied to an event setting can it be deleted.

To remove a media setting from the list, select a media name from the drop-down list and click **Delete**. Note that only when the media setting is not being applied to an event setting can it be deleted.

Server Settings

Click **Add Server** on Event Settings page to open the Server Setting page. On this page, you can specify where the notification messages are sent when a trigger is activated. A total of 5 server settings can be configured.

Server name: Enter a name for the server setting.

Server Type

There are four choices of server types available: Email, FTP, HTTP, and Network storage. Select the item to display the detailed configuration options. You can configure either one or all of them.

Email: Select to send the media files via email when a trigger is activated.

Server name:

Server Type

Email:

 Sender email address:

 Recipient email address:

 Server address:

 User name:

 Password:

 Server port:

This server requires a secure connection (SSL)

FTP:

HTTP:

Network storage:

- Sender email address: Enter the email address of the sender.
- Recipient email address: Enter the email address of the recipient.
- Server address: Enter the domain name or IP address of the email server.
- User name: Enter the user name of the email account if necessary.
- Password: Enter the password of the email account if necessary.
- Server port: The default mail server port is set to 25. You can also manually set another port.

If your SMTP server requires a secure connection (SSL), check **This server requires a secure connection (SSL)**.

To verify if the email settings are correctly configured, click **Test**. The result will be shown in a pop-up window. If successful, you will also receive an email indicating the result.



Click **Save** to enable the settings, then click **Close** to exit the page.

FTP: Select to send the media files to an FTP server when a trigger is activated.

Server name:

Server Type

Email:
 FTP:

Server address:

Server port:

User name:

Password:

FTP folder name:

Passive mode

HTTP:
 Network storage:

- Server address: Enter the domain name or IP address of the FTP server.
- Server port
By default, the FTP server port is set to 21. It can also be assigned to another port number between 1025 and 65535.
- User name: Enter the login name of the FTP account.
- Password: Enter the password of the FTP account.
- Remote folder name
Enter the folder where the media file will be placed. If the folder name does not exist, the Network Camera will create one on the FTP server.
- Passive mode
Most firewalls do not accept new connections initiated from external requests. If the FTP server supports passive mode, select this option to enable passive mode FTP and allow data transmission to pass through the firewall.

To verify if the FTP settings are correctly configured, click **Test**. The result will be shown in a pop-up window as shown below. If successful, you will also receive a test.txt file on the FTP server.



Click **Save** to enable the settings, then click **Close** to exit the page.

HTTP: Select to send the media files to an HTTP server when a trigger is activated.

Server name:

Server Type

Email:
 FTP:
 HTTP:
URL:
User name:
Password:

Network storage:

Test **Save** **Close**

- URL: Enter the URL of the HTTP server.
- User name: Enter the user name if necessary.
- Password: Enter the password if necessary.

To verify if the HTTP settings are correctly configured, click **Test**. The result will be shown in a pop-up window as below. If successful, you will receive a test.txt file on the HTTP server.



Click **Save** to enable the settings, then click **Close** to exit the page.

Network storage: Select to send the media files to a network storage location when a trigger is activated. Please refer to **Network Storage Setting** on page 78 for details.

Click **Save** to enable the settings, then click **Close** to exit the page.

When completed, the new server settings will automatically be displayed on the Event Settings page. For example:

Add Server Add Media

Server	Media	Extra parameter
<input type="checkbox"/> FTP <input type="button" value="----None----"/>		
<input type="checkbox"/> NAS <input type="button" value="----None----"/>	<input type="checkbox"/> Create folders by date time and hour automatically <input type="button" value="View"/>	
<input type="checkbox"/> Email <input type="button" value="----None----"/>		
<input type="checkbox"/> HTTP <input type="button" value="----None----"/>		

Media Settings

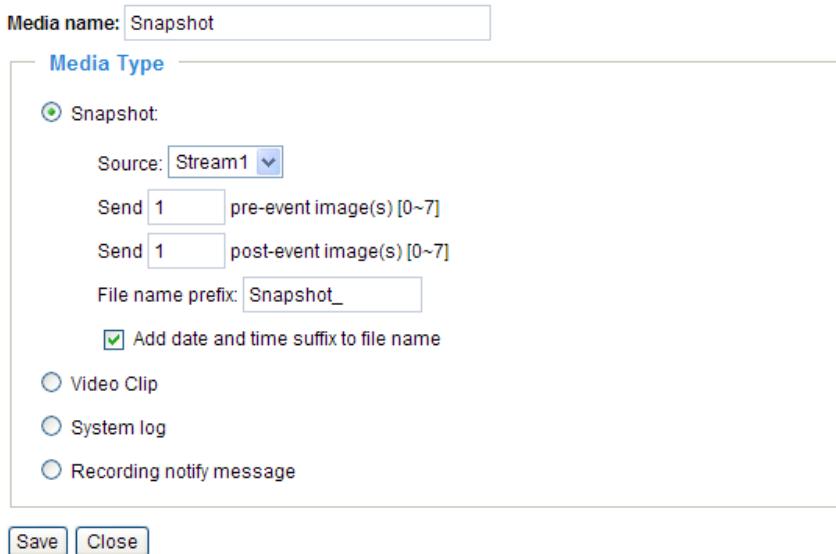
Click **Add Media** on the Event Settings page to open the Media Settings page. On this page, you can specify the type of media that will be sent when a trigger is activated. A total of 5 media settings can be configured.

Media name: Enter a name for the media setting.

Media Type

There are three choices of media types available: Snapshot, Video clip, and System log. Select the item to display the detailed configuration options. You can configure either one or all of them.

Snapshot: Select to send snapshots when a trigger is activated.



■ Source: Select to take snapshots from stream 1 or stream 2.

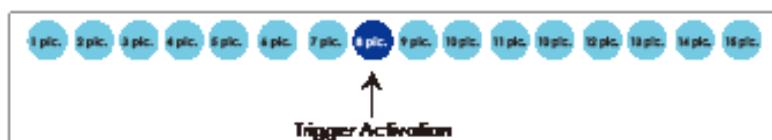
■ Send pre-event images

The Network Camera has a buffer area; it temporarily holds data up to a certain limit. Enter a number to decide how many images to capture before a trigger is activated. Up to 7 images can be generated.

■ Send post-event images

Enter a number to decide how many images to capture after a trigger is activated. Up to 7 images can be generated.

For example, if both the Send pre-event images and Send post-event images are set to 7, a total of 15 images are generated after a trigger is activated.



■ File name prefix

Enter the text that will be appended to the front of the file name.

■ Add date and time suffix to the file name

Select this option to add a date/time suffix to the file name.

For example:



Click **Save** to enable the settings, then click **Close** to exit the page.

Video clip: Select to send video clips when a trigger is activated.

Media name: Video Clip

Media Type

Snapshot
 Video Clip

Source: Stream1

Pre-event recording: 0 seconds [0~9]

Maximum duration: 5 seconds [1~10]

Maximum file size: 500 Kbytes [50~800]

File name prefix: Video Clip_

System log
 Recording notify message

Save **Close**

■ Source: Select to record video clips from stream 1 or stream 2.

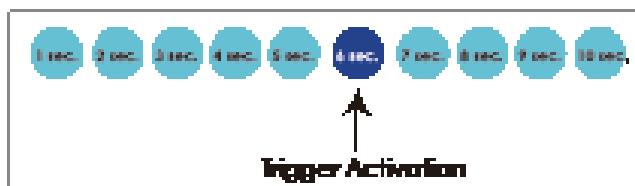
■ Pre-event recording

The Network Camera has a buffer area; it temporarily holds data up to a certain limit. Enter a number to decide the duration of recording before a trigger is activated. Up to 9 seconds can be set.

■ Maximum duration

Specify the maximum recording duration in seconds. Up to 10 seconds can be set.

For example, if pre-event recording is set to five seconds and the maximum duration is set to ten seconds, the Network Camera continues to record for another 4 seconds after a trigger is activated.



■ Maximum file size

Specify the maximum file size allowed.

■ File name prefix

Enter the text that will be appended to the front of the file name.

For example:

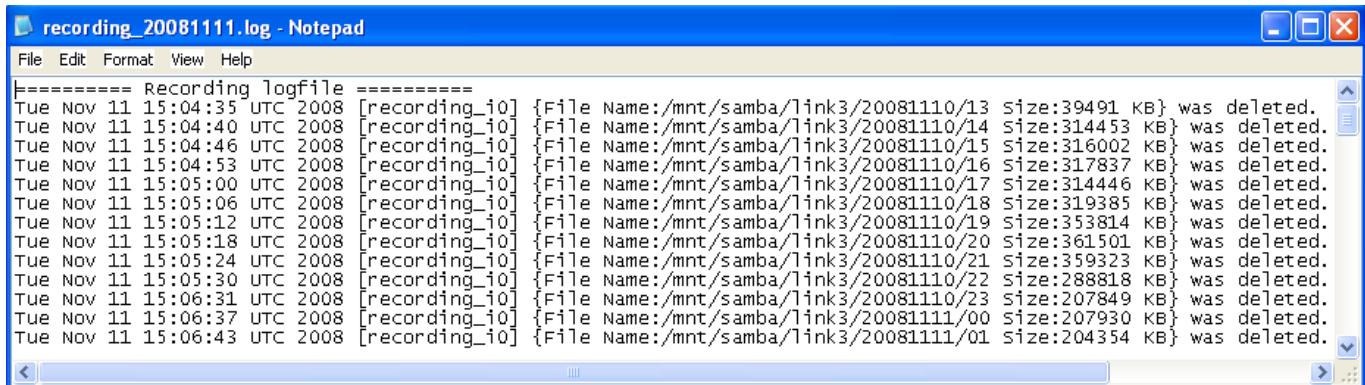


Click **Save** to enable the settings, then click **Close** to exit the page.

System log: Select to send a system log when a trigger is activated.

Click **Save** to enable the settings, then click **Close** to exit the page.

Recording notify message: Select to send a recording notification message when a trigger is activated. The following is an example of a recording notification message (.txt file), which shows a list of deleted previously-recorded data due to cycle recording.



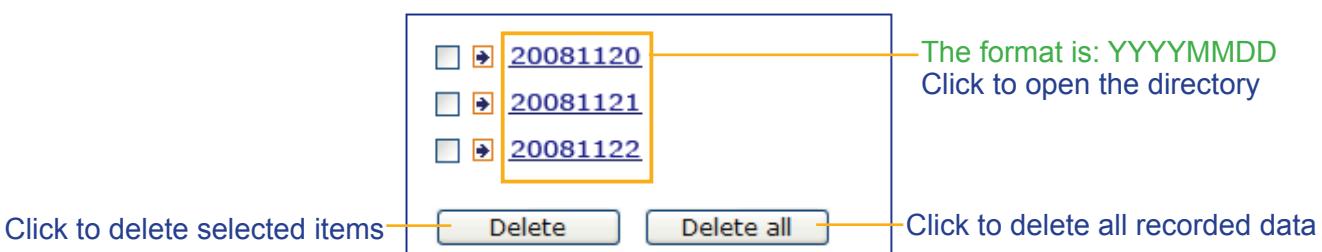
```
===== Recording logfile =====
Tue Nov 11 15:04:35 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/13 size:39491 KB} was deleted.
Tue Nov 11 15:04:40 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/14 size:314453 KB} was deleted.
Tue Nov 11 15:04:46 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/15 size:316002 KB} was deleted.
Tue Nov 11 15:04:53 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/16 size:317837 KB} was deleted.
Tue Nov 11 15:05:00 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/17 size:314446 KB} was deleted.
Tue Nov 11 15:05:06 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/18 size:319385 KB} was deleted.
Tue Nov 11 15:05:12 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/19 size:353814 KB} was deleted.
Tue Nov 11 15:05:18 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/20 size:361501 KB} was deleted.
Tue Nov 11 15:05:24 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/21 size:359323 KB} was deleted.
Tue Nov 11 15:05:30 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/22 size:288818 KB} was deleted.
Tue Nov 11 15:06:31 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081110/23 size:207849 KB} was deleted.
Tue Nov 11 15:06:37 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081111/00 size:207930 KB} was deleted.
Tue Nov 11 15:06:43 UTC 2008 [recording_10] {File Name:/mnt/samba/link3/20081111/01 size:204354 KB} was deleted.
```

When completed, click **Save** to enable the settings and click **Close** to exit this page. The new media settings will appear on the Event Settings page.

You can continue to select a server and media type for the event.

Add Server	Add Media	
Server	Media	Extra parameter
<input type="checkbox"/> FTP	-----None----- None Snapshot Video Clip System log Recording notify	<input type="checkbox"/> Create folders by date time and hour automatically
<input type="checkbox"/> Email		
<input type="checkbox"/> HTTP		
<input type="checkbox"/> NAS	-----None-----	<input type="checkbox"/> View

- **Create folders by date, time, and hour automatically:** If you check this item, the system will generate folders automatically by date.
- **View:** Click this button to open a file list window. This function is only for Network Storage. The following is an example of a file destination with video clips:



Click [20081120](#) to open the directory:

The format is: HH (24r)

Click to open the file list for that hour

<	07	08	09	10	11	12	13	14	15	16	17	>
	file name	size	date	time								
<input type="checkbox"/>	Recording1_58.mp4	2526004	2008/11/20	07:58:28								
<input type="checkbox"/>	Recording1_59.mp4	2563536	2008/11/20	07:59:28								
	Delete	Delete all	Back									

Click to delete selected items

Click to go back to the previous level of the directory

Click to delete all recorded data

<	07	08	09	10	11	12	13	14	15	16	17	>
	file name	size	date	time								
<input type="checkbox"/>	Recording1_58.mp4	2526004	2008/11/20	07 58 28								
<input type="checkbox"/>	Recording1_59.mp4	2563536	2008/11/20	07 59 28								
	Delete	Delete all	Back									

The format is: File name prefix + Minute (mm)

You can set up the file name prefix on Media Settings page.
Please refer to page 74 for detailed information.

Recording Advanced Mode

This section explains how to configure the recording settings for the Network Camera.

Recording Settings

Recording Settings

Note: Before setup recording, you have to setup network storage first via [Server page](#)

Name	Status	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time	Source	Destination
Add	Delete										

NOTE

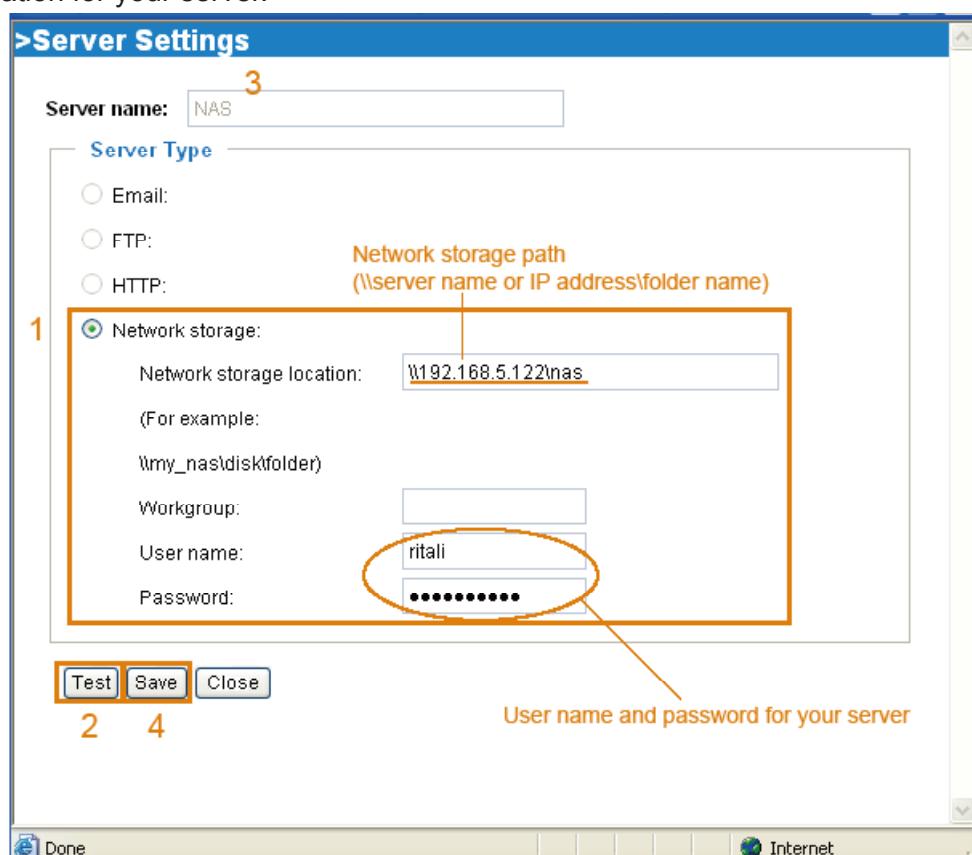
- Before setting up this page, please set up the Network Storage on the Server Settings page first.

Network Storage Setting

Click [Server](#) to open the Server Settings page and follow the steps below to set up:

1. Fill in the information for your server.

For example:

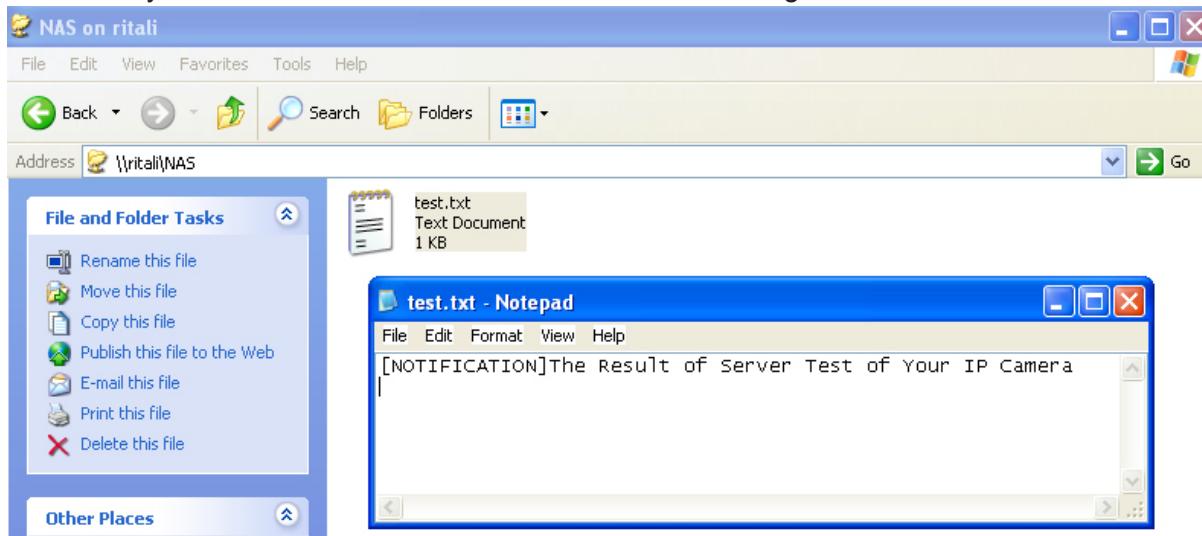


2. Click **Test** to check the setting. The result will be shown in the pop-up window.

http://192.168.5.151/cgi-bin/admin/testserver...
Mount successfully. Thanks

http://192.168.5.151/cgi-bin/admin/testserver...
Mount failed.

If successful, you will receive a test.txt file on the network storage server.



3. Enter a server name.
4. Click **Save** to complete the settings and click **Close** to exit the page.

Recording Settings

Click **Add** to open the recording setting page. On this page, you can define the recording source, recording schedule and recording capacity. A total of 2 recording settings can be configured.

Recording name: Video

Enable this recording

Priority: Normal

Source: Stream1

Recording Schedule

Sun Mon Tue Wed Thu Fri Sat

Time

Always
 From 00:00 to 24:00 [hh:mm]

Destination NAS

Capacity:

Entire free space
 Limit recording size in 100 Mbytes

File name prefix: Recording1_

Enable cyclic recording

Reserved amount: 15 Mbytes

Note: To enable recording notification please configure [Application](#) first

Save **Close**

Recording name: Enter a name for the recording setting.

Enable this recording: Select this option to enable video recording.

Priority: Select the relative importance of the recording setting (High, Normal, and Low).

Source: Select the recording source (stream 1 or stream 2).

Recording Schedule: Specify the recording duration.

- Select the days of the week.
- Select the recording start and end times in 24-hr time format.

Destination: You can select the network storage to store the recorded video files.

Capacity: You can choose either the “entire free space available” or “limit the recording size”. The recording size limit must be larger than the reserved amount for cyclic recording.

File name prefix: Enter the text that will be appended to the front of the file name.

Enable cyclic recording: If you check this item, when the maximum capacity is reached, the oldest file will be overwritten by the latest one. The reserved amount is reserved for cyclic recording to prevent malfunction. This value must be larger than 15 MBytes.

If you want to enable recording notification, please click [Application](#) to set up. Please refer to [Trigger > Recording notify](#) on page 67 for detailed information.

When completed, select **Enable this recording**. Click **Save** to enable the setting and click **Close** to exit this page. When the system begins recording, it will send the recorded files to the Network Storage. The new recording name will appear in the drop-down list on the recording page as shown below.

To remove a recording setting from the list, select a recording name from the drop-down list and click **Delete**.

Recording Settings

Note: Before setup recording, you have to setup network storage first via [Server](#) page

Name	Status	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time	Source	Destination
Video	ON	V	V	V	V	V	V	V	00:00~24:00	stream1	NAS

[Add](#) [Video](#) [Delete](#)

- Click [Video \(Name\)](#): Opens the Recording Settings page to modify.
- Click [ON \(Status\)](#): The Status will become [OFF](#) and stop recording.
- Click [NAS \(Destination\)](#): Opens the file list of recordings as shown below. For more information about folder naming rule, please refer to page 77 for details.

- [20081120](#)
- [20081121](#)
- [20081122](#)

[Delete](#) [Delete all](#)

System Log

Advanced Mode

This section explains how to configure the Network Camera to send the system log to the remote server as backup.

Remote Log

Remote Log

Enable remote log

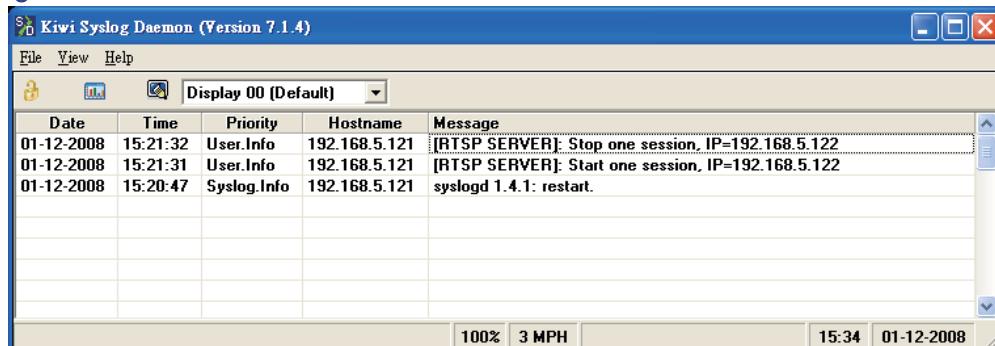
Log server settings

IP address:

port:

Save

You can configure the Network Camera to send the system log file to a remote server as a log backup. Before utilizing this feature, it is suggested that the user install a log-recording tool to receive system log messages from the Network Camera. An example is Kiwi Syslog Daemon. Visit <http://www.kiwisyslog.com/kiwi-syslog-daemon-overview/>.



Follow the steps below to set up the remote log:

1. In the IP address text box, enter the IP address of the remote server.
2. In the port text box, enter the port number of the remote server.
3. When completed, select **Enable remote log** and click **Save** to enable the setting.

Current Log

Current Log

Jun 30 13:46:52 syslogd 1.4.1: restart.
Jun 30 13:46:56 [DRM Service]: Starting DRM service.
Jun 30 13:47:06 [IR Cut Control]: Day mode
Jun 30 13:47:08 [IR Cut Control]: Day mode
Jun 30 13:47:09 [SYS]: Serial number = 0002D107258A
Jun 30 13:47:09 [SYS]: System starts at Mon Jun 30 13:47:09 UTC 2008
Jun 30 13:47:09 [NET]: === NET INFO ===
Jun 30 13:47:09 [NET]: Host IP = 192.168.5.151
Jun 30 13:47:09 [NET]: Subnet Mask = 255.255.255.0
Jun 30 13:47:09 [NET]: Gateway = 192.168.5.1
Jun 30 13:47:09 [NET]: Primary DNS = 192.168.0.10
Jun 30 13:47:09 [NET]: Secondary DNS = 192.168.0.20
Jun 30 13:47:10 [SYS]: Recording entry 0 stop
Jun 30 13:47:10 [SYS]: Recording entry 1 stop
Jun 30 13:47:11 [EVENT MGR]: reload config file
Jun 30 13:47:34 [Chronos]: Sync with NTP server failed!

This column displays the system log in chronological order. The system log is stored in the Network Camera's buffer area and will be overwritten when reaching a maximum limit.

View Parameters

Advanced Mode

The View Parameters page lists the entire system's parameters in alphabetical order. If you need technical assistance, please provide the information listed on this page.



Parameter List

```
system_hostname='Wireless Network Camera'
system_ledoff='0'
system_date='2009/05/21'
system_time='16:40:01'
system_datetime='052116382009.08'
system_ntp=''
system_timezoneindex='320'
system_daylight_enable='0'
system_daylight_dstactualmode='1'
system_daylight_auto_begintime='NONE'
system_daylight_auto_endtime='NONE'
system_daylight_timezones=',-360,-320,-280,-240,-241,-200,-201,-1
system_updateinterval='0'
system_info_modelname='PZ71x2'
system_info_extendedmodelname='PZ71x2'
system_info_serialnumber='0002D1778899'
system_info_firmwareversion='PZ71X2-VVTK-0102c'
system_info_language_count='9'
system_info_language_i0='English'
system_info_language_i1='Deutsch'
system_info_language_i2='Español'
system_info_language_i3='Français'
system_info_language_i4='Italiano'
system_info_language_i5='日本語'
system_info_language_i6='Português'
system_info_language_i7='简体中文'
system_info_language_i8='繁體中文'
system_info_language_i9=''
system_info_language_i10=''
system_info_language_i11=''
system_info_language_i12=''
system_info_language_i13=''
system_info_language_i14=''
system_info_language_i15=''
system_info_language_i16=''
system_info_language_i17=''
```

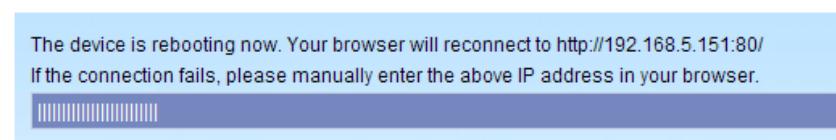
Maintenance

This chapter explains how to restore the Network Camera to factory default, upgrade firmware version, etc.

Reboot

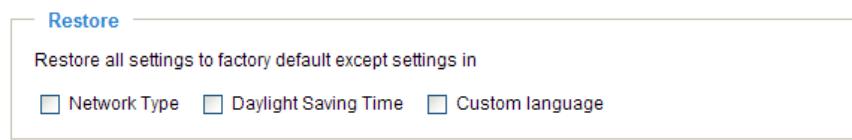


This feature allows you to reboot the Network Camera, which takes about one minute to complete. When completed, the live video page will be displayed in your browser. The following message will be displayed during the rebooting process.



If the connection fails after rebooting, manually enter the IP address of the Network Camera in the address field to resume the connection.

Restore



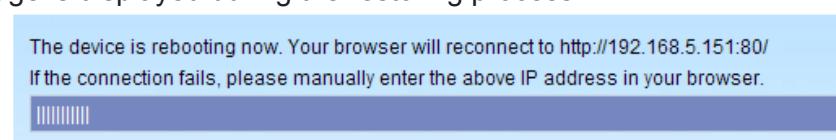
This feature allows you to restore the Network Camera to factory default settings.

Network Type: Select this option to retain the Network Type settings. (Please refer to Network Type on page 32.)

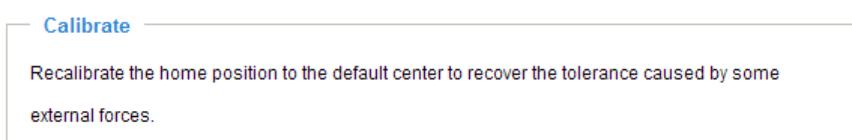
Daylight Saving Time: Select this option to retain the Daylight Saving Time settings. (Please refer to System on page 24.)

Custom Language: Select this option to retain the Custom Language settings.

If none of the options is selected, all settings will be restored to factory default. The following message is displayed during the restoring process.



Calibrate



This feature re-calibrate the home position to the default center to recover the any displacement caused by external forces. Please note that there is no confirm message box after clicking on Calibrate, and the Network Camera will calibrate immediately.

Export / Upload Files Advanced Mode

This feature allows you to Export / Upload daylight saving time rules, custom language files, and setting backup files.

Export files

Export daylight saving time configuration file	<input type="button" value="Export"/>
Export language file	<input type="button" value="Export"/>
Export setting backup file	<input type="button" value="Export"/>

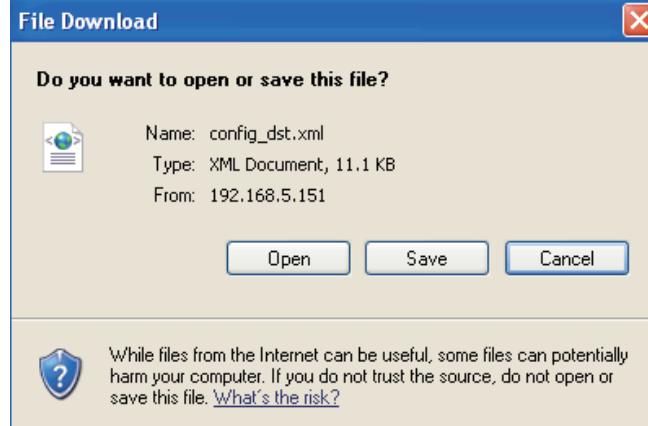
Upload files

Update daylight saving time rules	<input type="button" value="Browse..."/> <input type="button" value="Upload"/>
Update custom language file	<input type="button" value="Browse..."/> <input type="button" value="Upload"/>
Upload setting backup file	<input type="button" value="Browse..."/> <input type="button" value="Upload"/>

Export daylight saving time configuration file: Click to set the start and end time of DST.

Follow the steps below to export:

1. In the Export files column, click **Export** to export the daylight saving time configuration file from the Network Camera.
2. A file download dialog will pop up as shown below. Click **Open** to review the XML file or click **Save** to store the file for editing.



3. Open the file with Microsoft® Notepad and locate your time zone; set the start and end time of DST. When completed, save the file.

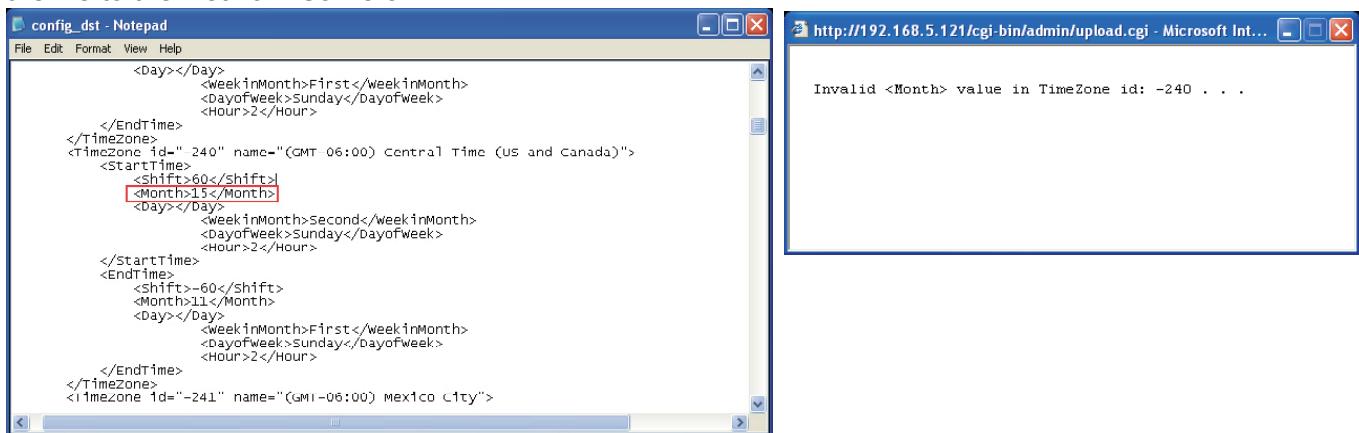
In the example below, DST begins each year at 2:00 a.m. on the second Sunday in March and ends at 2:00 a.m. on the first Sunday in November.

The screenshot shows a Microsoft Notepad window with the title "config_dst - Notepad". The content of the file is an XML document defining daylight saving time rules. A red box highlights the section for the Central Time zone (US and Canada). The XML code is as follows:

```
<Day></Day>
<Timezone id="-240" name="(GMT-06:00) Central Time (US and Canada)">
<StartTime>
<shift>-60</shift>
<Month>3</Month>
<Day></Day>
<weekInMonth>Second</weekInMonth>
<dayOfWeek>sunday</dayOfWeek>
<Hour>2</Hour>
</StartTime>
<EndTime>
<shift>-60</shift>
<Month>11</Month>
<Day></Day>
<weekInMonth>First</weekInMonth>
<dayOfWeek>sunday</dayOfWeek>
<Hour>2</Hour>
</EndTime>
</Timezone>
<Timezone id="-241" name="(GMT-06:00) Mexico City">
```

Upload daylight saving time rule: Click **Browse...** and specify the XML file to upload.

If the incorrect date and time are assigned, you will see the following warning message when uploading the file to the Network Camera.



The following message is displayed when attempting to upload an incorrect file format.



Export language file: Click to export language strings. LevelOne provides nine languages: English, Deutsch, Español, Français, Italiano, 日本語, Português, 簡體中文, and 繁體中文.

Upload custom language file: Click **Browse...** and specify your own custom language file to upload.

Export setting backup file: Click to export all parameters for the device and user-defined scripts.

Upload setting backup file: Click **Browse...** to upload a setting backup file. Please note that the model and firmware version of the device should be the same as the setting backup file. If you have set up a fixed IP or other special settings for your device, it is not suggested to upload a settings backup file.

Upgrade Firmware

A screenshot of a web-based configuration interface showing the 'Upgrade firmware' section. It includes a title bar 'Upgrade firmware', a 'Select firmware file' input field with a 'Browse...' button, and a large blue 'Upgrade' button.

This feature allows you to upgrade the firmware of your Network Camera. It takes a few minutes to complete the process.

Note: Do not power off the Network Camera during the upgrade!

Follow the steps below to upgrade the firmware:

1. Download the latest firmware file from the LevelOne website. The file is in .pkg file format.
2. Click **Browse...** and specify the firmware file.
3. Click **Upgrade**. The Network Camera starts to upgrade and will reboot automatically when the upgrade completes.

If the upgrade is successful, you will see "Reboot system now!! This connection will close". After that, re-access the Network Camera.

The following message is displayed when the upgrade has succeeded.

Reboot system now!!
This connection will close.

The following message is displayed when you have selected an incorrect firmware file.

Starting firmware upgrade...
Do not power down the server during the upgrade.
The server will restart automatically after the upgrade is completed.
This will take about 1 - 5 minutes.
Wrong PKG file format
Unpack fail