

USER MANUAL

DCS-5220

VERSION 2.0



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Package Contents

- D-Link DCS-5220 Wireless PT Internet 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® 2000 or XP
- At least 256MB of memory (512MB recommended)
- A wireless (802.11b or 802.11g) or Ethernet network
- Internet Explorer 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 PT Internet 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 54Mbps¹ (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 zoom² feature. The DCS-5220 gives you the ability to monitor video and audio in your home/office using an Internet browser from anywhere 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 PT Internet Camera can be pulled from the 3G cellular network by using a compatible cell phone with a 3G video player³. 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 Internet 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 Explorer Web browser, administrators can configure and manage the Internet 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 IP surveillance software allows an administrator to modify the Internet 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 Internet 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 Explorer Web browser for live image viewing with audio and allows the administrator to manage and control the Internet Camera anywhere and any time. Apply the Internet 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 Internet 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 Internet 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 Button

When the reset button is pressed, the power and activity LED light will both appear steady on. While pressing the reset button both LEDs will begin to flash, indicating that the DCS-5220's settings are now restored to factory default. Release the reset button.



Hardware Installation

Connect an Ethernet cable to the Ethernet connector located on the Internet 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 Internet Camera's back panel (labeled DC 12V) and connect it to an AC power outlet.



Wireless Installation Considerations

The D-Link Wireless PT Internet 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 is 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 IP 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 Connect (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 IP camera now.

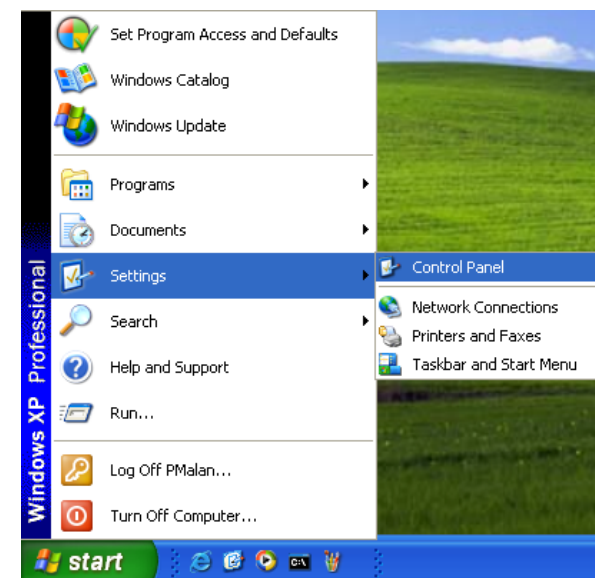
*A DHCP server is a device that supplies IP Addresses to its clients that are on the same network.



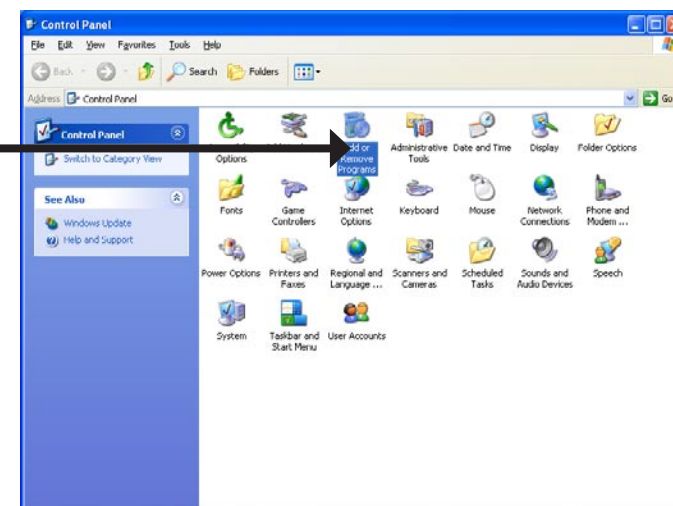
Enabling UPnP for Windows® XP

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 Internet 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. If you are running Windows® 98/2000, UPnP is not available.

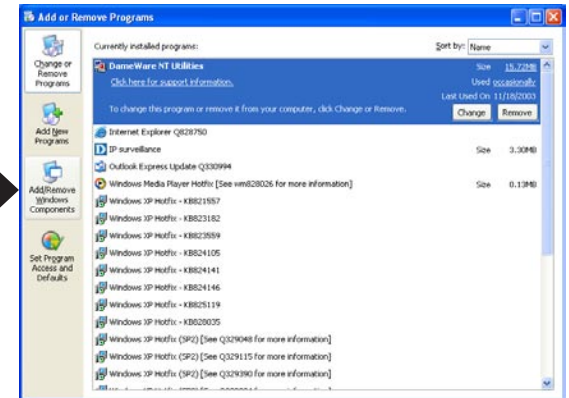
Go to **Start > Settings**. Click Control Panel.



Click **Add or Remove Programs**



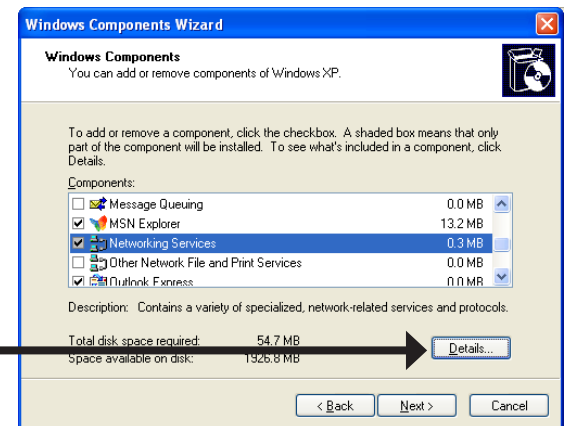
Click **Add/Remove Windows Components**



The following screen will appear.

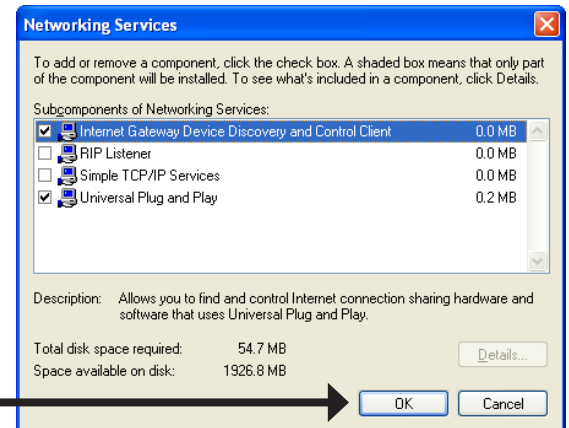
Select Networking Services.

Click **Details**

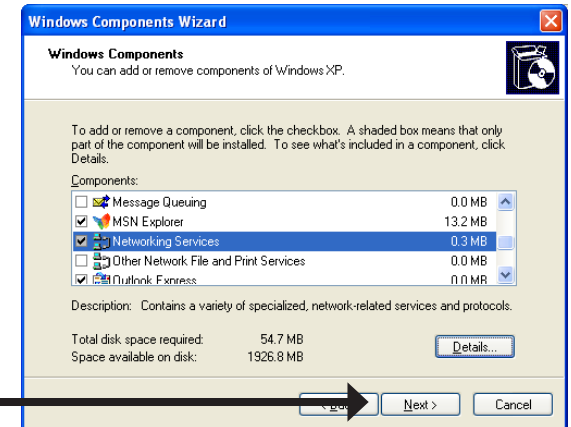


Select Universal Plug and Play.

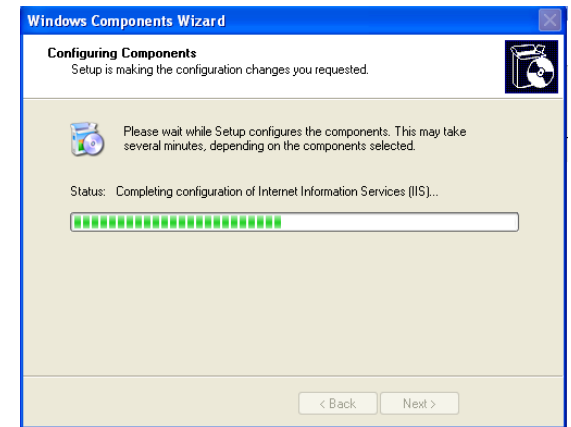
Click **OK**



Click **Next**



Please wait while Setup configures the components.



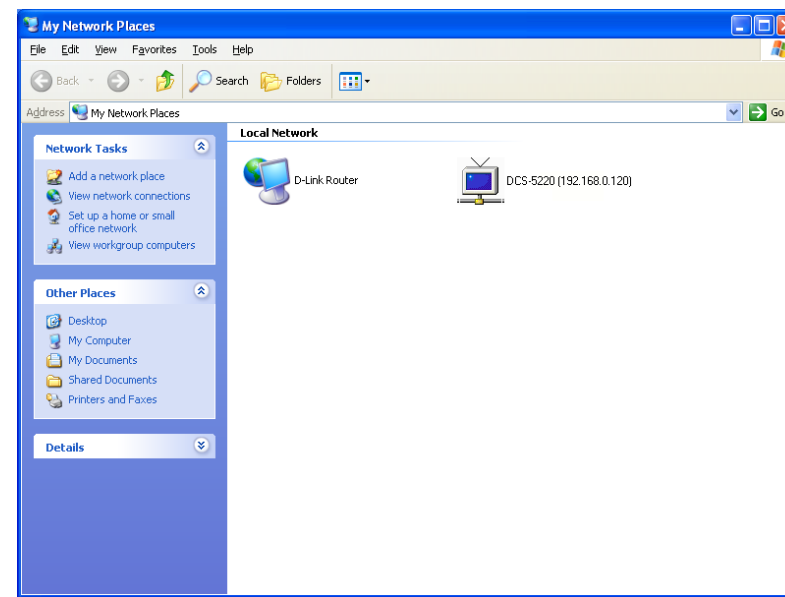
Click **Finish**



To view your DCS-5220 Internet 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.

Product Page: DCS-5220Firmware Version: 1.03

D-Link

DCS-5220LIVE VIDEOSETUPMAINTENANCESTATUSHELP

Camera

Client Setup

Logout

Go To

-- Select One --

Pan Speed

4

Tilt Speed

4

Auto Pan

Stop

Auto Patrol

Snapshot

HOME

This section shows your camera's live video. You can control your settings using the buttons below. Current resolution is 640x480

LIVE VIDEO

DCS-5220(TCP-AV)2007/09/21 02:51:14

The live video feed displays a test pattern with various resolution targets. A circular target in the center contains a checkerboard and a focus target. To the right, there are three labels: 'ABC-123' with percentages 5%, 4%, and 3%. Below these, there are two labels: 'Face Identification' and 'Face Recognition'. At the bottom, there is a color calibration bar with values: 0.7 V, 0.55, 0.43, 0.31, 0.22, 0.15, 0.09, 0.05, 0.02, 0.004, 0 V.

SECURITY

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 Troubleshooting section of this manual (page 128).

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 Explorer Web 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., <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 Internet Camera configured with the Installer program. This section of the manual will cover how to use the Internet Camera in two methods:

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



Using the DCS-5220 with an Internet Browser

Open your Internet Explorer Web browser and enter the IP address for your Internet 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 Explorer.



Home Page Screen

The image from the DCS-5220 should be visible from the device's Home page on your web browser.

Client Setup: Click on the Client Setup button to change settings related to the camera connection.

Logout: Click on the Logout button to logout from the camera server and close the browser.

Pan / Tilt : Click the Pan / Tilt button to control the camera 's pan or tilt. The Home button can move the camera to the preset home position.

Go to: Select from the preset drop-down list to quickly move the camera to the desired preset position. (Please refer to "camera control" setup for the preset list function).

Pan/Tilt Speed: This can change the camera Pan/Tilt speed.

Auto Pan: Press this button and the camera will start to pan from left to right one time.

Stop: This will stop Auto Pan and Auto Patrol.

Auto Patrol: Click this button to quickly move the camera to the desired patrol setup according to preset positions. (Please refer to "camera control" setup for the preset list function).

Snapshot: Click on the Snapshot button to capture a snapshot image. The image will pop up in a new window. This image can be saved to your local hard drive.



Client Setup

Media Options: You can disable audio when viewing video, disable video while keeping audio, or have both video and audio present.

Protocol Options:

Most users should use the UDP protocol. Generally, the client computer will automatically try these protocols in the following order, UDP -> TCP. After the client connects to the DCS-5220 successfully, the working protocol will be displayed in Protocol Options. The chosen protocol will be saved in your PC and used for the next connection. If the network environment is changed or users want to let the Web browser automatically detect the protocol, select UDP manually and click Save to change the setting and return Home to reconnect with the new setting.

Options:

UDP Protocol - Offers the highest image and video quality. However, packet losses will diminish image quality when bandwidth becomes restricted.

TCP Protocol - Packet loss is less likely to occur compared to UDP when bandwidth is restricted.

Product Page: DCS-5220 Firmware Version: 1.03

D-Link

DCS-5220 // LIVE VIDEO SETUP MAINTENANCE STATUS HELP

Camera
Client Setup
Logout

CONNECTION TYPE

Here you can configure the audio and video settings as well as the type of connection your camera uses when viewing it on a network.

Save Settings Don't Save Settings

MEDIA OPTIONS

☒ Video & Audio ☐ Video Only ☐ Audio Only

PROTOCOL OPTIONS

The auto-detection order of transmission protocol is UDP->TCP

Please select one protocol as the default protocol.

☐ UDP ☒ TCP

RECORD OPTIONS

Name: CLIP

File Name Prefix:

☒ Add date and time suffix to file name

Helpful Hints...

- **UDP Protocol** - This allows quality real-time performance for audio and video. Some packets may be lost due to network burst traffic and images may be obscured.
- **TCP Protocol** - Packet loss is less likely to occur and video displays are more accurate.

Record Options: Allows you to specify where the video image will be saved on your local hard drive, when recording video directly from the web interface.

DCS-5220 Configuration Setup

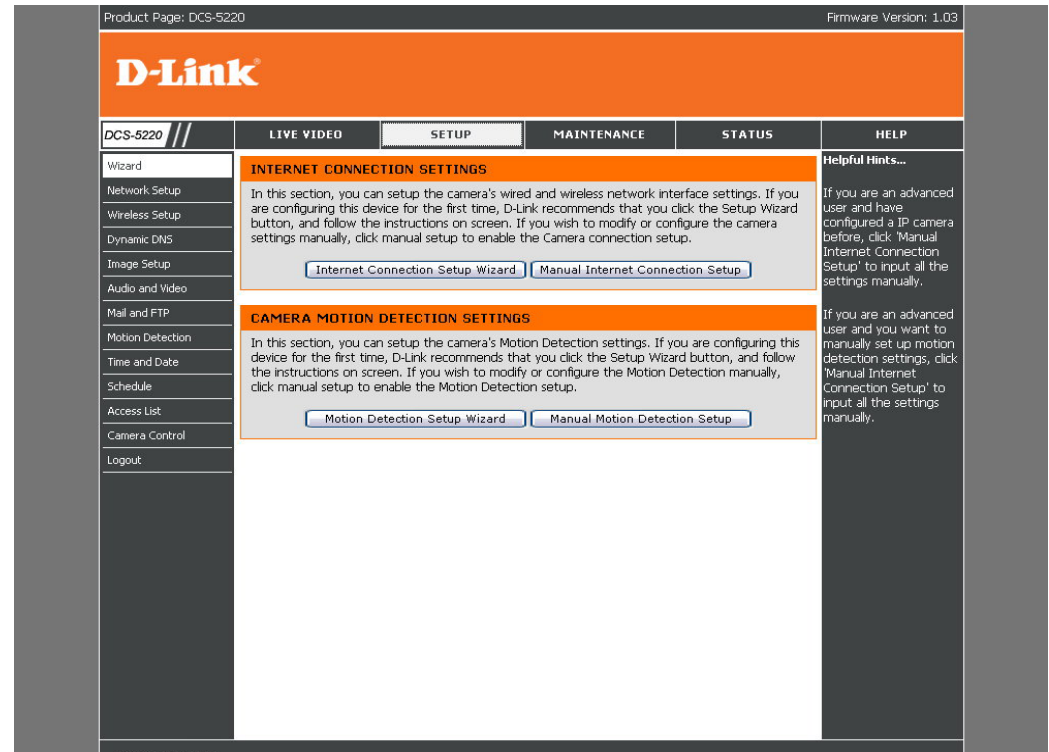
There are 5 tabs across the top of the Configuration screen. The LIVE VIDEO page is used for viewing live video and audio.

The SETUP page is used for basic setup of the DCS-5220.

The MAINTENANCE page is used for server system maintenance.

The STATUS page will show the camera's status and logs.

The HELP page contains useful information about the setup and features of the DCS-5220.



The Setup page provides the following configuration options: Wizard, Network Setup, Wireless Setup, Dynamic DNS, Image Setup, Audio and Video, Mail and FTP, Motion Detection, Time and Date, Schedule, Access List, Camera Control, and Logout.

Wizard

Internet Connection Settings: This section will help you to connect to Internet.

Internet Connection Setup Wizard:

This wizard can help you set up the Internet connection step by step. If you don't have enough information for the setup, please contact with your Internet Service Provider or network administrator.

Manual Internet Connection Setup:

This button will take you to the network setup page, where you can configure the Internet connection settings manually.

Camera Motion Detection Settings:

This section will help you set up motion detection and it's action.

Motion Detection Setup Wizard:

This wizard can help you to setup the motion detection step by step, including the motion detection area, sensitivity and the schedule of actions.

Manual Motion Detection Setup:

This button will take you to the motion detection setup page.



Network Setup

DHCP: DCS-5220 will request a new IP address from the DHCP server everytime it restarts. Once the DCS-5220 is configured, this radio should be unselected at all times. If this radio button has been selected and the connection is lost, run the DCC find the camera's IP address.

IP Address: Necessary for network identification.

Subnet Mask: Used to determine if the destination is in the same subnet. The default value is 255.255.255.0.

Default Router: Enter the IP address of the router/gateway. Invalid router settings may cause failed transmissions to a different subnet.

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

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

Enable UPnP: (Universal Plug & Play) This option allows a computer to find this camera through UPnP, which will show up under "Network Neighborhood" without configuration. UPnP is based on TCP/IP and Internet protocols. UPnP is a networking architecture that provides compatibility among networking equipment, software, and peripherals. The camera is a UPnP enabled device and it will work with other UPnP devices and software.

Enable UPnP port forwarding: The camera will add the port forwarding entry into the router automatically when this option is enabled.

PPPoE: (Point-to-Point Protocol over Ethernet) Select this option if the camera is directly connected to the Internet through a DSL modem, and the ISP (Internet Service Provider) requires you to use PPPoE for the Internet connection. Enter the authentication information from your ISP into these fields.

Note: The Internet (WAN) IP Address of the PPPoE will be sent through e-mail.

HTTP Port: Can be set to another value other than the default port 80. When the administrator changes the HTTP port of the DCS-5220(which has an IP address of 192.168.0.100) from 80 to 8080, you must type `http://192.168.0.100:8080` in the web browser address field to reach the web configuration page.

Enable RTSP authentication: This option will turn on the authentication of RTSP. You need to specify access name to login camera like this: `rtps://cameraip/live.sdp`.

Access name for computer viewing: This option allows you to specify the file name for RTSP streaming thru computer.

Access name for mobile viewing: This option allows you to specify the file name for RTSP streaming thru mobile phone.

RTSP port: This option allows you to set a port other than the default UDP port 554.

RTP port for video: The video channel port for RTP. It must be even number.

RTCP port for video: The video channel port for RTCP. It must be the port number of video RTP plus 1

RTP port for audio: The audio channel port for RTP. It must be even number.

RTCP port for audio: The video channel port for RTCP. It must be the port number of video RTP plus 1.

Wireless Setup

Disable Wireless: This option can turn off the wireless function. The camera server will detect the connection type when booting, it will detect a wired connection first, and then wireless. If wireless is not connected during booting, it will not detect again. If wireless is disabled, the camera will not detect wireless during booting.

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 **dlink**.

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 DI-624 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.

Preamble: Preamble Type - Short or Long. If your wireless network support Short Preamble, then enabling it can boost overall throughput. However, if any wireless device does not support Short Preamble, then it will not be able to communicate with your network. If you are not sure whether your radio supports the Short RF preamble, then make sure you disable this feature. Long Preamble is the default, as it is a required setting for Wi-Fi compatibility.

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**.

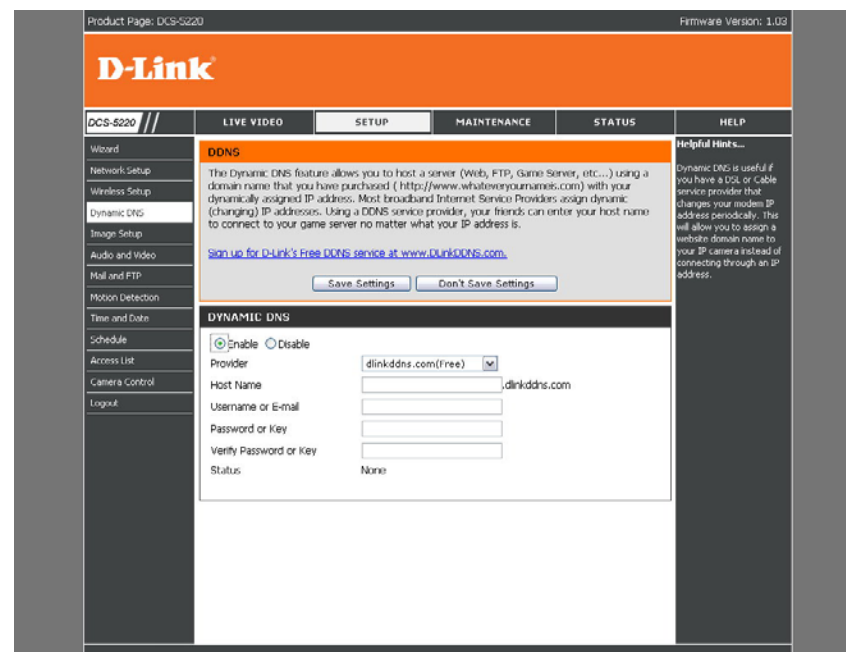
Key format: Select an **ASCII** or **HEX** (hexadecimal) key format.

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

Click the Dynamic DNS button on the left side of the Setup screen to access Dynamic DNS settings.



Dynamic DNS (DDNS): Dynamic DNS (Domain Name Service) is a method of keeping a domain name linked to a changing (dynamic) IP address. With most Cable and DSL connections, you are assigned a dynamic IP address and that address is used only for the duration of that specific connection. With the DCS-5220, you can set up your DDNS service and the DCS-5220 will automatically update your DDNS server every time it receives a different IP address.

Enable DDNS: Select to enable or disable the DDNS function.

Provider: Select your Dynamic DNS provider from the drop-down list.

Hostname: Enter the host name of the DDNS server.

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

Password / Key: Enter your password or key used to connect to the DDNS server.

Image Setup

Click the Image Setup button on the left side of the Setup screen to access additional settings that affect how the video image appears. From this screen you can fine tune the video image.

Color: Select the option for color or monochrome video display.

Power line frequency: This option allows you to choose the frequency of the power line for different regions (Power Line Frequency in US: 60Hz).

Video orientation:

Flip: Vertically rotate the video.

Mirror: Horizontally rotate the video. Check both flip and mirror if the DCS-5220 is installed upside down.

White Balance: White Balance is related to the color temperature. Color temperature is a way of measuring the quality of a light source. It is based on the ratio of the amount of blue light to the amount of red light, while the green light is ignored. The unit for measuring this ratio is in degrees Kelvin (K). Light with a higher color temperature (i.e. larger Kelvin value) has “more” blue light than a light with a lower color temperature. The default setting for white balance is “Auto”.

Brightness: Image Brightness is adjustable, you can set from among eleven levels ranged from -5 to +5. The default setting is zero.



Audio and Video

Click the Audio and Video button on the left side of the Setup screen to access audio and video settings that affect how the audio and video appears.

Configure for computer viewing:

Select this option to switch to computer viewing.

Configure for mobile viewing:

Select this option to switch to mobile device viewing. The frame size will change to 176x144, 5 FPS and 40kbps video quality.

Frame size:

There are 4 options for the size of the video display. You can select 160x120, 176x144, 320x240, or 640x480. The maximum frame rate is 30fps for all resolutions.

Maximum Frame Rate:

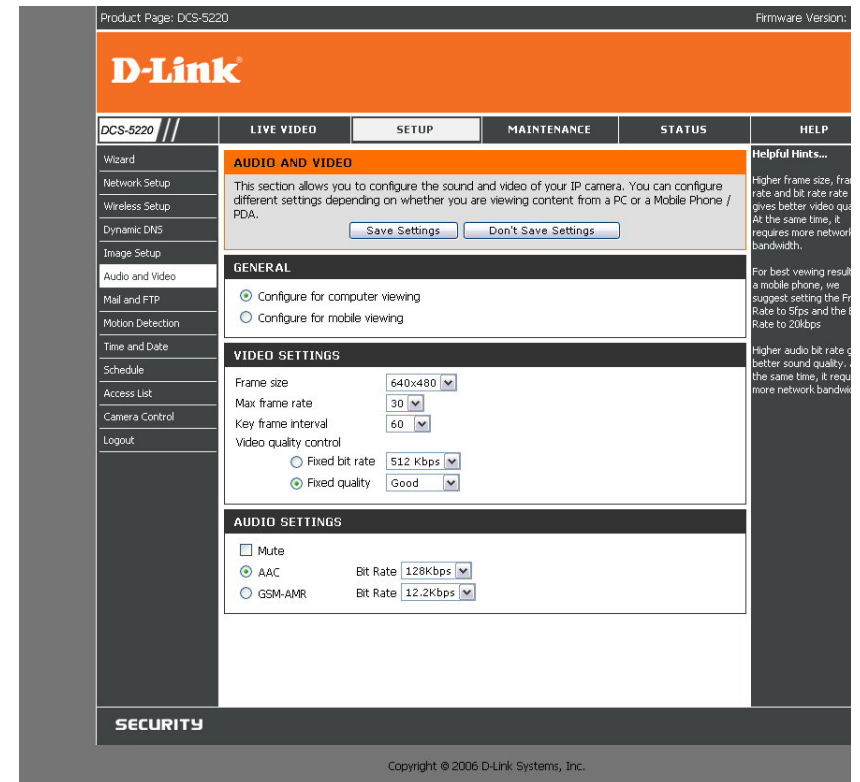
Limits the maximum refresh frame rate. The frame rate is used with the Video quality control setting (below) to optimize bandwidth utilization and video quality.

Key frame interval:

Determines how many repeated P frames will appear after one I frame. A large key frame interval can reduce the bit rate, but cause image to be corrupted longer if there is packet loss while transmitting. The video quality may be poor due to the sending of maximum frame rate within the limited bandwidth when images are moving rapidly. Consequently, to ensure detailed video quality (quantization rate) regardless of the network, it will utilize more bandwidth to send the maximal frames

Video quality control:

Used when images change drastically. To fix the bandwidth utilization regardless of the video quality, choose Fixed bit rate and select the desired bandwidth. The video quality may be reduced in order to send maximum frames with limited bandwidth, especially when images change drastically. For higher video detail regardless of the bandwidth selection, select Fixed quality and select a video quality level. This setting will utilize more bandwidth to send the maximum frames when images change drastically.



Fixed bit rate: These settings are to optimize your camera performance with your available bandwidth.

Select a fixed bandwidth for your camera operation. This option allows the user to select a custom frame rate suitable for the bandwidth and the storage space.

Fixed quality : Selecting fixed quality will roughly select your image quality and will not be as accurate as setting by bit rate. This setting is easier to use when image quality does not have to be precise. Below is a typical file size after 1 minute of recording at 30fps (frames per second). This is only an average measurement; your file size may differ due to lighting, black/white or color setting, and frame rate.

Medium	Standard	Good	Detailed	Excellent
2.589MB	2.857MB	3.571MB	4.598MB	5.357MB

Mute: This will mute the audio for all connections.

AAC: (Advanced Audio Coding) 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.

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

Mail and FTP

1st SMTP (mail) server: The domain name or IP address of an external mail server.

1st SMTP account name: The user name used to log into your e-mail account (e.g. jdoe or jdoe@yourisp.com).

1st SMTP password: The password used to log into your e-mail account. The password will appear as dots instead of entered characters.

1st recipient e-mail address: The e-mail address of the recipient for snapshots or a system log file.

2nd SMTP (mail) server: The domain name or IP address of a secondary mail server used only if the primary mail server is unreachable.

2nd SMTP account name: The user name for the second SMTP server.

2nd SMTP password: The password used to log into the second e-mail account. (The password will appear as dots instead of entered characters.)

2nd recipient email address: The e-mail address of the recipient for the secondary server.

Sender email address: The sender's email address that appears in the mail alert.

Local FTP server port: It can be another value other than default port 21. If you find that you want to change the port to a port number other than 21, you will need to specify the port when connecting to the FTP server. For example FTP://68.5.1.81:60 (if you are to use port 60 for your FTP server port)

Product Page: DCS-5220 Firmware Version: 1.03

D-Link

DCS-5220 // LIVE VIDEO SETUP MAINTENANCE STATUS HELP

MAIL AND FTP

This section enable you to specify the IP camera email and FTP settings. Only modify these settings if your details change or you are experiencing issues with alert notifications.

[Save Settings](#) [Don't Save Settings](#)

SMTP(MAIL) SERVER SETTINGS

1st SMTP (mail) server

1st SMTP account name

1st SMTP password

1st recipient email address

2nd SMTP (mail) server

2nd SMTP account name

2nd SMTP password

2nd recipient email address

Sender email address

FTP SERVER SETTINGS

Local FTP server port

1st FTP server

1st FTP server port

1st FTP user name

1st FTP password

1st FTP remote folder

1st FTP passive mode ☐

2nd FTP server

2nd FTP server port

2nd FTP user name

2nd FTP password

2nd FTP remote folder

2nd FTP passive mode ☐

Helpful Hints...

If you are setting up motion detection and will not be recording onto a PC, you can setup an FTP or SMTP account in the IP camera. You will be emailed or sent images when motion is detected.

SECURITY

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1st FTP server: The host name of the FTP server.

1st FTP server port: The port of the FTP server. Usually the port number of an FTP server is 21. It depends on the FTP server's setup.

1st FTP user name: The account name to access the FTP server.

1st FTP password: The password that was setup with the account to access the FTP server.

1st FTP remote folder:2nd The directory that the images will be uploaded into (e.g. \pub\images).

1st FTP passive mode: Check the checkbox to enable passive mode in transmission.

FTP server: The 2nd FTP server serves as a backup FTP server.

2nd FTP server port: The port of the FTP server. Usually the port number of an FTP server is 21. It depends on the FTP server's setup.

2nd FTP user name: The account name to access the FTP server.

2nd FTP password: The password that was setup with the account to access the FTP server.

2nd FTP remote Folder: The directory that the images will be uploaded into (e.g. \pub\images).

2nd FTP passive mode: Check it to enable passive mode in transmission.

Note: *The second FTP setting only activates when the first FTP setting fails.*

Invalid settings may cause the DCS-5220 to not respond. Change the configuration settings only if necessary. Consult with your network administrator or your Internet Service Provider (ISP) if you do not have the necessary information. If you cannot connect to the camera, refer to page 8 for camera reset and restore factory settings procedures.

Motion Detection

Click the Motion Detection button on the left side of the Setup screen to enable the motion detection function of the DCS-5220 Internet Camera.

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

New: Adds new windows that monitor a specific area of the image window. Up to 3 motion detection windows can be added.

Save: Saves the new windows settings.

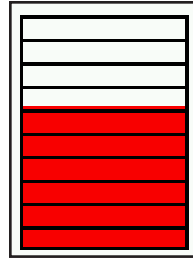
Window Name: The name of the motion detection window.

Sensitivity: Adjusting the sensitivity allows you to set the amount of motion required to trigger motion detection. If you want to detect most or all movement, use a high sensitivity. If you want to ignore smaller amounts of movement, use a low sensitivity.

Percentage: Adjusting the percentage allows you to set a requirement on how much of the motion window must be filled by movement. Example: If you set this to 50%, then the selected window must be half filled by a moving object before it triggers motion detection.



To display motion detection, a graphic bar will rise or fall depending on the image variation.



A green bar means the image variation is under the monitoring level, and no motion detection alert is triggered. A red bar means the image variation is over the monitoring level and a motion detected alert is triggered. When the bar goes red, the window that the motion is detected in will also be outlined in red (**Note:** *remember that you can have up to 3 windows selected for motion detection*). You can return to the DCS-5220 Home Page and the monitored window will not be visible, but the red frame will show on the home page when motion is detected.

Time and Date

Click on the Time and Date button to access the settings from the left side of the Setup menu.

Time zone: Used to adjust the hour of time servers for local settings.

Enable Daylight Saving: Check this to enable daylight saving time.

Daylight Saving Dates: Set daylight saving time start and end date by your local definition.

Automatic Time Configuration:

Enable NTP Server: Synchronize with the NTP server over the Internet whenever the DCS-5220 starts up. It will fail if the assigned time server cannot be reached.

NTP server Used: Assign the IP address or domain name of the time server. Leaving the text box blank will let the DCS-5220 connect to default time servers.

Update interval: Used to adjust the hour of time servers for local settings. The time interval for the camera to update the time settings from a NTP server.

Set the date and time manually: Adjust the date and time according to what is selected by the administrator.

Copy Your Computer's time

Settings: Synchronize the date and time of DCS-5220 with your local computer. The date and time of the PC is displayed and updated in the DCS-5220.

The screenshot shows the D-Link DCS-5220 web interface. The top bar displays 'Product Page: DCS-5220' and 'Firmware Version: 1.03'. The main navigation menu on the left includes options like Wizard, Network Setup, Wireless Setup, Dynamic DNS, Image Setup, Audio and Video, Mail and FTP, Motion Detection, Time and Date (selected), Schedule, Access List, Camera Control, and Logout. The main content area is titled 'TIME AND DATE' and contains the following sections:

- TIME CONFIGURATION:**
 - Current Server Time: 21 Sep 2007 03:06:08
 - Time zone: GMT-08:00
 - Enable Daylight Saving: ☐
 - Daylight Saving Dates: DST Start (Jan 1st Mon 12am), DST End (Jan 1st Mon 12am)
- AUTOMATIC TIME CONFIGURATION:**
 - Enable NTP Server: ☐
 - NTP Server Used: skip to invoke default server << ntp1.dlink.com
 - Update interval: One hour
- SET THE DATE AND TIME MANUALLY:**
 - Year: 2007, Month: 09, Day: 21, Hour: 03, Minute: 06, Second: 08
 - Copy Your Computer's Time Settings button

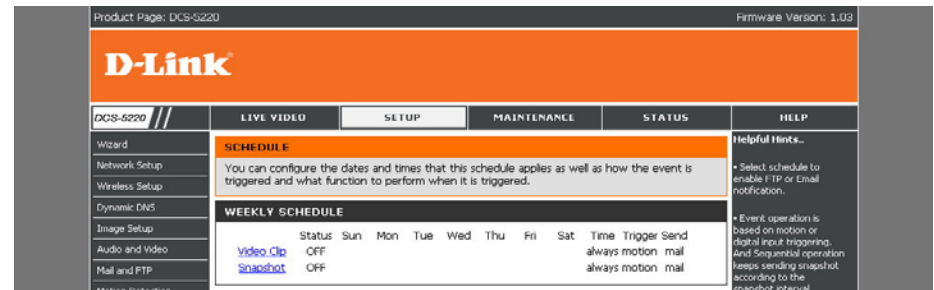
At the bottom of the interface, there is a 'SECURITY' section and a copyright notice: 'Copyright © 2006 D-Link Systems, Inc.'

Schedule

Click on the Schedule button to access the Schedule settings from the left side of the Setup menu.

Video Clip: This option enables the camera to record video clips.

Snapshot: This option enables the camera to take snapshots.



Schedule > Video Clip

Enable video clip: Check this option to enable video clip for motion detection and sequential video clip.

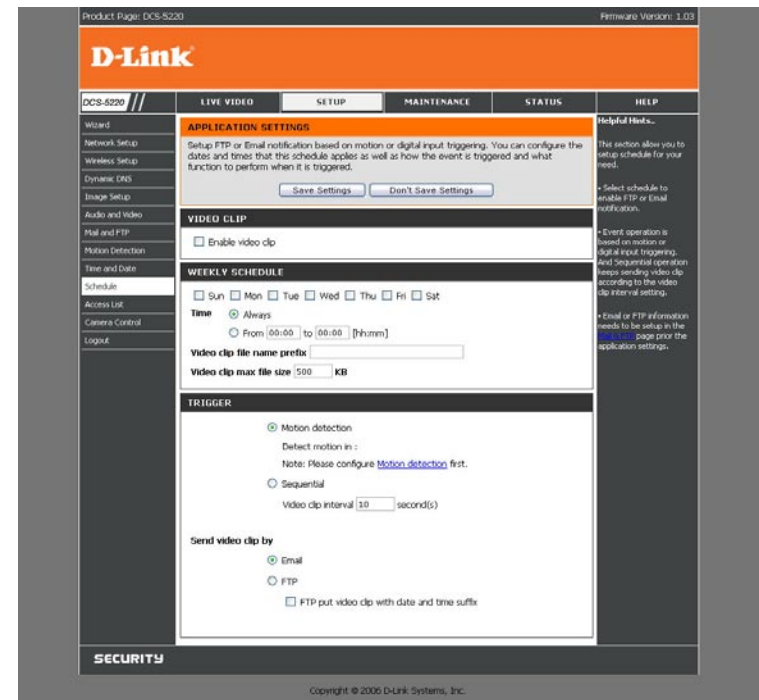
Weekly schedule: Select the day(s) according to when you want the camera to make a video clip.

Always: This enables the camera to make video clips continuously.

From [00:00] to [00:00]: The time range specified for the video clip. For example: the video clip will start at eight o'clock in the morning, and stop at five o'clock in the afternoon when the following time period is input - [From 08:00 to 17:00].

Video clip file name prefix: This option will add the prefix to the video clip file name.

Video clip max file size: This option sets the maximum file size for the video clip. If you don't have enough upload bandwidth, the video clip file will not complete uploading during the time interval and the upload file will not be able to playback. To avoid the problem, please reduce the maximum file size or enlarge the time interval.



Motion detection: This option enables motion detection triggering for video clip uploading.

Detect Motion in: Check the motion detection window(s) to enable motion triggering. The window(s) can be created in the **Advanced > Motion Detection** page.

Sequential: This option enables continuous Video Clip uploading.

Video Clip interval: The time interval for continuous Video Clip uploading.

Email: This option enables the camera to send the Video Clip via e-mail.

FTP: This enables the camera to send the Video Clip to a FTP server.

FTP put video clip with date and time suffix: This option will add a date and time indicator to the snapshot file name. For instance, "Video@20060102030405.jpg" indicates that the Video Clip was captured at Year: 2006; Month: January; Date: 2nd; Time: 03:04:05

Schedule > Snapshot

Enable snapshot: Check this option to enable the snapshot for motion detection and sequential snapshot.

Weekly schedule: Select the day(s) according to when you want the camera to take snapshots.

Always: This enables the camera to take snapshots continuously.

From [00:00] to [00:00]: The time range specified for the snapshot. For example: the snapshot will start at eight o'clock in the morning, and stop at five o'clock in the afternoon when the following time period is input - [From 08:00 to 17:00].

Snapshot file name prefix: This option will add the prefix to the snapshot file name. If you don't have enough upload bandwidth, the video clip file will not complete uploading during the time interval and the upload file will not be able to playback. To avoid the problem, please reduce the maximum file size or enlarge the time interval.

Motion detection: This option enables motion detection triggering for snapshot uploading.

The screenshot shows the D-Link DCS-5220 web interface. The top navigation bar includes tabs for LIVE VIDEO, SETUP, MAINTENANCE, STATUS, and HELP. The SETUP tab is selected, and the SNAPSHOT section is visible. The SNAPSHOT section includes a checkbox for 'Enable snapshot', a 'WEEKLY SCHEDULE' section with radio buttons for 'Always' and 'From [00:00] to [00:00] [hh:mm]', and a 'TRIGGER' section with radio buttons for 'Motion detection' and 'Sequential'. The 'Motion detection' section includes a 'Detect motion in' dropdown, a 'Note: Please configure Motion detection first.' message, and input fields for 'Send [] pre-event image(s)', 'Send [] post-event image(s)', and 'Delay [] second(s) before detecting the next event'. The 'Sequential' section includes a 'Snapshot interval [] second(s)' input field. The 'Send snapshot by' section includes radio buttons for 'Email' and 'FTP', and a checkbox for 'FTP put snapshots with date and time suffix'.

Detect Motion in: Check the motion detection window(s) to enable motion triggering. The window(s) can be created in the **Advanced > Motion Detection** page.

Sequential: This option enables continuous snapshot uploading.

Snapshot interval The time interval for continuous snapshot uploading.

Email: This option enables the camera to send the snapshot via e-mail.

FTP: This enables the camera to send the snapshot to a FTP server.

FTP put sanpshot with date and time suffix: This option will add a date and time indicator to the video clip file name. For instance, "snapshot@20060102030405.mpg" indicates that the snapshot was captured at Year: 2006; Month: January; Date: 2nd; Time: 03:04:05 AM.

Recommendations for Setting Video for the Best Performance:

“Best performance” means the image refresh rate should be the fastest possible and the video quality should be the best possible at the lowest network bandwidth possible. Three factors, Maximum frame rate, Fixed bit rate, and Fixed quality in the Video Configuration page, are related to performance.

Recording settings for real-time motion images

To achieve a real-time visual effect, the network bandwidth should be large enough to transmit 20 image frames per second (fps) or more. If you are on a broadband network over 1 Mbps, you can set Fixed bit Rate to 1000Kbps or 1200Kbps, or set Fixed quality to achieve the maximum frames. The maximum frame rate is 25 in 50Hz system and 30 in 60Hz system. If your network bandwidth is more than 384Kbps, you can adjust Fixed bit rate according to your bandwidth and set the maximum frame rate of 25 to 30.

If the images vary dramatically in your environment, you may slow down the maximum frame rate to 20 to decrease the transmitted data for better video quality. Since the human eye can not easily differentiate between 20 and 25 or 30 frames per second, the slower frame rate will not be noticed. If your network bandwidth is below 384 Kbps, you should adjust the bit rate according to your bandwidth and experiment to allow for the best frame rate that can be achieved. The faster frame rate in a slow network will blur the images. You may also try to choose 320x240 in size option for better images or 640x480 for larger image size. Because the network has burst constraints and everyone's environment is different, any poor connection will impair normal performance.

Recording settings for clear identification for each image

To have the best video quality, you should set Fixed quality to detailed or excellent and tune the Maximum frame rate to suit your network bandwidth. If you get some broken pictures in a slow network, you can set TCP protocol in Connection type for a more accurate transmission but the received images may have a lag. Note that any slow connection with multiple users will impair performance.

Recording settings to compromise between real-time and clear images

If you have a broadband network, set Fixed quality to Good image quality, or higher, instead of setting the Bit rate. Otherwise, fix the bit rate according to your actual network speed and set the frame rate to 30. If the image quality is low, select a lower frame rate above 15. If the image quality is still not improved, select a lower bit rate.

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.

The screenshot shows the D-Link DCS-5220 Setup interface. At the top, it says 'Product Page: DCS-5220' and 'Firmware Version: 1.03'. The D-Link logo is prominently displayed. Below the logo, there are tabs for 'LIVE VIDEO', 'SETUP', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'SETUP' tab is selected. On the left side, there is a navigation menu with options: Wizard, Network Setup, Wireless Setup, Dynamic DNS, Image Setup, Audio and Video, Mail and FTP, Motion Detection, Time and Date, Schedule, Access List (highlighted), Camera Control, and Logout. The main content area is titled 'ACCESS LIST' and contains the following text: 'Here you can set access permissions for users to view your DCS-5220.' Below this, there are two sections: 'ALLOW LIST' and 'DENY LIST'. The 'ALLOW LIST' section has input fields for 'Start IP address' and 'End IP address', an 'Add' button, and a 'Delete Allow List' section with a dropdown menu showing '1.0.0.0 ~ 255.255.255.255' and a 'Delete' button. The 'DENY LIST' section has similar input fields for 'Start IP address' and 'End IP address', an 'Add' button, and a 'Delete Deny List' section with a dropdown menu showing '-- none --' and a 'Delete' button. At the bottom of the screen, there is a 'SECURITY' section and a copyright notice: 'Copyright © 2006 D-Link Systems, Inc.'

Camera Control

Click the Camera Control button from the left side of the Setup screen to access settings that affect how the DCS-5220 Internet 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.

Zoom: “-” controls the zoom out function, “Zoom” automatically returns the lens to normal view, “+” controls the zoom in function.

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.

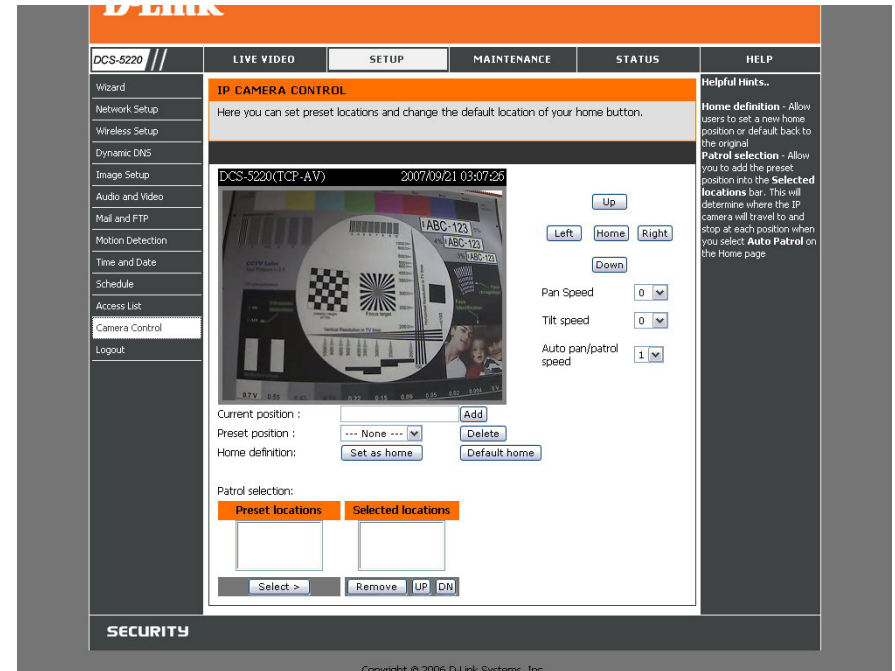
Auto Pan/Patrol Speed: Select the speed at which the camera will pan during auto patrol. Select a value between 1 and 5, 1 being the slowest setting.

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.



Maintenance

Click on the Maintenance tab to access 3 utility screens for controlling and administering the DCS-5220. The default screen for Maintenance is Device Management.

Device Management

The DCS-5220 is setup without any passwords by default. This allows the ability to access the DCS-5220 (including the Setup) by anyone as long as the IP address is known. It is recommended that you enter a password to restrict others from accessing your camera.

Type a password in the Admin Password field to enable protection, and then confirm the password in the Retype Password field.

This password is used to identify the administrator. You can add accounts with User name and User Password for other users in the Add user section. A maximum of 20 user accounts can be added.

The screenshot displays the D-Link DCS-5220 web interface. At the top, there is a navigation bar with tabs: LIVE VIDEO, SETUP, MAINTENANCE (selected), STATUS, and HELP. Below the navigation bar, the left sidebar contains links: Device Management, Backup and Restore, Firmware Update, and Logout. The main content area is titled 'DEVICE MANAGEMENT' and includes a description: 'You can configure the IP camera's administrative password as well as add more user accounts for access to the IP camera.' The interface is divided into three sections: 'ADMIN PASSWORD SETTING' with fields for Password and Retype Password, and a 'Save' button; 'ADD USER' with fields for User name, New Password, and Retype Password, and 'Add' and 'Cancel' buttons; and 'USER LIST' with a dropdown menu showing '-- no user --' and 'modify' and 'delete' buttons. Below these is the 'SERVER SETTING' section with a field for IP camera name (DCS-5220) and an 'Apply' button. On the right side, there is a 'Helpful Hints...' section with security recommendations. At the bottom, there is a 'SECURITY' section and a copyright notice: 'Copyright © 2006 D-Link Systems, Inc.'

Administrator's password: Password for the Administrator's account. The administrator password must be entered in twice for confirmation.

User name: Create a new user for accessing the video image. A maximum of twenty user accounts can be added. The new user name will be displayed in the list of user names for deletion.

User List: Administrator can edit or delete users here by selecting the user name.

Delete user: Remove a user from the user list.

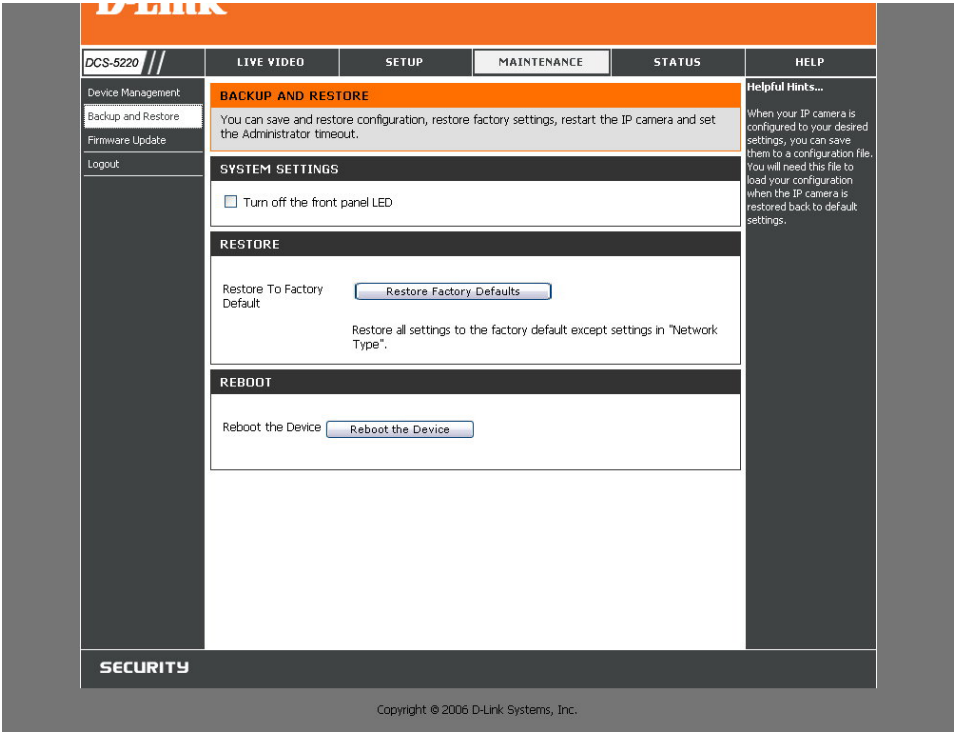
IP camera name: The name to identify your camera. Text entered will be displayed in the black bar above the video window with a timestamp.

Backup and Restore

Turn off the front panel LED: Check this option to turn off the LED next to the lens. This will prevent anyone from observing the operation of the Internet Camera.

Restore to Factory Default: This option will reset the camera back to its factory default settings. This will remove all the configuration settings that were made previously.

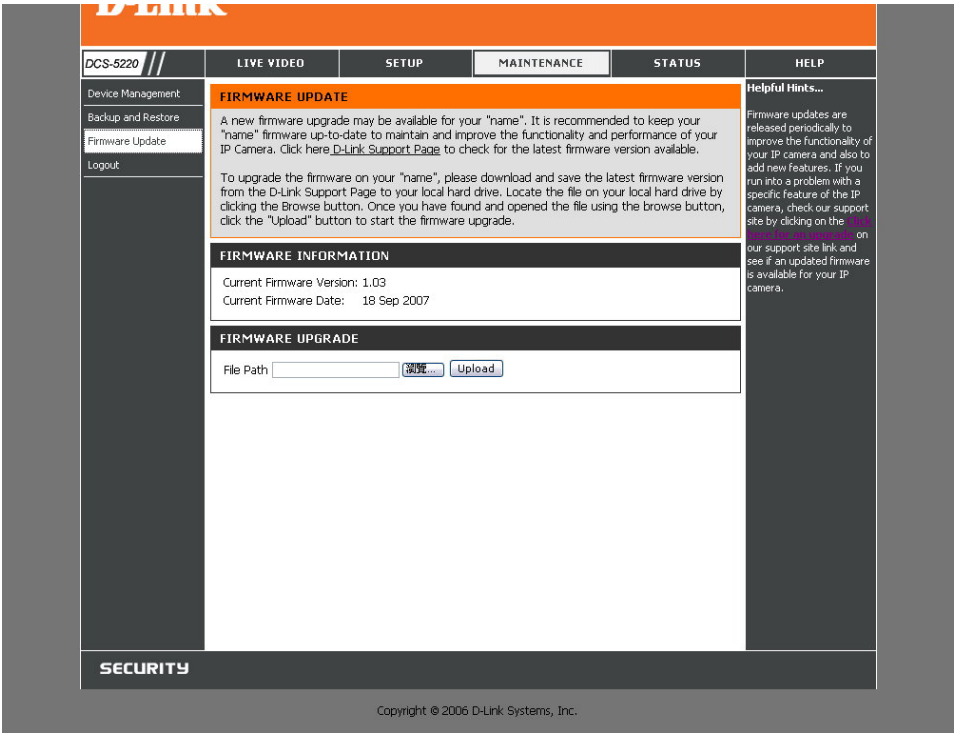
Reboot: This option will restart the camera.



Click Apply on this screen to restore the factory default settings. After confirmation, the system will restart and require the DCC program to locate the IP address of the DCS-5220.

Firmware Update

File Path: This option allows you to upgrade the firmware via a web browser. Click on **Browse** to locate the firmware file and then click on **Upgrade** to apply the firmware to the camera.



Status

Device Info

The Device Info screen lists the following important settings that are currently set for the DCS-5220:

- IP camera name
- Time and Date
- Firmware Version
- IP address
- IP Subnet mask
- Default Gateway
- Primary DNS
- Secondary DNS
- PPPoE
- DDNS

The screenshot displays the D-Link DCS-5220 web interface. The top navigation bar includes links for LIVE VIDEO, SETUP, MAINTENANCE, STATUS (which is highlighted), and HELP. On the left sidebar, there are links for Device Info, Logs, and Logout. The main content area is titled 'DEVICE INFO' and contains a 'BASIC INFORMATION' section with the following details:

IP camera name	DCS-5220
Time & Date	21 Sep 2007 03:09:22
Firmware Version	1.03, 18 Sep 2007
IP address	172.17.5.156
IP Subnet mask	255.255.255.0
Default Gateway	172.17.5.254
Primary DNS	192.168.168.210
Secondary DNS	192.168.168.201
PPPoE	Off
DDNS	Off

At the bottom of the interface, there is a 'SECURITY' section and a copyright notice: Copyright © 2006 D-Link Systems, Inc.

Log

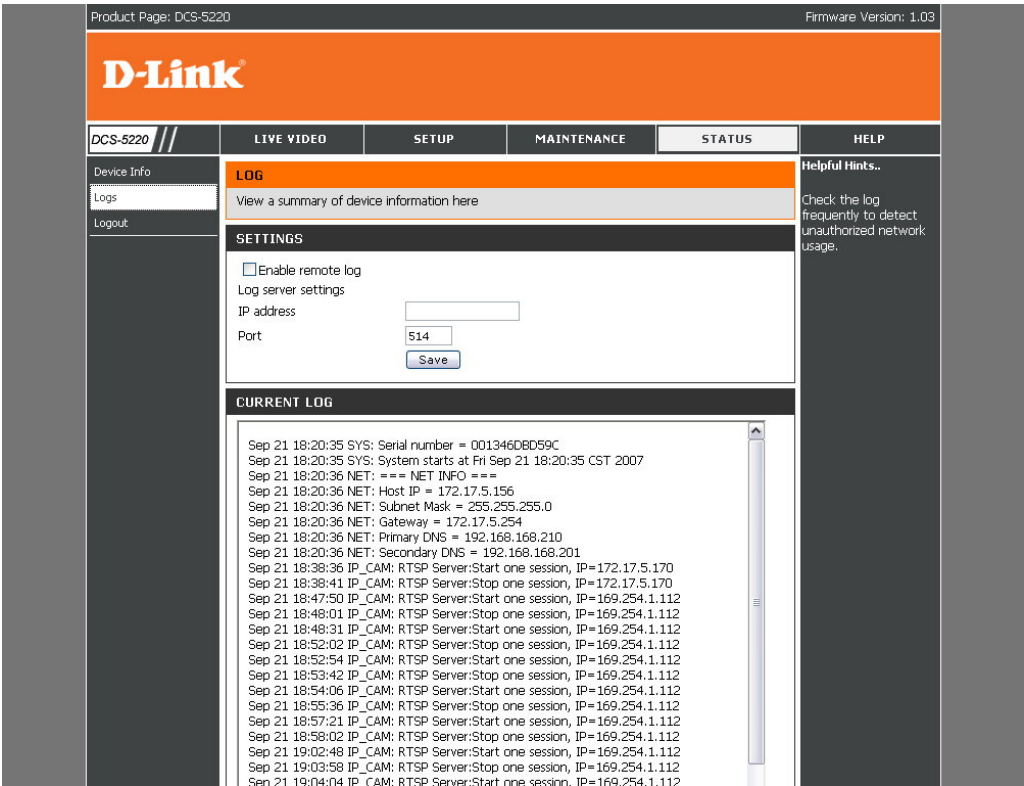
The content of the log file reveals useful information about the current configuration and connection logged after the DCS-5220 starts up.

Enable remote log: This option enables the camera to send camera log files to a remote server.

IP Address: The IP address of the remote server.

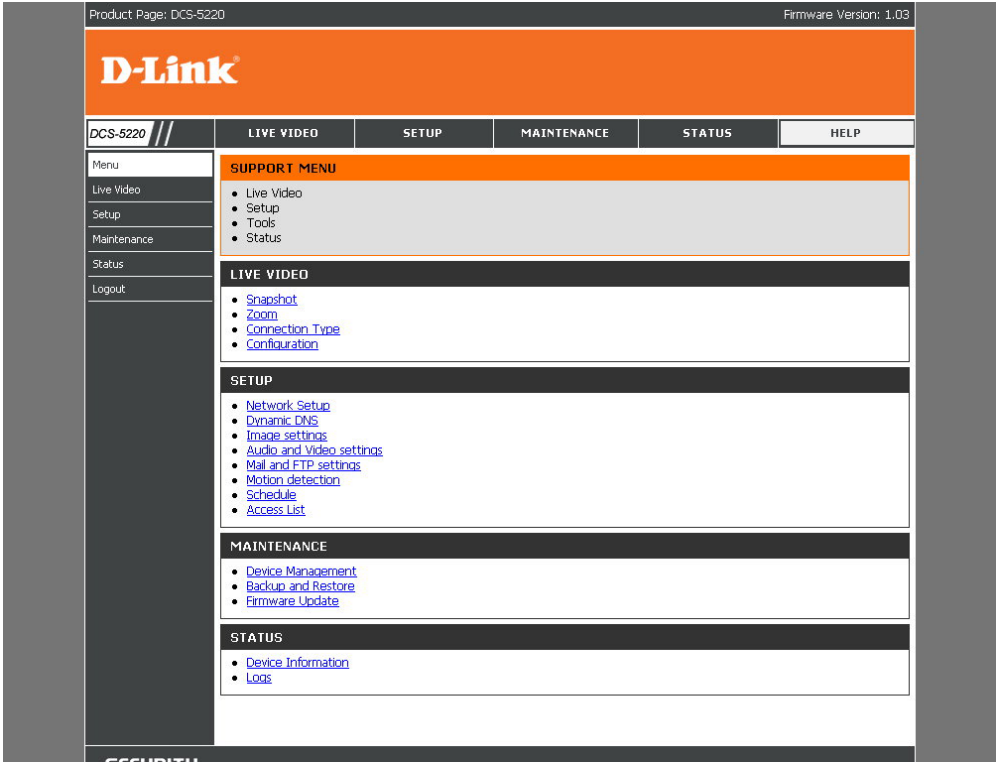
Port: The port number of the remote log server.
The default port is 514.

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



Help

The help page provides detailed information for the camera’s Web interface.



Record Snapshots to your FTP server with Motion Detection

Administrators can combine options on the application page to perform many useful security applications. To upload the snapshots, users can choose either email or FTP according to the user's needs. Both e-mail and FTP use the network settings on the network page. This section describes how to enable motion detecting and record snapshots to an FTP server.

Administrators can utilize the built-in motion detection to monitor any abnormal movement and then record the snapshots to an FTP server.

In this window, follow the steps below to ensure that motion detection is correctly enabled:

- 1 Check “Enable motion detection.”
- 2 Click on “New” to have a new window to monitor video.
- 3 Enter in a window name.
- 4 Tune the “Sensitivity” and “Percentage” according to the local environment. Combined higher sensitivity with lower percentage gives you high sensitivity for the motion detection.
- 5 Click on save to enable the activity



Next, click the Mail and FTP button under the Setup tab to set the FTP server settings for the DCS-5220.

In this window, enter the settings for the FTP server you wish to upload the image to. Optionally, you can enter settings for a secondary backup FTP server.

Local FTP server port: The Default port is 21. To connect to an FTP server, it is recommended that you do not change the port number unless your camera is behind a router. If your camera is behind a router, you can assign any port number to this field, but you must enable port forwarding on the router. Please refer to your router manual for more information on port forwarding.

1st FTP server: If you are going to upload snapshots to an FTP server, you will need to fill in the Domain name or IP address of your internal/external FTP server such as dlink.com or 192.168.0.123. (The server name and IP address will vary depending on the user.) The following user settings must be correctly configured for remote access.

1st FTP user name: Specify the user name to access the external FTP server (ex. John Smith).

1st FTP password: Specify the password to access the external FTP server (ex. 12345).

1st FTP remote folder: Specify the destination folder in the external FTP server (ex. snapshot).

Product Page: DCS-5220 Firmware Version: 1.03

D-Link

DCS-5220 // LIVE VIDEO SETUP MAINTENANCE STATUS HELP

Wizard
Network Setup
Wireless Setup
Dynamic DNS
Image Setup
Audio and Video
Mail and FTP
Motion Detection
Time and Date
Schedule
Access List
Camera Control
Logout

MAIL AND FTP
This section enable you to specify the IP camera email and FTP settings. Only modify these settings if your details change or you are experiencing issues with alert notifications.
Save Settings Don't Save Settings

SMTP(MAIL) SERVER SETTINGS

1st SMTP (mail) server
1st SMTP account name
1st SMTP password
1st recipient email address
2nd SMTP (mail) server
2nd SMTP account name
2nd SMTP password
2nd recipient email address
Sender email address

FTP SERVER SETTINGS

Local FTP server port 21
1st FTP server
1st FTP server port 21
1st FTP user name
1st FTP password
1st FTP remote folder
1st FTP passive mode ☐
2nd FTP server
2nd FTP server port 21
2nd FTP user name
2nd FTP password
2nd FTP remote folder
2nd FTP passive mode ☐

Helpful Hints...
If you are setting up motion detection and will not be recording onto a PC, you can setup an FTP or SMTP account in the IP camera. You will be emailed or sent images when motion is detected.

SECURITY

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2nd FTP server: Specify the Domain name or IP address of your second external FTP server. This field is optional if you have already filled in the information for the first FTP server.

2nd FTP user name: Specify the user name to access your backup FTP server.

2nd FTP password: Specify the user password to your backup FTP server.

2nd FTP remote folder: Specify the destination folder on your external backup FTP server.

For detailed information about each setting, please refer to **Configuration > SETUP > Mail & FTP** in the section titled “Using the DCS-5220 With an Internet Browser” (page 26). Click the “save settings” button when finished.

Click the Schedule button under the SETUP tab and select snapshot to set the application settings for the DCS-5220.

In this window, follow the steps below to set the Schedule settings for snapshots to be recorded to an FTP site:

- 1 Check the **Enable snapshot** box.
- 2 Select **Weekly schedule** and setup **Time**.
- 3 Select **Motion Detection** and check the motion window name (in this case: Moto).
- 4 Set the delay to “take snapshots after event” to capture the direction of the moving object.
5. Click **Send snapshots by FTP** and check “FTP put snapshots with date and time suffix”.
6. Click the “save settings” button to save the settings.

Click the save settings button when finished. You are now able to record snapshots to your FTP server when motion detection is triggered.

Installing the Multicamera Management Software

The IP surveillance software on the CD included with the DCS-5220 Internet Camera converts the DCS-5220 into a powerful, yet flexible, surveillance system for home or business, with these features:

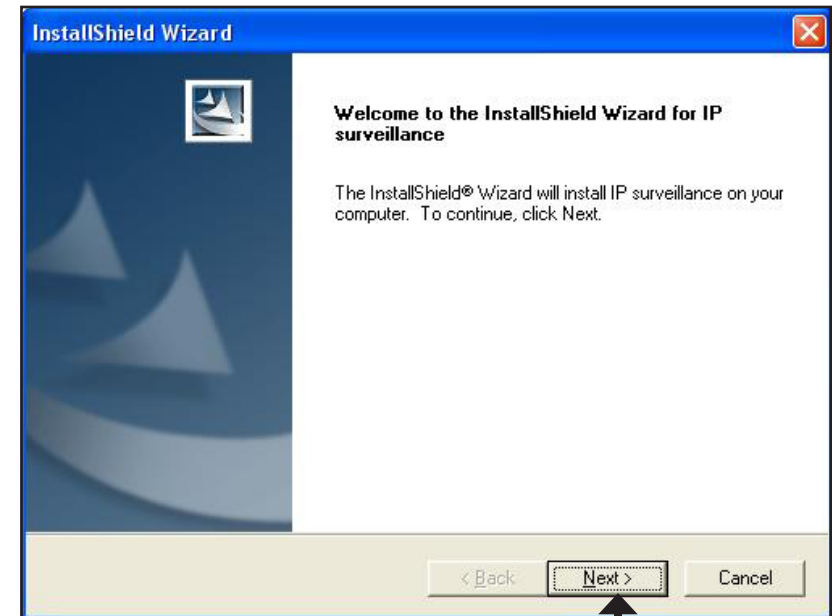
- Real-time Monitoring
- Video Recording to hard disk
- High quality video
- High video compression ratio
- Maximum of 16 cameras with different display layouts
- Smart playback
- Triggered event browsing
- Fast database searching
- Configurable automated alarms
- Account password protection
- Scheduled recording for each camera
- Email / FTP video snapshots
- AVI file export
- Motion detection for each camera

Click **Multicamera management**

To install IP surveillance, click on the **Multicamera management** link on the CD included with the Internet Camera.



The Welcome screen appears.



Click **Next**

Please read the Software Licensing Agreement and click Yes if you wish to accept the agreement. Click No to exit the installation.



Click **Yes**

Enter your User Name and Company Name information.

Note: This User Name is not the User Name to log into the IP surveillance program.

InstallShield Wizard

Customer Information
Please enter your information.

User Name:
D-Link Camera

Company Name:
D-Link

Install this application for:

- ☒ Anyone who uses this computer (all users)
- ☐ Only for me (D-Link Camera)

InstallShield

< Back Next > Cancel

Click **Next**

You must setup the administrator's password in order to proceed. Input and confirm your password in the window shown below.

InstallShield Wizard

Administrator Password Setup

You must set admin password before you could use this program. Please type the password in the following.

Password:

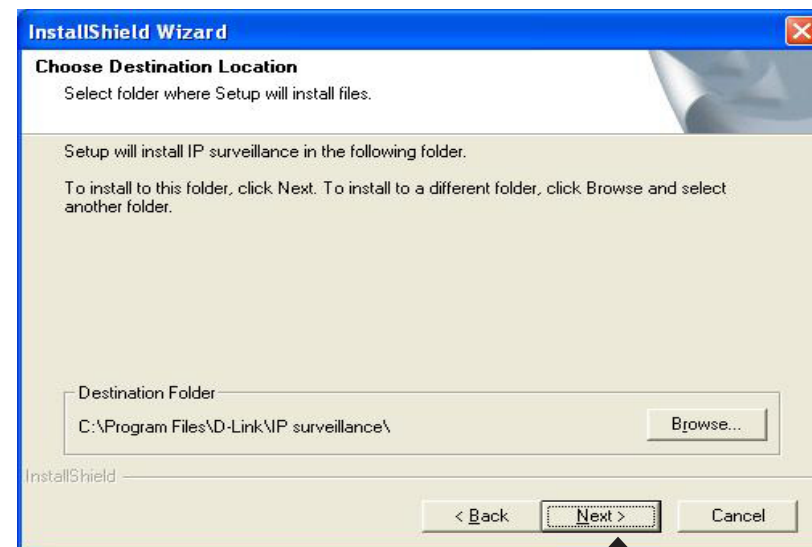
Confirm:

InstallShield

< Back Next > Cancel

Click **Next**

Select the installation directory for the IP surveillance software. You can change the installation directory by clicking Browse.

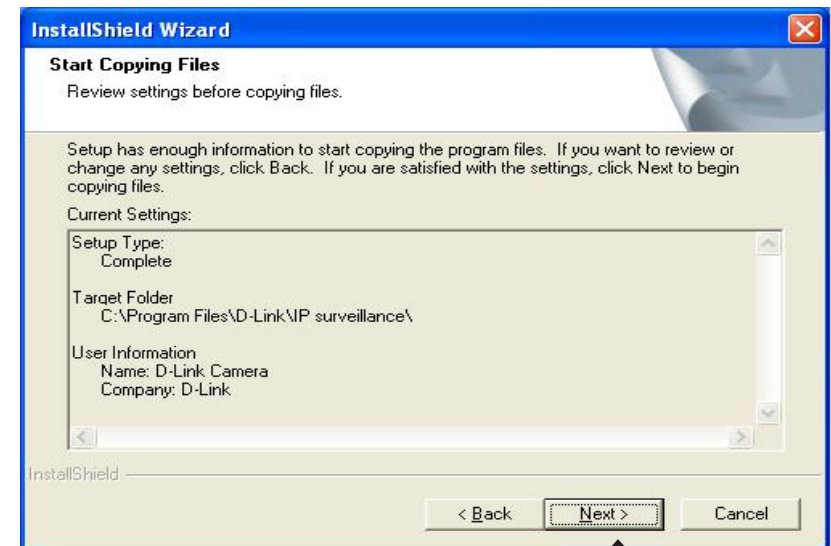


Click **Next**

Select the program folder to install the application software.

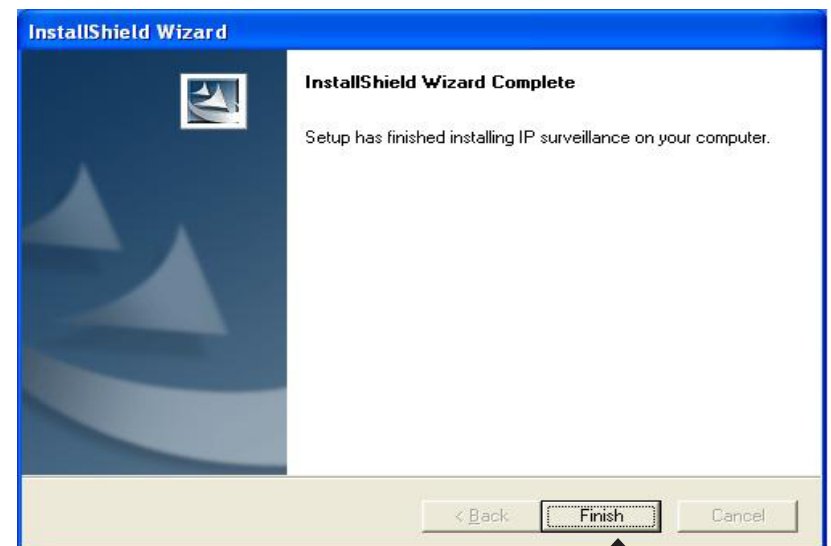


Click **Next**



Click **Next**

The installation is complete.



Click **Finish**

Using the Multicamera Management Software


Before you begin installing this application software, the hardware system requirements must be checked first. The minimum system requirements recommended for this application are as follows:

- Windows® 2000,XP or Vista
- At least 256MB of memory (512MB recommended)
- A wireless (802.11b or 802.11g) or Ethernet network
- Internet Explorer 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)

Launcher

Launcher is a controller program that allows users to invoke Monitor or Playback quickly.

System Tray Icon

The Launcher icon reflects current state of IP surveillance. The  icon in the system tray signifies that the IP surveillance Software is currently active on the system.

Security for Launcher

When Launcher starts, there is no need to undergo a username/password check. But when users want to click on the icon of Launcher on system tray, Launcher will pop up a username/password dialog the first time for menu popup or when Launcher is locked. If a user fails to pass the authentication check, no menu will show up. If a user fails 3 consecutive tries he/she will be locked out for a period of 60 seconds.



After passing authentication, users will be able to use all functions. If users want to leave the computer, it is possible to lock the Launcher for security reason. When Launcher is locked, the user will need to pass authentication again to see the popup menu.

Note: For initial setup, the default Username is “admin”. The password is the password provided during installation.

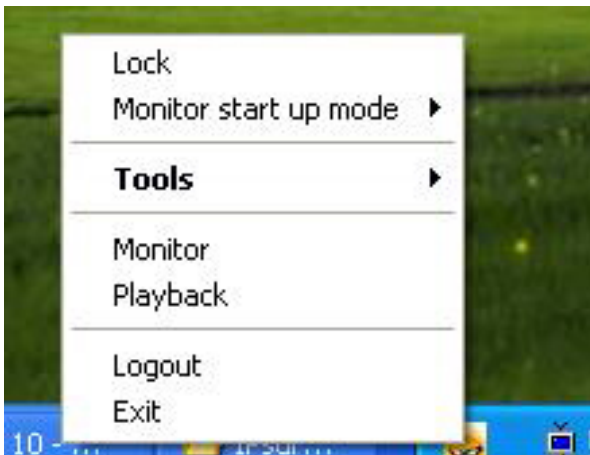
When Launcher is locked, the unlock window will appear, prompting for the user password in order to unlock.

The input area of the dialog will be grayed (disabled) for 60 seconds after 3 consecutive failures.



User Interface

Below is the user interface for Launcher:



The main user interface for Launcher is an icon on system tray, and the popup menu appears when the user clicks on the icon. The menu items are listed below:

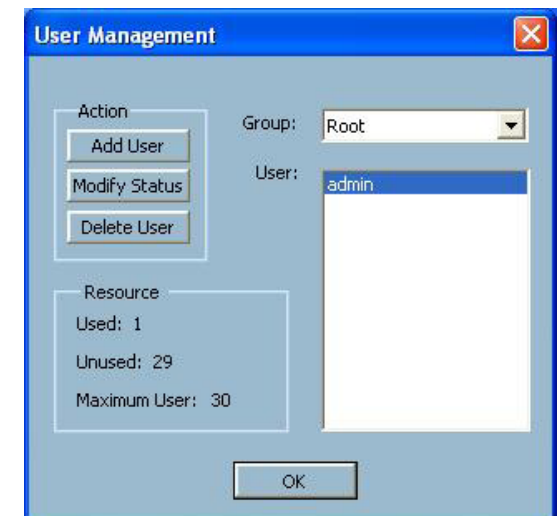
Lock: When this item is selected, Launcher will enter lock mode. In lock mode, whenever users want to invoke the menu, a dialog asking for ID and password will appear.

Monitor start up mode: Users can select whether or not to autorun Launcher when Window boots up.

Tools: The Change local admin's password dialog looks like this:



The User Management utility looks like this:



- Monitor:** Starts up the Monitor program. If the Monitor program is already running, clicking this button will re-open the Monitor window.
- Playback:** Starts up the Playback program. If the Playback program is already running, clicking this button will re-open the Playback window.
- Logout:** Logs out user from IP surveillance. After logging out, if the user wants to return to the menu, and clicks the Launcher icon, the authentication box will appear prompting for username and password again.
- Exit:** Exits Launcher. If users choose this option, Launcher will show a message box prompting to confirm if users really want to exit, and warn users that exiting Launcher will also close Monitor and Playback.

Monitor Program

Features of the Monitor Program

Traditional Surveillance Features:

- Real-time monitoring
- Pan and Tilt control
- Recording

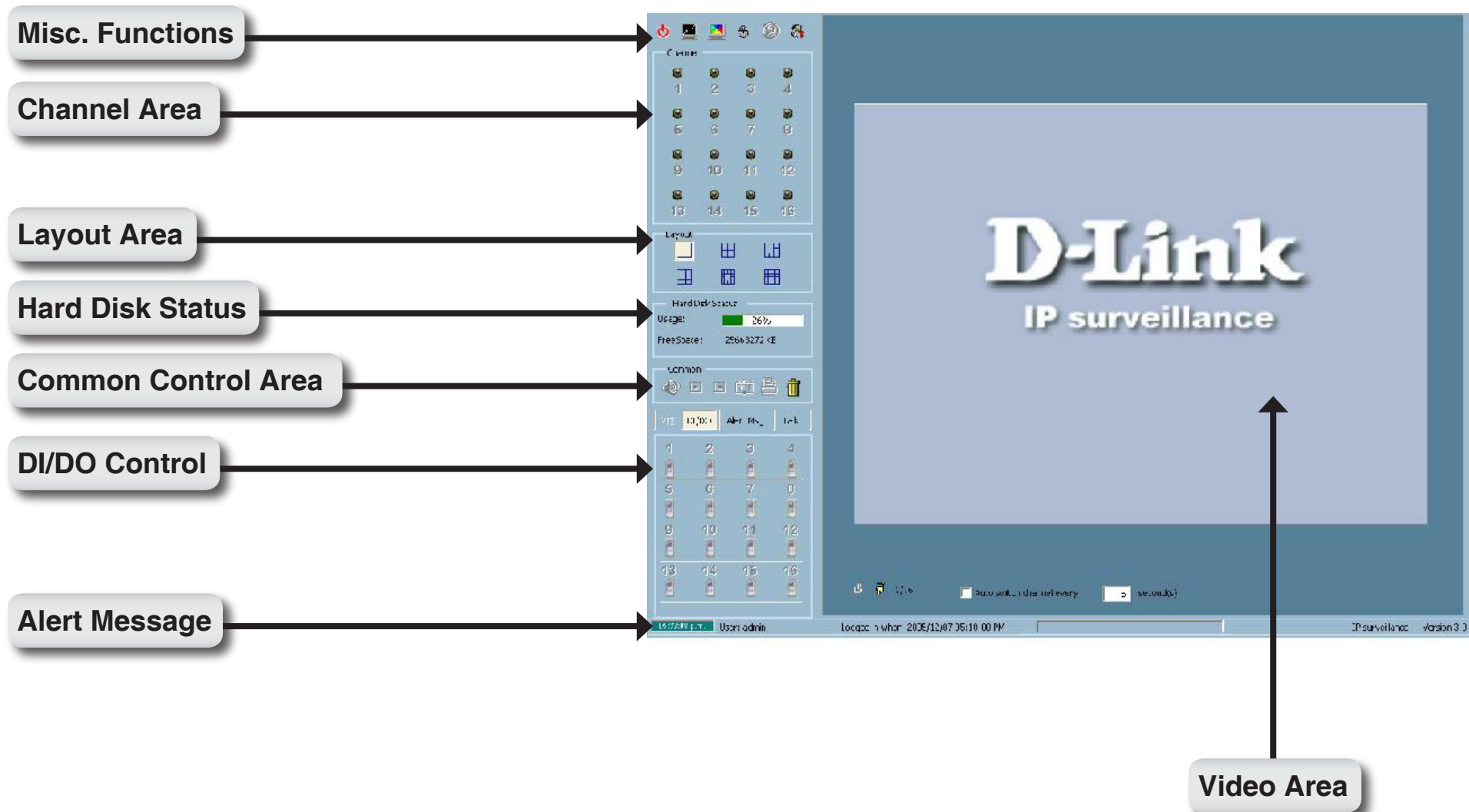
Special Features:

The digital surveillance system supports not only the features listed above, but also the following features, which make the system more powerful and convenient.

- Simultaneous real-time monitoring and recording audio and video
- High quality video up to full screen display
- High compression ratio
- Maximum of 16 cameras with different monitor layouts
- Auto alarm in multiple modes
- Account-password protection
- Multiple recording modes: Event-driven, Scheduled, and manual recording for each camera.
- Just-in-time snapshot
- Motion detection with 3 alert windows for each camera

Application Layout and Functionalities

This section demonstrates a global view of the monitor program, shown below. The components of the monitor tool will be introduced in detail in the following sections.



There are several parts in the monitor tool:

Misc. Functions: These include application exit, minimization, full screen monitoring, lock, stop alert, and configuration menu for camera configurations, global settings, scheduler settings and the user information of this application software. Tips for these operations are provided when you move the mouse cursor over each icon.

Channel area: This area displays the status of each video channel. The information indicates the status of connection, recording, selection, and alert-event trigger.

Video area: In this area, you can see the video of the selected channel in the display frame. The number of the display frames in the video area depends on the layout chosen by the user. You can also use convenient controls to alter the video display.

Layout area: You can change the monitoring layout in this area. There are six kinds of layouts: 1, 4, 6, 9, 13, or 16 video display windows in the video area.

Hard disk status: In this area, you can get the status of the hard disk in which the video database resides. The status reminds you of the available storage space remaining on the hard drive you have selected to record to.

Common control area: This area includes volume control, manual recording, video printing, snapshot, and trash can to remove video from display windows.

DI/DO control: This tool receives the digital input signal and sends digital output signal to the remote Video Server/ Network Camera series product associated with the dedicated video channel.

Alert Message: This tool will display the latest alert messages received by the remote Video Server / Network Camera series product associated with the selected video channel.

Logging In

You need to login the first time when you start the Launcher. The authentication window is shown below. If you do not have an account, the monitor tool will not execute. You must log in as admin (administrator) to use this application. Enter the password for the administrator.

Note: *The password is the one you provided during installation.*



The Admin Privilege

In the Monitor program, the admin has the right to access the DCS-5220 Network Camera through this application software and change the local settings as well. But the admin password for the software is not the same as the admin password for the Internet camera. You can change the settings of each selected Internet camera from the Monitor program only if you have the admin password for the Internet camera.

If you have the admin privilege, you have the right to do the following tasks:

- Run the configuration tool
- Change the recording schedule
- Change the local settings

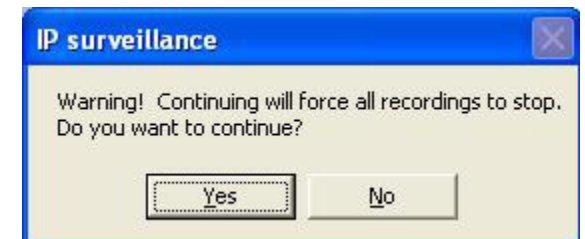
Again, if you need to change the settings of the DCS-5220, you must have the administrator's password for the camera itself.

Camera Configurations

When you log in for the first time, you should configure this application software to connect the DCS-5220 in **Configuration Menu > Camera Configurations**, shown in the figure below. You will need the admin (administrator) password of the camera in order to run the configuration.

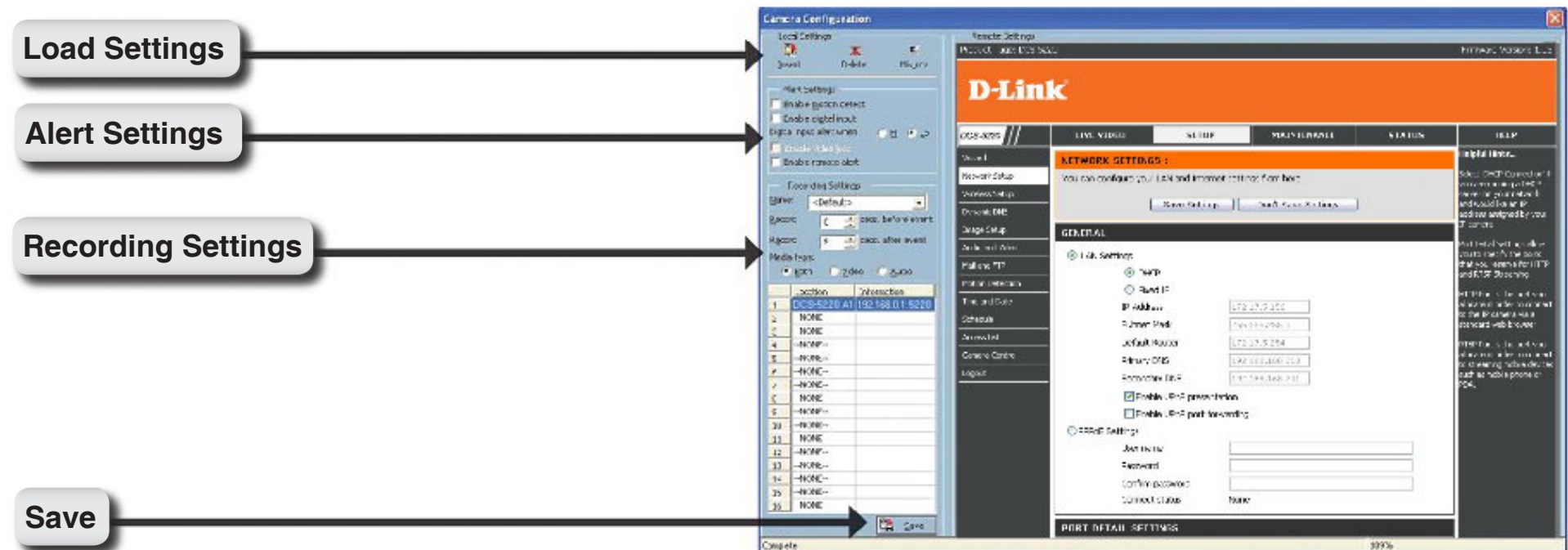


Once you click **Configuration Menu > Camera Configurations** for setting each camera, all recording processes will be stopped indicated by a warning window popped up in advance to keep you informed.



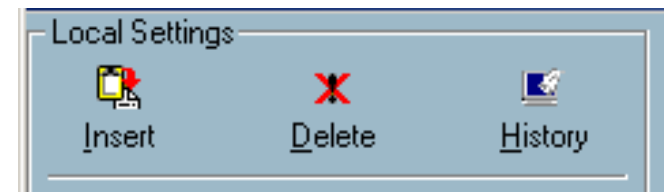
The Layout of the Configuration

This section discusses the local settings for the connection and the functional configuration of each camera. If you are interested in the remote settings for each camera, you can refer to “Using the DCS-5220 with an Internet Browser” (page 29).



In the local settings, shown below, three main functionalities are provided:

- Insert:** Click to insert a new camera to the list.
- Delete:** Click to delete a camera from the list.
- History:** Click to view the history of all cameras in the list.



Insert

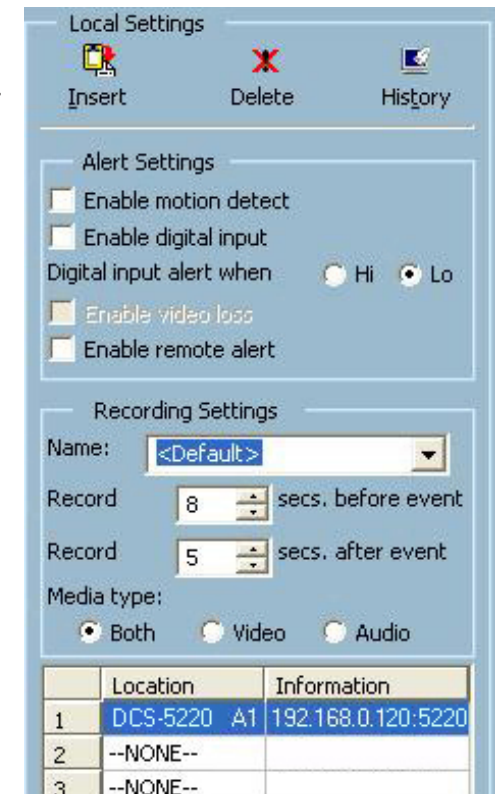
To insert a remote network camera to the camera list. Click the Insert button, an “Insert New Channel” dialog will popup, as shown here. Specify the IP address, port, and admin password of the network camera, click the **OK** button to close the dialog. Then the system will try to connect to the selected camera. If the connection succeeds, the camera will be inserted to the camera selection list.



The "Insert New Channel" dialog box is shown with the following fields and options:

- Address:** 192.168.0.120
- Port:** 80
- User:** admin
- Password:** (empty field)
- ☒ **Save Password**
- OK** and **Cancel** buttons at the bottom.

Once the camera is added, you will see the IP address of the camera and also the port that is opened on the camera (port 80 in this example). The selected camera has been added to the selection list.



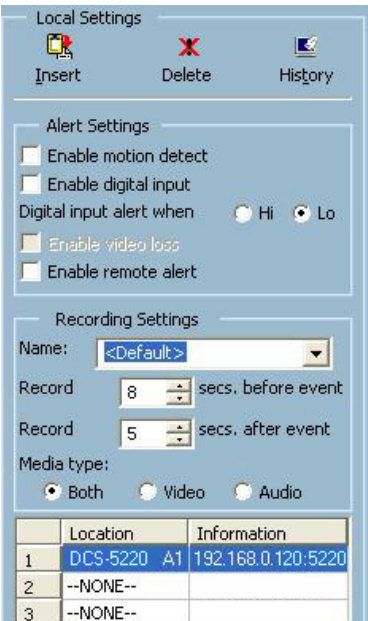
The "Local Settings" window displays various configuration options for the camera:

- Local Settings:**
 - Insert** (camera icon), **Delete** (X icon), **History** (list icon)
- Alert Settings:**
 - ☐ Enable motion detect
 - ☐ Enable digital input
 - Digital input alert when: ☐ Hi ☒ Lo
 - ☐ Enable video loss
 - ☐ Enable remote alert
- Recording Settings:**
 - Name: <Default>
 - Record: 8 secs. before event
 - Record: 5 secs. after event
 - Media type: ☒ Both ☐ Video ☐ Audio
- Table:**

	Location	Information
1	DCS-5220 A1	192.168.0.120:5220
2	--NONE--	
3	--NONE--	

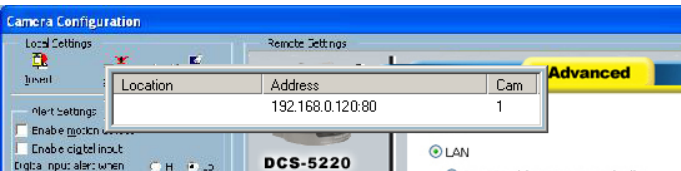
Delete

Highlight the camera that you want to delete from the list and click on the Delete button. The selected camera will be deleted.

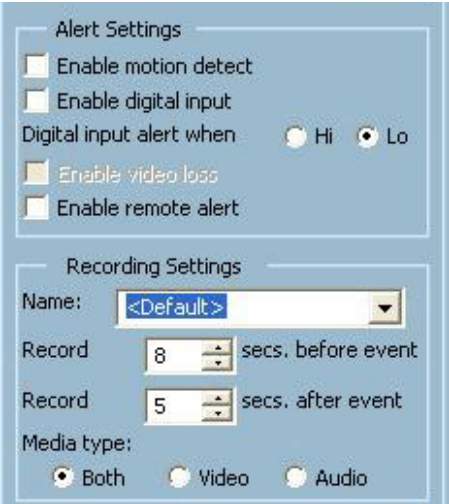


History

Clicking the History button will popup a historical camera list, which lists the latest 16 cameras you have inserted into the camera list. Clicking on one camera in the history list will insert the camera into the camera list. The history list is shown here.



Alert and Recording Settings



Alert Settings

Specific alert actions can be performed by setting the options in this window.

Enable motion detect: This will trigger an alert sound that has been specified in the section titled “Display & UI Settings\Local Alert Settings”. Check this option to enable audio alerts for the selected camera.

Enable digital input: This function is similar to “Enable Motion Detect” mentioned above. Once this option has been checked, a digital input device will be able to trigger an alert sound and recording.

Note: *The digital input/output is not available for the DCS-5220 model.*

Digital input alert: This application software provides options for you to define the triggering criteria for the digital input of the camera. The alert of the digital input can be defined as high-level triggered or low-level triggered.

Note: *The digital input/output is not available for the DCS-5220 model.*

Recording Settings

Record # secs before event: Once the automatic video recording has been activated, you can change this setting to regulate the recording of triggered events. Recording will start from the specified number of seconds before the alert event has been invoked.

Record # secs after event: Recording will last for the specified number of seconds after the alert event has been invoked.

Media Type: You can specify which media type you want to record: Video, Audio, or both.

Changing the Camera Order in the List

You can “drag and drop” in the grid area of the camera list to change the sequence of the connected Network Cameras, which is shown below. This will allow you to rearrange the cameras in an order of your choice. Once the camera is moved to a specified location, the proceeding cameras will then move 1 position up or 1 position down depending on which direction the selected camera was moved.

Press and hold the left mouse button at the gray index field of the camera you would like to move.

	Location	Information
1	Front Door	192.168.0.100:80
2	--NONE--	
3	--NONE--	
4	--NONE--	
5	--NONE--	
6	--NONE--	
7	--NONE--	
8	--NONE--	
9	--NONE--	
10	--NONE--	
11	--NONE--	
12	--NONE--	
13	--NONE--	
14	--NONE--	
15	--NONE--	
16	--NONE--	

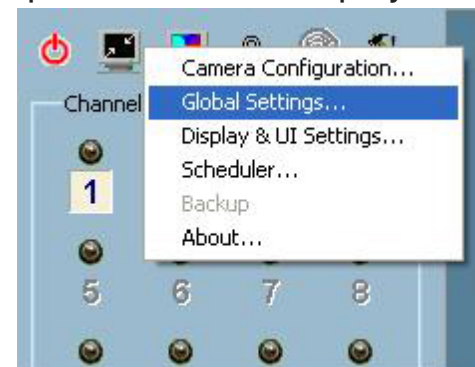
Drag the mouse to your new selected location and release the mouse button. Then Video 1 will be moved (to the 12th row in this example).

	Location	Information
1	--NONE--	
2	--NONE--	
3	--NONE--	
4	--NONE--	
5	--NONE--	
6	--NONE--	
7	--NONE--	
8	--NONE--	
9	--NONE--	
10	--NONE--	
11	--NONE--	
12	--NONE--	
13	Moving channel 12 ...	2.168.0.100:80
14	--NONE--	
15	--NONE--	
16	--NONE--	

Once you click the Save button (see page 75) in the left-bottom corner of this window, the changes for all camera configurations will be saved and will be applied immediately to the IP surveillance.

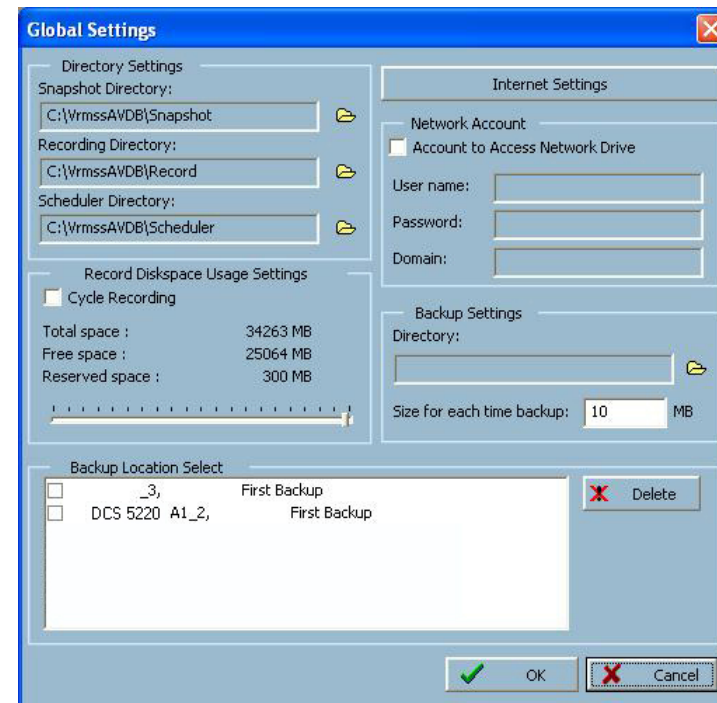
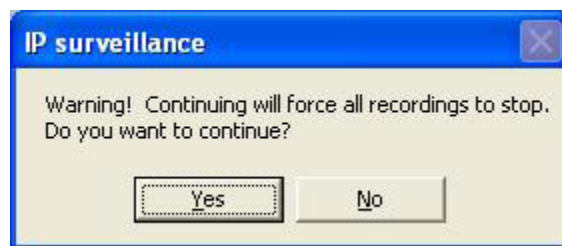
Global Settings

After completing the connection to each remote Network Camera, we need to configure the global settings for all the cameras. These include the video database directory, the usage of the Hard disk, and options for video display.



You can activate the global settings window from **Configuration Menu > Global Settings...** shown above.

All recording processes will be stopped when activating the global settings window, indicated by a warning window popped up in advance to keep you informed.



Directory Settings

- Snapshot directory:** The directory for storing snapshots in *.bmp format from video channels of the monitor tool and playback programs.
- Recording directory:** The directory for storing the recorded video data from video channels.
- Scheduler directory:** The directory for storing the default and user-customized schedules for the scheduled recording of each channel.

Record Diskspace Usage Settings

- Cycle Recording:** When you turn this setting on, the video database system of this application will overwrite the oldest data if the specified path has become full. That means it will record video data in a loop. If this setting is unchecked, all recording will stop when the limit of the hard disk usage is reached.
- Reserved space:** Indicate the size of the hard disk that will be reserved for other Windows® applications (at least 300MB). The remainder of the hard disk space will be available for recording. The more space you have reserved, the less there will be available for your camera(s) to record to. As you move the bar to the right, more space will be available for your camera(s) and conversely, less space will be available for your other applications. If the recording data exceeds this limitation, the new video data will replace the oldest data (on a First In First Out (FIFO) basis) when “Cycle Recording” has been checked.

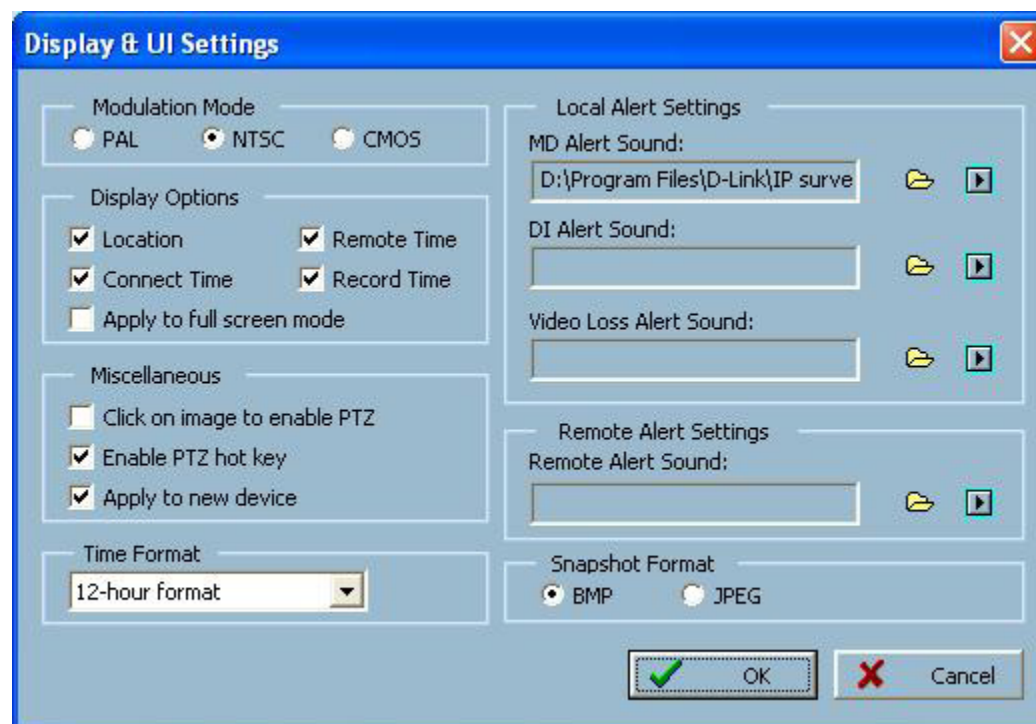
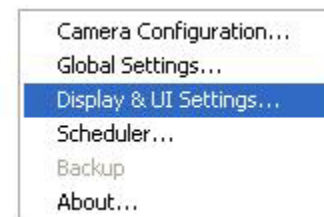
Display & UI Settings

Modulation Mode: You must select the input signal format (NTSC or PAL) for displaying the original resolution of video stream from DCS-5220.

Display Option: Enable/Disable the time displaying on the video image.

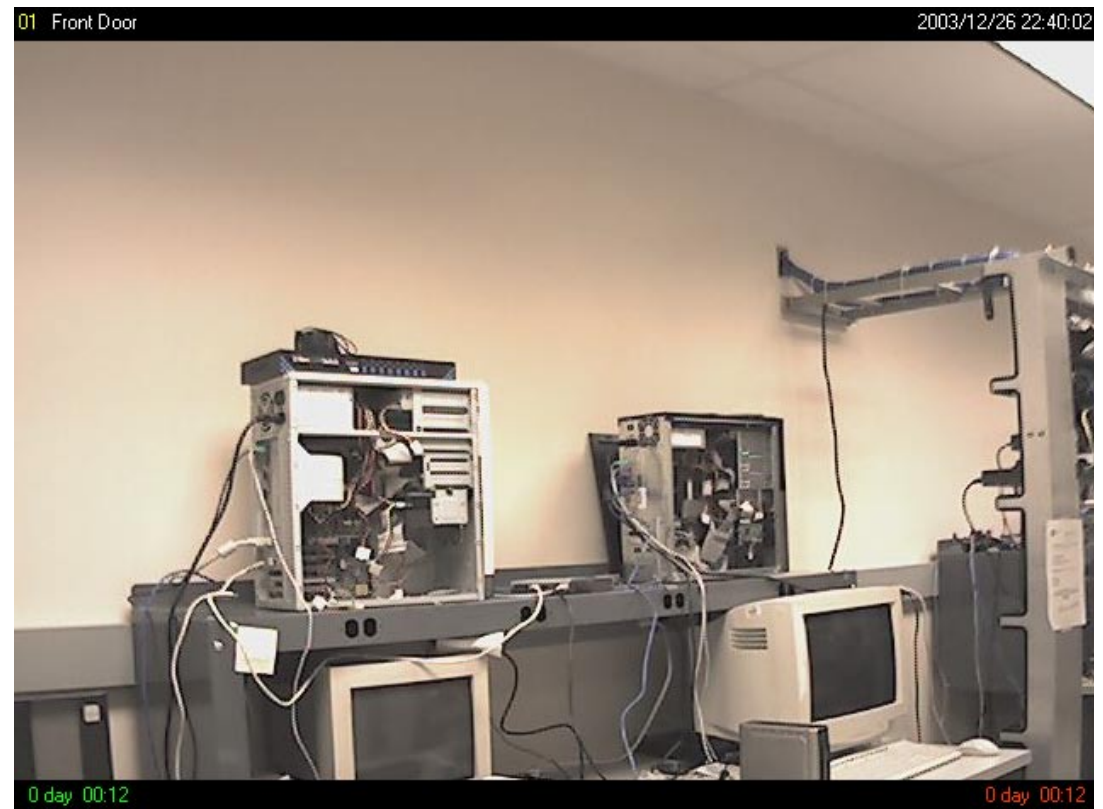
Misc: Allows the user to pan and tilt the camera from the video image.

Alert Sound: You can load a custom *.wav file for the alert triggering sound, or you can select a sound file from the Windows® sound file directory.



Display Options

In the video displaying frame of each channel, there are two status bars. The upper bar contains “Location” (channel number + camera name) and “Remote Time.” The lower bar contains “Connection Time” (Day:Hour:Min) and “Recording time” (Day: Hour:Min). All of them, shown in the figure below, can be enabled or disabled here individually for the status indication. Apply to full screen mode can also be turned on here. Once it has been checked, the status bar in each channel showing date, location, connection, and recording time will be shown in both display frame mode and full screen mode.



Using the Scheduler

This section discusses the method of how to use the scheduler.

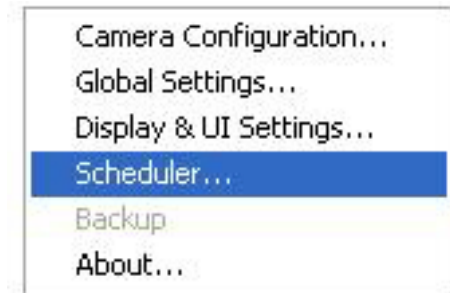
The scheduler allows the user to schedule recordings from the selected video channel of the DCS-5220. Through both the graphic user interface and time period selection options, you will be able to easily regulate a schedule for each video channel.

The main features of the scheduling tool are:

- Friendly graphic user interface for schedule editing
- Flexible schedule scheme suitable for all applications
- Individual schedule for each video channel
- Periodic automatic recording

Start the Scheduler

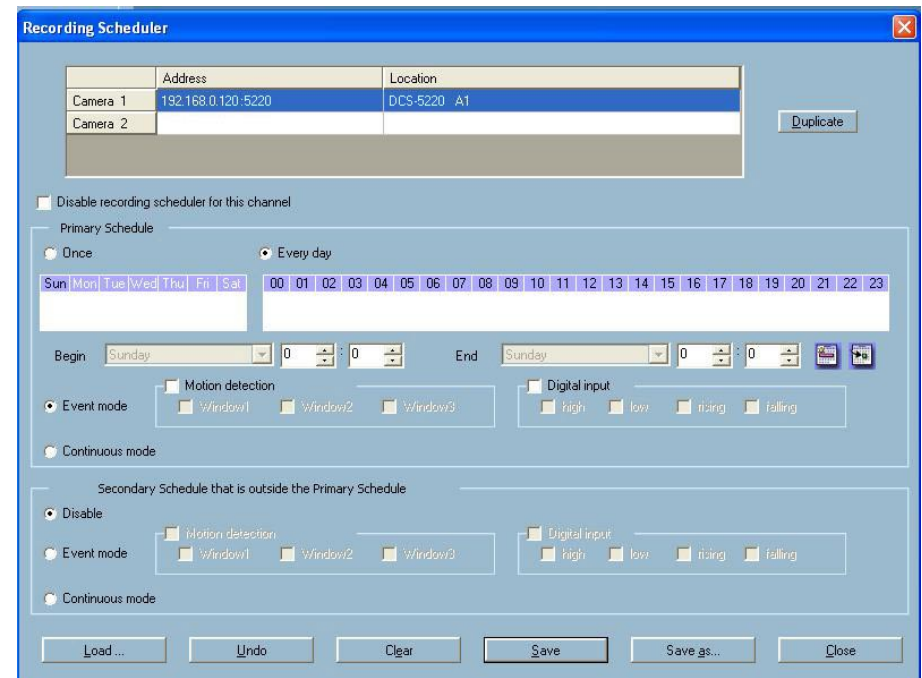
The scheduler will not be accessible until at least one camera has been added to the camera list. Go to the configuration menu and click on Scheduler to launch the Scheduler.



The Layout and Functionalities

Introduction

The layout of the scheduler and its components, shown below, will be described. The layout of the scheduler is roughly divided into 4 parts: Video Channel Selection Area, Primary schedule settings, Secondary schedule settings, and Operation Buttons.



Video Channel Selection Area: The video channel selection area provides the IP addresses and location information of the connected video channels for the user's reference. You can select a video channel in this area and create a schedule for it.

Primary Schedule: The Primary schedule consists of the day time-line, week time-line, begin time selector, end time selector, and event mode settings.

Secondary Schedule: The Secondary schedule consists of event mode settings.

Operation Buttons: The operation buttons allow the user to manipulate the edited schedule of the selected video channel. The scheduler can be closed from here.

The Functionalities of Configuration Components

The four main parts of the scheduler have been briefly described above. The four parts will be described in detail in the following section.

Video Channel Selection Area

In this area you will select the video channel that you want to set a schedule for. Each video channel will display a name, an IP address, and the location. Please note that when you switch between video channels in this area, the changes in the schedule of the previous video channel will be saved automatically.



	Address	Location
Camera 1	192.168.0.120:5220	DCS-5220
Camera 2		

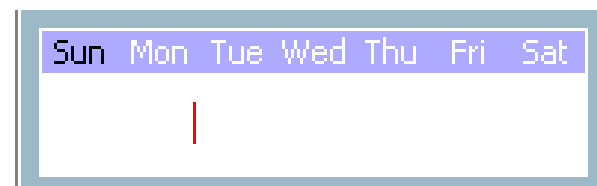
Primary Schedule

Schedule with Time Lines

There are two different time-lines: hour unit time-line and week unit time-line. You can make your own schedule by plotting markers in all time-lines. These two time lines are associated with each other. That is, if you make changes in one time-line, the corresponding changes will be applied with scale to the other three time-lines in the same schedule. Before you begin, make sure that you select “Once” (page 85) if you want to choose the days to record on.

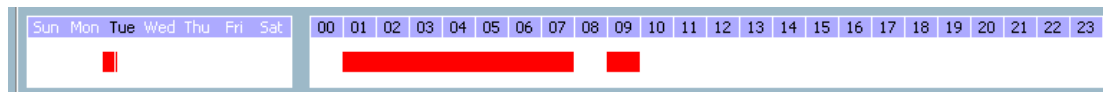
Week Time-Line

In the figure below, Week time-line is displayed. It includes the time-line, schedule information, and the selected day in the week.



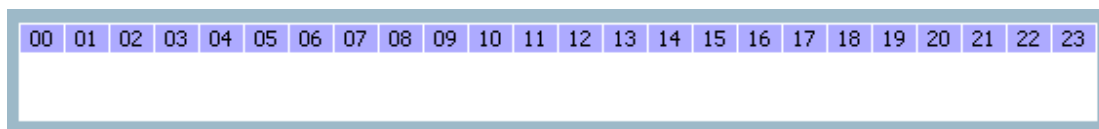
Marking/Unmarking the Recording Time on the Week Time-Line

The corresponding changes for the markers on the week time-line will be automatically added to the hour time-lines, which is shown above. You can also mark and unmark the plotted bar by clicking and dragging with the left and the right mouse button.



Hour Time-Line

In the figure below, the Hour time-line is displayed.



Marking/Unmarking the Recording Time on the Hour Time-Line

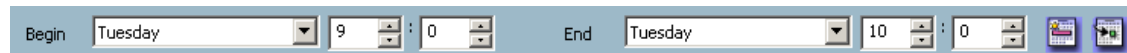
You can apply the one-click function by clicking the left mouse button and dragging to mark the time on this time-line. The operating method for the hour time-line is the same as that of the week time-lines. Please refer to the previous section about marking/unmarking on the week time-line for more details.

Schedule with Time Picker

Begin and End Time

There are three controlling units in both “Begin Time” and “End Time” selectors shown below. The first unit of these two selectors is the date picker. You can select day with it to set the beginning time and the ending time for the recording interval.

The second and third units are the hour picker and the minute picker. You can change the hour and minute settings for the beginning and ending time with them.



Note: The time set in “Begin time” must be earlier than that in “End time”. Otherwise the settings will not be applied.

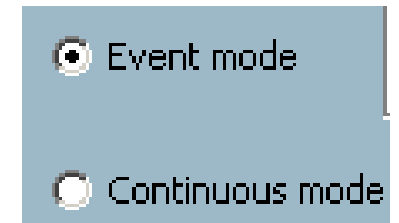
Apply and Erase Buttons

After you have selected the time period with “Begin time” and “End time” picker, you can apply the period picker, shown in the figure below, to set the periodical types of the time interval set previously. After the settings in “Begin Time”, “End Time” and “Period Picker” are all done, you should click the “Apply” button or “Erase” button on the right to add or clear this scheduling information to the editing schedule scheme. Note that only after you click on the “Apply” button, the scheduling information settings will be written back into the whole editing schedule scheme. That means this edited scheduling time interval is valid only after you “Apply” the changes.



Schedule in Event Mode

You can select to record in Event mode or Continuous mode by the Schedule mode selector as shown in the figure below. There are two types of event recording. Please refer to the following two sections for more information.



Motion Detection

As shown below, you can check the windows that you would like to record while the motion detection is triggered.



Digital Input

In the figure below, there are four conditions for the digital input. Check the condition that you would like to record while the condition triggers.

Note: The Digital Input is not available for the DCS-5220 camera.



High: Checking this will trigger recording while the digital input is high. The technical name for this event is line trigger.

Low: Checking this will trigger recording while the digital input is low. The technical name for this event is line trigger.

Rising: Checking this will trigger recording while the digital input is changing from low to high. The technical name for this event is edge trigger.

Falling: Checking this will trigger recording while the digital input is changing from high to low. The technical name for this event is edge trigger.

Schedule in Continuous mode

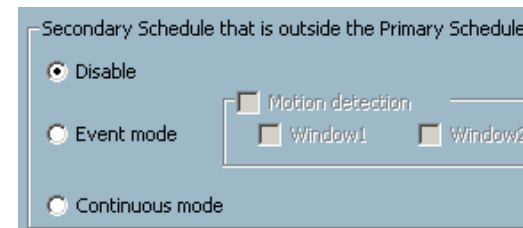
If you select Continuous mode in the schedule mode selector, it will record continuously during the schedule that is set up by the user.

Secondary Schedule

Secondary schedule is for recording outside of the primary schedule. The secondary schedule provides options to record without a specified date or time.

Schedule modes

There are three modes in the secondary schedule: Disable, Event mode, and Continuous mode. If event mode is selected in the secondary schedule, the camera will record whenever an event is triggered. If continuous mode is selected, the camera will begin recording continuously after scheduling settings are saved. These two modes are the same as the primary schedule. Please refer to the previous section for more detail.



Operation Buttons

There are six operation buttons that allow you to handle the schedule schemes: “Load...”, “Undo”, “Clear”, “Save”, “Save as...” and “Close.” These operation buttons are shown in the figure below.



Load: This button allows you to load pre-edited schedules from the scheduling directory for the selected video channel. Note that you should save the schedule you are currently working on before loading a new one. Otherwise, the current changes will be lost.

Clear: This button will clear all changes in the current schedule of the selected video channel.

Save: This button is used for saving changes to the current schedule.

Save As...: This button is used to save the current schedule as another file name instead of the default name.

Undo: Click on this button to undo all changes for the current schedule since the last save.

Close: Click on this button to close the scheduler.

Backup Settings

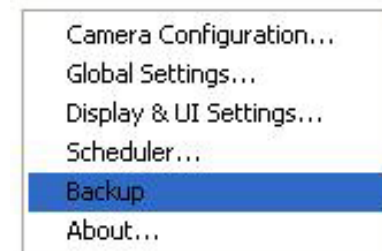
Using Backup Settings in the global settings window, you can backup recorded data from selected cameras to a specified location.

Directory: This is the directory where backup data will be saved. You can select the location by clicking on the folder icon.

Size: You can set the size limit of the data that will be backed up. The default size limit is 10MB. The maximum value for this setting depends on the amount of Free Space available on your hard drive. This value can be found under the “Record Disk space Usage Settings” section of the global settings window.

Backup Location Select: Select the locations to backup by clicking the checkbox next to the location/camera name. To delete a location, select the location and click the “Delete” button to the right of the Backup Location Select window.

After you have set your backup settings in the global settings window, you can backup recorded data by clicking “Backup” in the Configuration Menu, as seen below:



Using the Monitor Program

This section depicts, in detail, how to manipulate the monitor tool.

Connection of the DCS-5220

Once you have the privilege to connect to the DCS-5220, the cameras will automatically appear in the video area in the order they are connected. Once you have set up the camera in the video channel, the color of the channel number will turn green, indicating that the camera has been added to IP surveillance. If you do not set up the camera for the video channel, the color of the channel number will be gray.

There is a unique light signal associated with each channel number. It indicates the status of the dedicated video channel, which is depicted as follows:

Off: The video channel is not connected with any DCS-5220 yet.

Green: The green light means the DCS-5220 associated with this channel number is connected, and the video is monitored in the video area.

Red: The red light indicates the video from this channel is recording into the video database. In this mode, you don't have to drag and drop the channel to the video area. This means that this application software supports real-time recording with and without real-time monitoring for the dedicated video channel.

Blink: With the motion detection mechanism set in the DCS-5220, the light of the corresponding channel will blink once the motion event is triggered.

If you do not want to monitor one video, you can drag and drop the video (in the video area) to the trashcan in the common control area of the monitor program. The following section will demonstrate the procedures for “drag and drop” step-by-step.



Show the video of a specified channel

This section depicts the method of how to show the video of a specific channel in a display window.

Step 1: Move the mouse cursor to the camera you would like display in the window.

Step 2: Press and hold the left mouse button, and then drag it to a display window in the video area on the right side of the screen. Note that the cursor will change according to the area in order to indicate whether the area is droppable or not.

Step 3: Release the left mouse button while on top of a display window. The video will appear in the display window as shown below. In each display layout, only one window can be assigned to a camera. Also, each camera must have its own separate window when displayed. Once the video is in a display window, it can be dragged and dropped to other windows. If you drag one camera's video to a window that already has its own camera's video, the two cameras will trade display windows. Dragging and dropping is a very convenient way to manipulate the video channels in the IP surveillance Software.



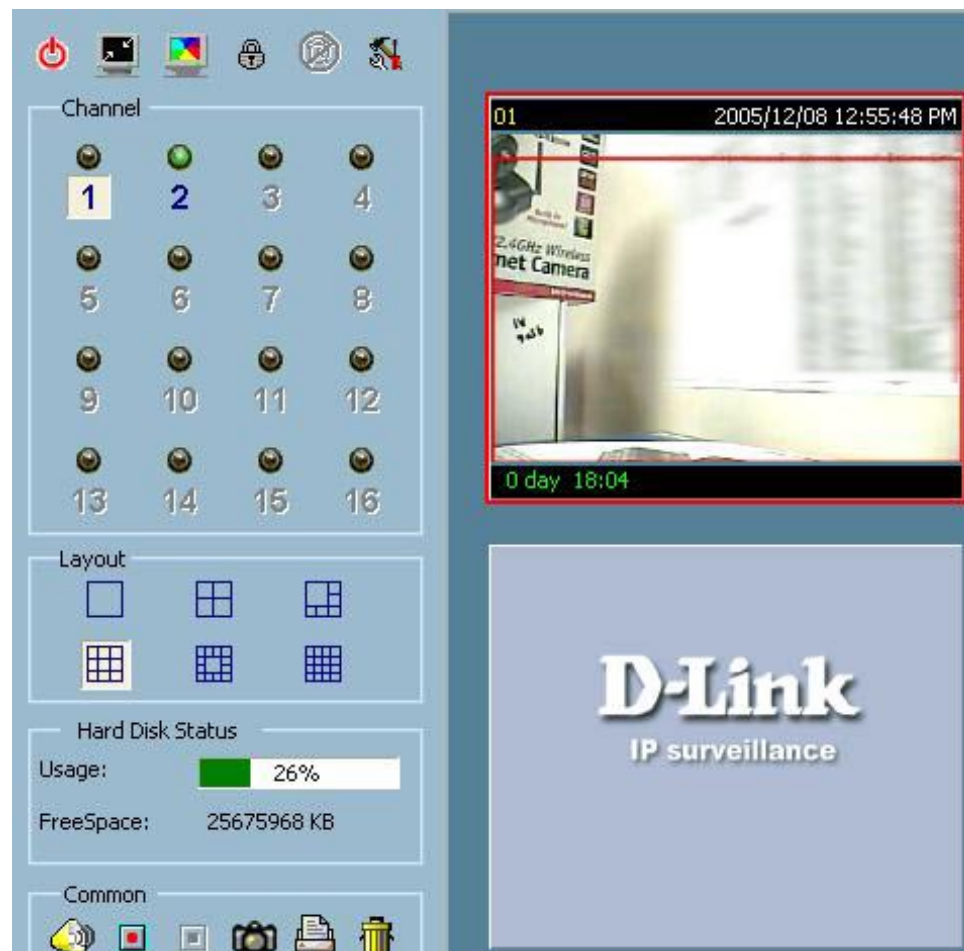
Removing video from a display window

Step 1: Move the mouse cursor to the display window that contains the video channel you wish to remove.

Step 2: Note that the cursor will change to the hand-shape when it has been moved onto the displaying frame. After that, press the left mouse button and hold it.

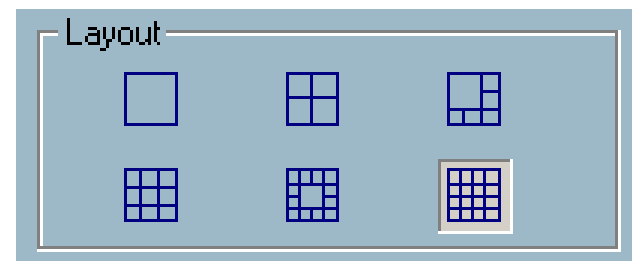
Step 3: Move the cursor, while still holding the left mouse button, to the trashcan in the common area of the monitor program.

Step 4: When the cursor shape changes to an arrow-shape over the trashcan, release the left mouse button. The video in the corresponding display window will disappear.

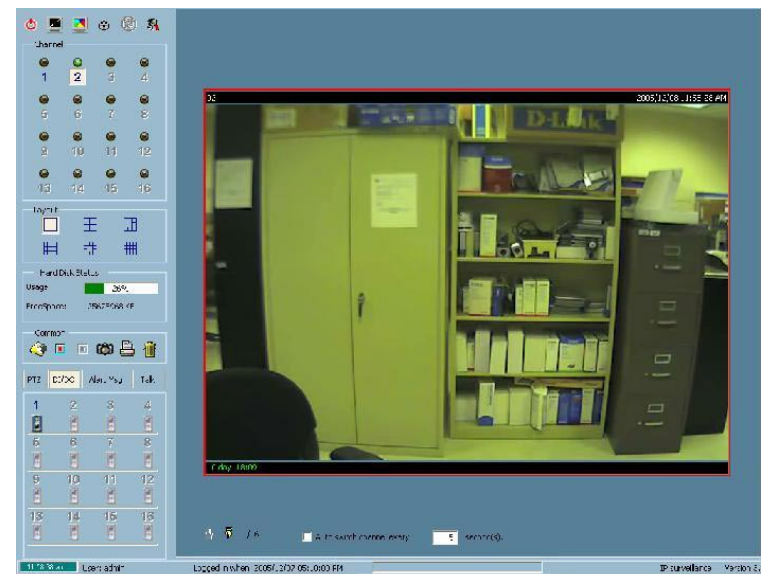


The Layout

There are six different layouts available, as shown below, for the display windows in the monitor program. You can select between 1 camera, 4 camera, 6, camera, 9 camera, 13 camera, and 16 camera layout. You can select one of them by clicking on a layout icon. In each layout, you can drag and drop the “channel number” to any display window in the video area. Following the procedures described in the section titled “Show the video of a specified channel”, you can add the video channels to display windows within the selected layout in the video area one by one. You can also exchange the video between different display windows by dragging and dropping. Double clicking on a display window will switch to single channel layout.

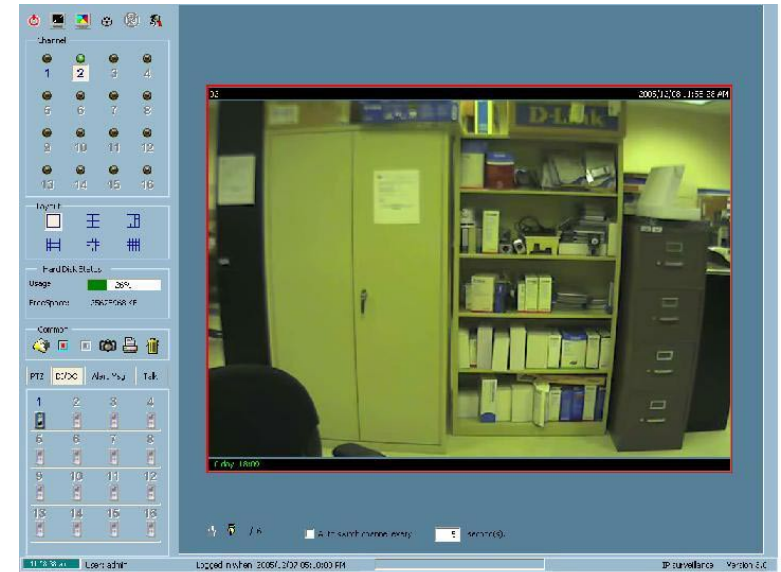


When you choose the one-channel layout or four-channel layout, the “Page up” and “Page down” buttons will be shown in the left-bottom corner of the video area. You can use these two buttons to switch the pages, as shown in the figure below.



To view an individual camera from the multi-camera layout, double-click on the desired display window. You will see that the size of the display window is the same as the one-channel layout. Clicking the Back button in the upper-left corner of the video area will switch to the previous selected multi-camera layout.

The position that each video channel is in for every layout will be saved for the next time the layout is selected.



Input/Output Control Tools

IP surveillance includes DI/DO control (Digital Input / Digital Output) control and an alert message receiver. Each of these are described in detail on the following pages.

Note: The DI/DO is not available in the DCS-5220 camera.



Clicking on the “DI/DO” button shown below, you can switch to the DI/DO controls. The color of the channel number indicates the status of the camera’s DI (Digital Input). You can click the “Switch button” to change the HI/LOW state of the DO (Digital Output). With these features, you can monitor the remote sensor input from DI and also trigger the camera by DO switch.



When the color of a DI/DO channel number is gray, that means the video channel has not yet been connected to a camera.

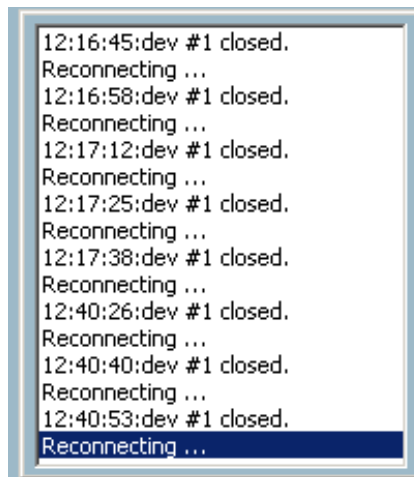
Alert Message

If you have checked the box “Enable Motion Detect” or “Enable Digital Input” on the **Camera Configurations > Alert Settings** screen, the alert message will show in the window shown above. Once the alert, caused by motion detection or a digital input level change is triggered, the alert message will be shown in this window. If there are more events than this window can display, a scroll bar will appear.

The message format is described as follows:

“time”=>”alert type” #”channel number”(“win1”, “win2”, “win3”)

For example, the message “PM 02:41:00=>MO #1(0,1,1)” means that this is a motion detection alert occurring at 02:41:00 PM in Motion Window 2 and Motion Window 3, for camera #1. If the message “PM 02:41:56=>DI #1” is listed, that means there is an alert triggered by the DI, for camera #1, at 02:41:56 PM .



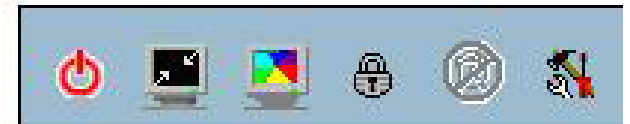
About

By choosing “About”, located in the configuration menu shown below, a dialog box will appear and display the information about the installed version of IP surveillance. The information includes the software name, version, user name, and company.



Miscellaneous Functions

This section will describe some other miscellaneous functions of the icons shown below. The icons, from left to right, are Quit, Minimize, Full Screen, Lock, Stop Alert Sound, and Configuration Menu.



Quit: By clicking this button, IP surveillance will be closed with the latest settings saved.

Minimize: Minimize the Monitor program.

Full Screen: With this function, you can enlarge the selected video channel to a full-screen display. Press the “ESC” key on the keyboard or double click the mouse on the screen to return to a regular display.

Lock: When this item is selected, Launcher will enter lock mode. In lock mode, whenever users want to invoke the menu, a dialog asking for ID and password will appear.

Stop Alert Sound: If an alert is triggered, the alert sound will start to play. After being informed of the situation, you can press this button to stop the alert sound. It will also switch the I/O Control to the Alert Message receiver, so that the alert messages can be reviewed.

Configuration Menu: The menu includes Camera Configuration, Global Settings, Scheduler, and About options.

Common Control Functions

This section will describe the common control functions of the icons shown below. These functions only apply to the currently selected channel. The icons, from left to right, are Volume, Record, Stop Record, Snapshot, Printer, and Trash Can.

Volume Control: Click on this button to adjust your volume settings.

Record: By clicking on this button, you can manually record video from the selected channel.



Stop: After video recording has been activated, this button allows you to manually stop recording the selected video channel.

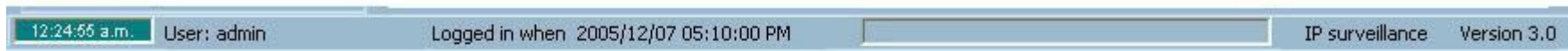
Snapshot: This button will take a snapshot of the selected video channel and then save the picture as a bitmap file to the hard disk. You can set the directory for storing these bitmap files at the **Configuration menu > Global Settings** screen. Please refer to the section titled “Global Settings” for more details (see page 80).

Printer: Click on the printer icon to print the current image to your default printer.

Trashcan: You can drag and drop the video channel to the Trashcan to close the video connection with the DCS-5220.

Status Bar

The status bar, shown below, displays information about the IP surveillance program such as: Local Time, Current Login User, Login Time, Software Name, and Software Version.



Playback Program

The playback program is a very powerful, convenient, and easy way to browse the recorded video. It has one display mode (normal display mode) and two playback methods (full range and time period). There are several main functions including special features in the Playback program. These functions are depicted as follows.

Features of Playback

Powerful play control tool:

- Play
- Stop
- Pause
- Step forward
- Fast play (from x1 to x16)
- Slow play (from /1 to /16)

Convenient display adjustment tool:

- Zoom in (from 1:1 to 2.25:1)
- Zoom out (from 1:1 to 1:2)
- Full screen

Flexible searching range adjustment tool:

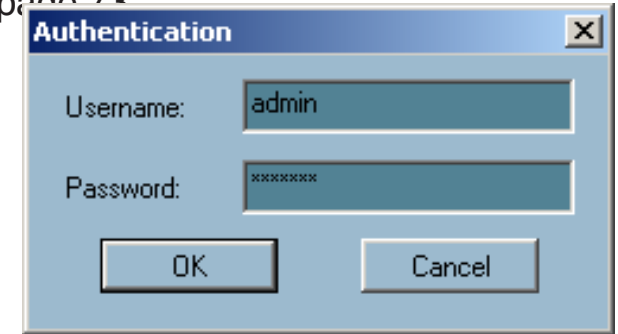
- User input (from full range to 1 second)
- Zoom in (from full range to 10 seconds)
- Zoom out (up to full range)
- Full range

System control tool:

- Program locking
- System settings

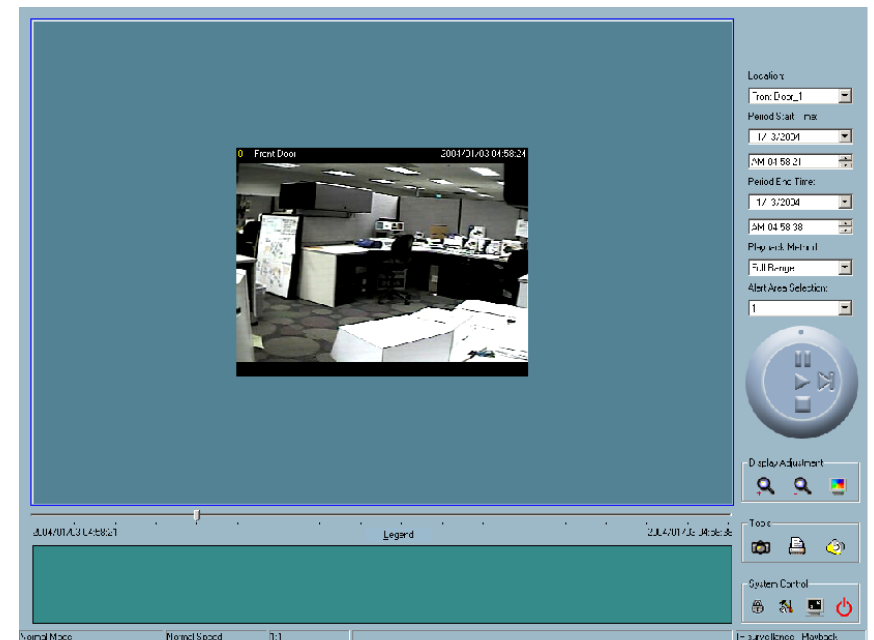
Logging In

Before you start the playback program, it is necessary for you to log in to the application software. The figure below shows the login dialog. For security concerns, only the admin account can log in to this program. To change the password of the admin account, please refer to the section titled “Logging In” on page 72.



Layout

When you successfully log in to the playback system, the main window will be shown on the top of the screen and the display resolution will be changed to 1024x768 automatically. There are four main areas, i.e. display area, histogram area, control area, and status area. There are also three visualized controls, i.e. area selection indicator, frame selection indicator, and pull bar. These features provide much more convenience while searching recorded video in the IP surveillance database.



Main Areas

Display Area

The display area is able to show the surveillance database of each camera by time. You can change the video size through the display adjustment tool and the playback method through the play control tool. Under the normal display mode as shown in the figure below, you can just double click on the frame area to change the frame size to 1:1 or 2.25:1.

Histogram Area

The histogram is an interactive control. Not only can you get the event's location in time domain and its quantity of the motion percentage, but you can also select a group of events or a period from the event histogram area and show it on the display area.

Control Area

The control area contains almost all the control selectors and toolboxes you need to browse the database. These control tools include location selector, period selector, playback method selector, jog dial, display adjustment tool, searching range adjustment tool, exporting tool, and system control tool.

Status Area

The status area is located at the bottom of the main window. It tells you the program status information including display mode, display size, display speed, exporting file format, and exporting file name.

Indicators

Area Selection Indicator

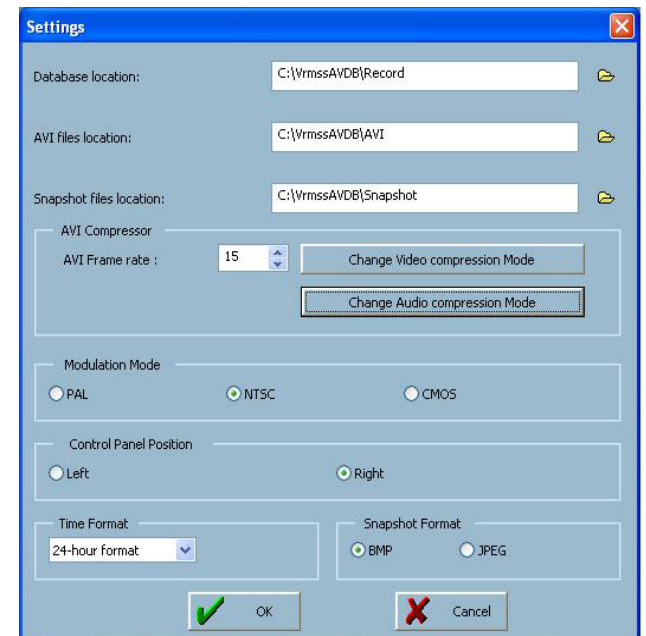
In the main playback window, the display area is surrounded by a blue rectangle. This rectangle is the area selection indicator. This indicator can be set to either display area or histogram area, as long as you move your mouse cursor to the area you intend to select. When you select the display area, the display adjustment tool will appear in the control area. If you select the histogram area, the display adjustment tool will disappear and the searching range adjustment tool will be shown in the same place of the control area.

Pull Bar

The pull bar is a fast, flexible control for seeking data in the selected time period. It represents the total length of time in that period. You can pull the indicator on the pull bar to the specific time-point you would like to view. The displaying video will halt and then restart, playing the video sequence from the point you selected. If the video sequence has been paused, the display area will show the point you selected without playing. Note that the pull bar will only function under the normal display mode.

Settings

After the main window is shown on the screen, you must modify the settings to make it to work properly. Click on the “Settings” button, shown below, in the system control tool, and the setting dialog will appear on the screen.



The items in the settings windows are:

Database Location: The most important item in the settings dialog is the database location setting. You must set it to the directory that contains the surveillance database to make the program work properly.

AVI File Location: This sets the directory where exported AVI files will be stored. Exported AVI files will be stored in the sub-directory (camera name) under the directory you set here.

Snapshot File Location: This sets the directory where bitmap files will be stored when you use the snapshot to export them. Exporting bitmap files will be stored in the sub-directory (camera name) under the directory you set here.

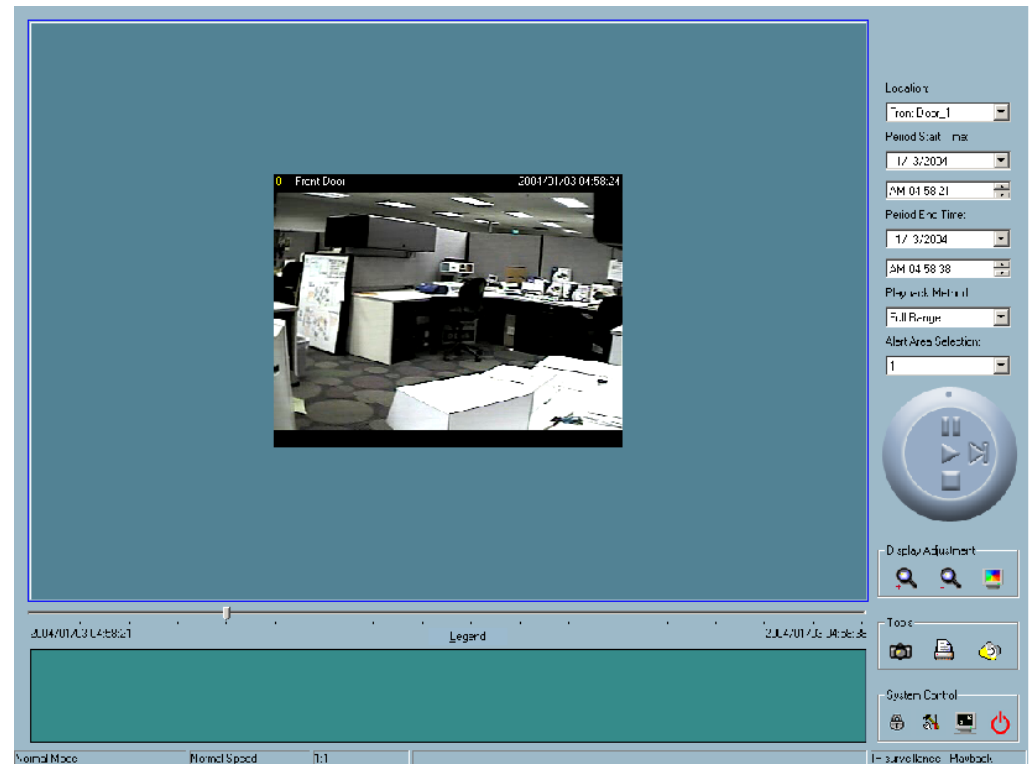
Modulation Mode: The modulation mode cannot be changed. This depends on how you recorded the video sequence in the monitor program. If you select the wrong mode, the video shown in the display area will become distorted. If you have chosen the wrong modulation mode, you may open the settings dialog again, change to the correct mode, and restart the playback program. The display will now be normal.

Normal (Single Frame) Mode

While in the normal (single frame) display mode, you can change the video currently displayed by:

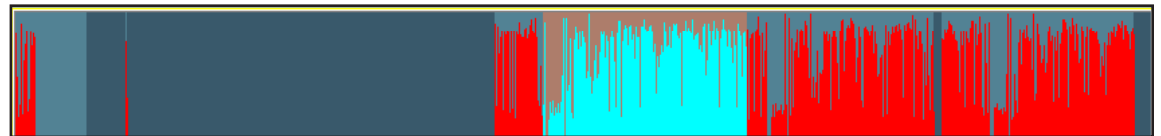
- 1) Changing the database path for retrieving another one in the settings dialog of “System Control” tool.
- 2) Changing the location selector to another location in control area.
- 3) Changing the playback method selector to “Full Range.”
- 4) Changing the playback method selector to “Time Period.”

Under the normal display (single frame) mode, you can use all the tools provided with the playback program, except the page control. In this mode, the two labels under the pull bar show the starting and the ending time of the interval individually (as shown below).



Histogram Area

The histogram area in the normal display (single frame) mode only shows the events' occurred time and the percentage of motion detection with red bars. If you want to access the histogram area, you must change the area selection indicator to the histogram area. You can mark one time interval you want to see with a color-inverted region by dragging your mouse with the left button pressed (as shown below). When you release the left button, the color-inverted region will be enlarged to the whole histogram area. This color-inverted region will be the new period the program is going to display. If you change your mind and don't want to see that period, you can cancel it by just pressing the right button of your mouse with the left button still pressed. If you click on the left button without dragging it, the action will be the same as clicking on the pull bar in the same x-axis position. That means the playback system will shift to the pointed time and show video on the displaying frame. Besides, the dark regions in the histogram area mean there is no existing video data in that interval. If you click on those regions, nothing will happen except a warning message will pop up.



Using Tools

In this section, the method of how to use the tools in the control panel (shown in the main playback window) will be discussed.

Selector Tools

The figure below shows the selector tools. They are location selector, period selector for the selection of the beginning time and the ending time, playback method selector, and alert area selector.

Location:
Front Door_1

Period Start Time:
1/ 3/2004
AM 04:58:21

Period End Time:
1/ 3/2004
AM 04:58:38

Playback Method:
Full Range

Alert Area Selection:
1

Location Selector

The location selector is a control that lets you select the camera you want to see (refer to the figure above). The location name is the same as the camera name (text on video) unless you have specified otherwise.

Period Selector

Period selector provides you a precise way to choose the start time and the end time of a new period. The end time must be later than the start time. After you provide the correct start and end time, clicking on the “Play” button in the jog dial will play the new period in the display area with changing the period start and end time label. Besides, the pull bar and histogram area will change, too. If the selected period is not present in the database, the data in the period selector will change to the previous correct start and end time, and a warning message will be displayed.

Playback Method Selector

Since the program will record the previous start and end time in “Time Period” and “Events Preview” mode, whenever you want to change the period selector to see the other periods, you must change the playback method selector to the mode you want to use first. Otherwise, the period selector will revert back to the previous period set the last time you changed the playback method selector.

Full Range: If you select this method, the database will be displayed from the beginning to the end of this location. Any change in the period selector will have no effect except when you change this selector to “Time Period.”

Time Period: If you change the playback method to “Time Period”, you can modify the start and end time in the period selector. When you click on the “Play” button in the jog dial, the period you selected will be displayed.

Alert Area Selector

In the preview mode, the playback program can show the information of total events of only one alert window each time. If you want to see the events of the other two alert area windows, you must change the alert area selector to the other window numbers. In the normal display mode, the alert window that the alert area selector indicates will be highlighted with red rectangle if you checked that window in the settings dialog. The alert area selector will be changed to alert window 0 by default settings when you change the location selector to another window.

Play Control

For the play control, the jog dial, shown in the figure below, is used to provide the easiest method of controlling the video sequence display. All buttons can control the displaying frame in the normal display mode.

Play: The supported “Play” button is an intelligent play user-interface. The functionality of this button can vary to fit different circumstances. In the normal display mode, clicking on the “Play” button can restart the displaying video sequence.

Stop: When you want to stop the displaying video sequence, you can click on the “Stop” button. Note that once you press the “Stop” button, the start point will be reset to the start of the present period.

Pause/Resume: The “Pause” button provides you a way to pause the video sequence display. When the displaying video is paused, click on the “Pause” button again to resume the video display.

Forward: This button is only valid when the displaying video sequence is paused. It will display the next frame in that period when you click on the “Forward” button one time.

Fast Play and Slow Play: The camera supports a maximum of x16 fast forward play and minimum of /16 slow forward play. This function helps you browse the surveillance database with more flexibility. If you want to change the playing speed, you just need to move the speed indicator. To increase playing speed, move the indicator in the clockwise direction. And to decrease playing speed, move it in the counterclockwise direction. The current speed that is set will be shown in the second column of status area.



Display Adjustment Tool

When you move the mouse cursor to the displaying area, the display adjustment toolbox will appear. Using the display adjustment toolbox, you can change the displaying video sequence to the size you want to see in the normal display mode when you move the area selection indicator to the display area. The figure below shows the display adjustment toolbox and its own three elements, i.e. “Zoom In”, “Zoom Out”, and “Full Screen.”

Zoom In: When you click on the “Zoom In” button one time, the image size in the display area will be magnified 12.5 percent to the original size. Due to the limitation of the display area size, the maximum zoom in ratio supported is only 2.25:1 for NTSC modulation mode and 1.875:1 for PAL modulation mode. If you want to see the image in more detail, you can use the full screen function that is supported in the same toolbox.

Zoom Out: When you click on the “Zoom Out” button one time, the image size in the display area will be minified 12.5 percent to the original size. To show the location and time information completely, the minimum zoom out ratio is limited in 0.5:1.

Full Screen: When you click on the “Full Screen” button, the video sequence will be enlarged to the whole screen instantly. You can double click on any place or the “ESC” key to return back to the normal screen. When you switch to the full screen display, you can press the “Alt” and “Space” keys together to pop the jog dial to control the displaying video sequence. Press the same keys again to close the jog dial. You can also press the “Alt” and “Enter” keys together to switch between the normal display and full screen display at any time when the program is under the normal display mode.



System Control Toolbox

The system control toolbox provides some basic operations for the playback program. The figure below shows the three elements of the system control toolbox, i.e. “Lock Window”, “Settings”, “Minimize”, and “Exit.”

Lock Window: If you are away from your computer, for security reasons, we recommend that you to close the playback program or you can just click on the “Lock Window” button to lock the main window. Once you click this button, the main window will be hidden and the login dialog will appear. To return to the main window, you need to re-enter the admin’s password again.



Settings: The settings dialog will pop up when you click the “Settings” button. For more information about setting this program, please refer to the section titled “Settings.”

Minimize: Click this button in order to minimize the playback program window.

Exit: The playback program will be closed immediately when you click on the “Exit” button.

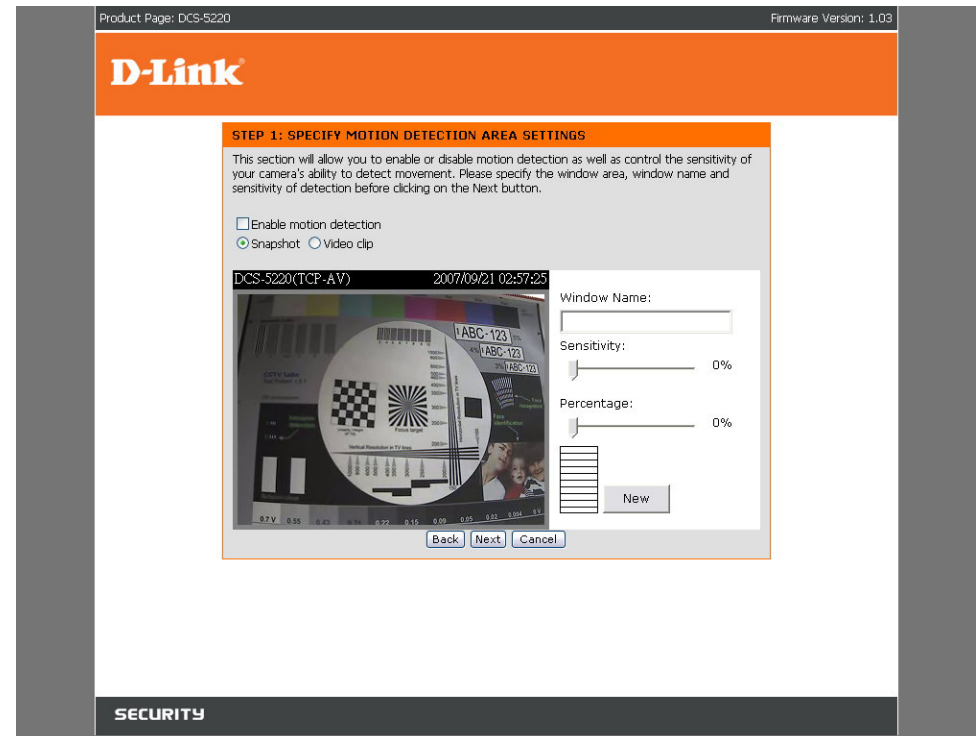
Schedule Video Recording with Motion Detection

To schedule video recording with motion detection, you must first enable motion detection on the Internet Camera. Click the Motion Detection button under the Advanced tab from the Configuration screen to access settings that affect how the DCS-5220 Internet Camera can serve as a security device by recording only when motion is detected.

Note: These settings can be configured in your Web browser and while logged into the IP surveillance Program.

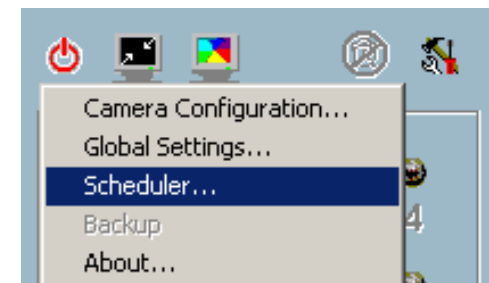
In this window, follow the steps below to ensure that motion detection is correctly enabled:

- 1 Check “Enable motion detection.”
- 2 Click on “New” to have a new window to monitor video.
- 3 Enter in a window name.
- 4 Adjust the “Sensitivity” and “Percentage” levels according to the local environment. The highest sensitivity and lowest percentage provides the most sensitive setting.
- 5 After adding the motion window, click on save to enable the activity display. You can add up to 3 motion windows to trigger recording.



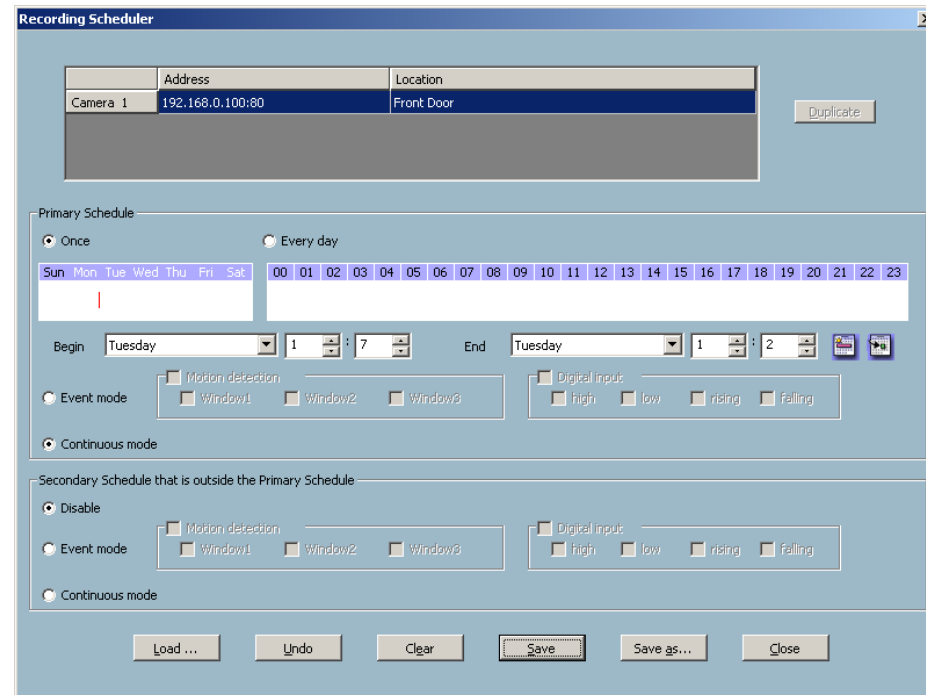
For detailed information about each setting, please refer to **Configuration > Advanced > Motion Detection** in the section titled “Using the DCS-5220 With an Internet Browser” (page 29).

Next, run the IP surveillance program. Click on the Configurations button and select Scheduler.



In the Primary Schedule you can choose either Once (for one time recording) or Every Day (for scheduled recording). For example, if you would like to record events every day during a certain time frame, click on the beginning time and drag your mouse to the ending time. Schedule recording can be configured by minutes, hours, days, weeks, or months.

The Secondary Schedule allows you to set a schedule outside the Primary Schedule. The Secondary Schedule provides two options to record without a specified date or time. You can select Event Mode, which will record whenever an event is triggered, or Continuous Mode, which will begin continuously after scheduling settings are saved. You do not need to set the Secondary Schedule with the Primary Schedule. To schedule video recording with motion detection, you can use either the Primary Schedule or Secondary Schedule, or both.



In this window, follow the steps below to schedule video recording with motion detection in the Primary Schedule:

- 1 Check if you want the recording schedule to occur Once or Every day.
- 2 Set the date, time-line, and begin and end times for recording.
- 3 Check Event Mode.
- 4 Select the motion detection window that will be used to trigger motion detection.

Note: *You must first create motion detection windows in the Web configuration page of the camera. Remember the names of the windows and the order in which you created them, as they are not displayed inside the scheduler. Instead, they are listed in the order they were added. For example, the first window created is labeled "Window1."*

- 5 Click on "Disable" under the Secondary Schedule.

Click the Save button when finished. You have now set a schedule to record video when motion detection is triggered. If you would like to save this configuration, click Save As to save this configuration to a folder in your hard drive. This configuration can be used on another system running IP surveillance or can be used as a backup if you need to re-install the IP surveillance software program.

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

The screenshot shows the 'SECURITY' configuration page for a D-Link DCS-5220 device. The interface includes a top navigation bar with tabs for LIVE VIDEO, SETUP, MAINTENANCE, STATUS, and HELP. A left sidebar lists options: Device Management, Backup and Restore, Firmware Update, and Logout. The main content area is titled 'DEVICE MANAGEMENT' and contains three sections: 'ADMIN PASSWORD SETTING', 'ADD USER', and 'USER LIST'. The 'ADMIN PASSWORD SETTING' section has fields for 'Password' and 'Retype Password' with a 'Save' button and a note: '* Blank: admin password will disable user authentication'. The 'ADD USER' section has fields for 'User name', 'New Password', and 'Retype Password' with 'Add' and 'Cancel' buttons. The 'USER LIST' section shows a table with one row for 'User name' set to '-- no user --', with 'modify' and 'delete' buttons. Below this is the 'SERVER SETTING' section with a field for 'IP camera name' set to 'DCS-5220' and an 'Apply' button. A 'Helpful Hints...' sidebar on the right provides security advice and the default camera name 'http://DCS_5220'. The footer indicates 'Copyright © 2006 D-Link Systems, Inc.'.

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

When the Internet 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 Internet 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 Internet Camera. This procedure should be done as soon as possible since the security features of the Internet 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 Internet 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 Internet 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 Internet Camera on your network is an easy 4–step procedure:

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

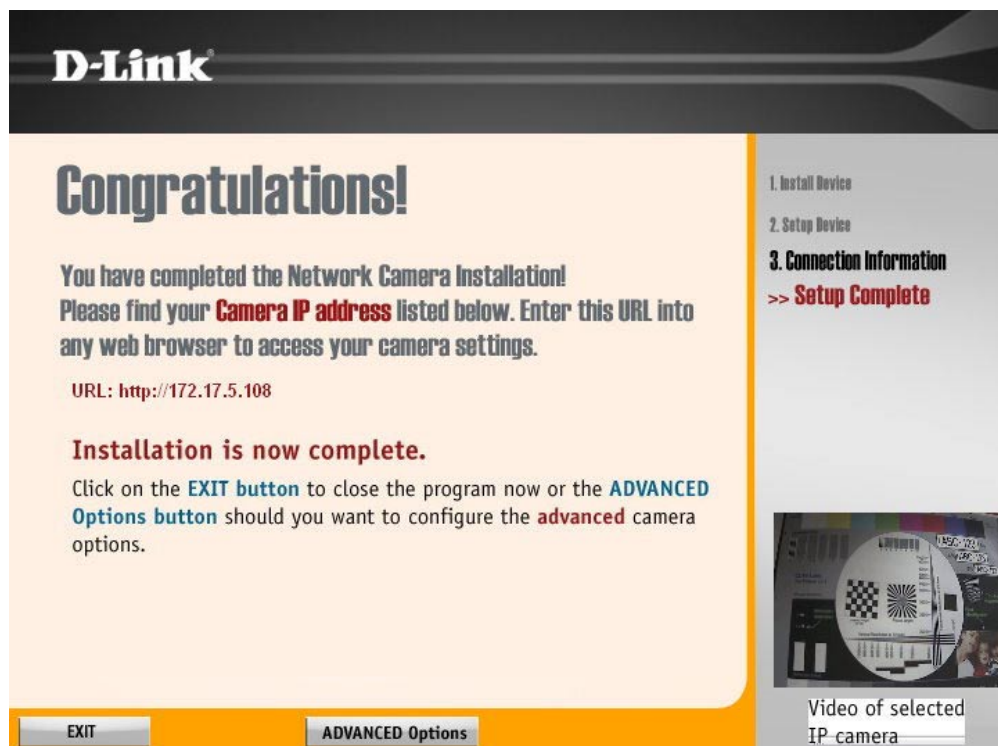
This section is designed to walk you through the setup process for installing your camera behind a router and enable remote video viewing. For the basic setup of the DCS-5220, follow the steps outlined in the Quick Installation Guide.

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 Internet 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 Internet Camera Using Your Internet Explorer Web Browser

Run your Internet Explorer Web browser. In the address bar, type in the IP Address that was assigned to the Internet 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 Explorer 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 24) 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 112 on how to open ports in the router.

The screenshot shows the D-Link DCS-5220 web interface. The top bar includes the D-Link logo, product page (DCS-5220), and firmware version (1.03). The main navigation tabs are LIVE VIDEO, SETUP, MAINTENANCE, STATUS, and HELP. The left sidebar lists various setup options: Wizard, Network Setup (selected), Wireless Setup, Dynamic DNS, Image Setup, Audio and Video, Mail and FTP, Motion Detection, Time and Date, Schedule, Access List, Camera Control, and Logout.

The **NETWORK SETTINGS** section is active, displaying a message: "You can configure your LAN and Internet settings from here" with "Save Settings" and "Don't Save Settings" buttons.

The **GENERAL** section contains two main options: LAN Settings and PPPoE Settings. LAN Settings is selected, showing fields for IP Address (172.17.5.156), Subnet Mask (255.255.255.0), Default Router (172.17.5.254), Primary DNS (192.168.168.210), and Secondary DNS (192.168.168.201). There are checkboxes for "Enable UPnP presentation" (checked) and "Enable UPnP port forwarding" (unchecked).

The **PORT DETAIL SETTINGS** section shows the HTTP port set to 80. There is a checkbox for "Enable RTSP authentication" which is checked. Below this are fields for "Access name for computer viewing" (live.sdp) and "Access name for mobile viewing" (ep-live.3gp). The RTSP port is set to 554. Below it are fields for RTP and RTCP ports for both video and audio. The values are: RTP video (5558), RTCP video (5559), RTP audio (5556), and RTCP audio (5557). A note at the bottom states: "Note: RTP video port and RTP audio port must be an 'even' number. RTCP video port and RTCP audio port must be RTP video port and RTP audio port add '1' individually."

On the right side, there is a "Helpful Hints..." section with text explaining DHCP connection and port details for HTTP and RTSP.

At the bottom of the page, there is a "SECURITY" section header and a copyright notice: "Copyright © 2006 D-Link Systems, Inc."

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

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

Product Page: DIR-655 Hardware Version: A1 Firmware Version: 1.02

D-Link

DIR-655 // SETUP ADVANCED TOOLS STATUS SUPPORT

DEVICE INFO LOGS STATISTICS INTERNET SESSIONS WIRELESS WIRELESS SESSIONS

DEVICE INFORMATION

All of your Internet and network connection details are displayed on this page. The firmware version is also displayed here.

GENERAL

Time : 2007/10/10 PM 10:10:33
Firmware Version : 1.02, 2006/10/13

WAN

Connection Type : DHCP Client
QoS Engine : Active
Cable Status : connected
Network Status : connected
Connection Up Time : N/A
Renew Release
MAC Address : 00:19:5B:03:04:E9
IP Address : 210.21.33.48
Subnet Mask : 255.255.255.248
Default Gateway : 210.21.33.254
Primary DNS Server : 168.95.1.1
Secondary DNS Server : 0.0.0.0

LAN

MAC Address : 00:19:5B:03:04:E8
IP Address : 192.168.0.1
Subnet Mask : 255.255.255.0
DHCP Server : Enabled

WIRELESS LAN

Wireless Radio : Enabled
WISH : Active
MAC Address : 00:19:5B:03:04:E8
Network Name (SSID) : dlink
Channel : 4
Security Mode : Disabled
Wi-Fi Protected Setup : Enabled/Not Configured

LAN COMPUTERS

IP Address	Name (if any)	MAC
192.168.0.195	end_user	00:05:5d:ce:b3:8d

IGMP MULTICAST MEMBERSHIPS

Multicast Group Address
239.255.255.250

WIRELESS

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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 122) 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.

Product Page: DIR-655 Hardware Version: A1 Firmware Version: 1.02

D-Link

DIR-655 // SETUP ADVANCED TOOLS STATUS SUPPORT

VIRTUAL SERVER

VIRTUAL SERVER

The Virtual Server option allows you to define a single public port on your router for redirection to an internal LAN IP Address and Private LAN port if required. This feature is useful for hosting online services such as FTP or Web Servers.

Save Settings Don't Save Settings

24--VIRTUAL SERVERS LIST

	Name	Port	Traffic Type	Schedule
<input checked="" type="checkbox"/>	DCS-5220	80	TCP	Always
	IP Address 192.168.0.120	Private 80	6	Inbound Filter Allow All
<input checked="" type="checkbox"/>	DCS-5220	554	TCP	Always
	IP Address 192.168.0.120	Private 554	6	Inbound Filter Allow All
<input type="checkbox"/>		0	TCP	Always
	IP Address 0.0.0.0	Private 0	6	Inbound Filter Allow All

Helpful Hints...

Check the **Application Name** drop down menu for a list of predefined server types. If you select one of the predefined server types, click the arrow button next to the drop down menu to fill out the corresponding field.

You can select a computer from the list of DHCP clients in the **Computer Name** drop down menu, or you can manually enter the IP address of the computer at which you would like to open the specified port.

Select a schedule for when the virtual server will be enabled. If you do not see the schedule you need in

Using & Configuring 3G Compatible Cell Phones

Before you start, please refer to page 30 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).

Product Page: DCS-5220 Firmware Version: 1.03

D-Link

DCS-5220 // LIVE VIDEO SETUP MAINTENANCE STATUS HELP

AUDIO AND VIDEO

This section allows you to configure the sound and video of your IP camera. You can configure different settings depending on whether you are viewing content from a PC or a Mobile Phone / PDA.

Save Settings Don't Save Settings

GENERAL

☐ Configure for computer viewing
☒ Configure for mobile viewing

VIDEO SETTINGS

Frame size: 640x480
Max frame rate: 30
Key frame interval: 60
Video quality control:
☐ Fixed bit rate: 512 Kbps
☒ Fixed quality: Good

AUDIO SETTINGS

☐ Mute
☒ AAC: Bit Rate 128Kbps
☐ GSM-AMR: Bit Rate 12.2Kbps

Helpful Hints...

Higher frame size, frame rate and bit rate rate gives better video quality. At the same time, it requires more network bandwidth.

For best viewing results on a mobile phone, we suggest setting the Frame Rate to 30ps and the Bit Rate to 20Kbps

Higher audio bit rate gives better sound quality. At the same time, it requires more network bandwidth.

SECURITY

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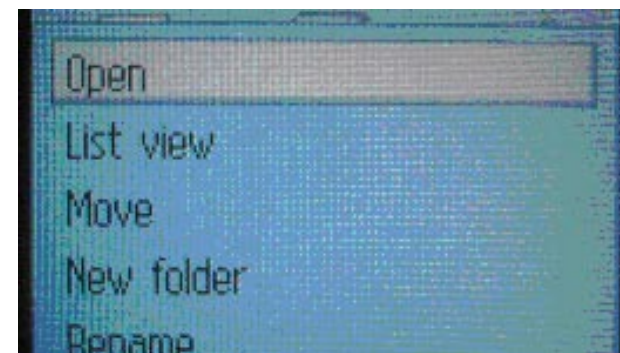
Play from RealPlayer

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

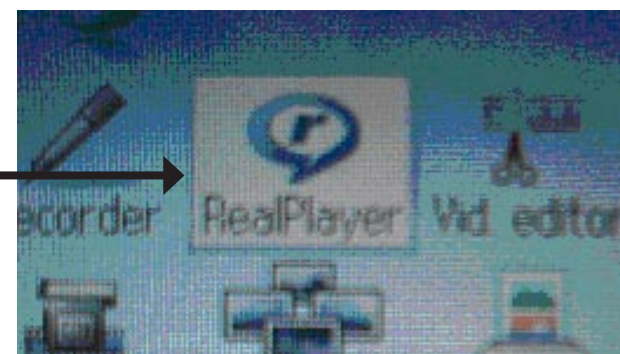
Press the Menu button and select **Media**



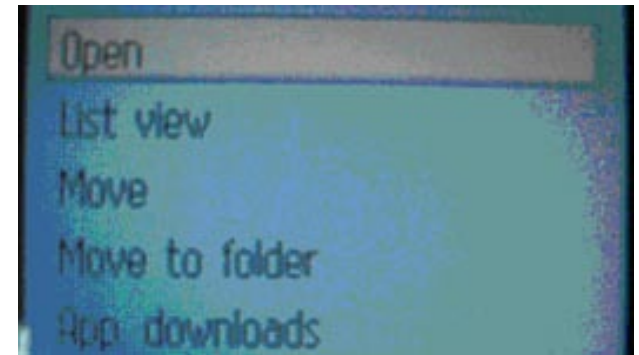
Select **Open**



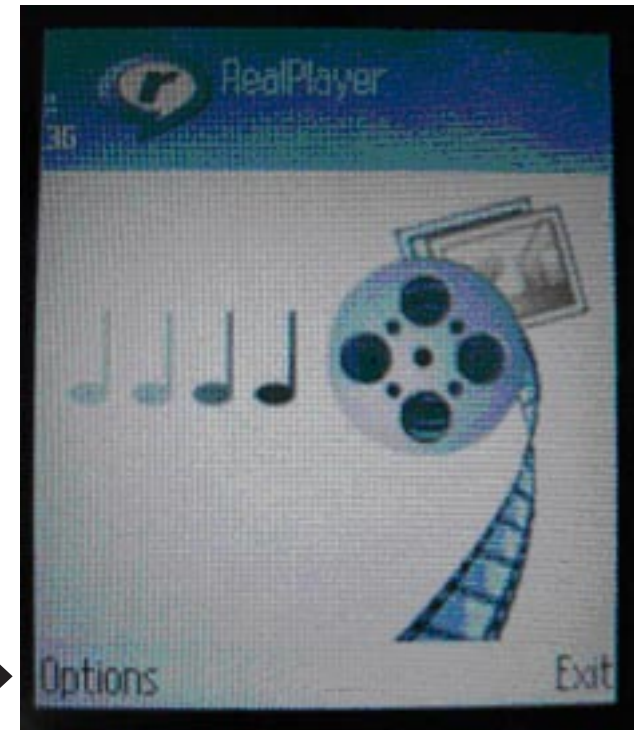
Select **RealPlayer**



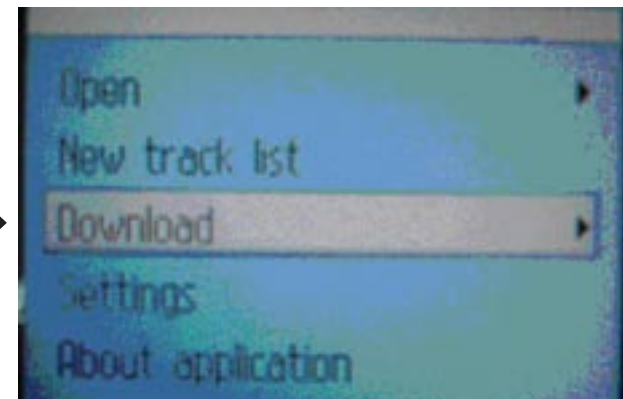
Select **Open**



When RealPlayer opens, press **Options**



Select **Download**

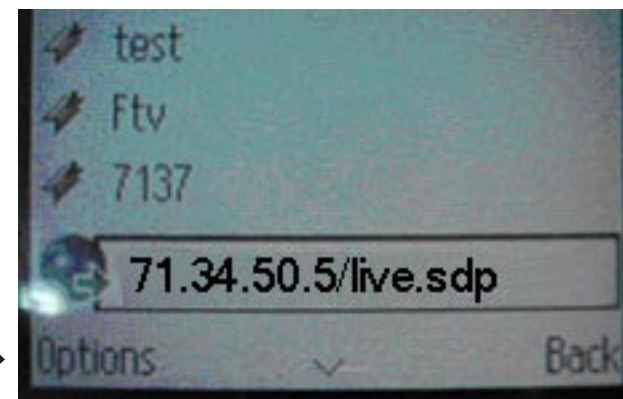


Select **Video Clips**

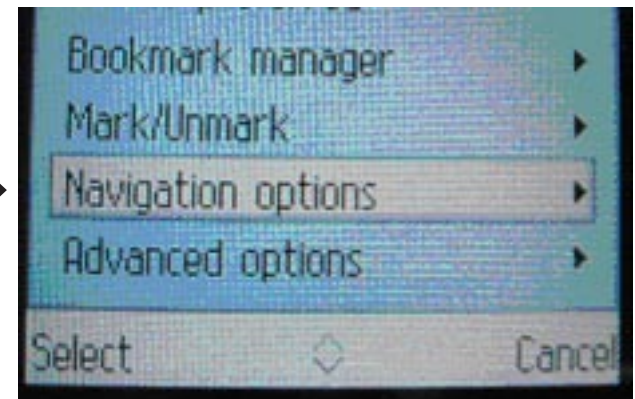


Note: 71.34.50.5 is the camera's IP address in this sample.

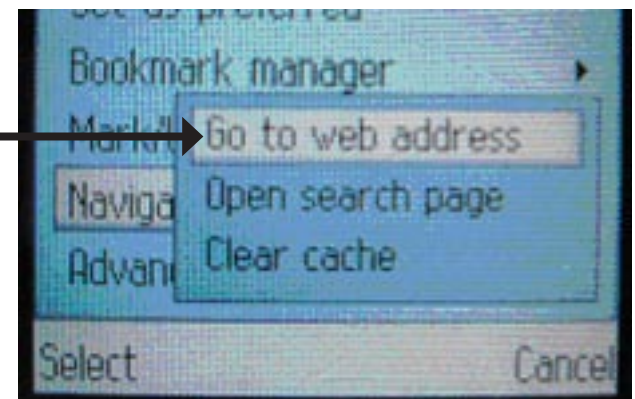
Press **Options**



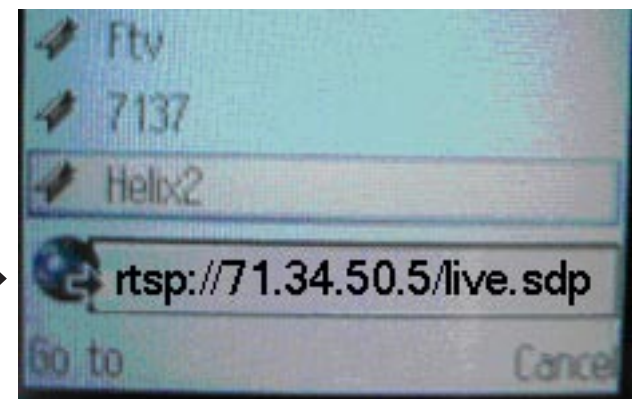
Select **Navigation Options**



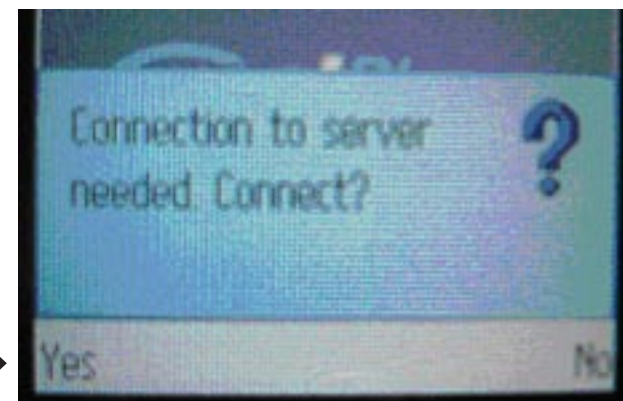
Select **Go to web address**



Input your rtsp address



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



Enjoy streaming video on your cellphone.

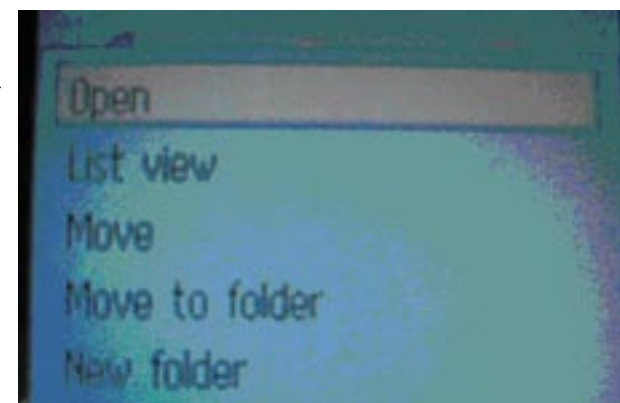


Play from PVPlayer

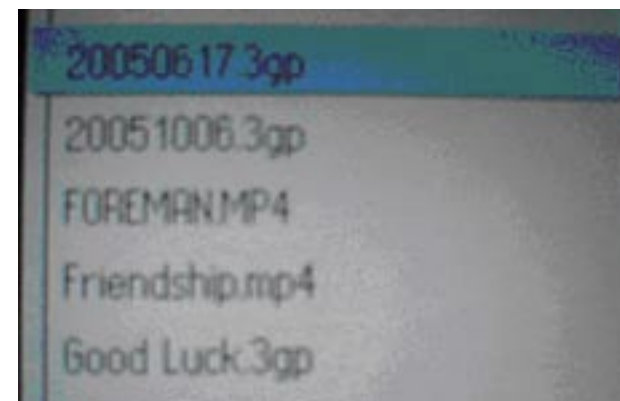
Press the Menu button and select **PVPlayer**



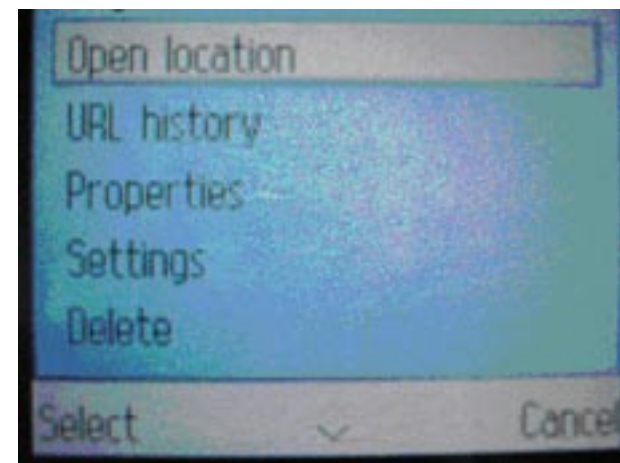
Select **Open**



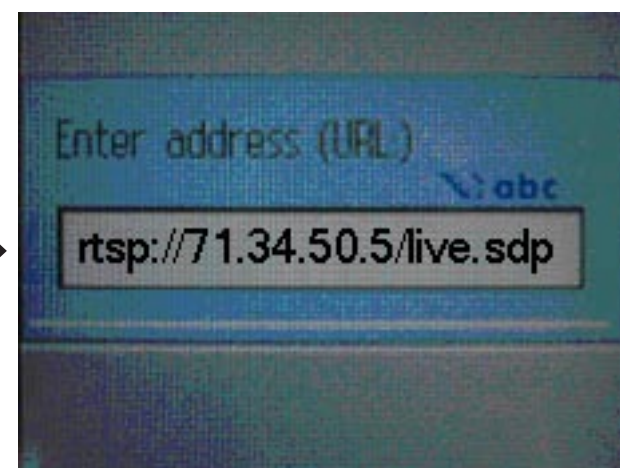
Press the **Options** button



Select **Open location**

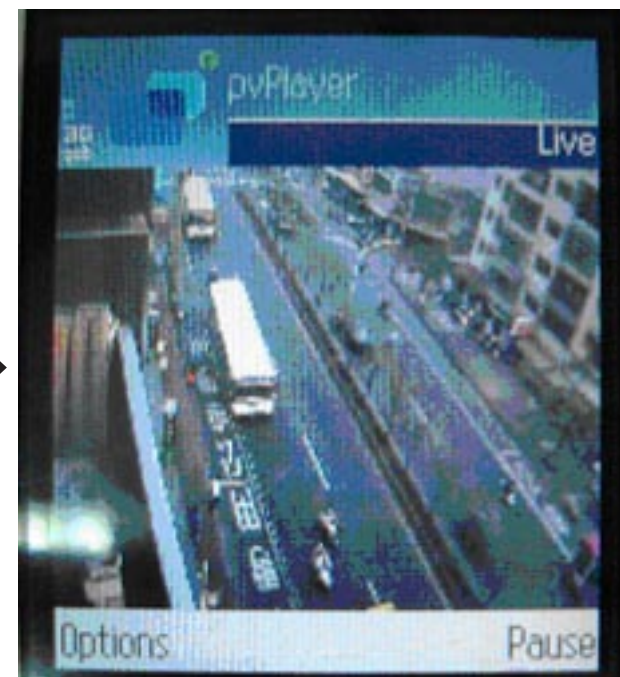


Input your rtsp address



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

Enjoy streaming video on your cellphone.



Troubleshooting

1 What is an Internet Camera?

The Internet Camera is a stand-alone system connecting directly to an Ethernet or Fast Ethernet network. It differs from a conventional PC Camera, the Internet Camera is an all-in-one system with built-in CPU and Web-based solutions providing a low cost solution that can transmit high quality video images for monitoring. The Internet Camera can be managed remotely, accessed and controlled from any PC/Notebook over an Intranet or the Internet from a Web browser.

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

The maximum number of users that can log onto the Internet Camera at the same time is 10. Please keep in mind the overall performance of the transmission speed will slow down when many users are logged on.

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

The Internet Camera utilizes MPEG-4 Simple Profile Mode image compression technology to provide high quality images.

4. Can I capture still images from the Internet Camera?

Yes you are able to capture still images with the snapshot function from the software application CD supplied with the Internet Camera or with the snapshot function on the Home page using an Internet browser.

5. Can the Internet Camera be used outdoors?

The Internet Camera is not weatherproof, and needs to be equipped with a weatherproof case in order to be used outdoors (recommended).

6. When physically connecting the Internet Camera to a network what network cabling is required?

The Internet Camera uses Category 5 UTP cable allowing 10 Base-T and 100 Base-T networking.

7. Can the Internet Camera be setup as a PC-cam on a computer?

No, the DCS-5220 Internet Camera is used only on a wireless 802.11b/g, Ethernet, or Fast Ethernet network.

8. Can the DCS-5220 be connected to the network if it consists of only private IP addresses?

Yes, the Internet Camera can be connected to a LAN with private IP addresses.

9. Can the DCS-5220 be installed and work if a firewall exists on the network?

If a firewall exists on the network, port 80 needs to be opened for ordinary data communication. The DCS-5220 uses HTTP port and RTSP port to stream video data. These ports (or the ports you specify from the Advanced Tab in the Configuration screen if you change the default ports) need to be opened in the firewall device. Please refer to page 124 for more information.

10. Why am I unable to access the DCS-5220 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 124 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, utilizing a Ethernet crossover cable. If the problem is not solved the Internet Camera might be faulty.

11. Why does the Internet Camera work locally but not externally?

This might be caused by network firewall protection. The firewall may need to have some settings changed in order for the Internet Camera to be accessible outside your local LAN. Check with the Network Administrator for your network.

Make sure that the Internet 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 allow the Internet Camera to be accessed outside your local LAN. Please refer to page 124 for more information.

12. I connected the Internet Camera directly to a computer with a cross-over cable Ethernet cable and received the following Windows error upon running the Installation Wizard:

This Windows error will occur if the Internet Camera is connected to a computer that is not properly configured with a valid IP address. Turn off DHCP from the Network Settings in Windows® and configure the computer with a valid IP address, or connect the camera to a router with DHCP enabled (see page 144).



13. Why does a series of broad vertical white lines appear throughout the image?

It could be that the CMOS sensor has become overloaded when it has been exposed to bright lights such as direct exposure to sunlight or halogen lights. Reposition the Internet Camera into a more shaded area immediately as prolonged exposure to bright lights will damage the CMOS sensor.

14. Noisy images occur. How can I solve the problem?

The video images might be noisy if the Internet Camera is used in a very low light environment. To solve this issue you need more lighting.

15. The images appear to be of poor quality, how can I improve the image quality?

Make sure that your computer's display properties are set above 256 colors. Using 16 or 256 colors on your computer will produce dithering artifacts in the image, making the image appear to be of poor quality.

The configuration on the Internet Camera image display is incorrect. Through the **Advanced > Image Setting** section of the Web management you need to adjust the image related parameters such as brightness, contrast, hue and power line frequency for fluorescent light. Please refer to the **Advanced > Image Setting** section on Page 43 for detailed information.

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 has 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. Refer to product manual for detail information on how to set it up.

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.

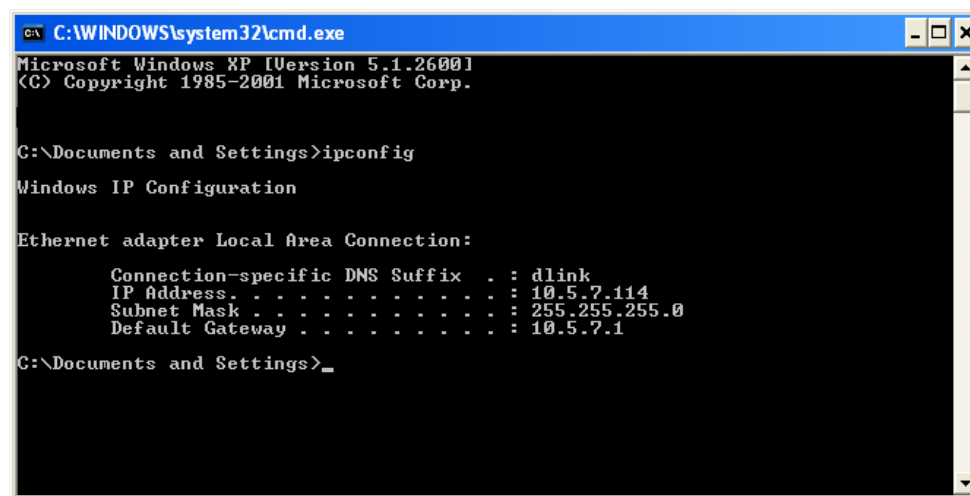
Click on **Start > Run**. In the run box type **cmd** and click **OK**.

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 router. 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.



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : dlink
    IP Address. . . . . : 10.5.7.114
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.5.7.1

C:\Documents and Settings>_
```

Statically Assign an IP Address

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

Step 1

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

Windows® 2000 - From the desktop, right-click **My Network Places > Properties**.

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

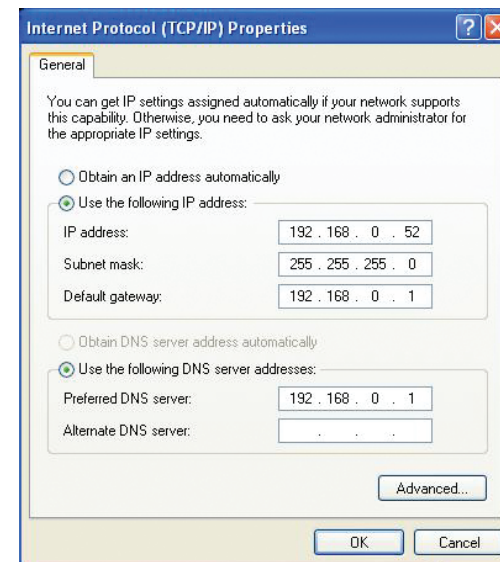
Click **Use the following IP address** and enter an IP address that is on the same subnet as your network or the LAN IP address on your router.

Example: If the router'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 router (192.168.0.1).

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

Step 5

Click OK twice to save your settings.



Technical Specifications

Remote Management

- Configuration Accessible via a Web Browser
- Take Snapshots and Save to a Local Hard Drive via a Web Browser

Networking Protocols

- TCP/IP, HTTP, SMTP, RTSP, FTP, NTP, DNS, DHCP, UPnP™, DDNS, PPPoE

Connectivity

- 802.11b/g Wireless with WEP/WPA security
- 10/100Mbps Fast Ethernet Auto Negotiation

Camera Specification

- 1/4" CMOS Sensor
- 1 Lux @ F2.0
- AGC/AWB/AES
- Electronic Shutter: 1/60~1/15,000 sec.
- Standard Fixed Mount Type Lens 4mm, F2.0
- Viewing Angle: 48.45° (Horizontal), 37.29 (Vertical)

Video Algorithm Supported

- 3G Video Support
- Enhanced Video Compression Using MPEG4 Simple Profile

Video Resolution¹

- Up to 30fps at 160x120
- Up to 30fps at 176x144
- Up to 30fps at 320x240
- Up to 30fps at 640x480

Audio

- 16kbps~128kbps (AAC)
- 4.75kbps~12.2kbps (GSM-AMR)

Security

- Administrator and User Group Protected
- Password Authentication

IP Surveillance Software

- Remotely Manage and Control up to 16 DCS-5220 Internet Cameras
- View Up to 16 Cameras on one screen
- Supports all Management Functions Provided in Web Interface
- Scheduled Motion Triggered, or Manual Recording Options

Recording Method

- Support video clips/snapshot upload FTP/Email
- Support NAS recording
- Homepage Recording/Snapshot
- Bundled PC software (IP surveillance) recording

Viewer

- ActiveX control plug-in for Microsoft Internet Explorer with D-Link digital certificate RealPlayer
- Apple Quicktime

Browser

- Internet Explorer v6

LEDs

- Power LED (red), Link LED (green)

Power

- External Power Supply
- 12V DC 1.5A
- Power Consumption 4.8W

Dimensions

- 4.33" (L) x 4.13" (W) x 4.41" (H) (without Antenna)

Temperature

- Operating 0 ~ 40°C / 32 ~ 104°F
- Storage -20 ~ 70°C / -4 ~ 158°F

Humidity

- 20-80% RH non-condensing

Warranty

- 1-Year

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.

Version 2.0
10/25/2007