USER MANUAL

DCS-5220

VERSION 4.0

D-Link®

SURVEILLANCE

Table of Contents

Package Contents

- D-Link DCS-5220 Wireless PTZ Network Camera with 3G Mobile Video Support
- CAT5 Ethernet Cable
- Power Adapter
- Antenna
- Manual and Software on CD
- Quick Install Guide
- Camera Stand

Note: *Using a power supply with a different voltage than the one included with your product will cause damage and void the warranty for this product.*

If any of the above items are missing, please contact your reseller.

System Requirements

- Windows® XP or Windows® Vista
- At least 256MB of memory (512MB recommended)
- A wireless (802.11b or 802.11g) or Ethernet network
- Internet browser 6.x or higher Internet Web Browser
- VGA card resolution: 800x600 or above
- CPU: 1.3GHz or above processor (2.4GHz processor or higher with 512MB memory and a 32MB video card is required for multiple camera viewing and recording in IP surveillance program)

Introduction

The D-Link SECURICAM Network DCS-5220 Wireless PTZ Network Camera is a powerful surveillance system that connects wirelessly to your 802.11b/g network. The DCS-5220 features enhanced 802.11b/g and connects wirelessly at a rate of up to 54Mbps[1] (Megabits per second). The DCS-5220 differs from a conventional PC Camera because it is a standalone system with a built-in CPU and Web server, providing a low-cost solution capable of solving demanding security and home/office monitoring needs. Snapshot enables you to save images directly from a Web browser to a local hard drive without installing any additional software. With 1 lux light sensitivity, the DCS-5220 is capable of capturing video in rooms with minimal lighting. You can also zoom in with the DCS-5220's 4x digital zoom[2] feature. The DCS-5220 gives you the ability to monitor video and audio in your home/office using an Internet browser from any where in the world! Simple installation procedures, along with the built-in Web-based interface offers easy integration to your network environments.

Customers also have the ability to view live video streams from a compatible 3G cell phone. The live camera feed of the D-Link Wireless PTZ Network Camera can be pulled from the 3G cellular network by using a compatible cell phone with a 3G video player[3]. From anywhere within the 3G service area, both consumers and small businesses are offered a flexible and convenient way to remotely monitor a home or office in real time.

Note: *Use of audio or video equipment for recording the image or voice of a person without their knowledge and consent is prohibited in certain states or jurisdictions. Nothing herein represents a warranty or representation that the D-Link product provided herein is suitable for the end-user's intended use under the applicable laws of his or her state. D-Link disclaims any liability whatsoever for any end-user use of the D-Link product, which fails to comply with applicable state, local, or federal laws.*

[1] Maximum wireless signal rate derived from IEEE Standard 802.11b/g specifications. Actual data throughput will vary. Network conditions and environmental factors lower actual data throughput rate.

[2] 4x digital zoom enlarges an image by magnifying the pixels in a selected portion of the image by 4 times.

[3] 3G phone must be equipped with 3G video playback such as RealPlayer® or PacketVideo for Symbian or PocketPC.

Features

- 3G Compatibility: Offers customers the ability to view live video streams from a compatible 3G cell phone. The live camera feed can be pulled from a 3G cellular network by using a compatible cell phone with a 3G video player.
- Supports a Variety of Platforms: Supporting TCP/IP networking, SMTP e-mail, HTTP and other Internet related protocols, the DCS-5220 Network Camera can be integrated into other Internet/Intranet applications because of its standards-based features.
- Remote Snapshot Images/ Video Clip: You can save snapshots/video clips directly from the Web browser to a local hard drive without installing any additional software, making it convenient to instantly capture any moment from a remote location.
- Low Light Recording and 4x Digital Zoom: The DCS-5220's 0.5 lux light sensitivity allows you to capture video in rooms with minimal lighting, making it ideal for use at night time. The camera also features 4x digital zoom for closer viewing.
- Web Configuration: Using the Internet browser, administrators can configure and manage the Network Camera directly from its own Web page via the Intranet or the Internet. Up to 20 user names and passwords are permitted, with privilege settings controlled by the administrator.
- Powerful Surveillance and Remote Monitoring Utility: The powerful D-ViewCam software allows an administrator to modify the Network Camera settings from a remote site via the Intranet or the Internet. Administrators are capable of monitoring live video feeds as well as recording video and taking snapshots.
- Variety Data Archive: Record video clips directly onto a Network Attached Storage (NAS) or to a network-based computer. The DCS-5220 allows you to schedule both recorded video and snapshots to be uploaded onto an FTP server or sent via e-mail.
- Broad Range of Applications: With today's high-speed Internet, the Network Camera provides the ideal solution for live video images over the Intranet and Internet for remote monitoring. The DCS-5220 allows remote access from an Internet browser for live image viewing with audio and allows the administrator to manage and control the Network Camera anywhere and any time. Apply the Network Camera to monitor various objects and places such as homes, offices, banks, hospitals, child-care centers, amusement parks and other varieties of industrial and public monitoring. The Network Camera can also be used for intruder detection with its motion-detection mode, capture still images and video images for archiving and many more applications. The wireless capability enables you to place the camera where it is inconvenient to install network cables.

Hardware Overview

Antenna Connector

One antenna is included with the DCS-5220. It is fastened onto the antenna connector located on the back panel, which is used to provide a connection with a wireless network.

Microphone

The DCS-5220 Network Camera has a built-in internal microphone.

Power LED

As soon as the power Adapter is connected to the camera, the red LED and the green LED light will both appear steady on. As the camera is booting, a flashing red LED and steady green LED light will appear next.

The red LED will be turned off during self-test. Upon passing the self-test, a steady red LED and flashing green LED light will appear, indicating a good connection to the Ethernet port.

DC Power Connector

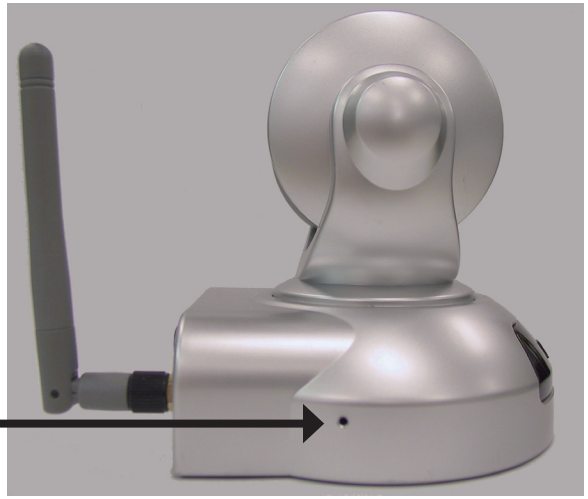
The DC Power input connector is labeled DC 12V with a single jack socket to supply power to the DCS-5220.

Ethernet Cable Connector

The DCS-5220 features a RJ-45 connector for connections to 10Base-T Ethernet cabling or 100Base-TX Fast Ethernet cabling. The port supports the NWay protocol, allowing the DCS-5220 to automatically detect or negotiate the transmission speed of the network.

Reset / Restore Button

Press this button to reset or restore the DCS-5220, please see page 104 for detail.



Hardware Installation

Connect an Ethernet cable to the Ethernet connector located on the Network Camera's back panel and attach it to the network.

Note: *It is required that an Ethernet cable is used during initial setup. Once your wireless configuration is set, you may disconnect the Ethernet cable and begin communicating wirelessly with your DCS-5220.*

Attach the external power supply to the DC power input connector located on the Network Camera's back panel (labeled DC 12V) and connect it to an AC power outlet.

Wireless Installation Considerations

The D-Link Wireless PTZ Network Camera lets you access your network using a wireless connection from virtually anywhere within the operating range of your wireless network. Keep in mind, however, that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF (radio frequency) noise in your home or business. The key to maximizing wireless range is to follow these basic guidelines:

1. Keep the number of walls and ceilings between the D-Link adapter and other network devices to a minimum - each wall or ceiling can reduce your adapter's range from 3-90 feet (1-30 meters.) Position your devices so that the number of walls or ceilings is minimized.

2. Be aware of the direct line between network devices. A wall that is 1.5 feet thick (.5 meters), at a 45-degree angle appears to be almost 3 feet (1 meter) thick. At a 2-degree angle it looks over 42 feet (14 meters) thick! Position devices so that the signal will travel straight through a wall or ceiling (instead of at an angle) for better reception.

3. Building Materials make a difference. A solid metal door or aluminum studs may have a negative effect on range. Try to position access points, wireless routers, and computers so that the signal passes through drywall or open doorways. Materials and objects such as glass, steel, metal, walls with insulation, water (fish tanks), mirrors, file cabinets, brick, and concrete will degrade your wireless signal.

4. Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.

5. If you are using 2.4GHz cordless phones or X-10 (wireless products such as ceiling fans, lights, and home security systems), your wireless connection may degrade dramatically or drop completely. Make sure your 2.4GHz phone base is as far away from your wireless devices as possible. The base transmits a signal even if the phone in not in use.

Configuration

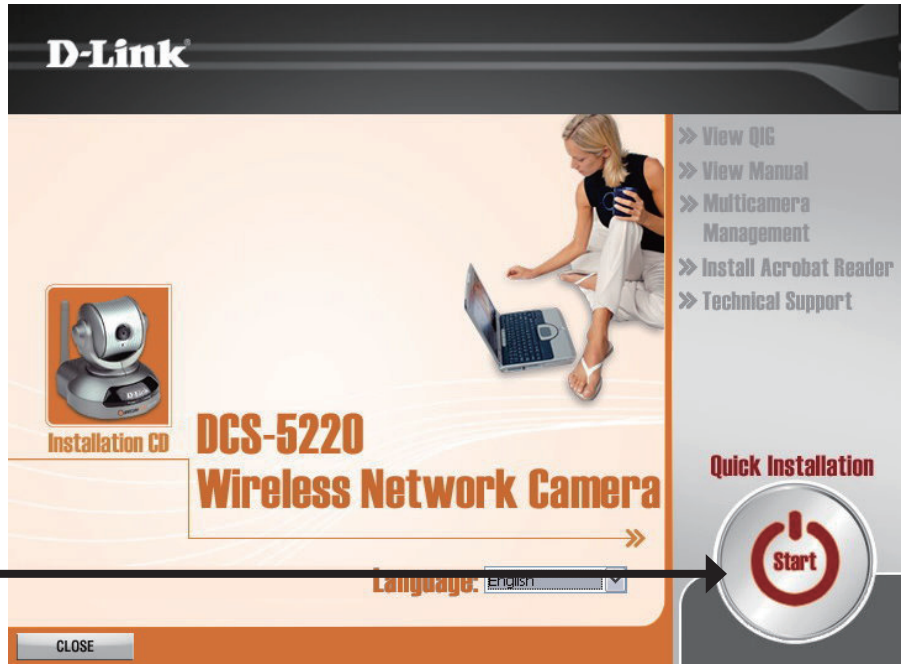
Turn on the computer and Insert the D-Link DCS-5220 Driver CD in the CD-ROM drive. The step-by-step instructions will help you to search and setup your Network camera smoothly and quickly.

If the CD Autorun function does not automatically start on your computer, click Windows® Start > Run. In the Run command box type “D:\DCS5220.exe”, where D: represents the drive letter of your CD-ROM. If it does start, proceed to the next screen.

D-Link Click’n Conenct (DCC)

DCC will show the MAC address and IP address of your DCS-5220. If you have a DHCP* server on your network, there will be a valid IP Address displayed at the end of DCC process. You can begin to use the Network camera now.

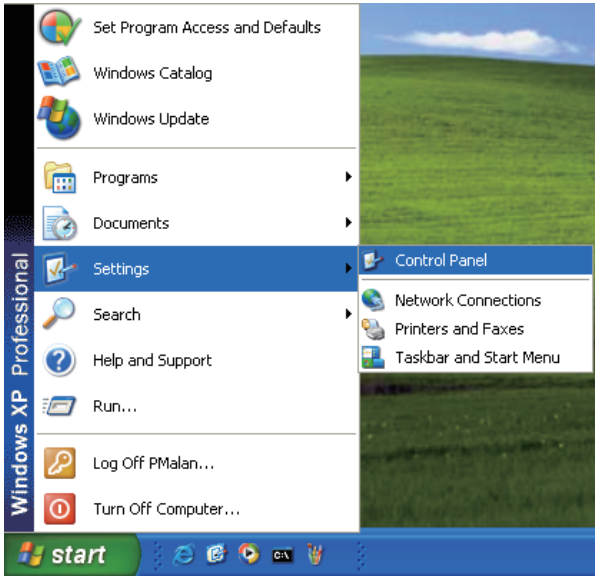
*A DHCP server is a device that supplies IP Addresses to its clients that are on the same network.



Click **Start**

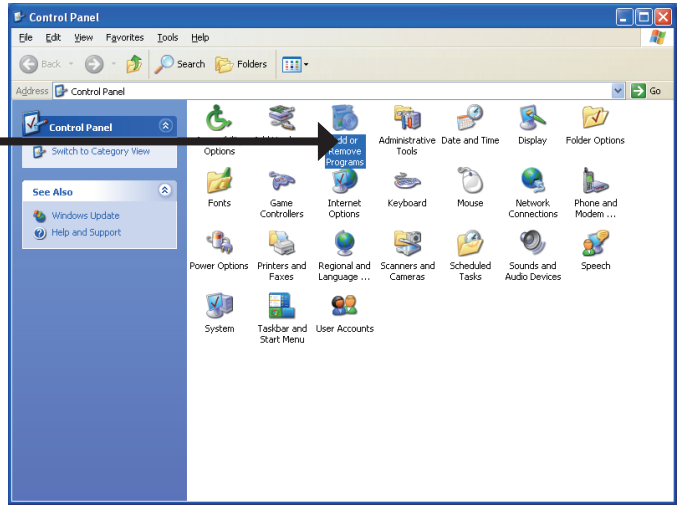
Enabling UPnP for Windows® XP, Vista (Optional)

UPnP (Universal Plug and Play) is a networking architecture that provides compatibility among networking equipment, software, and peripherals. The DCS-5220 is an UPnP enabled Network Camera. If your operating system is UPnP enabled, the device will be easier to configure. If you do not want to use the UPnP functionality, it can be disabled by unchecking the **Enabled UPnP** checkbox in the **Advanced > Network** page (see page 32). Use the following steps to enable UPnP settings only if you are running Windows® XP or above. If you are running Windows® 98/2000, UPnP is not available.

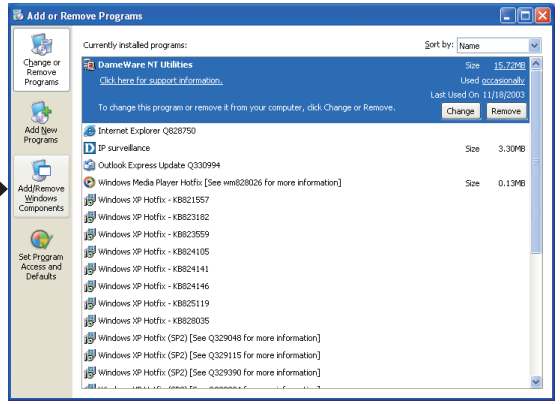


Go to **Start > Settings**. Click Control Panel.

Click **Add or Remove Programs**

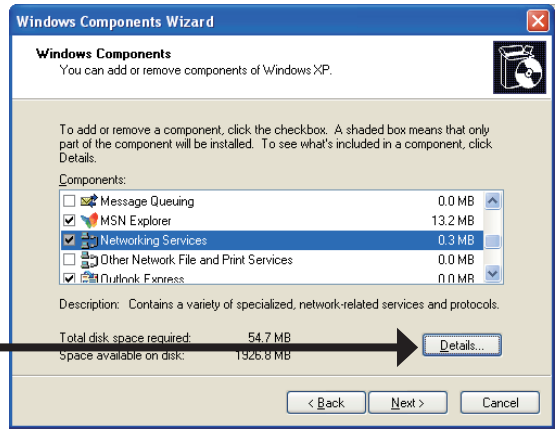


Click **Add/Remove Windows Components**



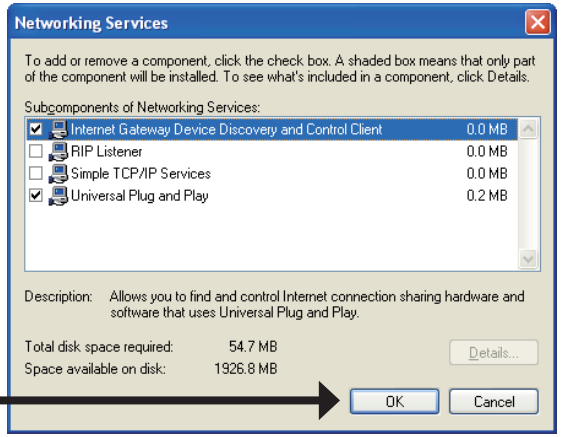
The following screen will appear.

Select Networking Services.

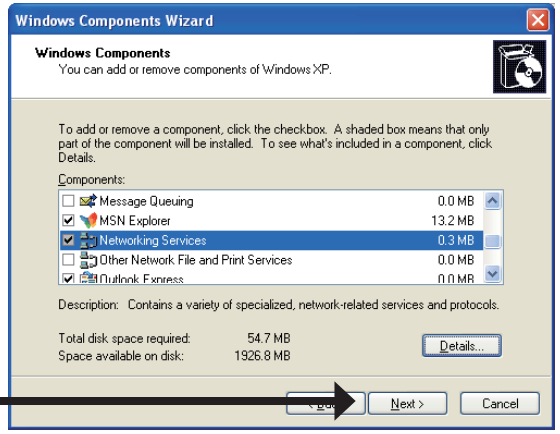


Click **Details**

Select Universal Plug and Play.

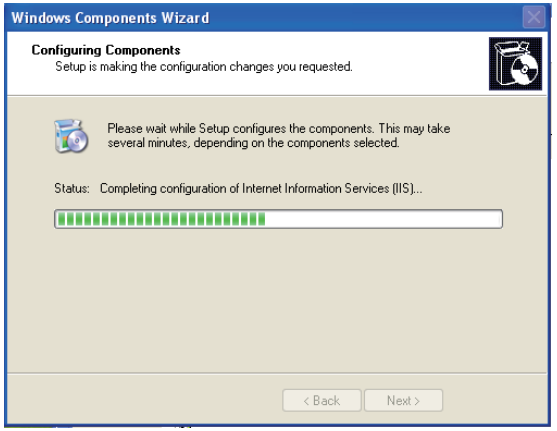


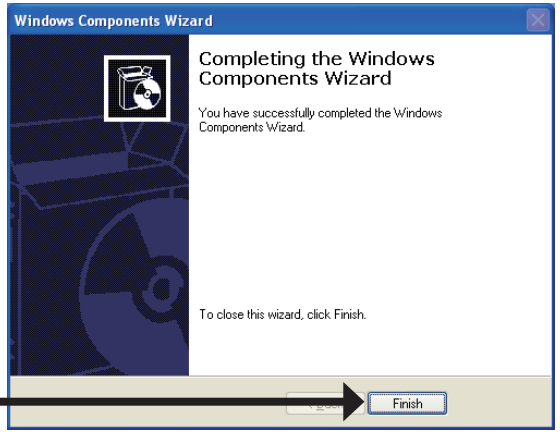
Click **OK**



Click **Next**

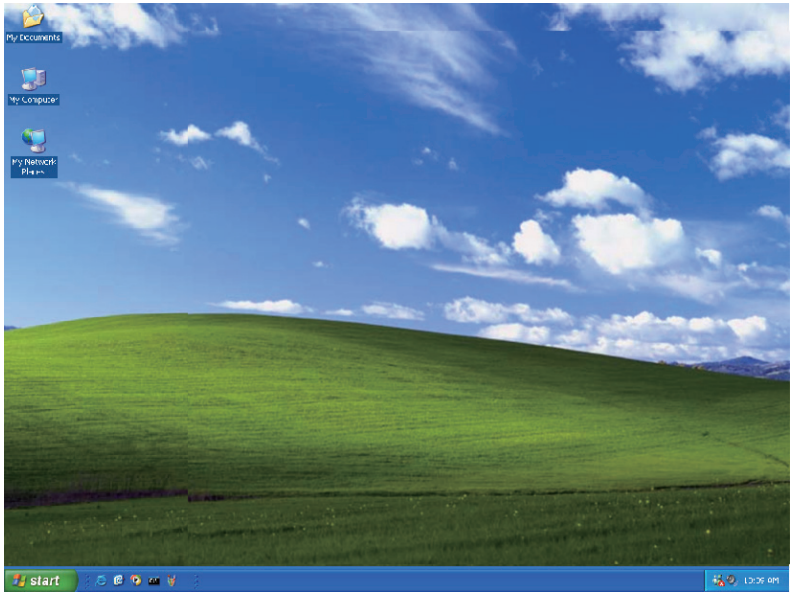
Please wait while Setup configures the components.



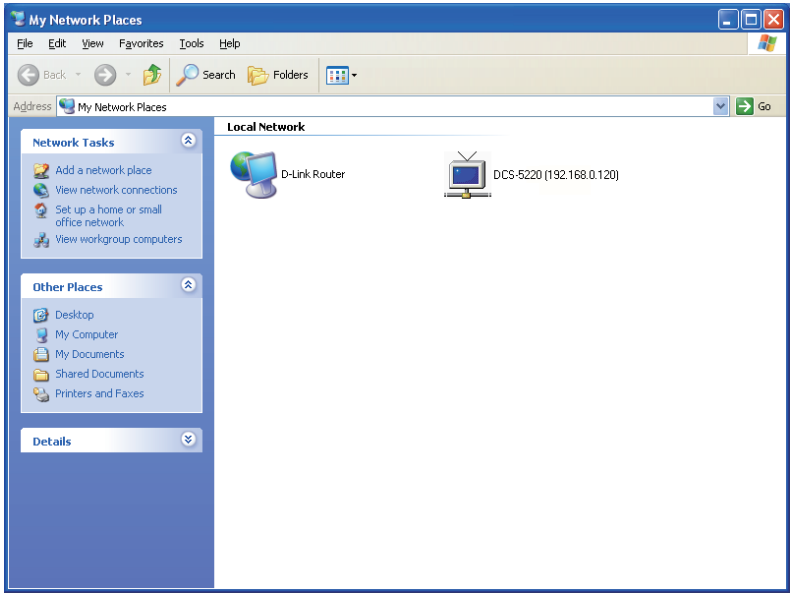


Click **Finish**

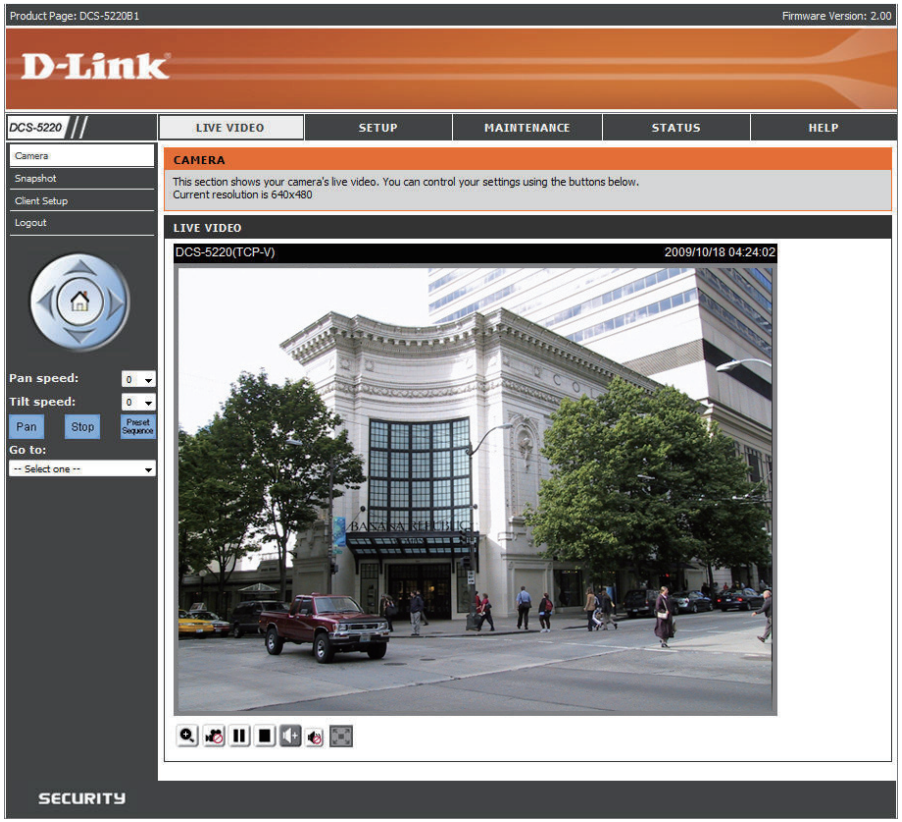
To view your DCS-5220 Network Camera in an Internet browser, go to your Desktop and click My Network Places.



Click DCS-5220 (192.168.0.120).

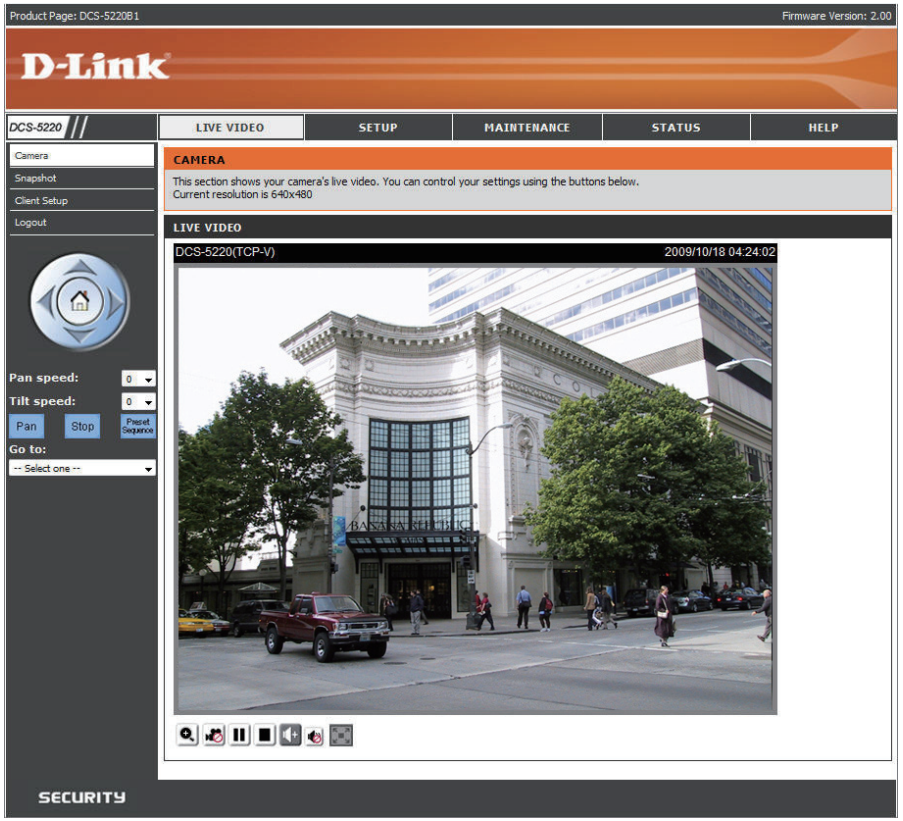


After you click on the DCS-5220 icon, your Internet browser will automatically be opened to the IP Address of the DCS-5220, in this example it is: http://192.168.0.120. Your DCS-5220 may have a different IP Address.



Testing the DCS-5220

Open your Internet browser and type in the IP address of the DCS-5220. In this example, the address is: http://192.168.0.120 (your DCS-5220 may have a different IP address based on what you used in the DCC program).



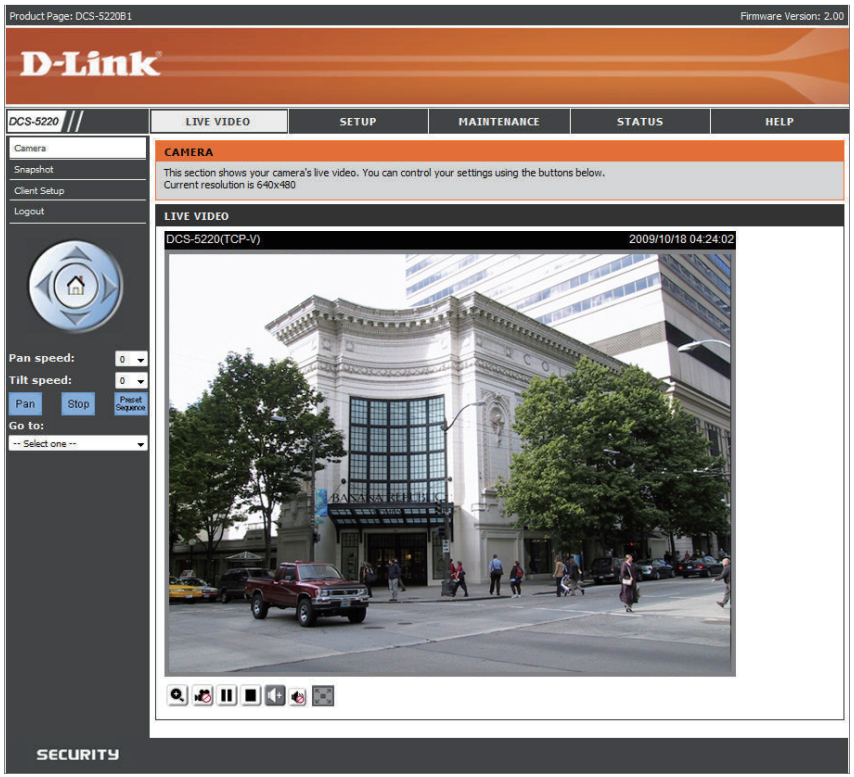
The window in the center of your browser is the camera image window. You should now see a video image and hear the audio over your computer speakers from the DCS-5220. If you are having problems, please consult the Frequently Asked Questions section of this manual (page 105).

Viewing Your DCS-5220

After all the router settings have been entered correctly, a PC user inside or outside your network will have access to the camera through the Internet browser. To access the camera from the Internet, type the IP Address of the router given to you by your ISP, followed by a colon, and the port number that you gave your camera (e.g., For example: http://70.42.15.9:83). It is not necessary to enter the colon and port number if you are using the default Web server port 80. To access from a computer on your local (home) network, simply enter the local IP Address of the Camera followed by a colon and the port number (e.g., 192.168.0.120:83).

If you are following this manual in the order it is presented, you should now have an operating DCS-5220 Network Camera configured with the Installer program.

- Using the DCS-5220 with an Internet browser and accessing the screens to control and monitor the camera.



Using the DCS-5220 with an Internet Browser

Open your Internet browser and enter the IP address for your Network Camera (http://192.168.0.120).

In the example, this address is 192.168.0.120. Your address may differ.

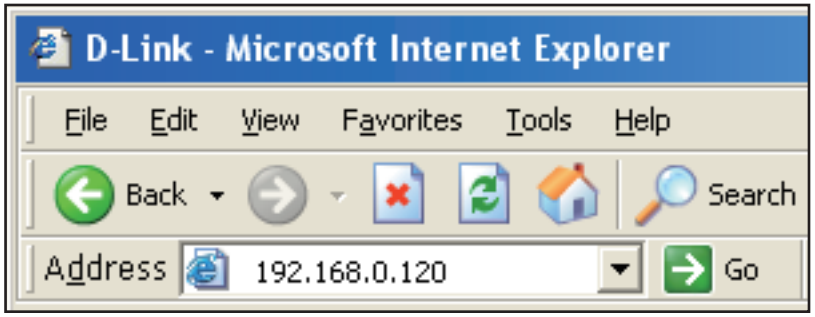
If a window appears asking to install a Verisign certificate for authentication click Yes. This allows the proprietary MPEG4 video stream to be recognized by Internet browser.

Web-based Configuration Utility

This section will show you how to configure your new D-Link Network Camera using the Web-based Configuration Utility.

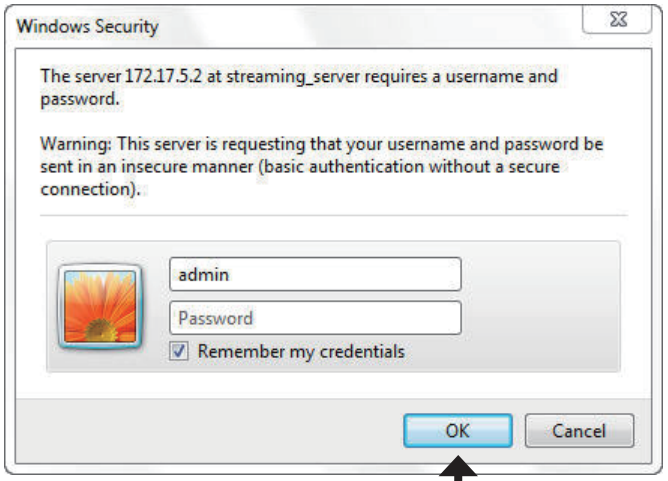
To access the configuration utility, open a web-browser such as Internet browser and enter the IP address of your Network Camera (http://192.168.0.120)

Note: *In the example, this address is 192.168.0.120. Your address may differ.*



Type **Admin** in the user name field and leave the password blank by default.

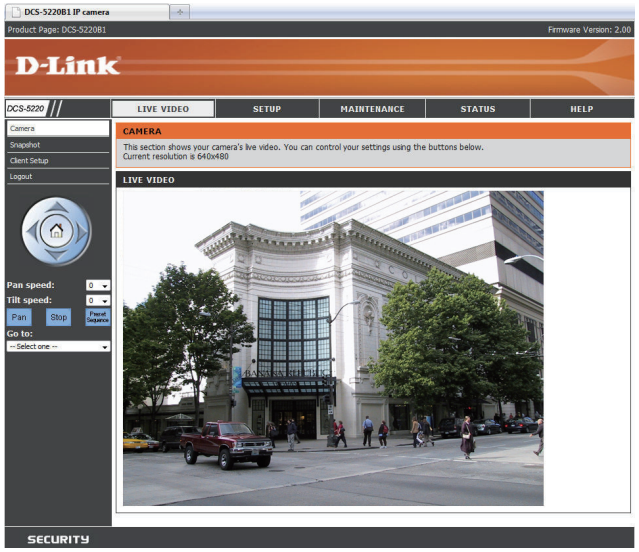
Note: *You may refer to page 64 to change the password for your admin account.*



Click **OK**

Live Video

As seen by Mozilla Firefox and Netscape users, Quick Time player is invoked to stream the live video.



Using RTSP Players

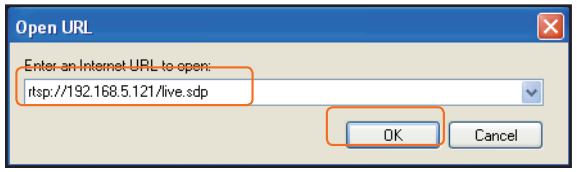
Use one of the following media players that support RTSP streaming to view MPEG-4 streaming media.

Quick Time Player
Real Player
VLC media player
mpegable Player
pvPlayer

1. Launch a RTSP player.
2. Choose File > Open URL.
3. Type the URL command in the text box and then click OK.
   URL command = rtsp://<ip address of your camera>:<rtsp port>/<access name for stream1 or stream2>

Note: *Please refer to pages 44-45 for the RSTP port settings and streaming files.*

For example:



4. You can view the live video in your player, as shown in the figure.

Using 3GPP Mobile Phones

To view streaming media using mobile phones, make sure the Network Camera is setup on the Internet.

To utilize this feature, please check the Network Settings for your camera.

1. Most of the 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, see page 44.

2. The 3G network bandwidth is limited, therefore users cannot use large size videos. Please set the video and audio streaming parameters as listed below. For more information, see **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

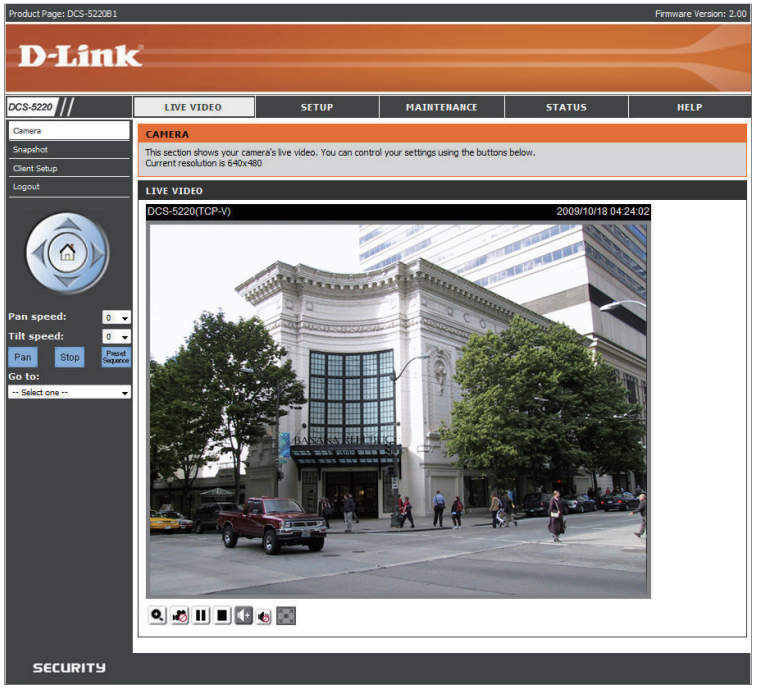
3. Set the RTSP port to 554, since most ISPs and players do not support other port numbers.

4. Launch the players on 3GPP mobile phones, (ex. Real Player). Type the URL command in the player.

   URL Command = rtsp://<public ip address of your camera>:<rtsp port>/<access name for stream1/stream2>

Camera

This section shows your camera's live video. You can configure the settings using the buttons listed below.



Logout: Logout the camera server and close the browser.

Client Settings: Click this button to access the Client Settings.

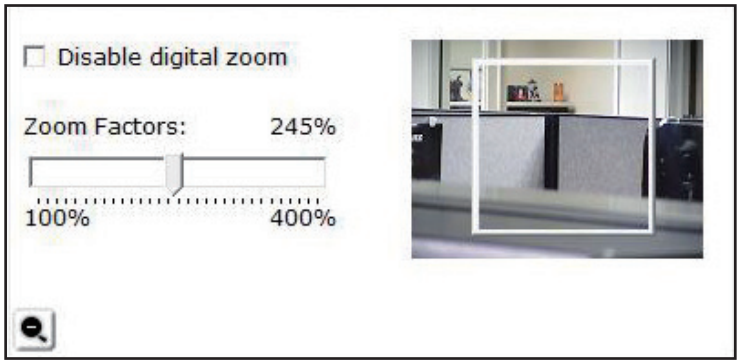
Snapshot: Capture a still picture of a video.

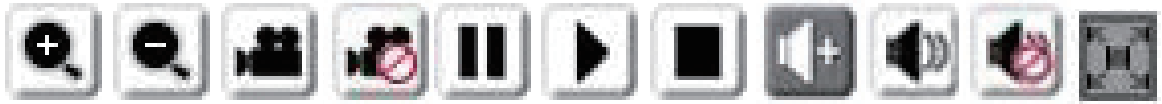
Enable/Disable the digital zoom feature. After selecting this icon, a small pop-up window will appear (see below).

Disable Digital Zoom: Select this to disable the digital zoom feature.

Zoom Factors: Adjust the threshold of the zoom factor. You can also adjust and position the zoom area by dragging the box in the window.

Click this icon to hide the window.

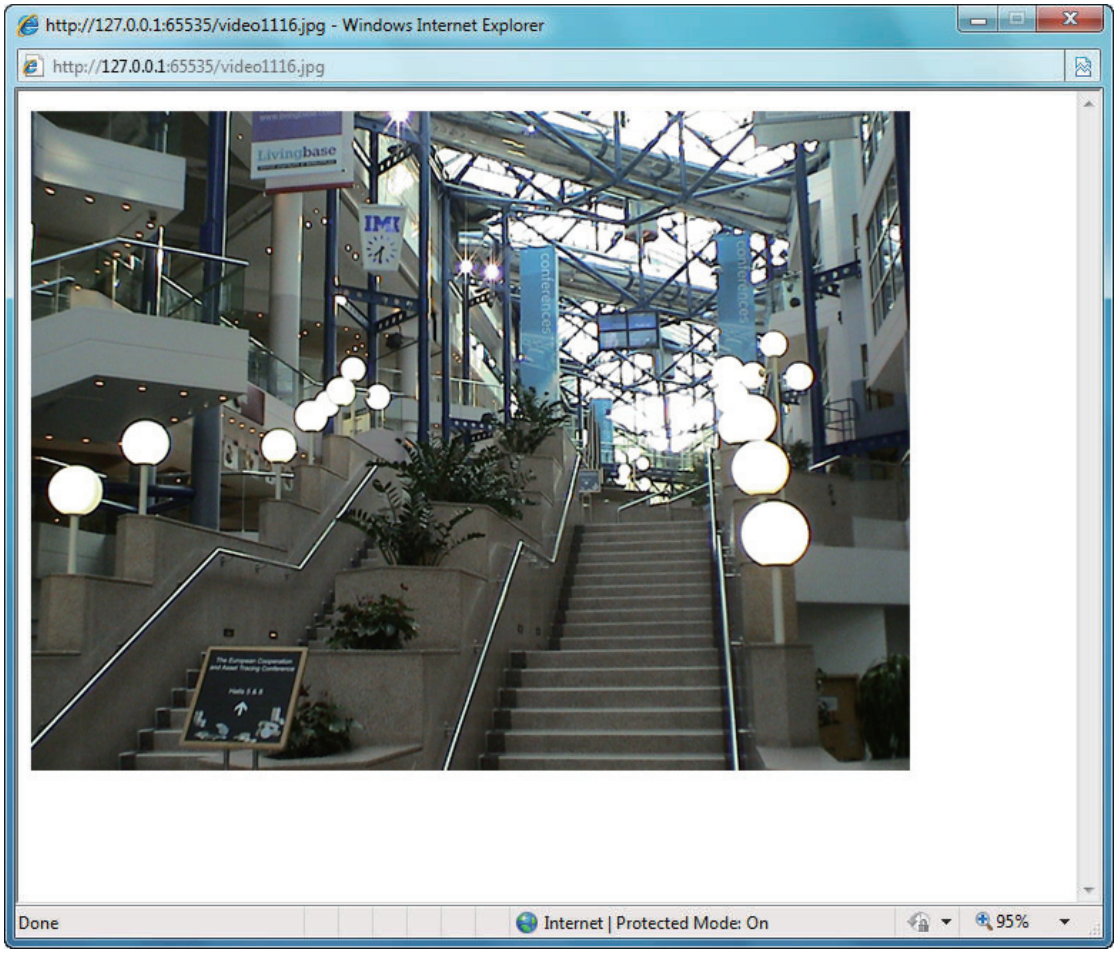




1/2	Digital Zoom - Refer to the previous page for more information.
3/4	Start/Stop Recording - Click (#3) to start recording. Video clips will be recorded in MP4 format to your computer. Press the button again (#4) to stop recording. If you close your Internet browser, the video will stop recording.
5/6	Resume/Pause - Click this button (#6) to start or resume the transmission of video streaming. Click the button again (#5), the video will pause.
7	Stop - Click to stop the transmission of video streaming. Click the resume button (#6) to begin streaming.
8	Speaker Volume - When the mute function is not active, move the slider bar to adjust the volume of the speakers that are connected to your network camera.
9/10	Speaker Mute/Unmute - Click (#10) to mute the external speaker that is connected to the network camera. Press again (#9) to unmute the speaker.
11	Full screen: To enlarge the video to full screen.

Snapshot

This page shows a snapshot image of a live video taken from DCS-5220 network camera.



Client Setup

Select client settings to access this section. To configure the settings for media streaming and recording, please read the following definitions.

Stream Options: Select which video stream profile to use.

Media Options: There are 3 selectable Media Options for your stream profile. The Default setting is **Video and Audio**.

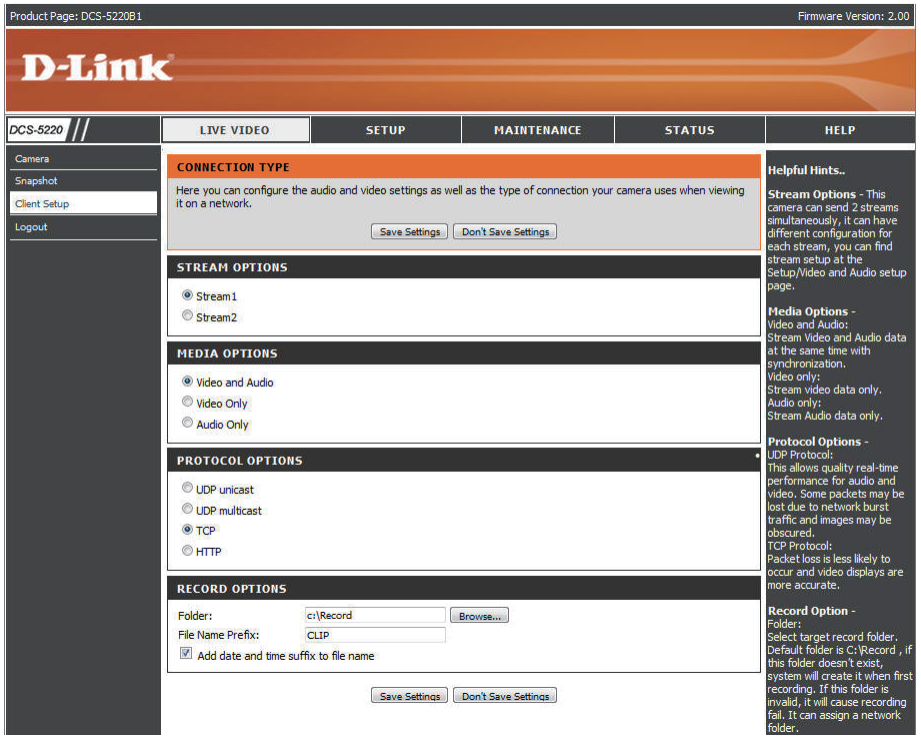
Protocol Options: There are 4 protocols for you to choose for video streaming.

UDP Protocol: This is recommended because it is an ideal protocol for transmitting real-time audio and video data, which can tolerate some lost packets.

UDP Unicast: Stream to a single computer.

UDP Multicast Stream to multiple computers using multicast streaming.

TCP: Provides higher quality video streaming than UDP and provides error correction. However, transmission speed will be reduced.



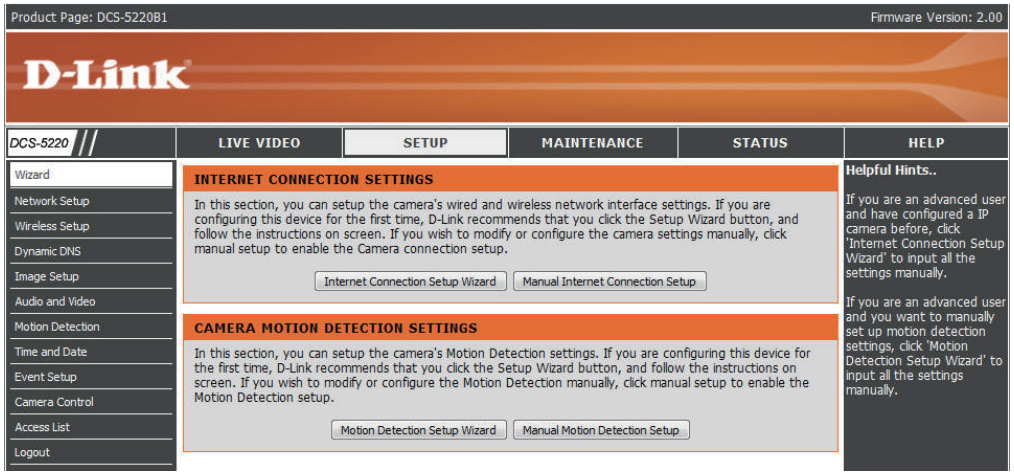
HTTP Protocol: Offers the highest image and video quality. However, packet loss will diminish image quality when bandwidth becomes restricted. If the network is protected by a firewall and it opens only HTTP port (80), HTTP protocol must be selected. In this mode, audio is disabled and only video can be viewed. UDP connections will not be available to remote users if all four ports have not been forwarded (as shown on page 41). Only the HTTP port must be forwarded for remote users to make an HTTP connection (video only).

Record Options: Allows the user to specify a destination folder and prefix filename for the recorded video.

Setup
Wizard

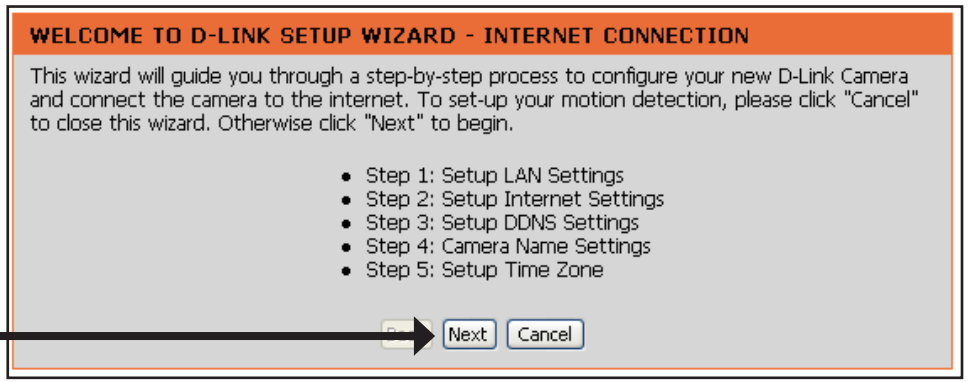
To quickly configure your network camera, click **Internet Connection Setup Wizard**. Otherwise, click **Manual Internet Connection Setup** to manually configure your network camera.

To quickly configure your network camera's motion detection settings, click **Motion Detection Setup Wizard** and skip to page 33. If you want to enter your settings without running the wizard, click **Manual Motion Detection Setup** and skip to page 50.



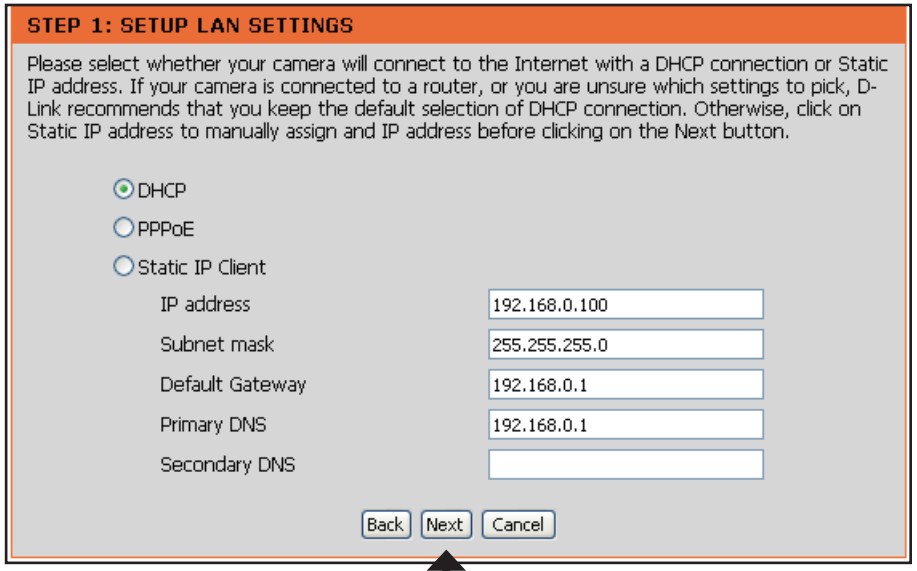
Internet Connection Setup Wizard

This wizard will guide you through a step-by-step process to configure your new D-Link Camera and connect the camera to the internet. Click **Next** to continue.



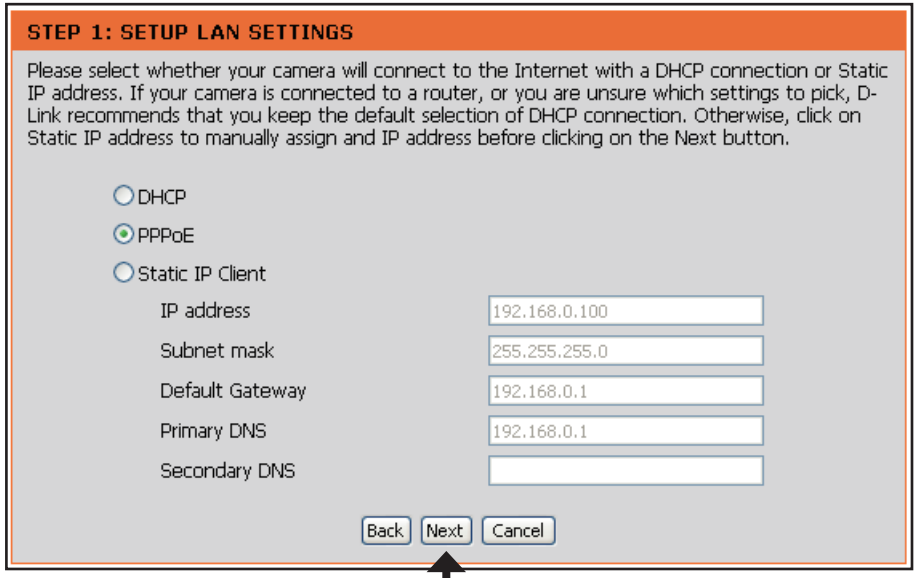
Click **Next**

Select **DHCP** if you are unsure which settings to pick. Click **Next** to continue and skip to page 31.



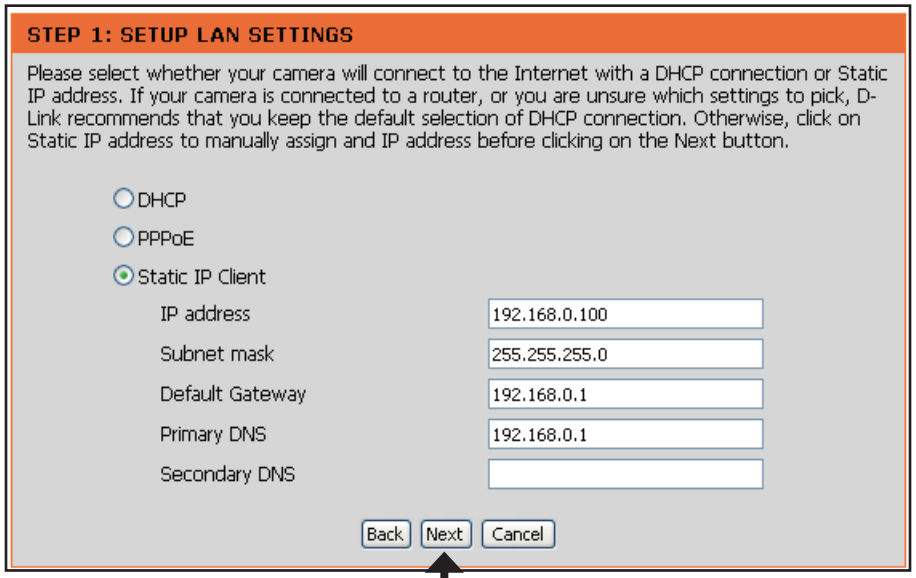
Click Next

Select **PPPoE** if the camera is directly connected to the Internet through a DSL modem and your ISP (Internet Service Provider) requires you to use PPPoE for the Internet connection. Click **Next** to continue and skip to Step 2 on page 30.



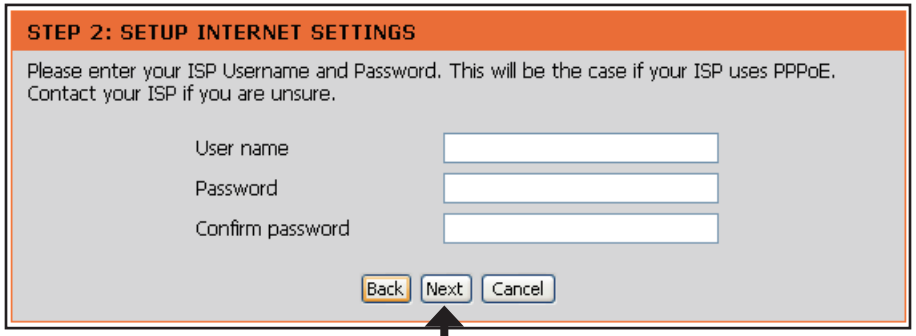
Click Next

Select **Static IP** if your Internet Service Provider has provided you with connection settings, or you wish to set a static address within your home network. Enter all the relevant LAN information. Click **Next** to continue.



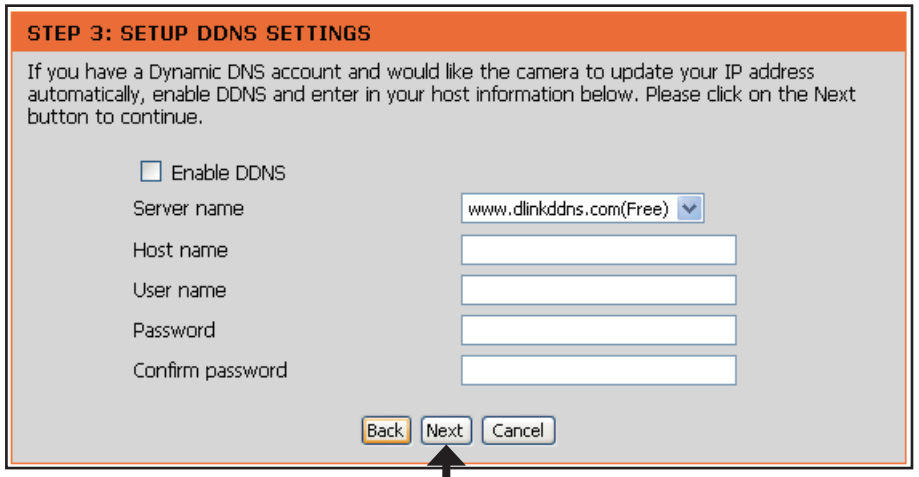
Click **Next**

If you have selected PPPoE, enter your username and password. Click **Next** to continue.



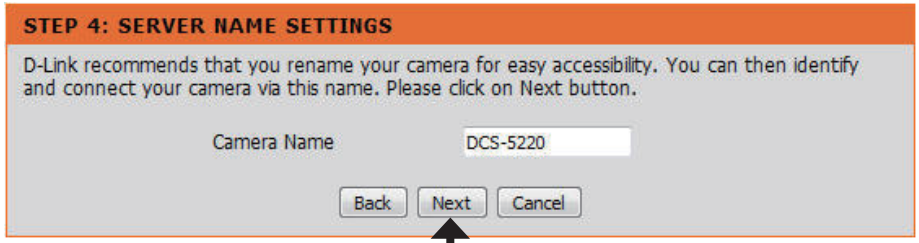
Click **Next**

With a Dynamic DNS account, the camera automatically updates your IP address. To enable **DDNS**, enter your host information. Click **Next** to continue.



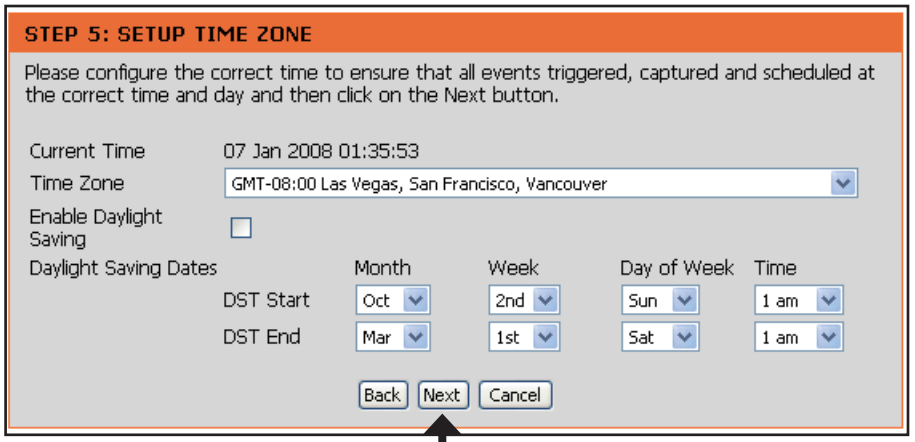
Click **Next**

Enter a name for your camera and click **Next** to continue.



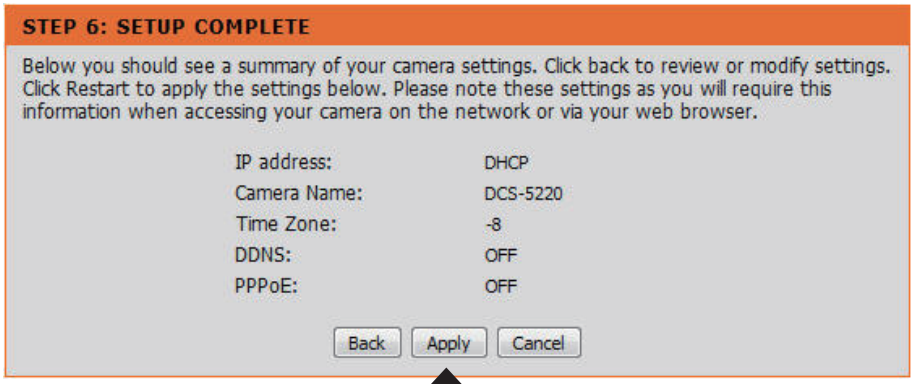
Click **Next**

Configure the correct time to ensure all the events will be triggered and scheduled at the correct time.Click **Next** to continue.



Click **Next**

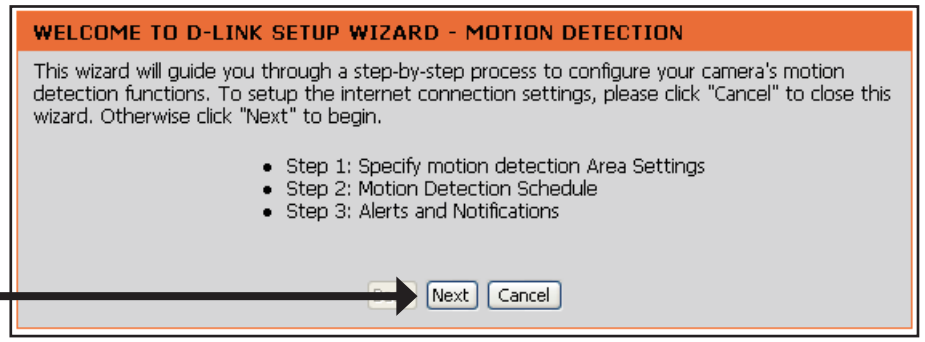
Once you have selected **Dynamic**, **PPPoE**, or **Static**, you will see a summary of your camera's settings. Click **Apply** to save and activate your settings.



Click **Apply**

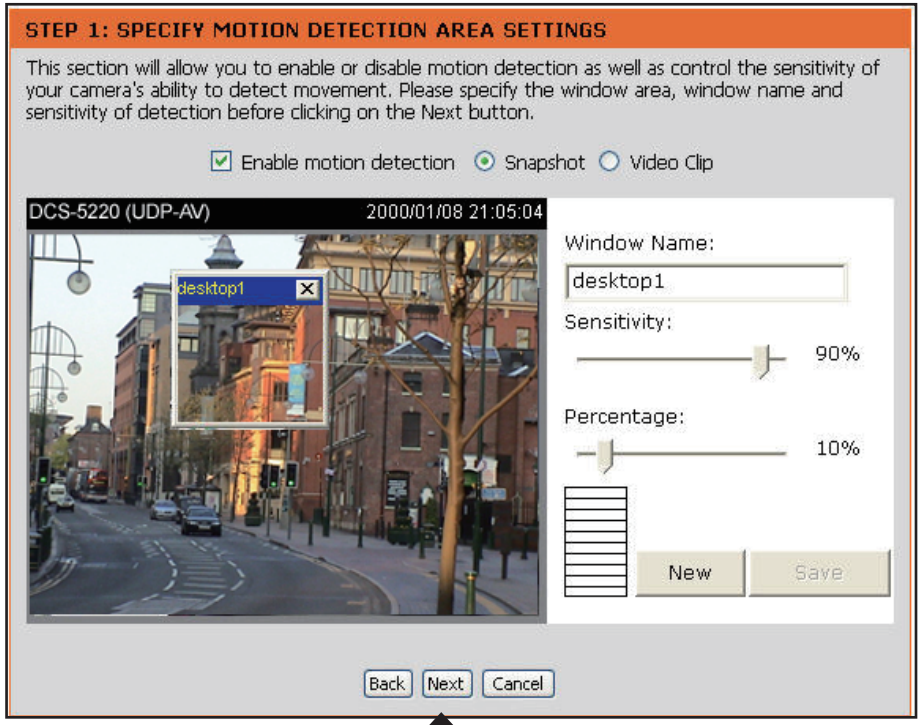
Motion Detection Setup Wizard

This wizard will guide you through a step-by-step process to configure your new D-Link Camera's motion detection functions. Click **Next** to begin the process.



Click **Next**

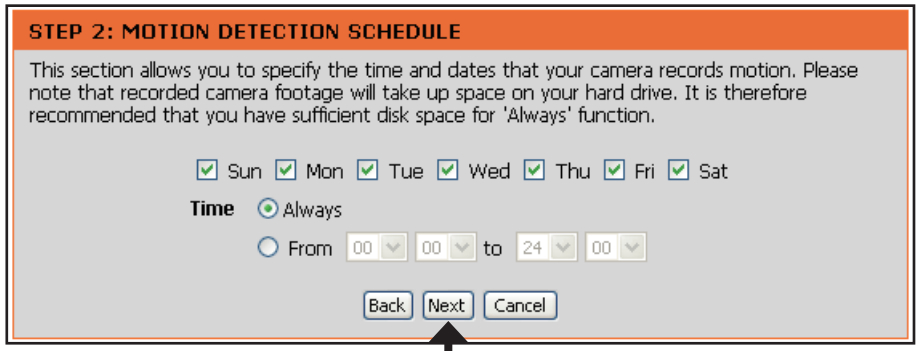
This screen will allow you to enable or disable the motion detection feature. Click **New** to create and draw the motion detection window. Then configure the type of recording (snapshot, video clip), **Window Name**, **Sensitivity** of detection, and **Percentage** of the window required in order to set off motion detection.Click **Next** to continue.



Click **Next**

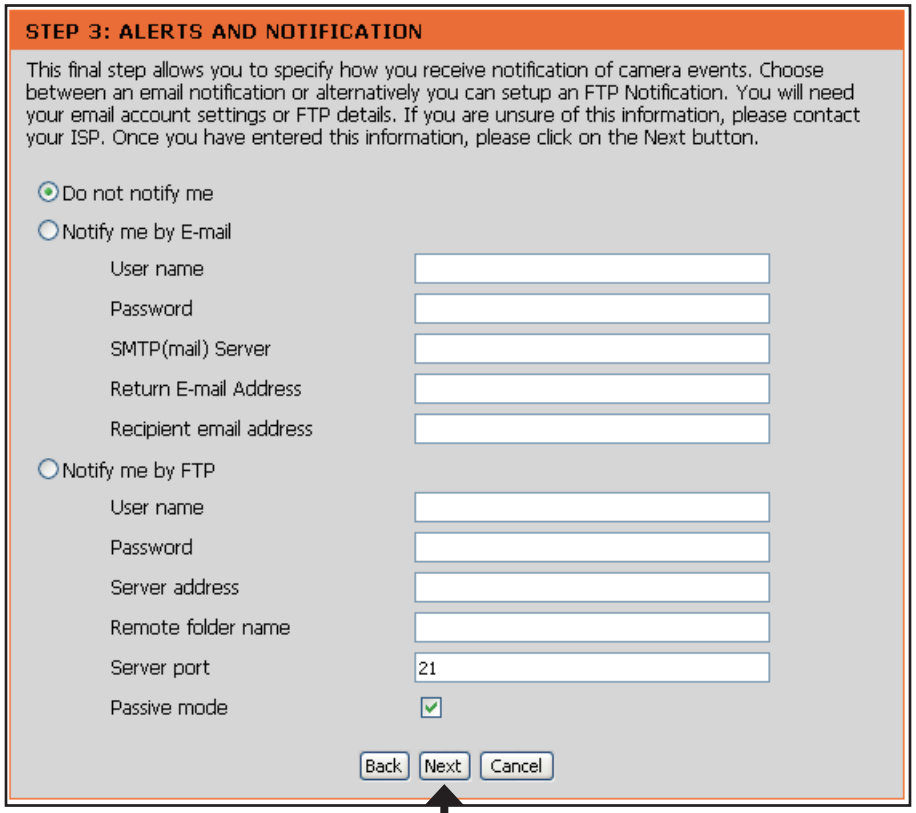
Select the recording time and date for your camera. Click **Next** to continue.

Note: *Recording camera footage will take up space on your hard drive. It is recommended that you have sufficient disk space for* ***Always*** *function.*



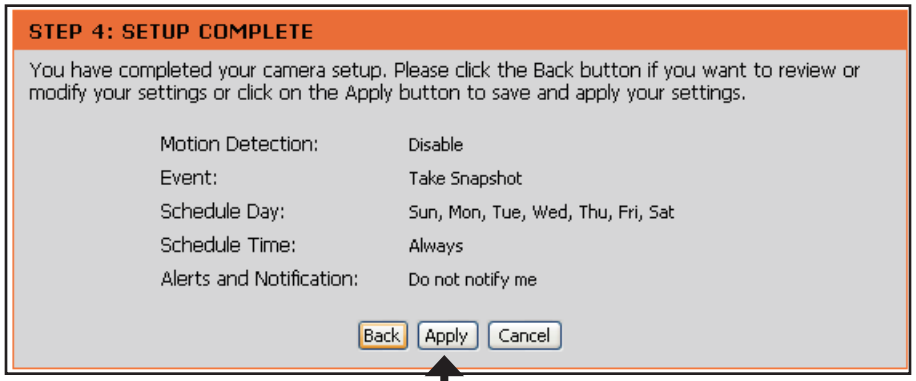
Click **Next**

This step allows you to specify your event notification, either via email or FTP. Enter the relevant information of your email account or FTP settings and then click **Next** to continue.



Click **Next**

You have completed the Motion Detection Wizard. Click **Apply** to activate and save your settings.



Click **Apply**

Network Setup

LAN Settings: Settings for your local area network.

DHCP: Select this connection if you have a DHCP server running on your network and would like a dynamic IP address to be assigned to your camera automatically.

Static IP Client: You may enter a static or fixed IP address for your camera.

IP Address: Enter an IP address.

Subnet Mask: The default value is “255.255.255.0.” This helps to determine if the designated IP address is on the same subnet.

Default Gateway: The gateway used to forward frames to destinations in a different subnet. Invalid gateway settings may cause the failure of transmissions to a different subnet. Usually the IP address of your router.

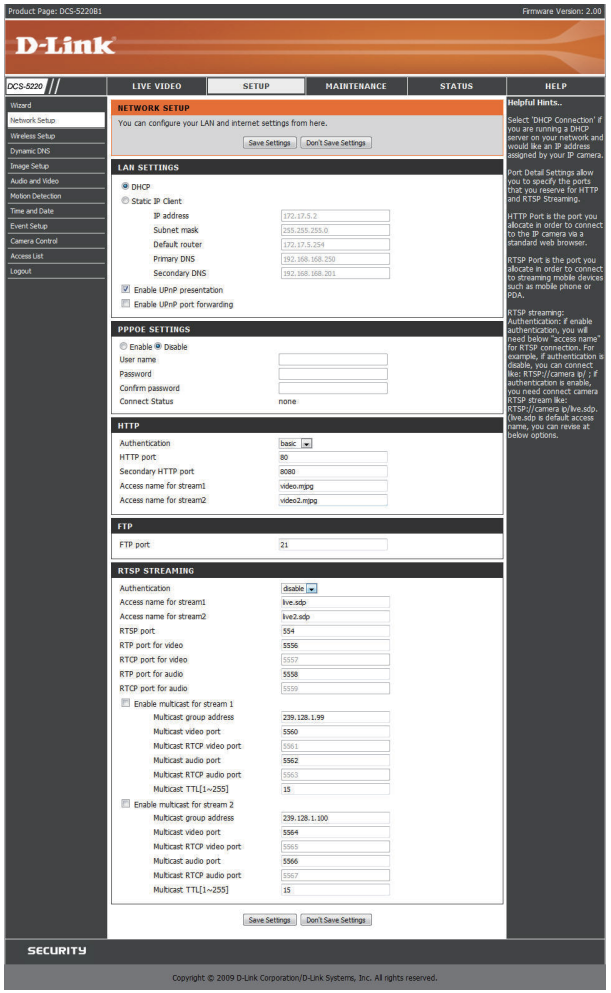
Primary DNS: Primary domain name server that translates names to IP addresses.

Secondary DNS: Secondary domain name server to backup the primary one.

Enable UPnP Presentation: Allows a user to find, view, and control this camera via a presentation page or “Network Neighborhood” without configuration.

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 bothersome network configuration. In the case of Network Cameras, you will see Network Camera shortcuts at My Network Places.



Enabling UPnP port forwarding allows the Network Camera to open a secondary HTTP port on the router. You have to add the secondary HTTP port number behind 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 a local area network
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 settings.

Enable UPnP Port Forwarding: Enables the camera to automatically add the port forwarding entry into the router.

PPPoE Settings: Enable this setting if your ISP (DSL service) is using PPPoE. You may already have both Username and Password given by your ISP, or you may check with your ISP. The Connect Status will be determined automatically by the system.

HTTP: You may configure two HTTP ports for your camera. HTTP ports allow you to connect to the camera via a standard web browser. These ports can be set to a number other than the default TCP ports 80 and 8080. A corresponding port must be opened on the router. For example, if the port is changed to 1010, users must type in the web browser "http://192.168.0.100:1010" instead of "http://192.168.0.100".

Authentication: Choose either **Basic** where the password is not encrypted, or **Digest** where the password is encrypted during the transmission to the web server.

Note: *Restart your browser, if you select* ***Digest*** *mode.*

Basic authentication: The password is sent in plain text format; there can be potential risks of being intercepted.
Digest authentication: User credentials are encrypted in MD5 algorithm and thus provide better protection against unauthorized accesses.

HTTP Port: The default value is 80.

Secondary HTTP Port: The default value is 8080.
After you have enabled the Authentication, you will need to configure and use the access name to access your video file. For example, http://camera ip/video.mjpg (video.mjpg is the Access name, you can modify it here)

Access name for stream1: The default name is video.mjpg.

Access name for stream2: The default name is video2.mjpg.

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 continuous JPEG pictures. This technology, known as "server push", allows the Network Camera to feed live pictures to Mozilla Firefox and Netscape. Use the following command to obtain the JPEG file:

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

For example, when the access name for stream 1 is set to video.mjpg:

The URL command is **http://192.168.0.051:80/video.mjpg**

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

FTP Port: Default port is 21. If you want to change the port number, you will need to specify the port when connecting to the FTP server. For example, FTP://68.5.1.81:60 (if you use port 60 for your FTP server)

RTSP Streaming: This setting enables you to connect to a camera by using streaming mobile device(s), such as a mobile phone or PDA.

Authentication: Select either Basic where the password is not encrypted, or Digest where the password is encrypted during the transmission to the web server. After you have enabled the Authentication, you will need to configure and use the access name to access your video file. RTSP://camera ip/live.sdp (live.sdp is the default access name, you can modify in the section below)

Access name for stream1: The default name is live.sdp.

Access name for stream2: The default name is live2.sdp.

The accessibility of the RTSP streaming for the three authentication modes are listed in the following table.

	Quick Time player	Real Player	VLC media player	mpegable Player	pvPlayer
Disable	O	O	O	O	O
Basic	O	O	X	X	X
Digest	O	X	X	X	X

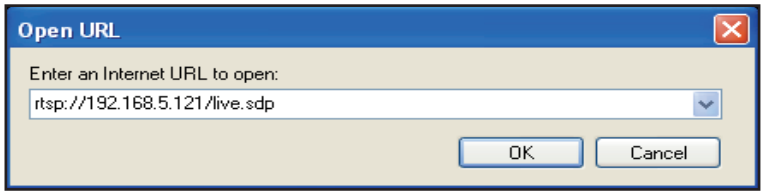
O indicates that the authentication mode is supported by the RTSP player.
X indicates that the authentication mode is NOT supported by the RTSP player.

Access name for stream 1 / Access name for stream 2 : The access name is used to differentiate the streaming source. When using a RTSP player to access the Network Camera, and the video mode is set to MPEG-4, use the following RTSP URL command to request a transmission of 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, the URL command is : **rstp://192.168.5.121/live.sdp**

1 : Launch a RTSP player.
2 : Choose File > Open URL. This opens the URL dialog box.
3 : Type the URL command in the text box.
For example:



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

RTSP port: The port number that you use for RSTP streaming, the default port number is 554. RTP (Real Time Protocol) Port is used to streaming audio and video while RTCP (Real Time Control Protocol) port is used to monitor QoS of RTP stream.
Note: *RTP video port and RTP audio port must be an "even" number. The numbers of RTCP video port and RTCP audio port must equal to the numbers of RTP video port and RTP audio port, plus one repetitively.*

RTP port for video: Default port number is 5556.

RTCP port for video: Default port number is 5557.

Multicast group address: You may choose to enable multicast for your camera audio and video streaming so that your cameras (sources) and the receivers (clients) can establish the connection to send and receive contents.

An IP Multicast group address is used to send and receive content. Sources use this group address as the destination address while sending their data packets. Receivers use this group address to inform the network that they are interested in receiving packets sent to that group.

For example, if some content is associated with group 239.1.1.1, the source will send data packets destined to 239.1.1.1. Receivers for that content will inform the network that they are interested in receiving data packets sent to the group 239.1.1.1. The receiver "joins" 239.1.1.1. The Multicast address ranges from 224.0.0.0 to 239.255.255.255, or, equivalently, 224.0.0.0/4

Multicast video port:	Default port number is 5560, or please choose between 1024 and 65534.
Multicast RTCP video port:	Default port number is 5561, or please choose between 1024 and 65534.
Multicast RTCP audio port:	Default port number is 5563, or please choose between 1024 and 65534.
Multicast TTL {1~255]:	Set a Time to Live(TTL) value for multicast packet, please choose between 1 and 255.

Unicast video transmission delivers a stream through point-to-point transmission. On the other hand, multicast video transmission sends a stream to the multicast group address and allows multiple clients to acquire the stream by requesting a copy from the Multicast group address.

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

Wireless Setup

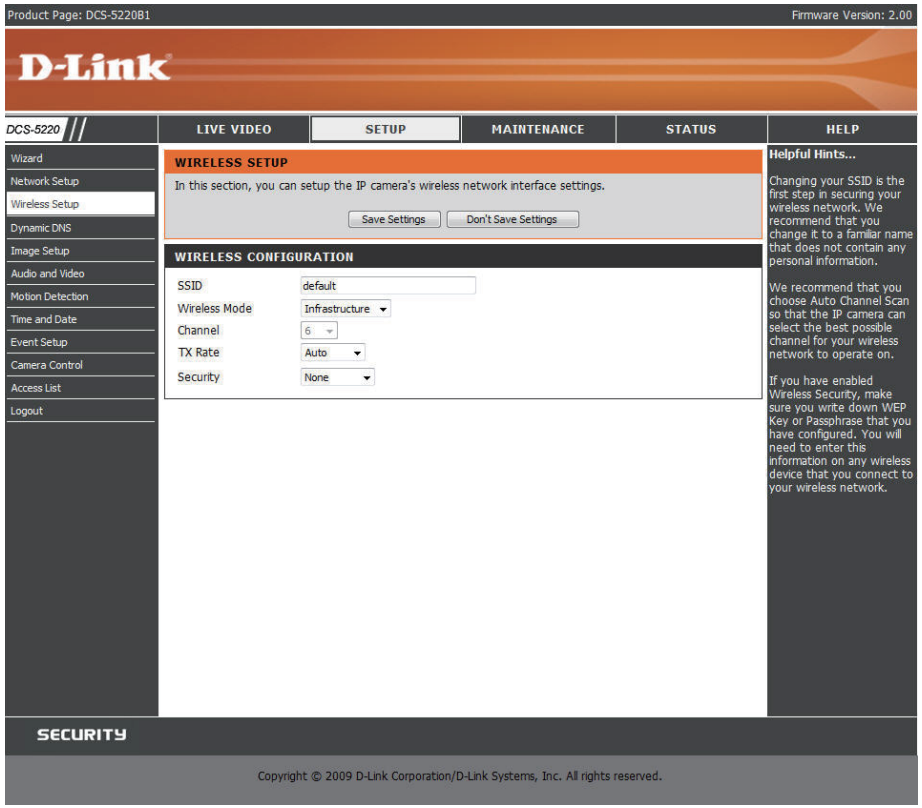
SSID: (Service Set Identifier) is a name that identifies a wireless network. Access Points and wireless clients attempting to connect to a specific WLAN (Wireless Local Area Network) must use the same SSID. The default setting is **default**.

Wireless Mode: Click on the drop-down list and select from the following options: **Infrastructure** - connecting the WLAN using an Access Point such as the DWL-2100AP or a DIR-655 wireless router. **Ad-Hoc** – wireless mode used when connecting directly to a computer equipped with a wireless Adapter in a peer-to-peer environment.

Channel: In Infrastructure mode, the wireless channel is automatically selected by the camera. In Ad-Hoc mode, the default wireless channel setting is channel 6. Select the channel that is the same as the other wireless devices on your network.

TX Rate: Select the transmission rate on the network. **Auto** is the default setting.

Security: Select the encryption type from the drop-down list. The default setting for encryption is None, which means the security is disabled.



Auth mode: If the encryption type selected is WEP from the Security drop-down list, choose one of the authorization modes:
Open - communicates the key across the network.
Shared – allows communication only with other devices with identical WEP settings.

Key length: Select the key length, either **64 bits** or **128 bits.**

Key format: Select an **ASCII** or **HEX** (hexadecimal) key format.

Key index: You can create up to 4 different security keys.

Pre-shared key: The Key allows the camera to connect to other devices by using WPA-PSK encryption. Pre-shared key must be 8-63 characters or 64 hex characters.

Dynamic DNS

DDNS (Dynamic Domain Name Server) will hold a DNS host name and synchronize the public IP address of the modem when it has been modified. The username and password are required when using the DDNS service.

Enable DDNS: Click to enable the DDNS function.

Server Name: Select your Dynamic DNS provider from the drop down menu.

Host Name: Enter the host name of the DDNS server.

Username: Enter your username or e-mail used to connect to the DDNS server.

Password: Enter your password used to connect to the DDNS server.

Status: Indicates the current connection status.

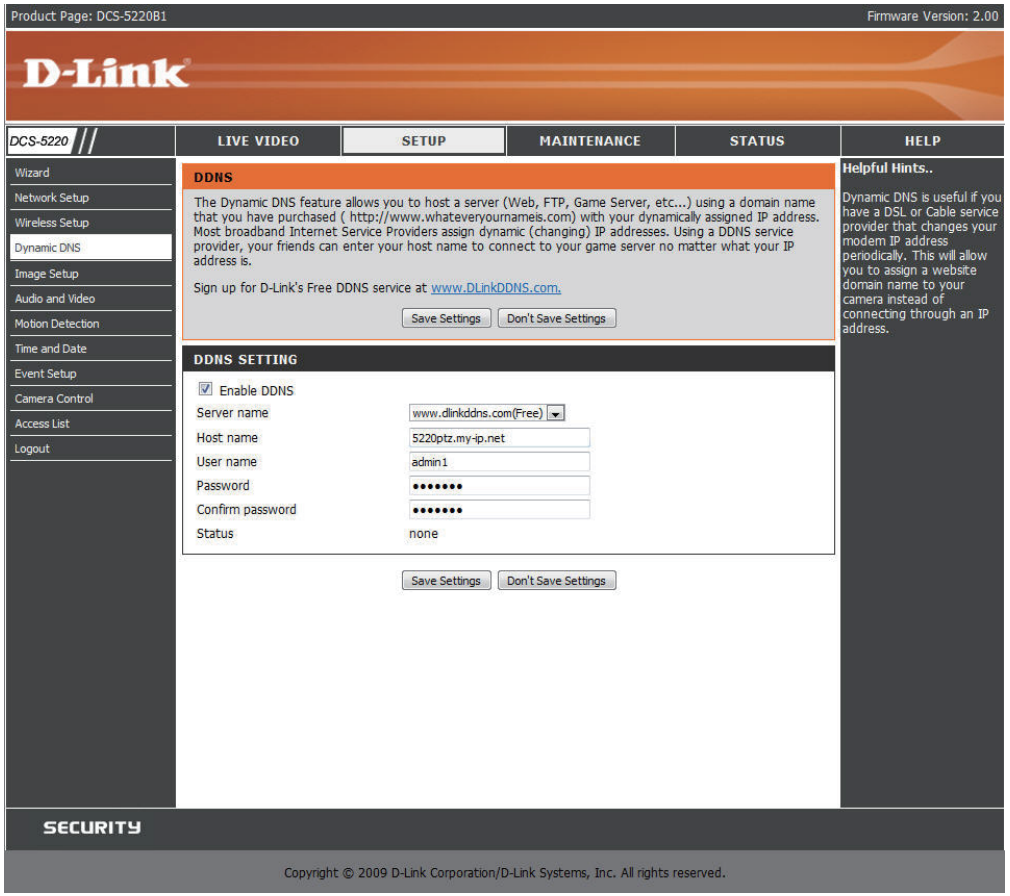


Image Setup

You may configure the image settings of the video for your network camera. A preview of the image will be shown in the window of Live Video. Click **Save Settings** to save and activate your changes.

Color: Select either a **Color** or **B/W (black and white, monochrome)** video display.

Power Line Frequency: Select either 50 or 60Hz.

Video Orientation: **Flip** will vertically rotate the video. **Mirror** will horizontally rotate the video. You may check both options if the camera is being installed upside down.

White Balance: Select either **Auto** or **Fix** from the drop-down box. Select **Auto** to automatically adjust the white balance of the object. Otherwise, select **Fix** to manually set the white balance conditions in advance.

Brightness: Select to change the brightness value for the Network Camera. The range varies from -5 to +5.

Saturation:	Select to change the saturation value of the camera. The default value is 0.
Sharpness:	Select to change the Sharpness value of the camera. The default value is 0.
Overlay Title and Time Stamp on Video:	Select to add a date and time stamp on the video.
Allow unauthenticated snapshots:	Select to allow user to get snapshot without authentication via web CGI command.

Audio and Video

Settings for two video streams (stream 1 and stream 2) can be configured here. You may configure one setting for computer display and the other one for mobile display.

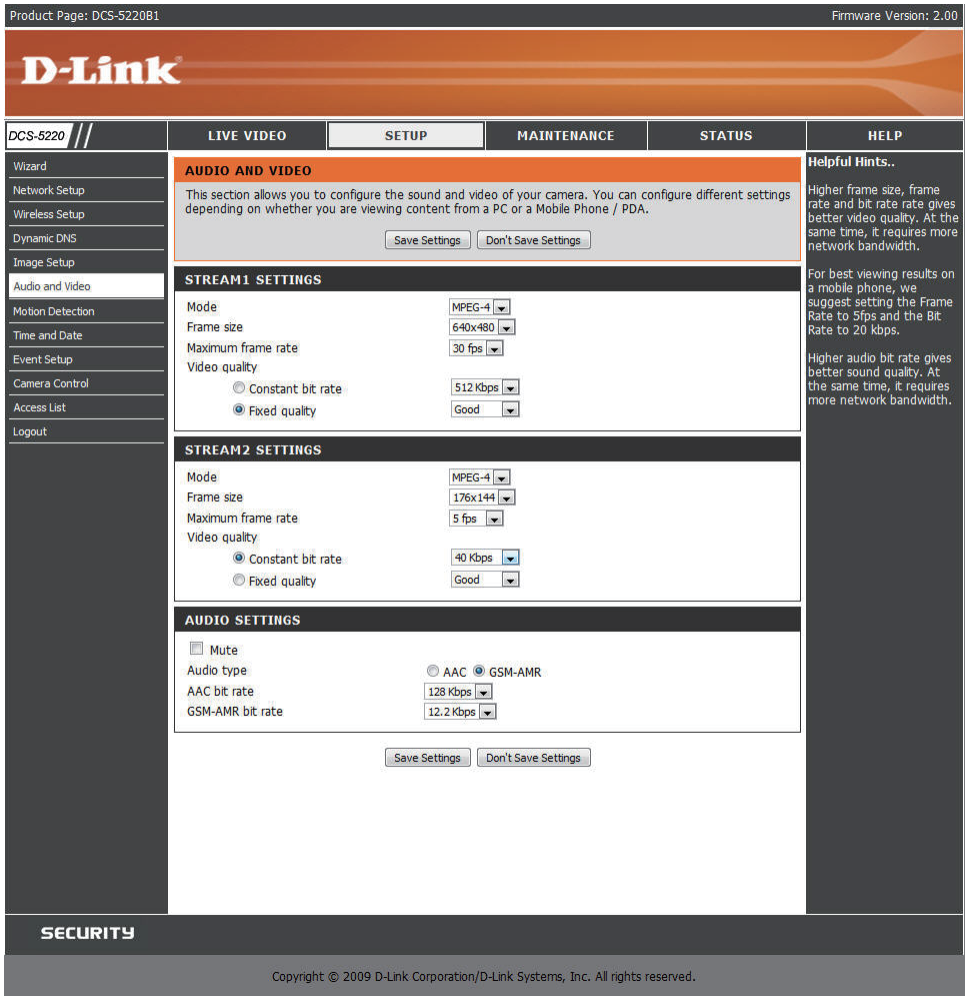
Mode: Select either **JPEG** or **MPEG4**. In JPEG mode, the video frames are independent. However, MPEG4 consumes much less network bandwidth than JPEG.

Frame Size: Select **176 x 144, 352 x 240 or 640 x 480** pixels for the frame size. We recommend **176 x 144** for mobile viewing and **640 x 480** for a computer monitor.

Maximum frame rate: The minimum frame rate value is **1fps** and the maximum is **30fps**. We recommend **30fps** for computer monitors and **5fps** for mobile viewing.

Video quality: This setting limits the maximum refresh frame rate. To set a fixed bandwidth regardless of the video quality, select **Constant bit rate** and the desired bandwidth. Select **Fixed Quality** to optimize the bandwidth utilization and video quality.

Mute: Select to mute audio.



Audio type: **Advanced Audio Coding (AAC)** is a wide band audio coding algorithm that exploits two primary coding strategies to dramatically reduce the amount of data needed to convey high-quality digital audio. Select a higher bit rate number for better audio quality.

AAC bit rate: Select an AAC bit rate from the drop-down list. Higher bit rate means higher audio quality but it takes more network bandwidth to transmit.

GSM-AMR: A standard adaPTZd audio codec by the 3GPP video (3rd Generation Partnership Project). It is an Adaptive Multi Rate-Narrow Band (AMRNB) speech codec. Select a higher bit rate number for better audio quality.

GSM-AMR bit rate: Select the GSM-AMR bit rate from the drop-down list. Higher bit rate means higher audio quality but it takes more network bandwidth to transmit.

Motion Detection

Once Motion Detection feature is enabled, users will be able to monitor three windows with different settings. This allows your camera to serve as a security device that records only when motion is detected.

Enable motion detection: Check this option to turn on the motion detection feature.

Window name: Create your own name for the monitored area/ window. It will show at the top of the motion window.

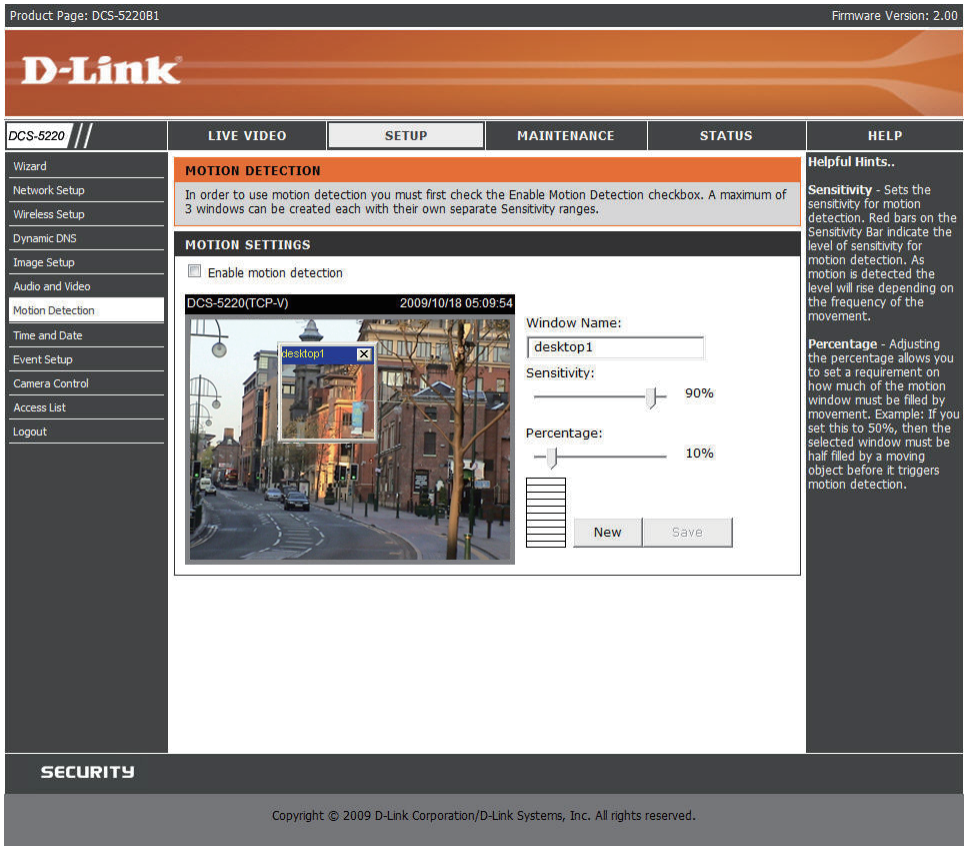
Sensitivity: Set the measurable difference between two sequential images that would indicate motion.

Percentage: Set the amount of motion in the window being monitored that is required to initiate a motion detected alert. If this is set to 100%, this means that motion must be detected within the whole window to trigger a snapshot.

Note: *Setting a higher sensitivity and a lower percentage will make motion easier to be detected.*

New: Click to add a new window. A maximum of three motion windows can be opened simultaneously. Use your mouse to drag the window frame to re-size or the title bar to move. Clicking on the 'x' at the upper right corner of the window will close the window.

Save: Save the related settings of that window.



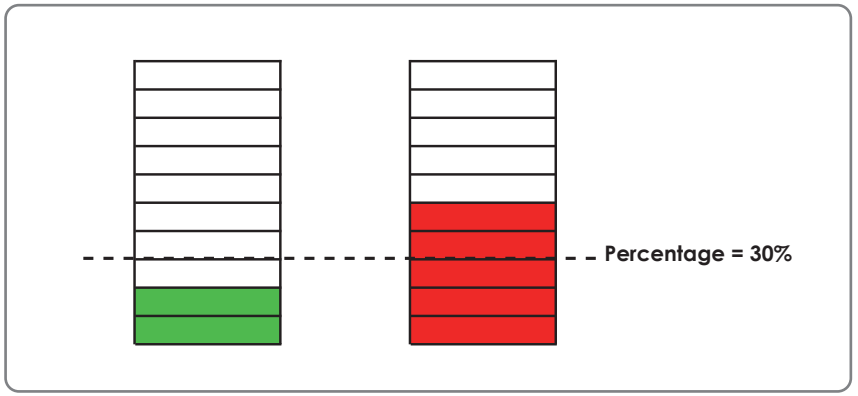
To enable motion detection, follow the steps below:

1. Click **New** to add a new motion detection window.
2. Enter a name in the **Window Name** field.
3. Define the sensitivity to moving objects and the space ratio of all alerted pixels by moving the **Sensitivity** and **Percentage** slide bar.
4. Click **Save** to apply the changes.
5. Select **Enable motion detection** to activate motion detection.

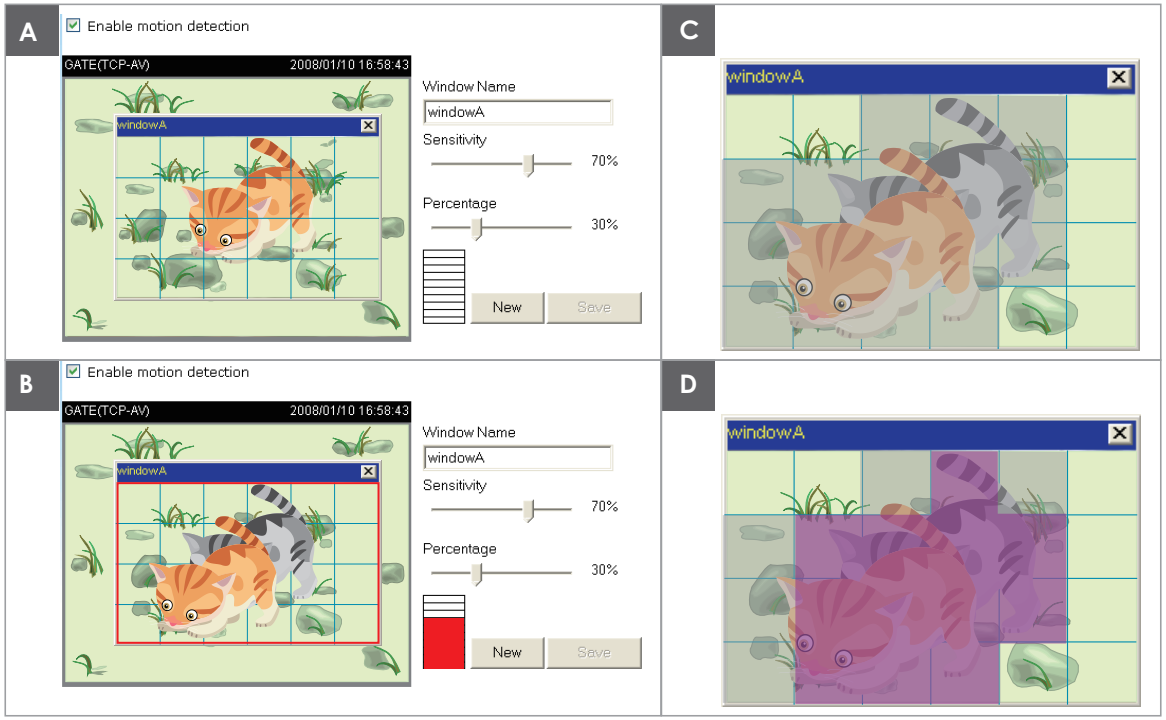
Note: *Drag to resize the window and click X to close the window.*

The Percentage Indicator will rise or fall depending on the image variation. When motions are detected by the Network Camera and are judged to exceed the defined threshold, a red bar rises. Meanwhile, the motion detection window will be outlined in red. Utilizing this device as a trigger source, photos or videos can be captured instantly and sent to the remote server (Email, FTP).

A green bar indicates that even though motions are detected, the event will not be triggered because the image variations are still falling under the defined threshold.



How does motion detection work?



There are two parameters for setting the motion detection: **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 sense a slight movement while smaller sensitivity settings tend to neglect it. 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 higher security management, it is suggested to set higher sensitivity settings and smaller percentage values.

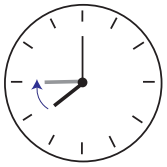
Time and Date

Automatically or manually configure, update, and maintain the internal system clock for your camera.

Current Server Time: Displays current time.

Time Zone: Select your time zone from the drop-down menu.

Enable Daylight Saving: Select this to enable the daylight saving time (DST). During DST, the system clock moves one hour ahead.



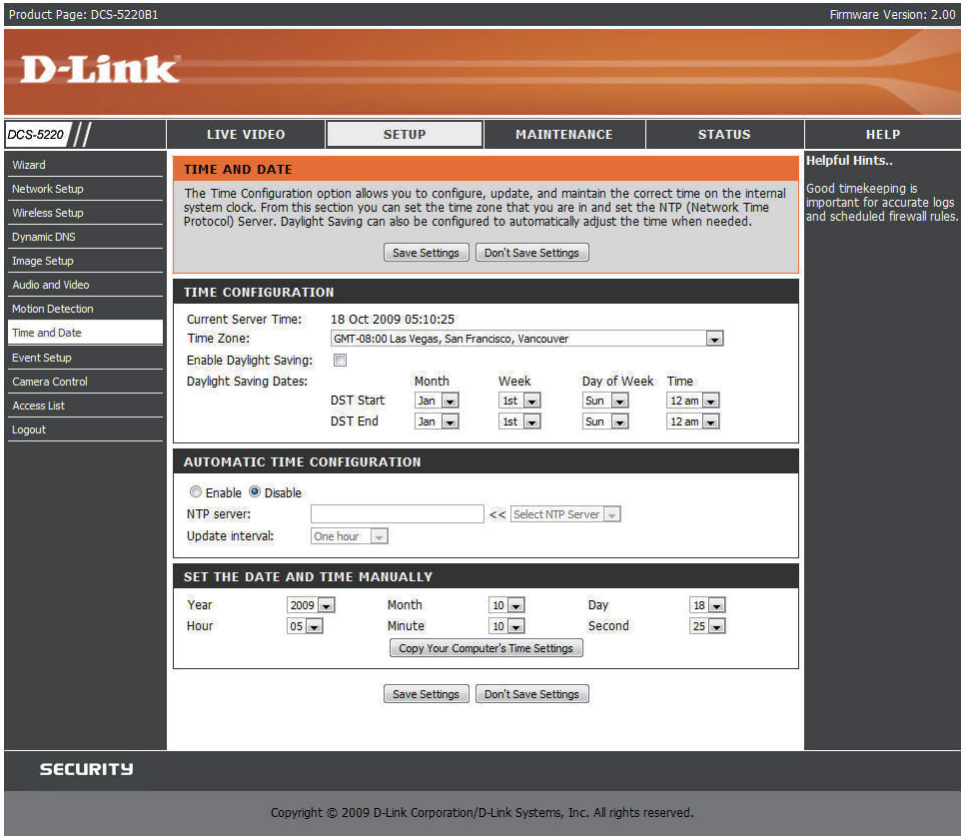
Note: *To utilize this feature, ensure to set the time zone of your network camera. Then starting and ending time of the DST is displayed upon selecting the option.*

Daylight Saving Dates: You may configure the daylight saving date and time.

Automatic Time Configuration: Enable this feature to obtain time configuration automatically from NTP server.

NTP Server: Network Time Protocol (NTP) synchronizes the DCS-5220 with an Internet time server. Choose the one that is closest to your location.

Update Interval: The time interval for updating the time information from NTP server.



Set the date and time manually: This option allows you to set the time and date manually.

Copy Your Computer's Time Settings: This will synchronize the time information from your PC.

Event Setup

There are four sections in Event Setup page.

- Event
- Server
- Media
- Recording

1. To add a new item - event, server or media, click **Add**. A pop-up will appear and update the fields accordingly.

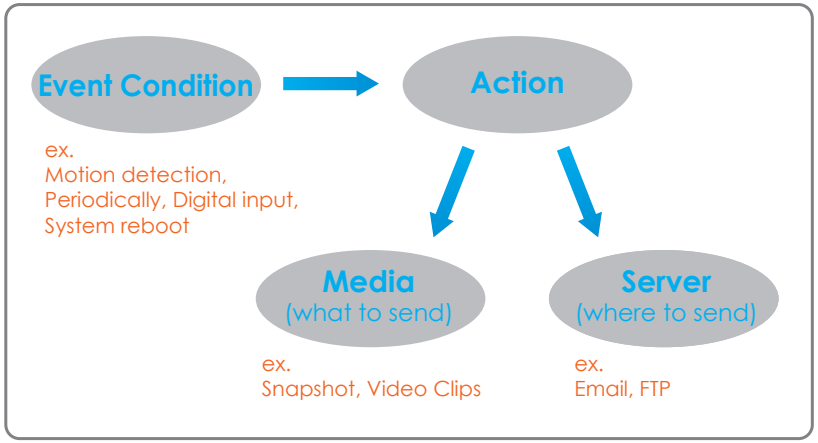
2. To delete the selected item from the pull-down menu of event, server or media, click **Delete**.

3. Click on the item name for further modification.

Note: *You can add up to four events, five servers and five media fields.*

Application

A typical application is that when motion is detected, the DCS-5220 Network Camera sends images to a FTP server or via e-mail as notifications. For example, as seen in the illustration below, 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 kind of action will be performed. You can configure the Network Camera to send snapshots or videos to your email address or FTP site.



To start plotting an event, it is suggested to configure server and media columns first so that the Network Camera will know what action shall be performed when a trigger is activated.

Add Server

You may configure up to 5 servers for media storage.

Server Name: Unique name of your server.

Email: Select this to enable and apply your email account setting for your camera.

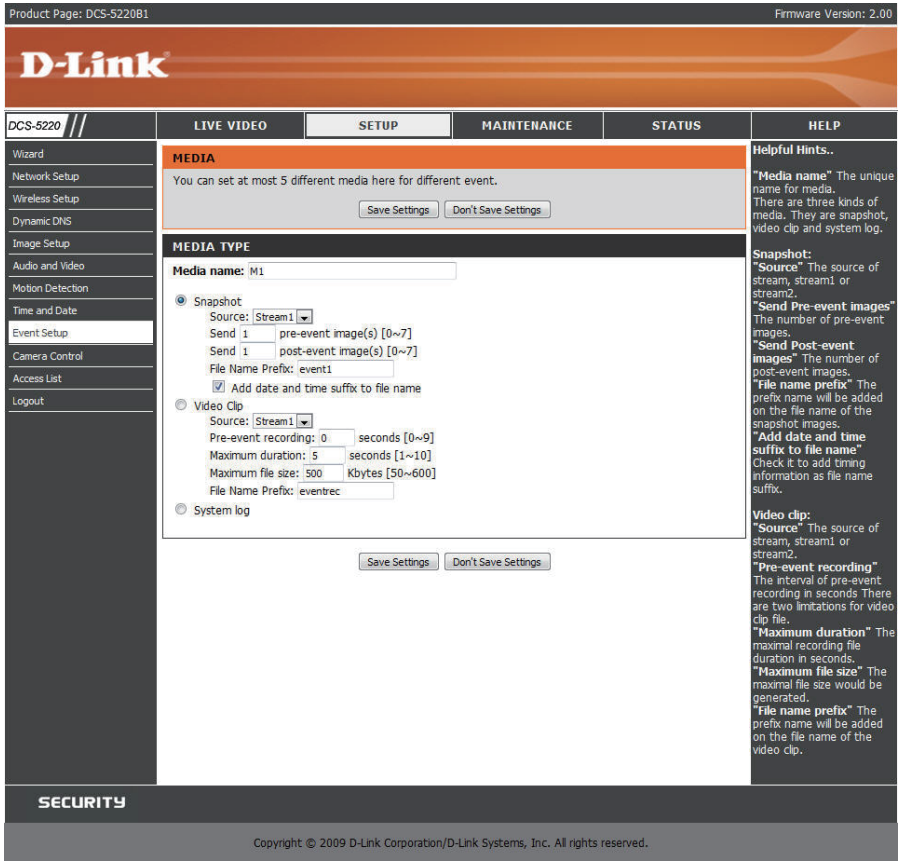
FTP: Select this to access a granted folder on the external FTP server.

HTTP: Select this to use a web server to store the media.

Network Storage: Only one network storage device is supported.

Add Media

There are three types of media-Snapshot, Video Clip and System Log.



Media Name: Enter an unique name for media.

Snapshot: Select this feature to enable camera to take snapshot.

Source: The source of stream: stream1 or stream2.

Send pre-event image(s) [0~7]: The number of pre-event images.

Send post-event image(s) [0~7]: The number of post-event images. Refer page 61 for more information.

File name prefix: The prefix name will be added on the file name.

Add date and time suffix to file name: Check it to add timing information as file name suffix. Refer page 61 for more information.

Video clip: Select this feature to enable camera to take video clip.

Source: The source of stream: stream1 or stream2.

Pre-event recording: The interval of pre-event recording in seconds.

Maximum duration: The maximal recording file duration in seconds. Refer page 62 for more information.

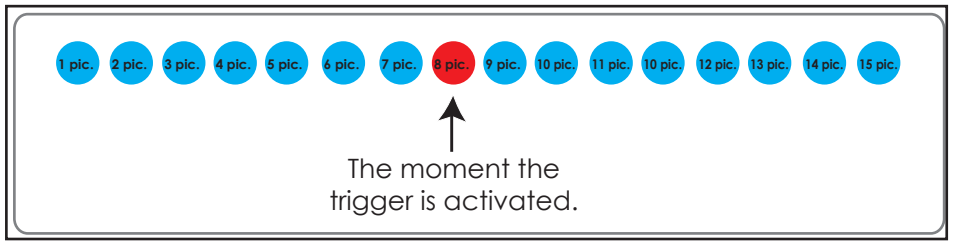
Maximum file size: The maximal file size would be generated.

File name prefix: The prefix name will be added on the file name of the video clip. Refer page 62 for more information.

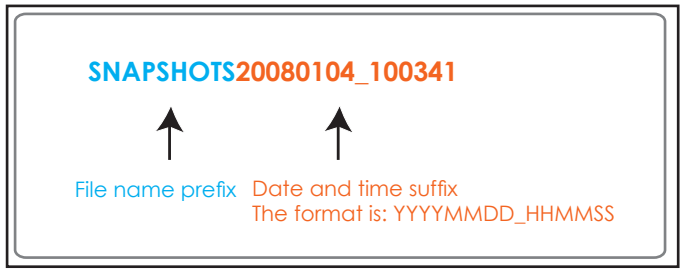
System log: Select this feature to enable camera to display system log.

Send post-event image (s) [0~7)
Specify to capture the number of images after a trigger is activated. A maximum of seven images can be generated.

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

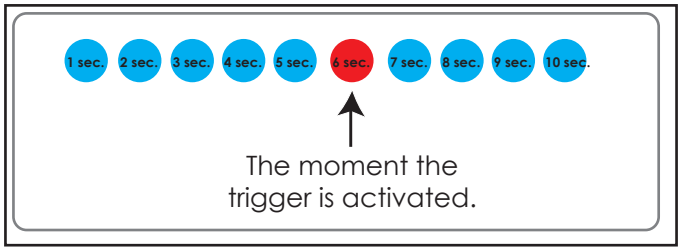


Add date and time suffix to file name
Select this option to add date and time to the file name suffix.

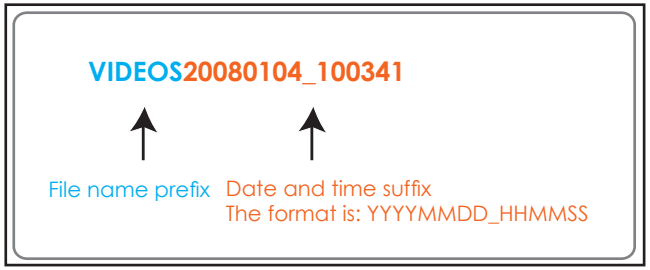


Maximum duration
Specify the maximal recording duration in seconds. You can set up to ten seconds.

For example:
If the 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 four seconds after a trigger is activated.



File name prefix
Enter the text that will be added at the beginning of the file name.



Add Event

Create and schedule up to 3 events with their own settings here.

Event name: Enter a name for the event.

Enable this event: Select to activate this event.

Priority: Set the priority for this event. The event with higher priority will be executed first.

Delay: Select the delay time before checking next event. It is being used for both events of motion detection and digital input trigger.

Trigger: The input type that triggers the event.

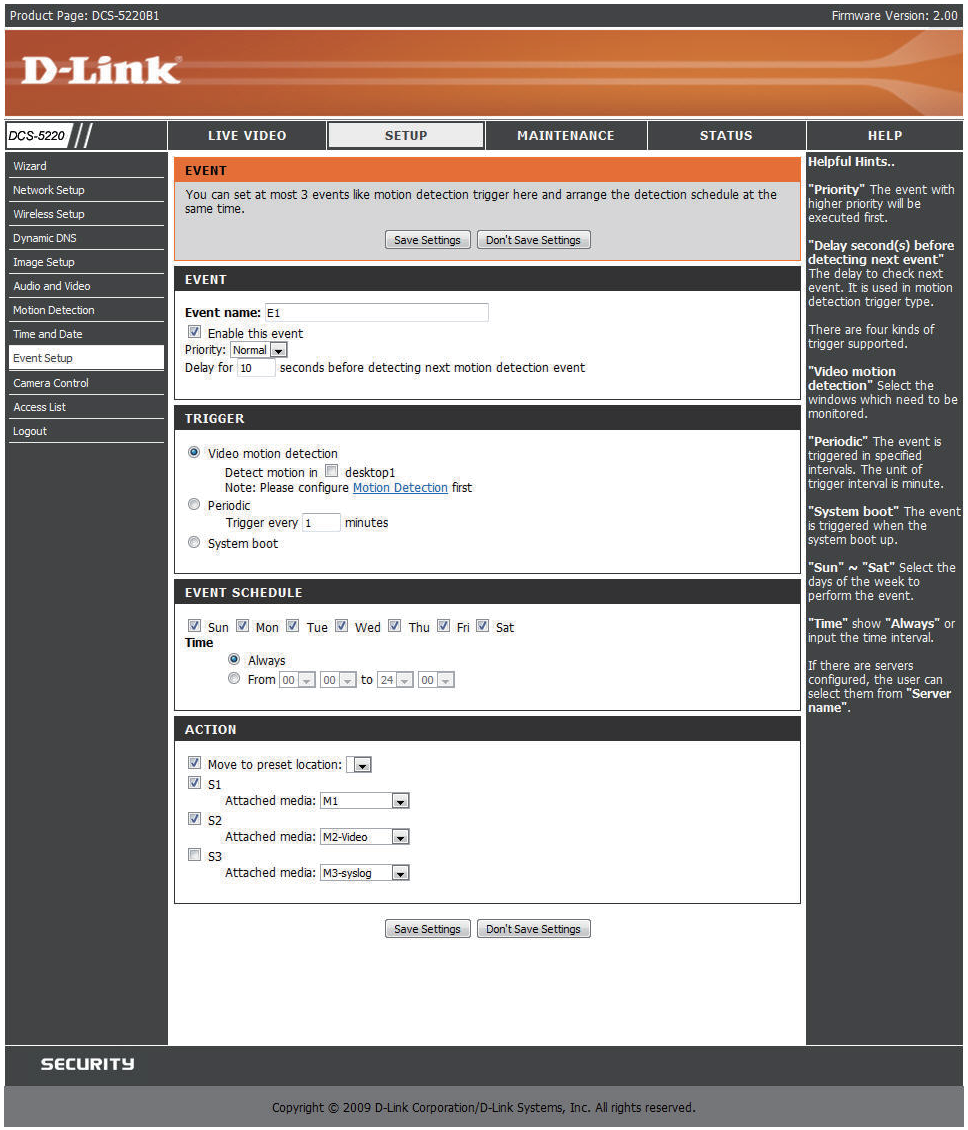
Video motion detection: Motion is detected during live video monitoring. Select the windows that need to be monitored.

Periodic: The event is triggered in specified intervals. The unit of trigger interval is minute.

System boot: Triggers an event when the system boots up.

Time: Select Always or enter the time interval.

Move to preset location: Select to move camera PTZ to the preset position.



Add Recording

Here you can configure and schedule the recording settings.

Recording entry name: The unique name of the entry.

Enable this recording: Select this to enable the recording function.

Priority: Set the priority for this entry. The entry with a higher priority value will be executed first.

Source: The source of stream.

Recording schedule: Scheduling the recording entry.

Recording settings: Configuring the setting for the recording.

Destination: Select the folder where will store the recording file.

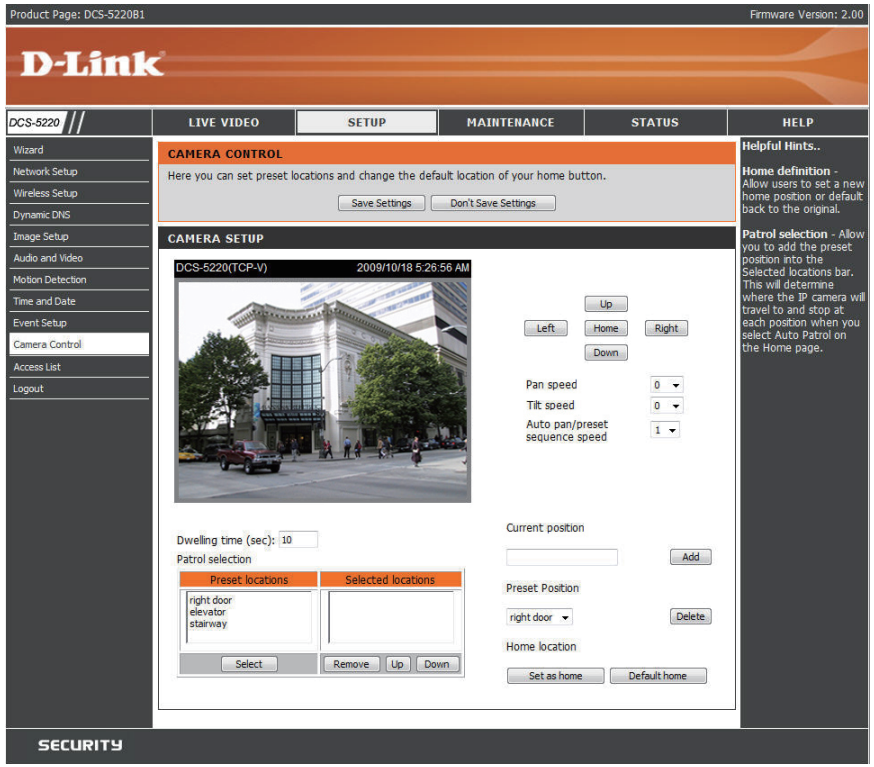
Total cycling recording size Please input a HDD volume between 1MB and 200GB for recording space. The recording data will replace the oldest one when total recording size exceeds this value. For example, if each recording file is 6MB, and the total cycling recording size is 600MB, then the camera will record 100 files to the specified location (folder) and then will delete the oldest file and create new file for cycling recording.
Please note that if the HDD empty space is not enough, the recording will stop. Before you setup this option please make sure your HDD has enough space and it is better to not save other files in the same folder as recording files.

Size of each file for recording: File size for each recording file. You may input the value in the range of 200-6000.

File Name Prefix: The prefix name will be added on the file name of the recording file(s).

Camera Control

Click the Camera Control button from the left side of the Setup screen to access settings that affect how the DCS-5220 Network Camera can pan and move to preset locations.



Left, Up, Right, Down, & Home: "Home" aims the camera to the center and the other buttons aim the camera accordingly.

Pan Speed: Select the speed at which the camera will pan for a full cycle from the drop-down list. Select a value between -5 and +5, -5 being the slowest setting.

Tilt Speed: Select the speed at which the camera will tilt for a full cycle from the pull down menu. Select a value between -5 and +5, -5 being the slowest setting.

Auto Pan/ Patrol Speed: Select the speed at which the camera will pan during auto patrol. Select a value between 1 and 5, 1 being the slowest setting.

Current Position: Enter a name for the position at which you would like to preset the DCS-5220. Click **Add** to add the new preset position to the **Preset Locations** list.

Preset Position: Using the drop-down list, you can delete a preset position by selecting it and clicking **Delete**.

Home definition: Use the **Save as home** button to set the current position as the home position. The Home position is the first position the camera goes to after the camera boots. You can also recall the default home position, use the **Default home** button.

Patrol Selection: To use the Auto Patrol feature, select the desired preset positions from the **Preset Locations** list and add them to the **Selected Locations** list by clicking **Select**. You can then select the order in which the camera will patrol through the preset locations by selecting a location and clicking **UP** or **DN**. Click **Remove** to remove a location from the list.

Access List

Click the Access List button from the left side of the Setup screen to access Access List settings.

Allow List Start IP Address: The starting IP Address of the devices (such as a computer) that have permission to access the video of the camera.

Allow List End IP Address: The ending IP Address of the devices (such as a computer) that have permission to access the video of the camera.

Delete Allow List: Remove the customized setting from the Allow List.

Deny List Start IP Address: The starting IP Address of the devices (such as a computer) that don't have permission to access the video of the camera.

Deny List End IP Address: The ending IP Address of the devices (such as a computer) that don't have permission to access the video of the camera.

Delete Deny List: Remove the customized setting from the Deny List.

Maintenance

Admin

You can modify both the camera's name and the administrator's password, as well as add more user accounts for accessing the camera.

Admin password setup: Modify the password for the administrator's account.

Add user account: Add a new user account.

Username: Enter a username for the new account.

Password: Enter a password for the new account.

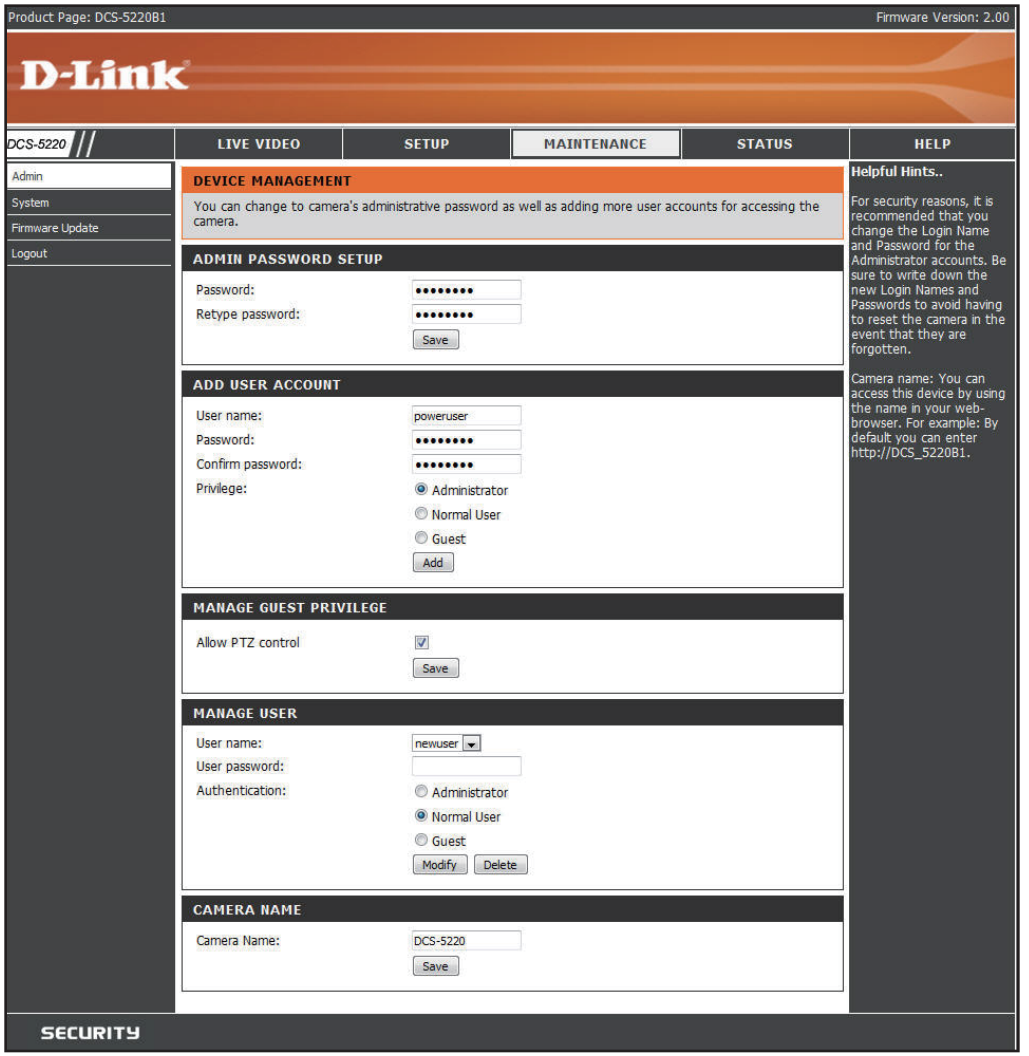
Privilege: Select the access rights for the new user.

Allow PTZ control: Select to allow guest account to control PTZ function.

Manage user: Manage the accounts for existing users.

Authentication: The access rights for existing users.

Camera Name: Create a unique name for your camera and you can access the camera using this name in your web-browser. For example: http://DCS-5220 (by default).



SYSTEM

The Backup and Restore page will allow you to turn the front panel LED off, restore factory default settings, and reboot the camera.

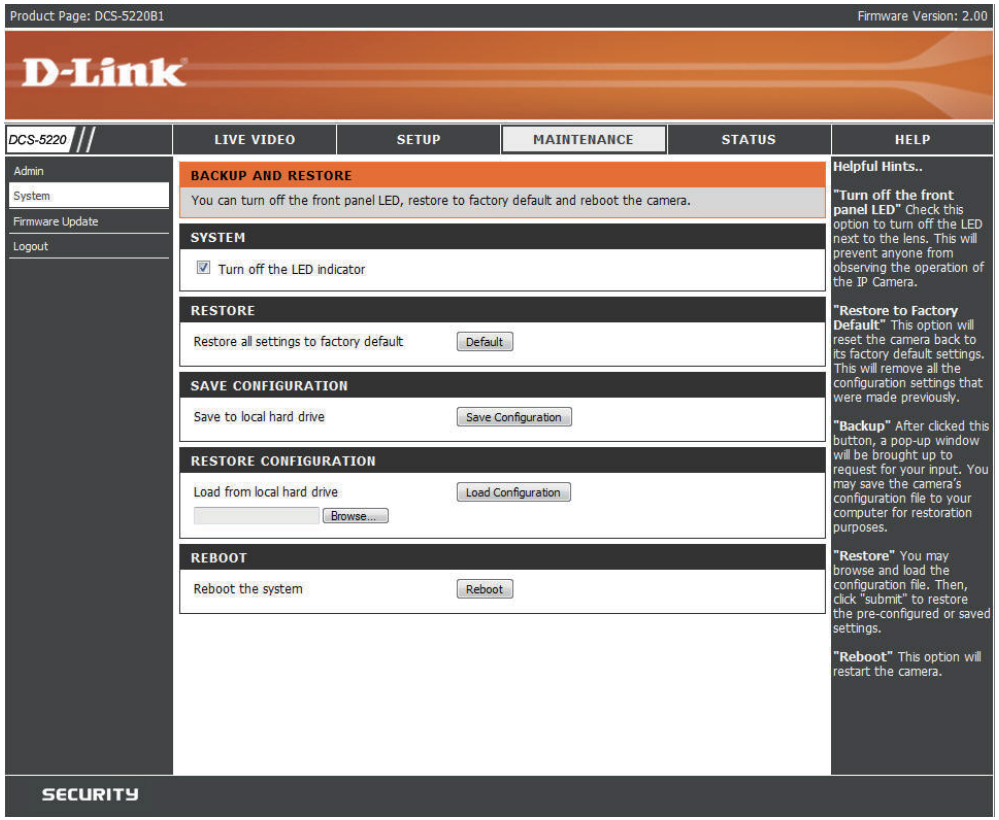
Turn off the LED indicator: Select this option to turn off the LED next to the lens. This will prevent anyone from observing the operation of the network camera.

Restore: Click the **Restore** button to reset the camera back to its factory default settings. This will remove all the configuration settings that were previously made.

Save configuration: Click to save the camera's configuration file to your computer for restoration purpose.

Restore configuration: You may browse and load the configuration file, then click Load Configuration to restore the pre-configurated or saved settings.

Reboot: Click the **Reboot** button to restart the camera.



Firmware Update

Your current firmware version and date will be displayed on your screen. You may go to the D-Link Support page to check for the latest firmware version available.

To upgrade the firmware on your DCS-5220, please download and save the latest firmware version from the D-Link support site to your local hard drive. Locate the file on your local hard drive by clicking the Browse button. Then, open the file and click the "**Upload**" button to start the firmware upgrade.

Current firmware version: It will be automatically determined and displayed by the system.

Current firmware date: It will be automatically determined and displayed by the system.

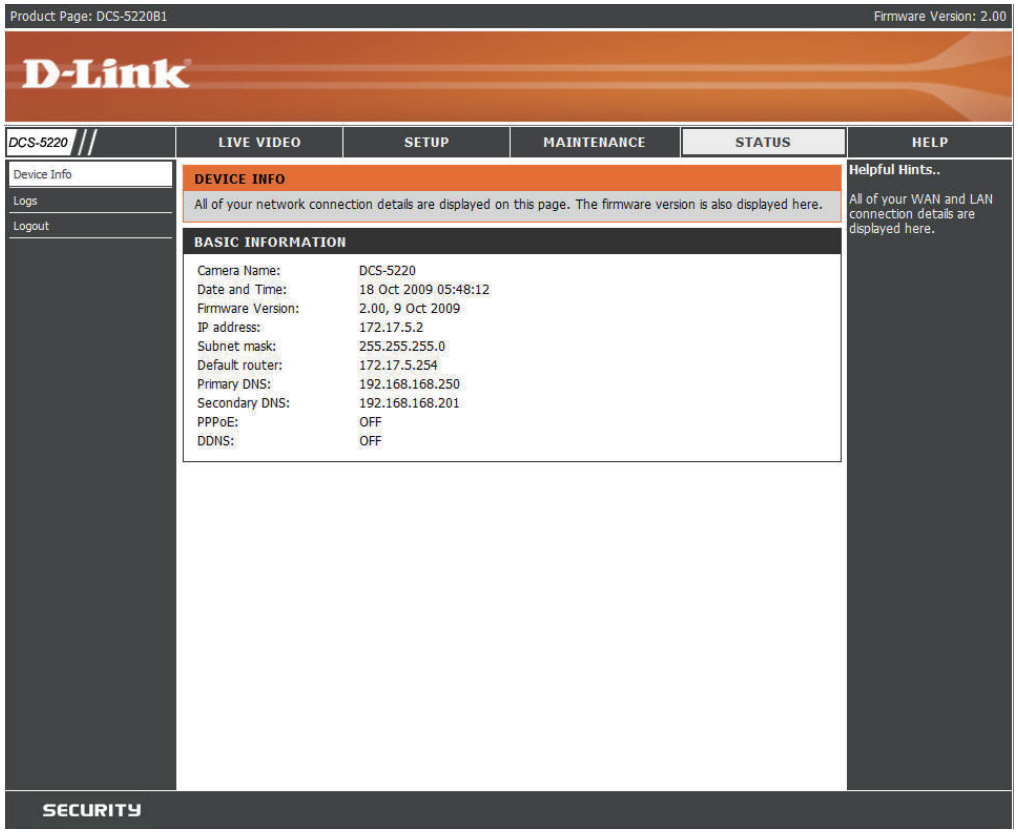
File Path: Locate the file (upgraded firmware) on your hard drive using the browse feature.

Upload: Start uploading and upgrading the new firmware to your camera.

Status

Device Info

This page displays all the details information about your device and network connection.



Logs

This page displays the log information of your camera. You can configure a remote log server so that you can view your log details remotely.

Enable remote log: Click to enable this feature so that the camera can send camera log files to a remote server.

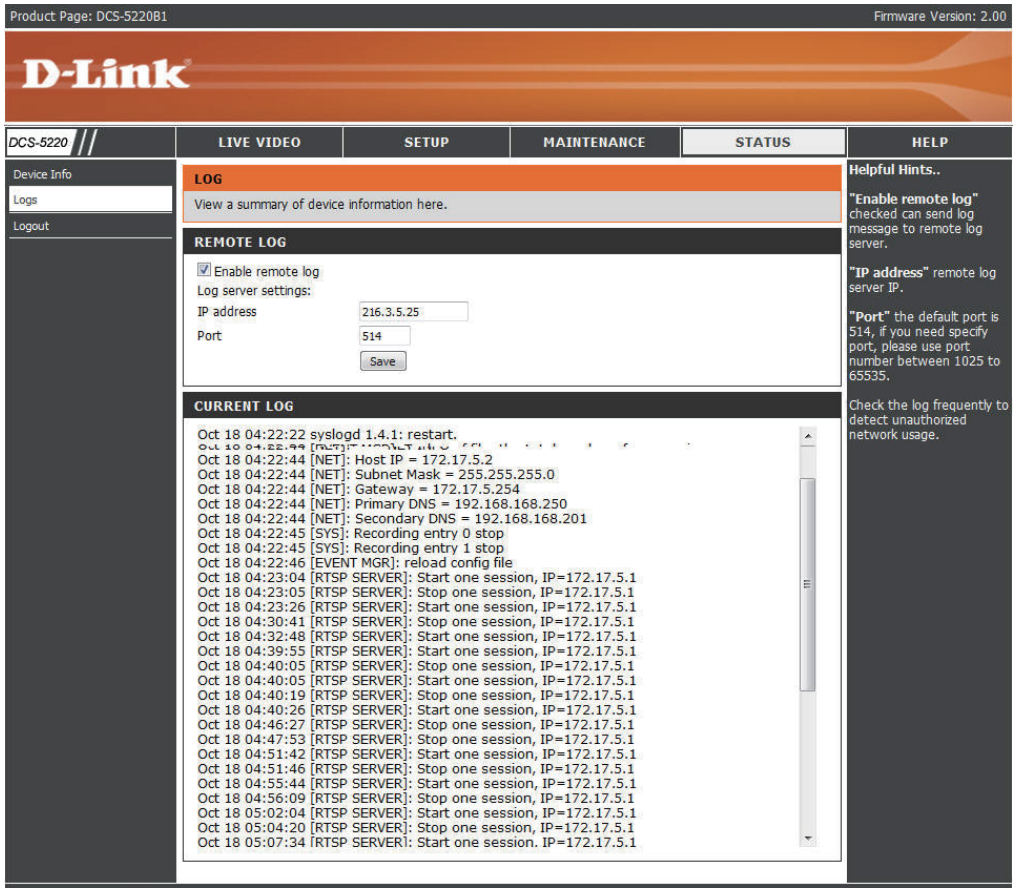
Log server settings: Configure the settings for the log server.

IP Address: The IP address of the remote server.

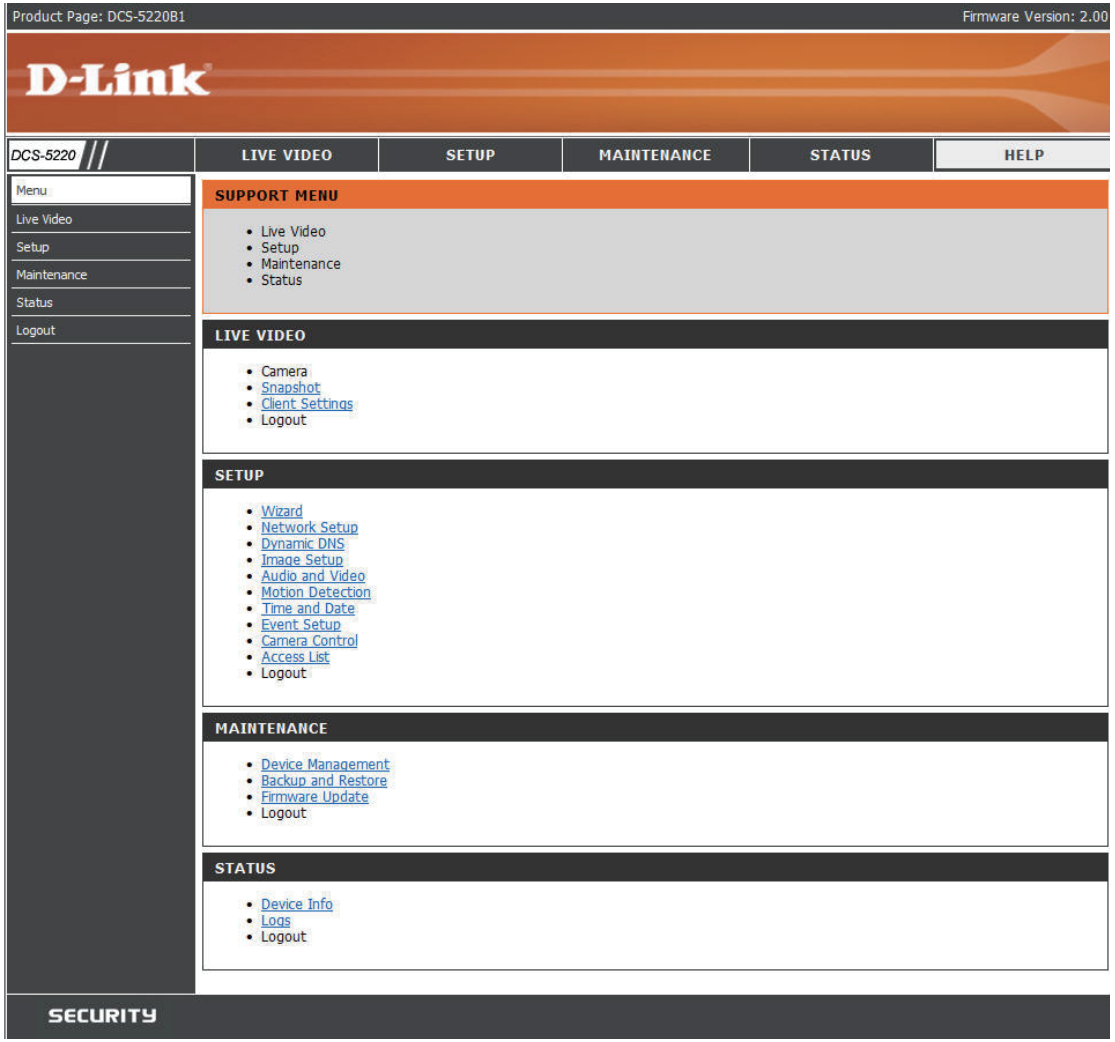
Port: The port number of the remote log server. The default port is 514.

Save: Click to save the settings.

Current Log: Displays the the system's log file. The content of the file reveals useful information about camera configuration and connectivity status after the camera boots up.



Help


Product Page: DCS-5220B1
Firmware Version: 2.00
D-Link
DCS-5220
LIVE VIDEO
SETUP
MAINTENANCE
STATUS
HELP
Menu
Live Video
Setup
Maintenance
Status
Logout
SUPPORT MENU
Live Video
Setup
Maintenance
Status
LIVE VIDEO
Camera
Snapshot
Client Settings
Logout
SETUP
Wizard
Network Setup
Dynamic DNS
Image Setup
Audio and Video
Motion Detection
Time and Date
Event Setup
Camera Control
Access List
Logout
MAINTENANCE
Device Management
Backup and Restore
Firmware Update
Logout
STATUS
Device Info
Logs
Logout
SECURITY

Wireless Security

This section will show you the different levels of security you can use to protect your data from intruders. The DCS-5220 offers the following types of security:

- WPA-PSK (Pre-Shared Key)
- WEP (Wired Equivalent Privacy)

What is WEP?

WEP stands for Wired Equivalent Privacy. It is based on the IEEE 802.11 standard and uses the RC4 encryption algorithm. WEP provides security by encrypting data over your wireless network so that it is protected as it is transmitted from one wireless device to another.

To gain access to a WEP network, you must know the key. The key is a string of characters that you create. When using WEP, you must determine the level of encryption. The type of encryption determines the key length. 128-bit encryption requires a longer key than 64-bit encryption. Keys are defined by entering in a string in HEX (hexadecimal - using characters 0-9, A-F) or ASCII (American Standard Code for Information Interchange – alphanumeric characters) format. ASCII format is provided so you can enter a string that is easier to remember. The ASCII string is converted to HEX for use over the network. Four keys can be defined so that you can change keys easily.

What is WPA?

WPA, or Wi-Fi Protected Access, is a Wi-Fi standard that was designed to improve the security features of WEP (Wired Equivalent Privacy).

The 2 major improvements over WEP:

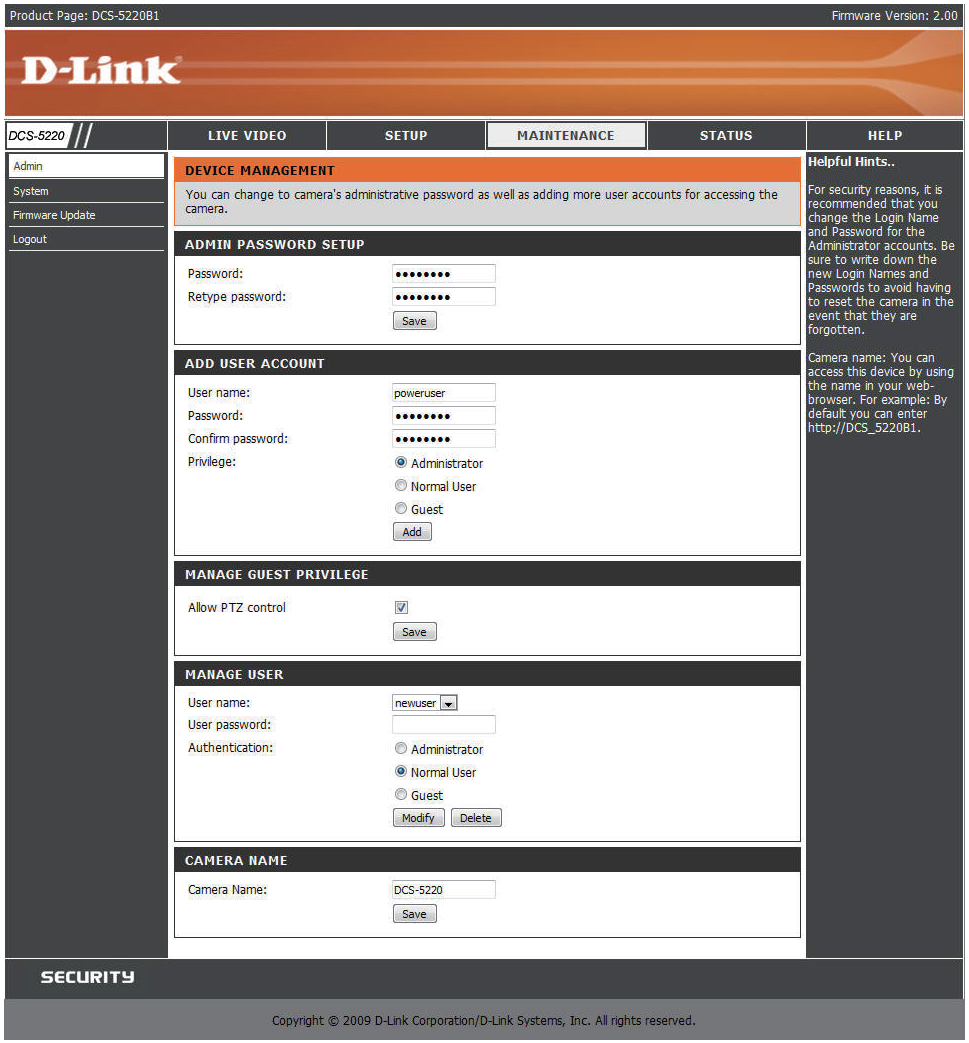
- Improved data encryption through the Temporal Key Integrity Protocol (TKIP). TKIP scrambles the keys using a hashing algorithm and, by adding an integrity-checking feature, ensures that the keys haven't been tampered with. WPA2 is based on 802.11i and uses Advanced Encryption Standard instead of TKIP.

- User authentication, which is generally missing in WEP, through the extensible authentication protocol (EAP). WEP regulates access to a wireless network based on a computer's hardware-specific MAC address, which is relatively simple to be sniffed out and stolen. EAP is built on a more secure public-key encryption system to ensure that only authorized network users can access the network.

WPA-PSK/WPA2-PSK uses a passphrase or key to authenticate your wireless connection. The key is an alpha-numeric password between 8 and 63 characters long. The password can include symbols (!?*&_) and spaces. This key must be the exact same key entered on your wireless router or access point.

Setting Security

At this point it is highly recommended that you click on the Maintenance button on the Home screen, and then the Tools tab to bring you to the Admin screen. Enter a password for security purposes.



To ensure the highest security and prevent unauthorized use of the Network Camera, the Administrator has the exclusive privilege to access the System Administration settings to allow users entry and authorize privileges for all users. The Network Camera supports multi-level password protection/access to the Network Camera that can be restricted to defined users who have a User Name and User Password, which is assigned by the Administrator.

The Administrator can release a public user name and password so that when remote users access the Network Camera they will have the right to view the image transmitted by the Network Camera.

When the Network Camera is used for the first time, it is highly recommended that the Administrator set the Administrator's Password to constrain user access to the Network Camera since the Default settings are Null String (no password). Once the Password is defined, only the Administrator has access to the management of the Network Camera. This procedure should be done as soon as possible since the security features of the Network Camera will not be enabled until the Administrator Password is defined.

Using & Configuring the DCS-5220 with a NAT Router

D-Link's DCS-5220 is a versatile and cost effective Network Camera offering both video and audio monitoring. It can also serve as a powerful surveillance system in security applications. The DCS-5220 can be used with any wired or 802.11b/g wireless router. This section explains how to view the camera from either the Internet or from inside your internal network.

Materials Needed:

- 1 DCS-5220 Network Camera
- 1 Ethernet Cable
- A Wired or Wireless router such as the D-Link DIR-655 Wireless Router
- Ethernet based PC for system configuration

Setting up the DCS-5220 for Use Behind a Router

Installing a DCS-5220 Network Camera on your network is an easy 4–step procedure:

1. Assign a Local IP Address to Your Network Camera
2. View the Network Camera Using Your Internet Browser
3. Access the Router with Your Web Browser
4. Open Virtual Server Ports to Enable Remote Image Viewing

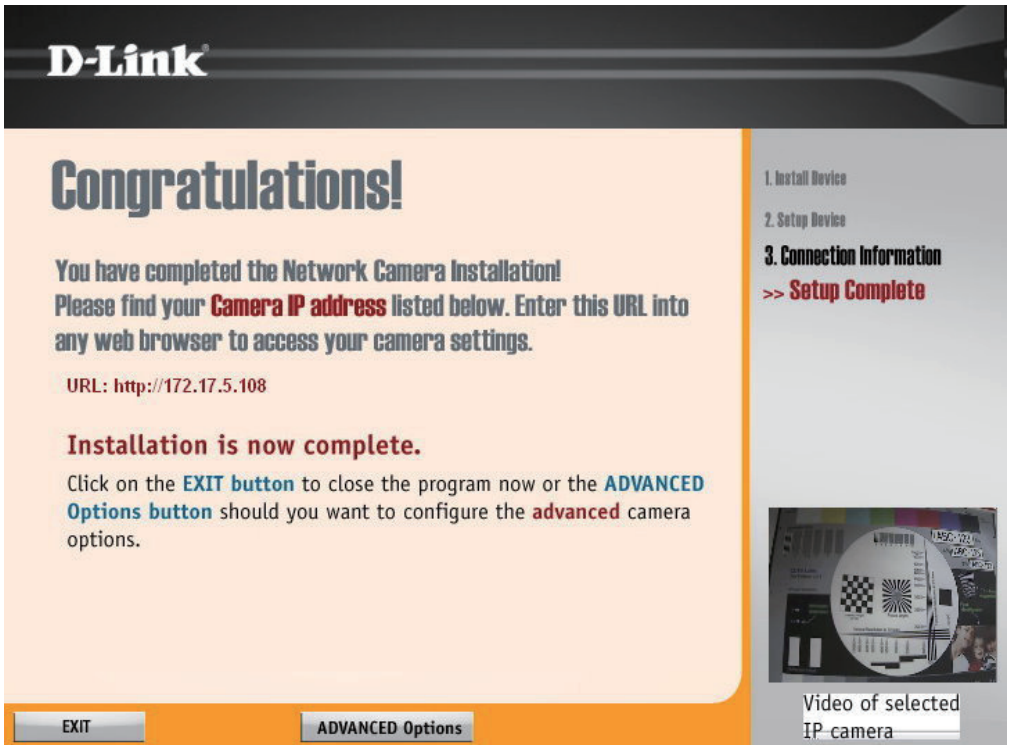
This section is designed to walk you through the setup process for installing your camera behind a router and enable remote video viewing. For the basic setup of the DCS-5220, follow the steps outlined in the Quick Installation Guide.

After you have completed the setup of the DCS-5220 outlined in the Quick Installation Guide you will have an operating camera that has an assigned IP Address. Because you are using a router to share the Internet with one or more PCs, the IP Address assigned to the Network Camera will be a local IP Address. This allows viewing within your Local Area Network (LAN) until the router is configured to allow remote viewing of the camera over the Internet.

1 Assign a Local IP Address to Your Camera

Run the DCC program from the CD included with the DCS-5220. Follow the steps in the Quick Installation Guide to configure the DCS-5220. The camera will be assigned a local IP Address that allows it to be recognized by the router. Write down this IP Address for future reference.

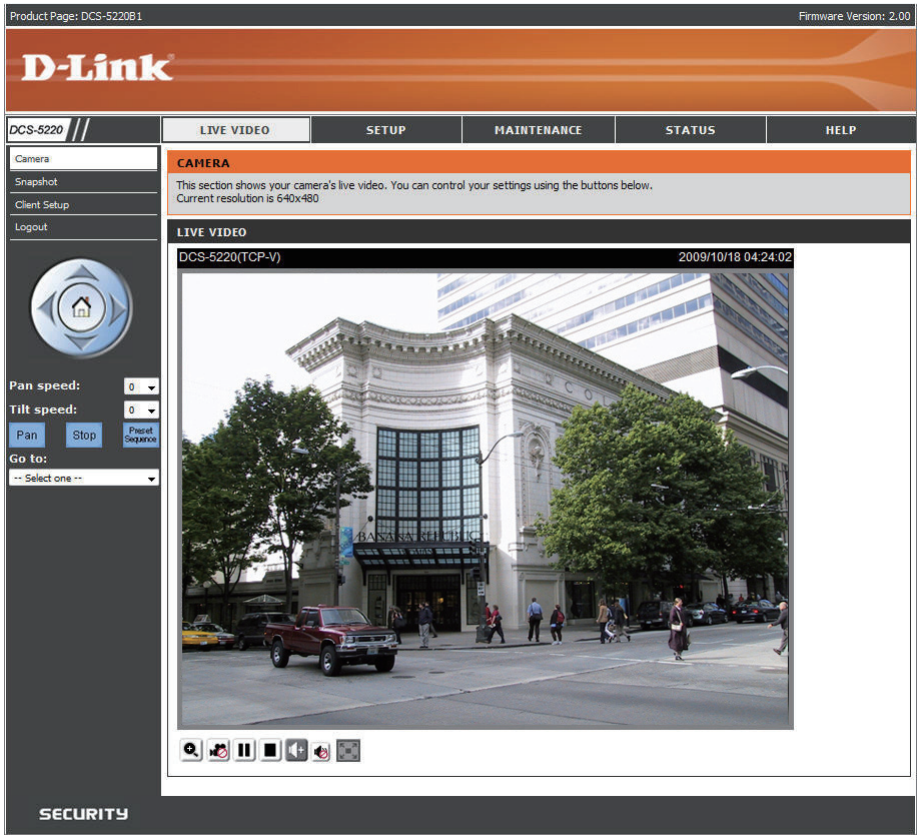
This is the IP Address assigned to your camera. Write it down for later use. 172.17.5.108 is only an example. You will probably have a different IP Address.



2 View the Network Camera Using Your Internet Browser

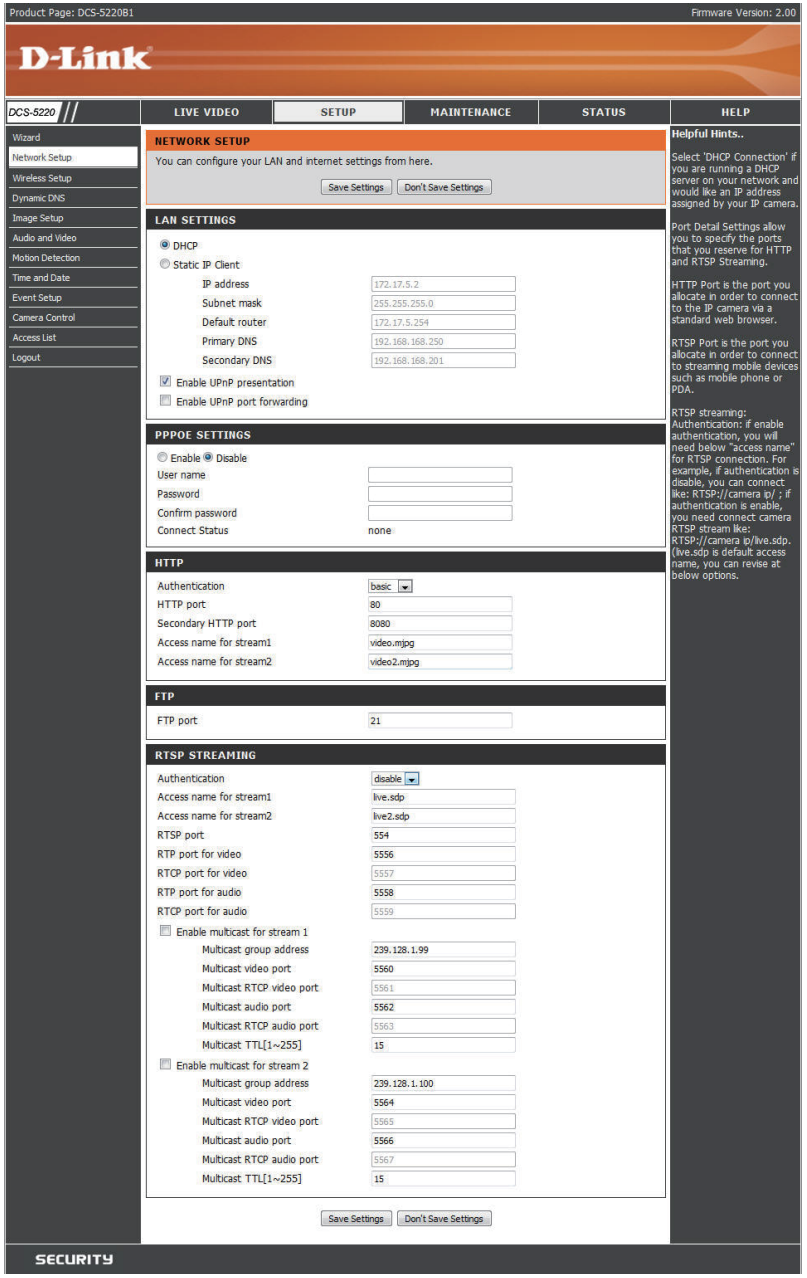
Run your Internet browser. In the address bar, type in the IP Address that was assigned to the Network Camera by the DCC program. The DCS-5220 Live Video Page appears with a window displaying live video from the camera. You are able to view this screen from any PC running Internet browser on your LAN.

Click on the Setup button on the left side of the display. Scroll to the bottom of the Network Setup page (see page 36) to display the ports used by HTTP and Streaming audio and video.



The **Setup > Network Setup** page displays the port settings for your camera. If necessary, these ports can be changed if they are already in use by other devices (e.g. in a multiple camera environment).

Note: *Ports 5556 - 5559, and both* ***HTTP*** *port and* ***RTSP*** *port are required to be opened for the DCS-5220. Please refer to page 86 on how to open ports in the router.*



Router Set-Up and Installation

The following steps generally apply to any router that you have on your network. The D-Link DIR-655 is used as an example to clarify the configuration process. Configure the initial settings of the DIR-655 by following the steps outlined in the DIR-655 Quick Installation Guide.

3 Access the Router with Your Web Browser

If you have cable or DSL Internet service, you will most likely have a dynamically assigned WAN IP Address. 'Dynamic' means that your router's WAN IP address can change from time to time depending on your ISP. A dynamic WAN IP Address identifies your router on the public network and allows it to access the Internet. To find out what your router's WAN IP Address is, go to the Status menu on your router and locate the WAN information for your router (as shown on the next page). The WAN IP Address will be listed. This will be the address that you will need to type in your Web browser to view your camera over the Internet.

Your WAN IP Address will be listed on the router's
Status > Device Info page.

Note: *Because a dynamic WAN IP can change from time to time depending on your ISP, you may want to obtain a Static IP address from your ISP. A Static IP address is a fixed IP address that will not change over time and will be more convenient for you to use to access your camera from a remote location. The Static IP Address will also allow you to access your camera attached to your router over the Internet.*

4 Open Virtual Server Ports to Enable Remote Image Viewing

The firewall security features built into the DIR-655 router prevent users from accessing the video from the DCS-5220 over the Internet. The router connects to the Internet over a series of numbered ports. The ports normally used by the DCS-5220 are blocked from access over the Internet. Therefore, these ports need to be made accessible over the Internet. This is accomplished using the Virtual Server function on the DIR-655 router. The Virtual Server ports used by the camera must be opened through the router for remote access to your camera. Virtual Server is accessed by clicking on the Advanced tab of the router screen.

Follow these steps to configure your router's Virtual Server settings:

1 Click Enabled.

2 Enter a different name for each entry.

3 Enter your camera's local IP Address (e.g., 192.168.0.120 in the example in step 2 on page 87) in the Private IP field.

4 Select TCP for HTTP port, both (TCP and UDP) for RTSP and both (TCP and UDP) for 5556 - 5559 ports.

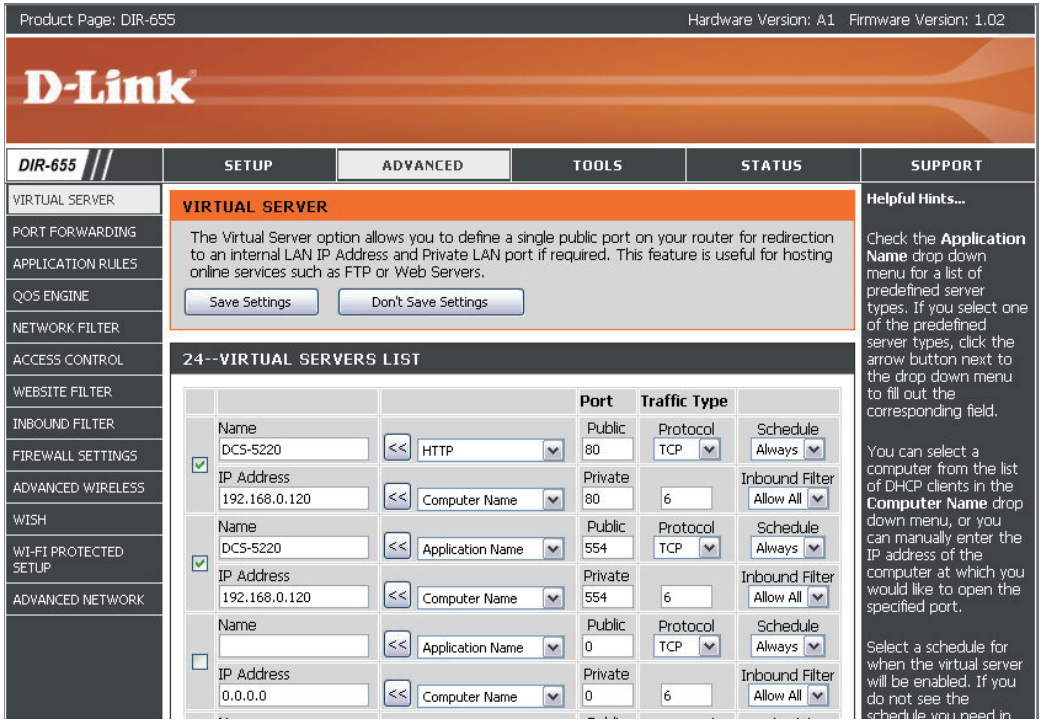
5 If you are using the default camera port settings, enter 80 into the Public and Private Port section, click Apply.

6 Scheduling should be set to Always so that the camera images can be accessed at any time.

Repeat the above steps adding the port 554 to both the Public and Private Port sections. A check mark appearing before the entry name will indicate that the ports are enabled.

Important: *Some ISPs block access to port 80 and other commonly used Internet ports to conserve bandwidth. Check with your ISP so that you can open the appropriate ports accordingly. If your ISP does not pass traffic on port 80, you will need to change the port the camera uses from 80 to something else, such as 800. Not all routers are the same, so refer to your user manual for specific instructions on how to open ports.*

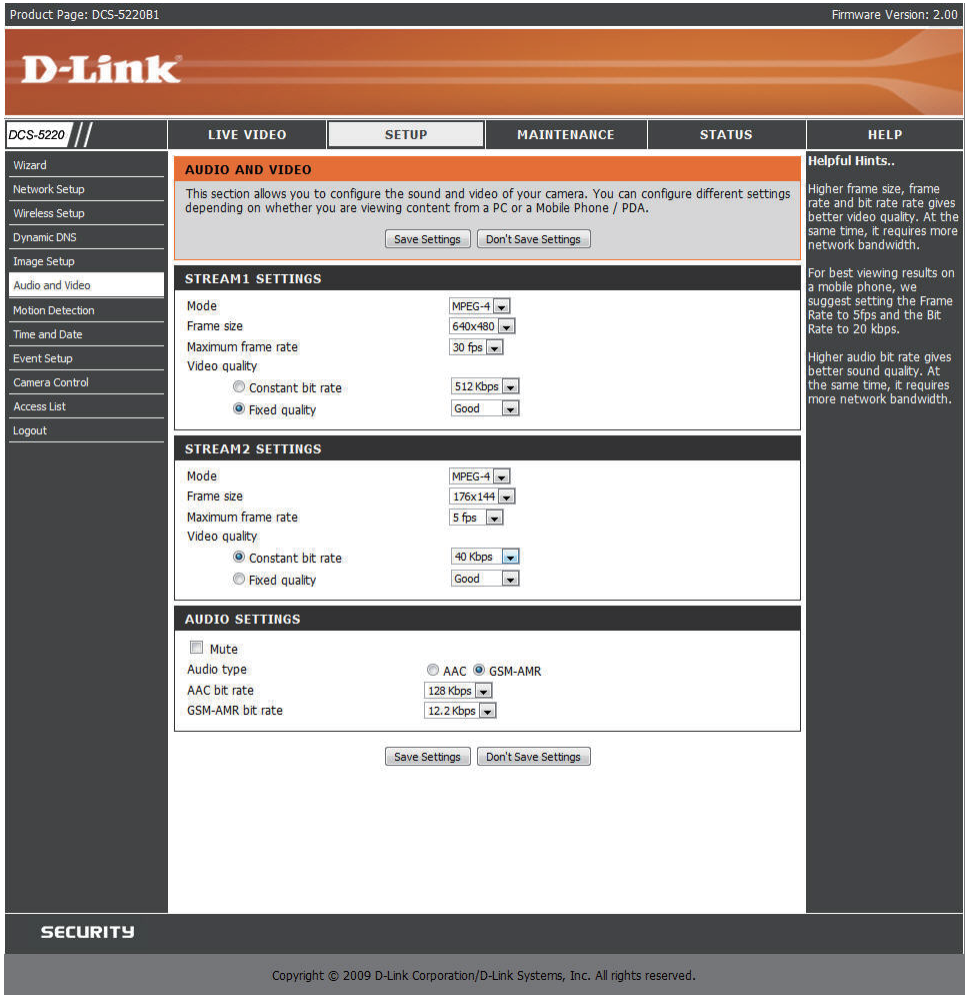
Enter valid ports in the Virtual Server section of your router. Please make sure to check the box next to the camera name on the Virtual Server List to enable your settings.



Using & Configuring 3G Compatible Cell Phones

Before you start, please refer to page 39 to find the Access Name of the RTSP protocol. To enter the RTSP streaming address, please follow this format: rtsp://*ip address of the camera*/live.sdp.

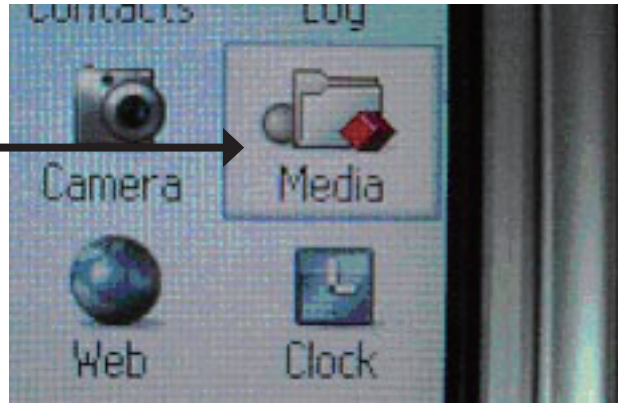
To enable mobile device video streaming, you will need to select **Configure for mobile viewing** (see sample screenshot to the right).



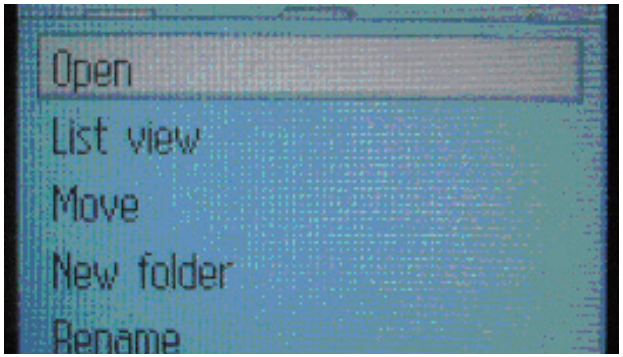
Play from RealPlayer

The following steps are based on a Nokia 6630 cell phone.

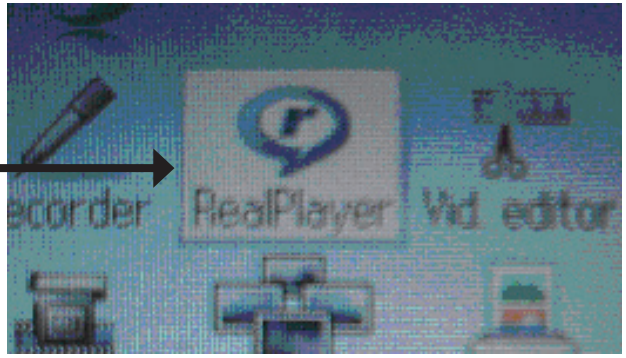
Press the Menu button and select **Media**



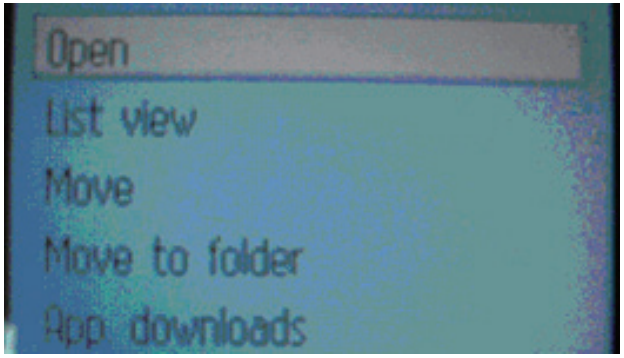
Select **Open**



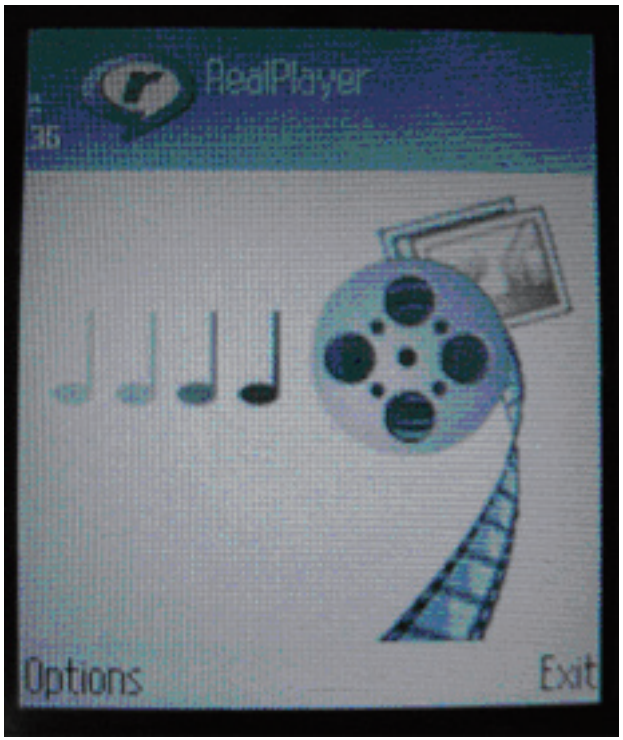
Select **RealPlayer**



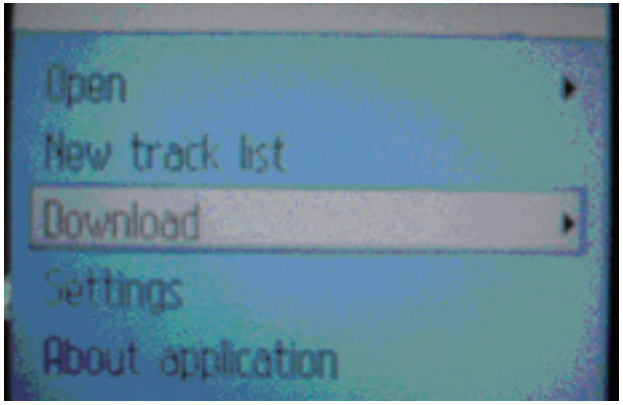
Select **Open**



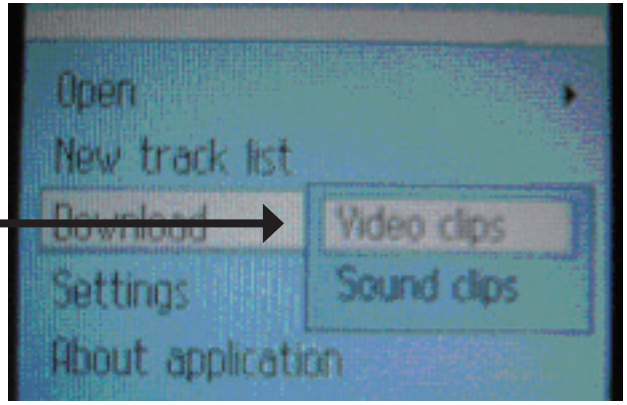
When RealPlayer opens, press **Options**



Select **Download**

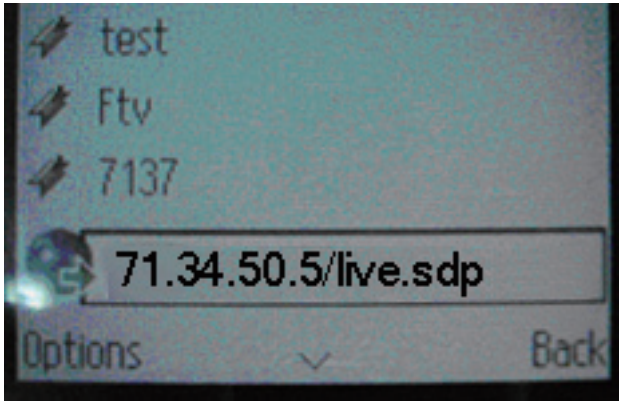


Select **Video Clips**

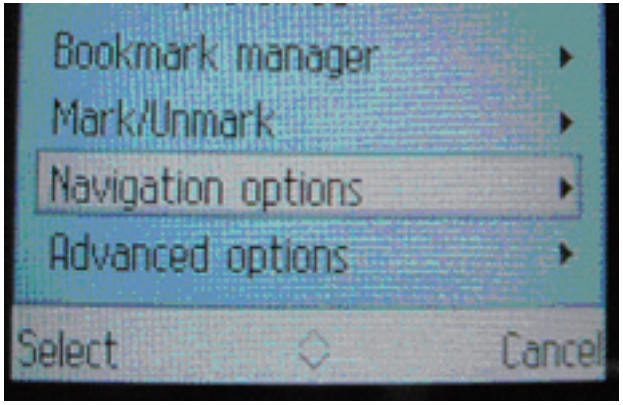


Note: *71.34.50.5 is the camera's IP address in this sample.*

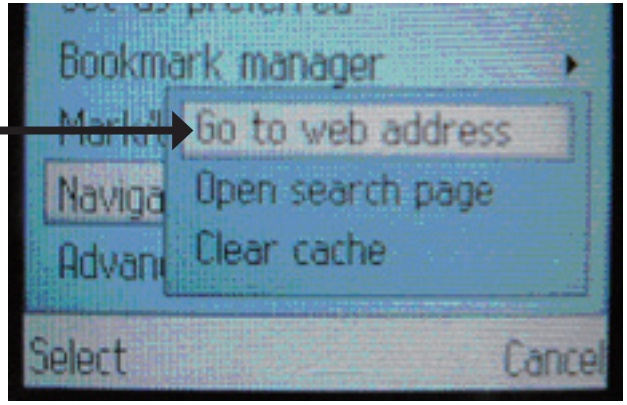
Press **Options**



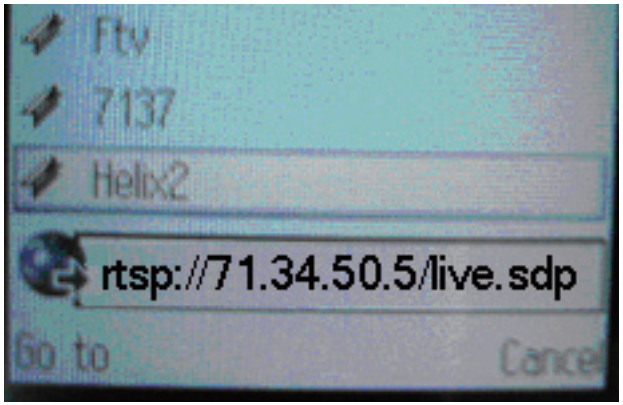
Select **Navigation Options**



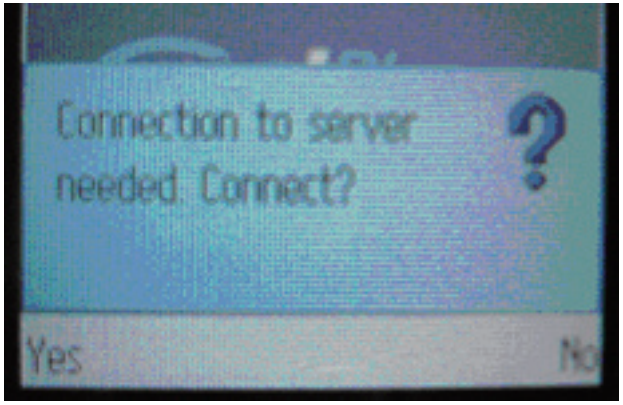
Select **Go to web address**



Input your rtsp address



Press **Yes**, and allow Connection and Loading of the streaming video.

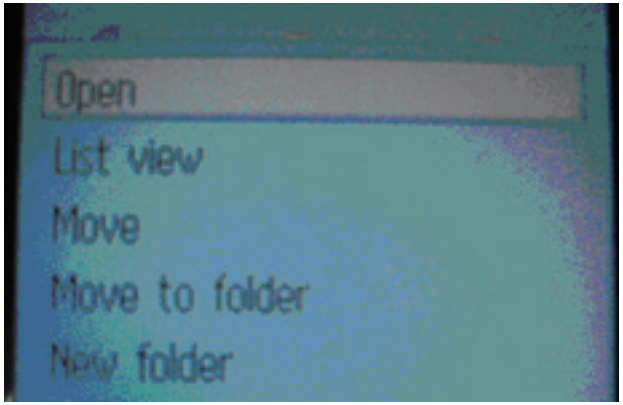


Enjoy streaming video on your cellphone.

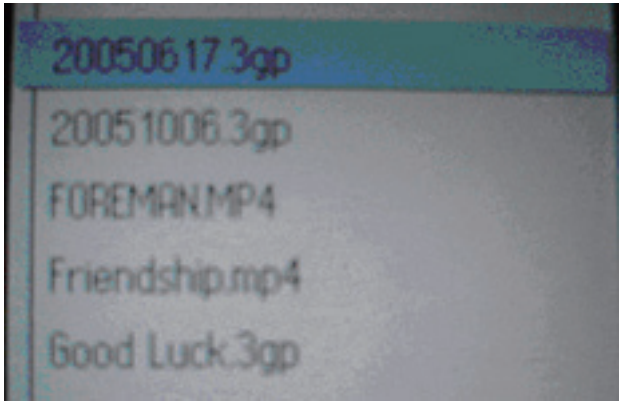
Play from PVPlayer

Press the Menu button and select **PVPlayer**

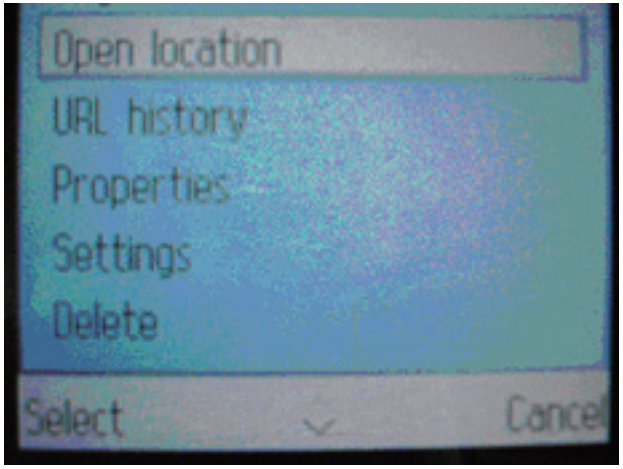
Select **Open**



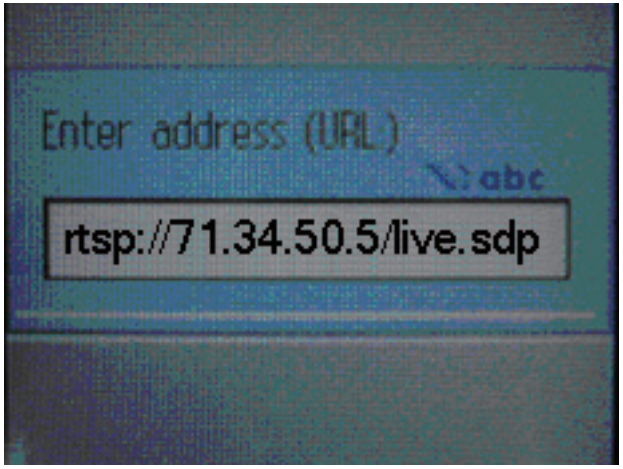
Press the **Options** button



Select **Open location**



Input your rtsp address



Note: *71.34.50.5 is the camera's IP address in this sample.*

Enjoy streaming video on your cellphone.

Wireless Basics

D-Link wireless products are based on industry standards to provide easy-to-use and compatible high-speed wireless connectivity within your home, business or public access wireless networks. Strictly adhering to the IEEE standard, the D-Link wireless family of products will allow you to securely access the data you want, when and where you want it. You will be able to enjoy the freedom that wireless networking delivers.

A wireless local area network (WLAN) is a cellular computer network that transmits and receives data with radio signals instead of wires. Wireless LANs are used increasingly in both home and office environments, and public areas such as airports, coffee shops and universities. Innovative ways to utilize WLAN technology are helping people to work and communicate more efficiently. Increased mobility and the absence of cabling and other fixed infrastructure have proven to be beneficial for many users.

Under many circumstances, it may be desirable for mobile network devices to link to a conventional Ethernet LAN in order to use servers, printers or an Internet connection supplied through the wired LAN. A Wireless Router is a device used to provide this link.

What is Wireless?

Wireless or WiFi technology is another way of connecting your computer to the network without using wires. WiFi uses radio frequency to connect wirelessly, so you have the freedom to connect computers anywhere in your home or office network.

Why D-Link Wireless?

D-Link is the worldwide leader and award winning designer, developer, and manufacturer of networking products. D-Link delivers the performance you need at a price you can afford. D-Link has all the products you need to build your network.

How does wireless work?

Wireless works similar to how cordless phone work, through radio signals to transmit data from one point A to point B. But wireless technology has restrictions as to how you can access the network. You must be within the wireless network range area to be able to connect your computer. There are two different types of wireless networks Wireless Local Area Network (WLAN), and Wireless Personal Area Network (WPAN).

Wireless Local Area Network (WLAN)

In a wireless local area network, a device called an Access Point (AP) connects computers to the network. The access point has a small antenna attached to it, which allows it to transmit data back and forth over radio signals. With an indoor access point as seen in the picture, the signal can travel up to 300 feet. With an outdoor access point the signal can reach out up to 30 miles to serve places like manufacturing plants, industrial locations, college and high school campuses, airports, golf courses, and many other outdoor venues.

Who uses wireless?

Wireless technology as become so popular in recent years that almost everyone is using it, whether it's for home, office, business, D-Link has a wireless solution for it.

Home

- Gives everyone at home broadband access
- Surf the web, check email, instant message, and etc
- Gets rid of the cables around the house
- Simple and easy to use

Small Office and Home Office

- Stay on top of everything at home as you would at office
- Remotely access your office network from home
- Share Internet connection and printer with multiple computers
- No need to dedicate office space

Where is wireless used?

Wireless technology is expanding everywhere not just at home or office. People like the freedom of mobility and it's becoming so popular that more and more public facilities now provide wireless access to attract people. The wireless connection in public places is usually called "hotspots".

Using a D-Link Cardbus Adapter with your laptop, you can access the hotspot to connect to Internet from remote locations like: Airports, Hotels, Coffee Shops, Libraries, Restaurants, and Convention Centers.

Wireless network is easy to setup, but if you're installing it for the first time it could be quite a task not knowing where to start. That's why we've put together a few setup steps and tips to help you through the process of setting up a wireless network.

Tips

Here are a few things to keep in mind, when you install a wireless network.

Centralize your router or Access Point

Make sure you place the router/access point in a centralized location within your network for the best performance. Try to place the router/access point as high as possible in the room, so the signal gets dispersed throughout your home. If you have a two-story home, you may need a repeater to boost the signal to extend the range.

Eliminate Interference

Place home appliances such as cordless telephones, microwaves, and televisions as away as possible from the router/access point. This would significantly reduce any interfere that the appliances might cause since they operate on same frequency.

Security

Don't let you next-door neighbors or intruders connect to your wireless network. Secure your wireless network by turning on the WPA or WEP security feature on the router.

Wireless Modes

There are basically two modes of networking:

- **Infrastructure** – All wireless clients will connect to an access point or wireless router.

- **Ad-Hoc** – Directly connecting to another computer, for peer-to-peer communication, using wireless network adapters on each computer, such as two or more DCS-5220 wireless network Cardbus adapters.

An Infrastructure network contains an Access Point or wireless router. All the wireless devices, or clients, will connect to the wireless router or access point.

An Ad-Hoc network contains only clients, such as laptops with wireless cardbus adapters. All the adapters must be in Ad-Hoc mode to communicate.

Networking Basics

Check your IP address

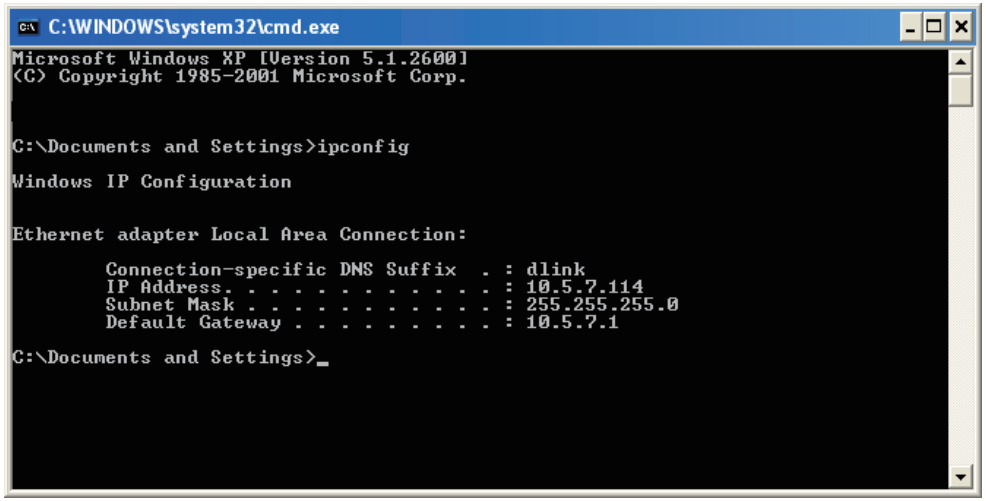
After you install your new D-Link adapter, by default, the TCP/IP settings should be set to obtain an IP address from a DHCP server (i.e. wireless router) automatically. To verify your IP address, please follow the steps below.

Click on **Start > Run**. In the run box type ***cmd*** and click **OK**. (Windows Vista® users type *cmd* in the **Start Search** box.)

At the prompt, type ***ipconfig*** and press **Enter**.

This will display the IP address, subnet mask, and the default gateway of your adapter.

If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your access point. Some firewall software programs may block a DHCP request on newly installed adapters.



If you are connecting to a wireless network at a hotspot (e.g. hotel, coffee shop, airport), please contact an employee or administrator to verify their wireless network settings.

Statically Assign an IP address

If you are not using a DHCP capable gateway/access point, or you need to assign a static IP address, please follow the steps below:

Step 1

Windows Vista® - Click on **Start > Control Panel > Network and Internet > Network and Sharing Center > Manage Network Connections.**

Windows® XP - Click on **Start > Control Panel > Network Connections.**

Step 2

Right-click on the **Local Area Connection** which represents your D-Link network adapter and select Properties.

Step 3

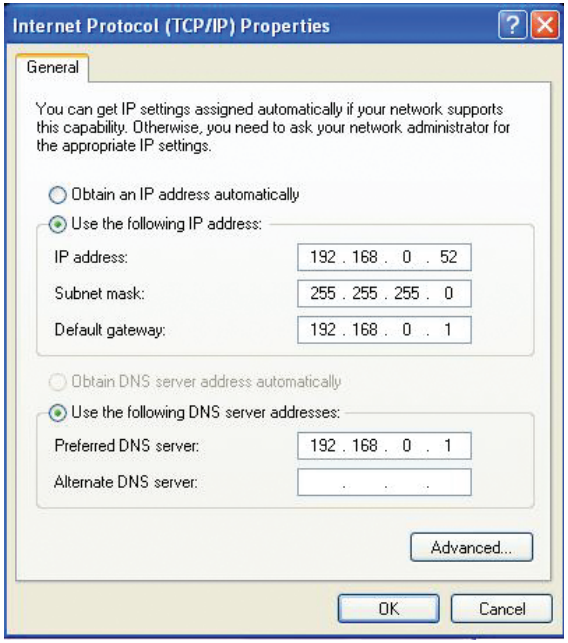
Highlight **Internet Protocol (TCP/IP)** and click **Properties**.

Step 4

Click **Use the following IP address** and enter an IP address that is on the same subnet as your network or the LAN IP address on your access point.

Example: If the network camera's LAN IP address is 192.168.0.1, make your IP address 192.168.0.X where X is a number between 2 and 99. Make sure that the number you choose is not in use on the network. Set Default Gateway the same as the LAN IP address of your access point (192.168.0.1).

Set Primary DNS the same as the LAN IP address of your access point (192.168.0.1). The Secondary DNS is not needed or you may enter a DNS server from your ISP.



Step 5

Click **OK** to save your settings.

Reset and Restore

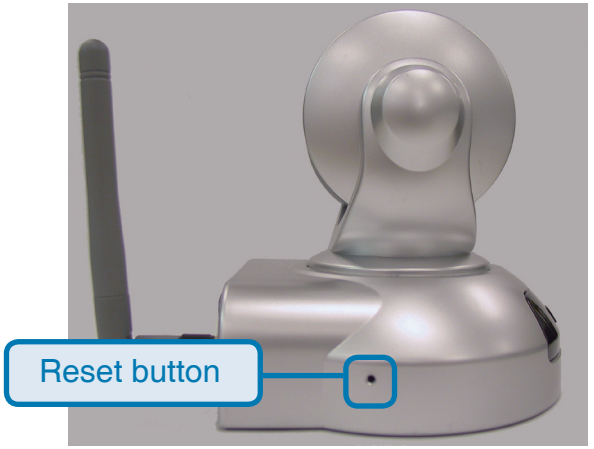
The hidden button in the pinhole beside the Ethernet socket is used to **reset** the system or **restore** the factory default settings. Sometimes resetting the **DCS-5220** will return the system back to a normal state. If the system still has problems after reset, restore the factory settings and install again:

RESET:

1. Lightly insert a paper clip (or a similar sized tool) into the reset hole on the back of the camera, press lightly and then release the button.

2. The LED on the front of the camera will begin blinking red and green.

3. When the LED stops the blinking the reset has completed.



RESTORE:

1. Insert the paperclip or other tool and hold the button in.

2. Wait for the LED on the front of the camera to blink red and green and hold the button for 30 seconds.

3. Withdraw the tool after the second cycle of the LED blinking and a factory restore has been completed.

Restoring the factory defaults will result in the loss of any previous settings and will require running the Installation Wizard to return the DCS-5220 to a normal state.

Frequently Asked Questions

This chapter provides solutions to problems that may occur during the installation and operation of the DCS-5220. Read the following descriptions if you are having any problems.

Wireless PTZ Network Camera Features

1. What is a Wireless PTZ Network Camera ?

The Wireless PTZ Network Camera is a stand-alone system connecting directly to an Ethernet or Fast Ethernet network. The Wireless PTZ Network Camera differs from a conventional PC Camera because it has an integrated system with built-in CPU and web-based solutions, providing a low cost solution that can transmit high quality video images for monitoring. The Wireless PTZ Network Camera can be remotely managed, accessed and controlled using a web browser from any computer over an Intranet or Internet.

2. What is the maximum number of users that can access DCS-5220 simultaneously?

The maximum number of users that can log onto the Wireless PTZ Network Camera at the same time is 10. Please keep in mind the overall performance of the transmission speed will be reduced if many users have logged on to the camera simultaneously.

There is no limit on the number of users when a multicast-enabled router is being used. The multicast protocol helps reduce the network bandwidth consumption.
Note that the Network Camera must be configured to enable multicast streaming. For more information, see RTSP Streaming on page 41.

3. What algorithm is used to compress the digital image?

The Wireless PTZ Network Camera utilizes MPEG-4 simple profile or MJPEG Mode image compression technology providing high quality images. MJPEG is a standard for image compression and it can be applied to various web browsers and application software without installing any extra software

4. Can I capture still images from the Wireless PTZ Network Camera?

Yes, you can capture still images using the snapshot function.

Fixed Dome Day & Night Network Camera Installation

1. Can the Network Camera be used outdoors?

The Wireless PTZ Network Camera is not weatherproof. It needs to be equipped with a weatherproof case for outdoor use but it is not recommended for wireless camera.

2. When physically connecting the Network Camera to a network, what network cabling is required?

The Wireless PTZ Network Camera uses Category 5 UTP cable allowing 10 Base-T and 100 Base-T networking solutions.

3. Can the Network Camera be setup as a PC-cam on a computer?

No, the Wireless PTZ Network Camera is used only on an Ethernet or Fast Ethernet network. The D-Link DSB-C110, DSB-C310, can be used as a PC Camera (Webcam).

4. Can the Network Camera be connected to the network if it consists only of private IP addresses?

Yes, the Wireless PTZ Network Camera can be connected to a LAN using only a private IP address.

5. Can the Network Camera be installed and work if a firewall exists in the network?

If a firewall exists in the network, port 80 is open for ordinary data communication and HTTPS port 443 for . The DCS-5220 uses RTSP port 554, RTP port 556, and RTP port 558 for streaming audio and video. These ports (or the ports you have specified in the Setup Tab in the Configuration screen) need to be opened on the firewall.

6. Why am I unable to access the Network Camera from a web browser?

If a router or firewall is used on the network, the correct ports for the DCS-5220 may not be configured on the router or firewall. To correct the problem, you need to determine if the DCS-5220 is behind a router or firewall and if the router or firewall is properly configured for the ports the DCS-5220 is using. Refer to Page 38 for help in opening the correct ports on a router or firewall for use with the DCS-5220. Other possible problems might be due to the network cable. Try replacing your network cable. Test the network interface of the product by connecting a local computer to the unit. If the problem is not solved, the Wireless PTZ Network Camera might be faulty.

7. Why does the Network Camera work locally but not externally?

- This might be caused by network firewall protection. The setting of the firewall may need to be changed in order for the Wireless PTZ Network Camera to be accessible outside of your local LAN. Check with the Network Administrator for your network.
- Make sure that your Wireless PTZ Network Camera isn't conflicting with any Web server you may have running on your network.
- The default router setting might be a possible reason. Check that the configuration of the router settings allows the Wireless PTZ Network Camera to be accessed outside of your local LAN.

Technical Specifications

NETWORK PROTOCOL SUPPORT
+ IPv4, TCP/IP, RTSP/ RTP/ RTCP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, DDNS, PPPoE, IGMP, Samba client, IP Filtering, 3GPP

BUILT-IN NETWORK INTERFACES
+ 10/100BASE-TX Ethernet port, RJ45

VIDEO ALGORITHM SUPPORT
+ JPEG for still image
+ Compression: MJPEG & MPEG-4
+ Streaming: Simultaneous dual-streaming
+ MPEG-4 streaming over UDP, TCP, or HTTP
+ MPEG-4 multicast streaming
+ MJPEG streaming over HTTP
+ Supports 3GPP mobile surveillance
+ Camera live viewing for up to 10 clients

VIDEO RESOLUTION[1]
+ MPEG-4/MJPEG video resolution up to 640x480 (VGA)
+ Up to 30fps at 176 x 144
+ Up to 30fps at 320 x 240
+ Up to 30fps at 640 x 480

VIDEO FEATURES
+ Adjustable image size, quality, and bit rate
+ Time stamp and text overlays
+ 3 configurable motion detection windows
+ Flip & mirror
+ Configurable brightness, saturation, sharpness
+ Adjustable AWB

VIDEO BIT RATE
20K to 4M

SENSOR & LENS SPECIFICATIONS
+ 1/4” VGA CMOS sensor
+ 4mm F2.0 standard fixed mount lens
+ Minimum illumination: 1Lux, F2.0
+ View angle: 48.45(Horizontal), 37.29(Vertical)

EVENT MANAGEMENT
+ Motion detection weekly schedule
+ Event notification and upload snapshots/video clips via HTTP, SMTP, or FTP
+ Multiple HTTP, SMTP, or FTP server setups
+ Multiple event notification setups for flexible application
+ Multiple recording methods for easier backup

SECURITY
+ Administrator and user group protected
+ Password authentication
+ HTTP and RTSP digest encryption
+ Remote client access allow / deny list

SURVEILLANCE SOFTWARE FUNCTIONS
+ Remote management/control of up to 32 cameras
+ Viewing of up to 32 cameras on one screen
+ Supports all management functions provided in web interface
+ Scheduled motion triggered, or manual recording options

REMOTE MANAGEMENT
+ Configuration accessible via web browser
+ Take snapshots/video clips and save to local hard drive or NAS via web browser

SYSTEM REQUIREMENTS
+ Operating System: Microsoft Windows 2000, XP, Vista

SUPPORTED PDA, MOBILE PHONES & SOFTWARE
HANDSETS WITH 3GPP PLAYER
+ Packet Video Player 3.0
+ QuickTime 6.5
+ Real Player 10.5

NETWORK INTERFACE
+ IEEE 802.3/802.3u 10/100BASE-TX Ethernet port
+ Supports half/full-duplex operations
+ Supports 802.3x Flow Control in full-duplex mode
+ Supports IEEE 802.3af PoE
+ 802.11b/g wireless with WEP/WPA/WPA2 security

AUDIO
+ Compression and bit rate:
  - GSM-AMR speech compression, bit rate: 4.75 kbps ~12.2 kbps
  - MPEG-4 AAC audio encoding, bit rate: 16 kbps ~128 kbps
+ Interface: internal microphone
+ Supports software audio mute

DIAGNOSTIC LED
2 color LEDs

POWER INPUT
100 - 240VAC, 50/60Hz, 12VDC, 1.25A

POWER CONSUMPTION
MAX 4.8 W

DIMENSIONS
105 (W) X 105 (D) X 112 (H) (mm), 4.13” X 4.13” X 4.41” (without Antenna)

WEIGHT
650 grams

OPERATION TEMPERATURE
0° to 40° C (32° to 104° F)

STORAGE TEMPERATURE
-20° to 70° C (-4° to 158° F)

HUMIDITY
20% to 80% non-condensing

CERTIFICATIONS
+ FCC
+ CE
+ C-Tick

PACKAGE INCLUDES
+ DCS-5220 camera
+ External power adapter
+ CAT5 Ethernet cable
+ Quick Installation Guide
+ Master CD

[1] 4X digital zoom enlarges an image by magnifying the pixels in a selected portion of the image by 4 times.

Maximum wireless signal rate derived from IEEE Standard 802.11b/g specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental factors will adversely affect wireless signal range.