
Network Camera



User's Guide

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Introduction

This Chapter provides details of the Network Camera's features, components and capabilities.

Overview

The Network Camera has an Integrated Microcomputer and a high quality CMOS digital-Image-Sensor, enabling it to display high quality live streaming video over your wired LAN, the Internet, and for the Network Camera, an 802.11g Wireless LAN.

Using enhanced MPEG-4 technologies, the Network Camera is able to stream high quality video and audio directly to your PC. The high compression capabilities of MPEG-4 reduce network bandwidth requirements to amazingly low levels.

With built-in PIR sensor and White Light LEDs, the Network camera can provide home security and illumination around 5 meters long under low light conditions in a simple, economical manner.

A convenient and user-friendly Windows program is provided for both viewing and recording video. If necessary, you can even view video using your Web Browser, on a variety of software platforms.

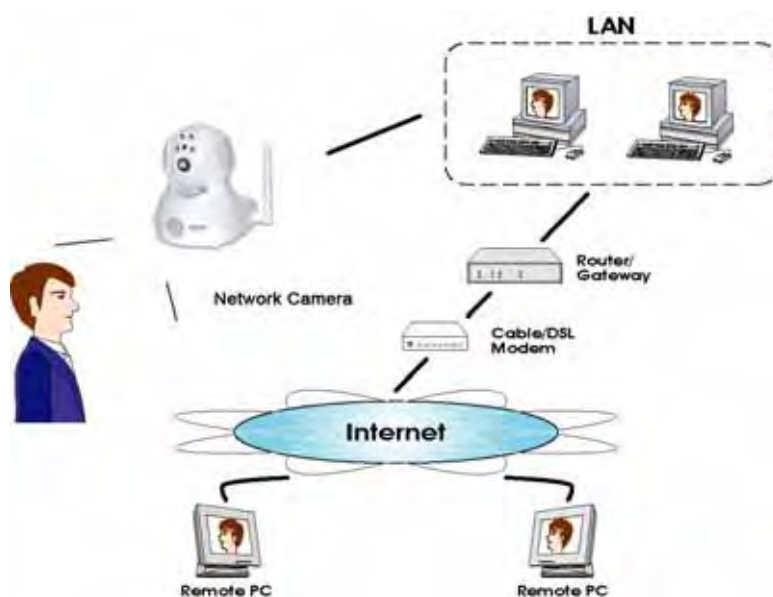


Figure 1: Network Camera

Features

- **Standalone Design.** The Network Camera is a standalone system with built-in CPU and Video encoder. It requires only a power source and a connection to your LAN or Wireless LAN.

- **Dual Video Support.** The Network Camera can support both MPEG4 and MJPEG video for different image compression.
- **Stream Live Video to Multiple Users.** The MPEG4 encoder and HTTP server built into the camera generate a ready-to-view video stream. Just connect to the camera using your Web browser or the provided Windows utility to view live video.
- **Suitable for Home, Business or Public Facilities.** Whether for Home, Business or Public Facility surveillance, or just for entertainment and fun, the Network Camera has the features you need.
- **Multi-Protocol Support.** Supporting TCP/IP networking, SMTP (E-mail), HTTP and other Internet related protocols, the Network Camera can be easily integrated into your existing network.
- **Easy Configuration.** A Windows-based Wizard is provided for initial setup. Subsequent administration and management can be performed using a standard web browser. The administrator can configure and manage the Network Camera via the LAN or Internet.
- **Viewing/Recording Utility.** A user-friendly Windows utility is provided for viewing live video. For periods when you are absent, or for scheduled recording, this application also allows you to record video to an ASF file on your PC. The recorded files are in a standard Windows Media format, and thus usable by a wide variety of programs if required.
- **Motion Detection.** This feature can detect motion in the field of view. The Network Camera will compare consecutive frames to detect changes caused by the movement of large objects. This function only works indoors due to the sensitivity of the CMOS sensor. When motion is detected, an E-mail alert can be sent, or some other action may be triggered.
- **Flexible Scheduling.** You can limit access to the video stream to specified times using a flexible scheduling system. The Motion Detection feature can also have its own schedule, so it is active only when required.
- **Syslog Support.** If you have a Syslog Server, the Network Camera can send its log data to your Syslog Server.
- **Audio Support.** You can listen as well as look! Audio is encoded with the video if desired. You can use either the built-in microphone or an external microphone.
- **PIR (Passive Infrared Sensor) Support.** The Network Camera is embedded with an PIR Sensor, which senses infrared light radiating from human bodies in its field of view. This feature is very helpful in enhancing home security systems.
- **White Light LEDs Support.** Each Network Camera has 4 white light LEDs. The LEDs can provide illumination around 5 meters long, that can help to output a better video quality while under low-light conditions such as indoors, on cloudy days, or in the morning or evening. The white light can be used to deliver warning as well.

Internet Features

- **User-definable HTTP port number.** This allows Internet Gateways to use "port mapping" so the Network Camera and a Web Server can share the same Internet IP address.
- **SMB Client Support.** With Server Message Block Protocol (SMB protocol) support, the client applications in a computer can read, create, and update files on the remote server.
- **DDNS Support.** In order to view video over the Internet, users must know the Internet IP address of the gateway used by the Network Camera. But if the Gateway has a dynamic IP address, DDNS (Dynamic DNS) is required. Since many existing Gateways do not support DDNS, this function is incorporated into the Network Camera.

- ***NTP (Network-Time-Protocol) Support.*** NTP allows the Network Camera to calibrate its internal clock from an Internet Time-Server. This ensures that the time stamp on Video from the Network Camera will be correct.

Security Features

- ***User Authentication.*** If desired, access to live video can be restricted to known users. Users will have to enter their username and password before being able to view the video stream. Up to 10 users can view the video simultaneously.
- ***Password-Protected Configuration.*** Configuration data can be password protected, so that it only be changed by the Network Camera Administrator.

Wireless Features (Wireless Model Only)

- ***Standards Compliant.*** The Network Camera complies with the IEEE802.11g (DSSS) specifications for Wireless LANs.
- ***Supports both 802.11b and 802.11g Standards.*** The Network Camera supports both 802.11b and 802.11g standards.
- ***Speeds to 54Mbps.*** All speeds up to the 802.11g maximum of 54Mbps are supported.
- ***Wired and Wireless Network Support.*** The Network Camera supports either wired or wireless transmission.
- ***WEP Support.*** Full WEP support (64/128 Bit) on the Wireless interface is provided.
- ***WPA/WPA2 Support.*** The WPA Personal/WPA2 Personal standard is also supported, allowing advanced encryption of wireless data.
- ***WPS Support.*** WPS (Wi-Fi Protected Setup) can simplify the process of connecting any device to the wireless network by using the push button configuration (PBC) on the Wireless Access Point, or entering a PIN code if there's no button.

Physical Details - Network Camera

Front - Network Camera

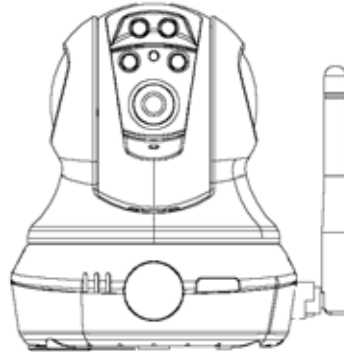


Figure 2: Front Panel

White Light LEDs	These white LEDs are designed for the supply of backlighting while under the low-light environments.
Light Sensor	The light sensor can be used to distinguish between light and dark, as well as determine the intensity of the light.
Echo Cancellation	Echo cancellation can reduce background noise and remove hybrid to provide better voice quality.
Lens	No physical adjustment is required or possible for the lens, but you should ensure that the lens cover remain clean. The image quality is degraded if the lens cover is dirty or smudged.
Microphone	The built-in microphone is mounted on the front.
Power LED (Green)	On - Power on. Off - No power. Blinking - The <i>Power</i> LED will blink during start up. This will take 15 to 20 seconds.
Active LED (Green)	Off - No user is viewing the camera. Blinking - User(s) is viewing the camera.
Network LED (Green, Amber)	On (Green) - Wireless or LAN connection is available. Off - Wireless or LAN is not connected or camera is not sending/receiving data. Blinking (Green) - Data is being transmitted or received via the LAN or Wireless connection. On (Amber) - If the LED is on for 5 seconds, the WPS is not processing successfully. Blinking (Amber) - WPS function is being processed.
PIR Sensor	The PIR sensor is designed for human body detection.

Privacy Button **On (Green)** - The privacy button is in use.
Off - The privacy button is not activated.

Rear - Network Camera

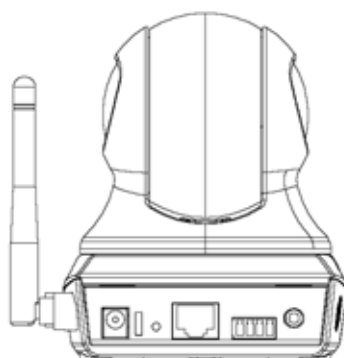


Figure 3: Rear Panel

- Antenna** Attach the supplied antenna here. The antenna is adjustable; best results are usually obtained with the antenna positioned vertically.
- Power Input** Connect the supplied 5V power adapter here. Do not use other power adapters; doing so may damage the camera.
- Reset Button** This button is recessed; you need a pin or paper clip can be used to depress it. It can be activated at any time the camera is in the "ready" mode.
- **Reset to manufacturer default valued and reboot.** When pressed and held over 10 seconds, the settings of Network Camera will be set to their default values.
- Note:**
- After this procedure is completed, all LEDs will blink three times to confirm that the reset was completed successfully.
- WPS Button (Wireless Model Only)** Push the WPS button on the device and on your other wireless device to perform WPS function that easily creates an encryption-secured wireless connection automatically.
- **WPS PBC Mode.** When pressed and released (less than 3 seconds), the Network Camera will be in the WPS PBC mode (Auto link mode).
 - **WPS Pin Code Mode.** When pressed and held for over 3 seconds (less than 10 seconds), the Network Camera will be in the WPS Pin Code mode.

LAN port

Use a standard LAN cable to connect your Network Camera to a 10/100BaseT hub or switch.

Note:

- Plugging in the LAN cable will disable the Wireless interface. Only 1 interface can be active at any time.
- The LAN cable should only be connected or disconnected when the camera is powered OFF. Attaching or detaching the LAN cable while the camera is powered on does NOT switch the interface between wired and wireless.

**Digital
Input/Output**

The GPIO terminal block includes 1 input port and 1 output port.

Speaker out

If required, an external speaker can be plugged in here.

Package Contents

The following items should be included: If any of these items are damaged or missing, please contact your dealer immediately.

1. Network Camera
2. Antenna (Wireless Model Only)
3. Power adapter
4. Installation CD-ROM
5. Quick Installation Guide

Chapter 2



Basic Setup

This Chapter provides details of installing and configuring the Network Camera.

System Requirements

- To use the wired LAN interface, a standard 10/100BaseT hub or switch and network cable is required.
- To use the Wireless interface on the wireless model, other Wireless devices must be compliant with the IEEE802.11b or IEEE802.11g specifications. All Wireless stations must use compatible settings.



Note!

The default Wireless settings are:

Mode: Infrastructure

SSID: ANY

Wireless Security: Disabled

Domain: USA (USA Area)

Eu (Europe Area)

Channel No.: Auto

Installation - Network Camera

1. Assemble the Camera

- Screw the supplied antenna to the mounting point on the rear.
- Attach the Camera Mount to the camera.

2. Connect the LAN Cable

- Connect the Network Camera to a 10/100BaseT hub or switch, using a standard LAN cable.



For the Wireless Model, this will disable the Wireless Interface. The Wireless and LAN interfaces cannot be used simultaneously. Using the LAN interface is recommended for initial configuration. After the Wireless settings are correct, the Wireless interface can be used.

The first time you connect to the camera, you should connect the LAN cable and configure the Network Camera with appropriate settings. Then you can unplug the LAN cable and power off the camera. The Network Camera will be in wireless interface when you power on the camera again.

3. Power Up

- Connect the supplied 5V power adapter to the Network Camera and power up. Use only the power adapter provided. Using a different one may cause hardware damage.

4. Check the LEDs

- The *Power* LED will turn on briefly, then start blinking. It will blink during startup, which takes 15 to 20 seconds. After startup is completed, the *Power* LED should remain ON.
- The *Network* LED should be ON.

For more information, refer to *Physical Details - Network Camera* in Chapter 1.

NOTE: Do not force the Pan/Tilt part of the Network Camera to twist, otherwise it may cause internal gear set damages.

Setup using the Windows Wizard

Initial setup should be performed using the supplied Windows-based setup Wizard. This program can locate the Network Camera even if its IP address is invalid for your network. You can then configure the Network Camera with appropriate TCP/IP settings for your LAN.

Subsequent administration can be performed with your Web browser, as explained in *Chapter 5 - Web-based Management*.

Setup Procedure

1. Insert the supplied CD-ROM into your drive. If the setup program does not start automatically, run **NetworkCamera.exe** in the root folder.
 - You will see the *Welcome* screen shown below.
 - Click the *Setup Camera* button to start the setup Wizard



Figure 4: Welcome Screen

2. The next screen, shown below, will list all the Network Cameras on your LAN.

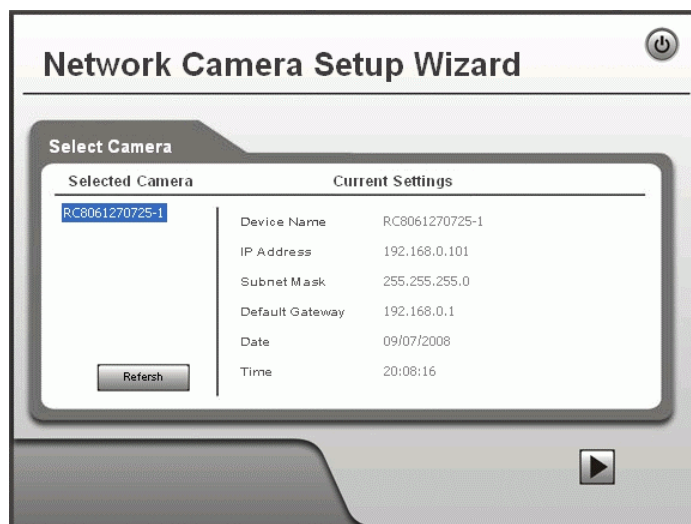


Figure 5: Camera List Screen

- Select the desired Camera from the list on the left. The current settings for the selected Camera will be displayed in the table on the right.
 - Click *Next* to continue.
3. You will be prompted to enter the *Administrator Name* and *Administrator Password*, as shown below.
- If using the default values, enter **administrator** for the name, and leave the password blank.
 - Otherwise, enter the *Administrator Name* and *Administrator Password* set on the *Maintenance* screen.

Figure 6: Password Dialog

4. This screen allows you to enter a suitable **Description**, and set the correct **Time Zone**, **Date**, and **Time**. Make any desired changes, then click *Next* to continue.

Figure 7: Camera Settings

5. On the following **IP Address Settings** screen, shown below, choose *Fixed IP Address* or *Dynamic IP Address*.

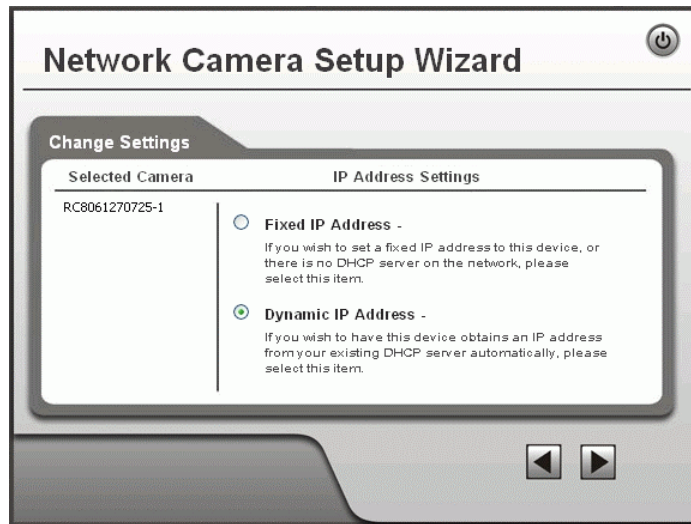


Figure 8: Fixed or Dynamic IP Selection

- *Fixed IP Address* is recommended, and can always be used.
- *Dynamic IP Address* can only be used if your LAN has a DHCP Server.

Click *Next* to continue.

6. If you chose *Fixed IP Address*, the following **TCP/IP Settings** screen will be displayed.

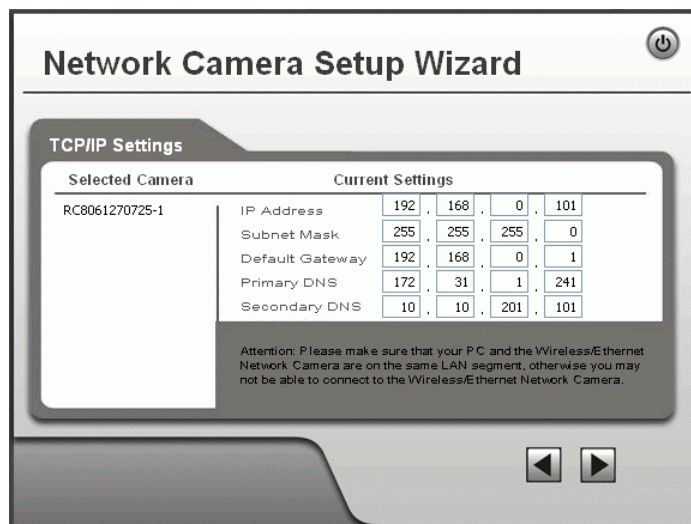


Figure 9: TCP/IP Settings

- Enter an unused **IP Address** from within the address range used on your LAN.
- The **Subnet Mask** and **Default Gateway** fields must match the values used by PCs on your LAN.
- The **Primary DNS** address is required in order to use the E-mail alert or Dynamic DNS features. Enter the DNS (Domain Name Server) address recommended by your ISP.
- The **Secondary DNS** is optional. If provided, it will be used if the Primary DNS is unavailable.

Click *Next* to continue.

7. The next screen, shown below, displays all details of the Network Camera.

- Click *Next* if the settings are correct
- Click *Back* to modify any incorrect values.

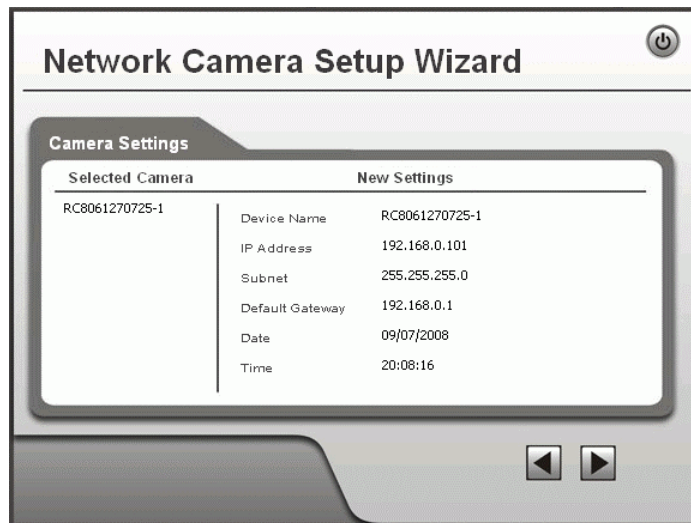


Figure 10: Save Settings

8. Click *OK* to confirm that you want to save the new settings. If you want to cancel your changes, click *Cancel*.

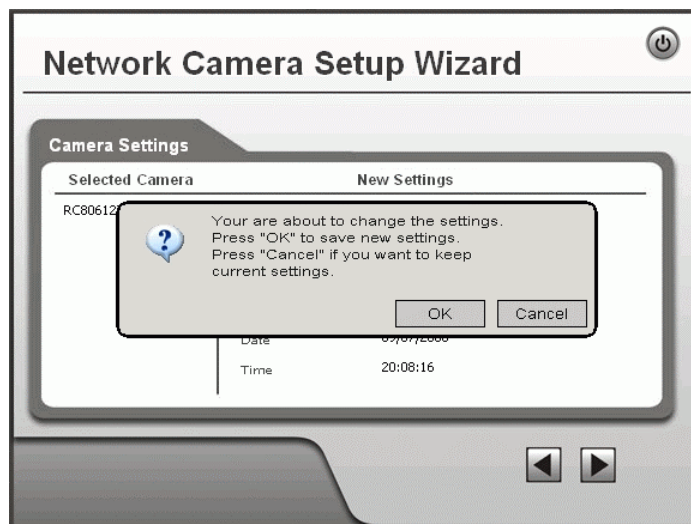


Figure 11: Confirm Screen

9. After clicking *OK*, you will see the screen below.

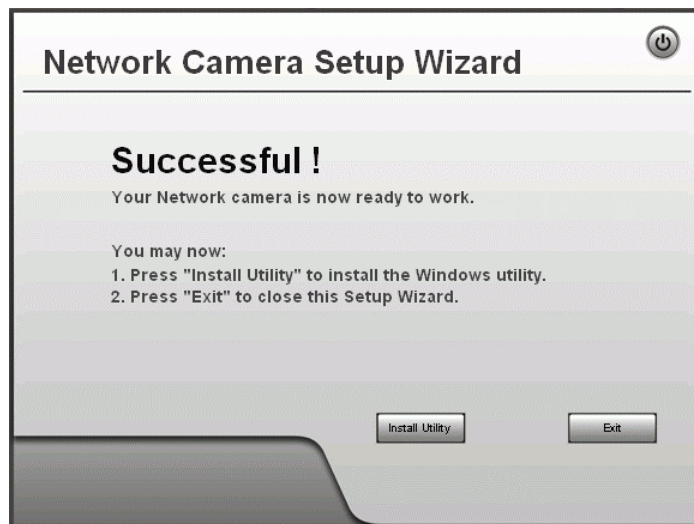


Figure 12: Final Screen

Clicking the *Install Utility* button will install the Viewing/Recording utility described in *Chapter 6 - Windows Viewing/Recording Utility*.

10. Click *Exit* to end the Wizard.
Setup is now complete.

Viewing Live Video

This Chapter provides basic information about viewing live video.

Overview

After finishing setup via the Windows-based Wizard, all LAN users can view live video using Internet Explorer on Windows.

This Chapter has details of viewing live video using Internet Explorer.

But many other powerful features and options are available:

- To view multiple cameras simultaneously, or record video (either interactively or by schedule), you should install the Windows Viewing/Recording utility. Refer to **Chapter 6 - Windows Viewing/Recording Utility** for details on installing and using this program.
- The camera administrator can also adjust the Video Stream, and restrict access to the video stream to known users by requiring viewers to supply a username and password. See **Chapter 4 - Advanced Viewing Setup** for details.
- To make Live Video from the camera available via the Internet, your Internet Gateway or Router must be configured correctly. See *Making Video available from the Internet* in **Chapter 4 - Advanced Viewing Setup** for details.

Requirements

To view the live video stream generated by the Network Camera, you need to meet the following requirements:

- Windows 2000, Windows XP.
- Internet Explorer 6 or later.

Connecting to a Camera on your LAN

To establish a connection from your PC to the Network Camera:

1. Use the Windows utility to get the IP address of the Network Camera.
2. Start Internet Explorer.
3. In the Address box, enter "HTTP://" and the IP Address of the Network Camera.
4. When you connect, the following screen will be displayed.

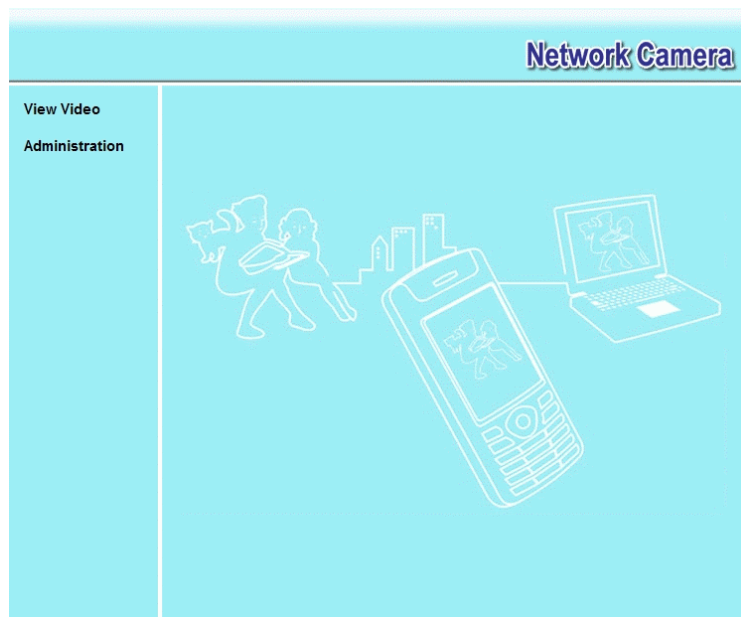


Figure 13: Home Screen

5. Click *View Video*.
6. If the Administrator has restricted access to known users, you will then be prompted for a username and password.
Enter the name and password assigned to you by the Network Camera administrator.
7. The first time you connect to the camera, you will be prompted to install an ActiveX component (OCX or CAB file), as in the example below.
You must install this ActiveX component (OCX or CAB file) in order to view the Video stream in Internet Explorer.
Click the "Yes" button to install the ActiveX component.



Figure 14: ActiveX OCX Prompt

8. Video will start playing automatically. There may be a delay of a few seconds while the video stream is buffered.

Connecting to a Camera via the Internet

You can NOT connect to a camera via the Internet unless the camera Administrator has configured both the camera and the Internet Gateway/Router used by the camera.

See *Making Video available from the Internet* in *Chapter 4 - Advanced Viewing Setup* for details of the required configuration.

Also, you need a broadband Internet connection to view video effectively. Dial-up connections are NOT supported.

To establish a connection from your PC to the Network Camera via the Internet:

1. Obtain the following information from the Administrator of the camera you wish to connect to:
 - Internet IP Address or Domain Name of the camera.
 - Port number for HTTP connections.
 - Login (username, password) if required.

2. Start Internet Explorer.

3. In the Address box, enter the following:

`HTTP://Internet_Address:port_number`

Where `Internet_Address` is the Internet IP address or Domain Name of the camera, and `port_number` is the port number used for HTTP (Web) connections to the camera.

Examples using an IP address:

`HTTP://203.70.212.52:1024`

Where the Internet IP address is 203.70.212.52 and the HTTP port number is 1024.

Example using a Domain Name:

`HTTP://mycamera.dyndns.tv:1024`

Where the Domain name (using DDNS in this example) is `mycamera.dyndns.tv` and the HTTP port number is 1024.

- When you connect, the following screen will be displayed.

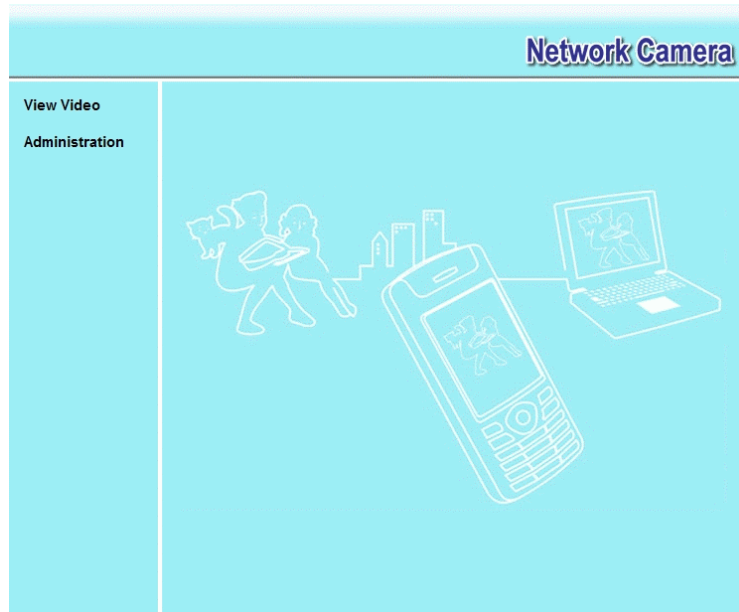


Figure 15: Home Screen

- Click *View Video*.
- If the Administrator has restricted access to known users, you will then be prompted for a username and password.
Enter the name and password assigned to you by the Network Camera administrator.
- The first time you connect to the camera, you will be prompted to install an ActiveX component (OCX or CAB file), as in the example below.
You must install this ActiveX component (OCX or CAB file) in order to view the Video stream in Internet Explorer.
Click the "Yes" button to install the ActiveX component.



Figure 16: ActiveX OCX Prompt

- Video will start playing automatically. There may be a delay of a few seconds while the video stream is buffered.

Viewing Live Video

After installing the ActiveX component, you will be able to view the live video stream in its own window, as shown below.



Figure 17: View Video Screen

There are a number of options available on this screen, accessed by select list, button or icon. See the table below for details.

Note: The options can only be configured while using IE browser. Other browsers can just view the video rather than configuration.

General Options

These options are always available, regardless of the type of camera you are connected to.



Resolution. Use this drop-down list to select the desired video size.



Zoom. A digital zoom feature is available. To zoom in on a section of the window, click this icon. Then use your mouse to select the section you want to magnify. Click the icon again to disable the zoom feature.



Snapshot. Click this to take a single JPEG "snapshot" image of the current video.



Flip. Click this to have the image swapped top-to-bottom.



Mirror. Click this to have the image swapped left-to-right.



Audio On. This icon is displayed if audio is On. Click on the icon to turn audio Off.



Speaker On. This icon is displayed if speaker is On. Click on the icon to turn speaker Off.



Volume. If audio is enabled, use this slider to adjust the volume.



Setup. Select the desired video format from the drop-down list.



ON. Click this to set the output I/O port to ON mode.



OFF. Click this to set the output I/O port to OFF mode.



LED ON. Click this to turn on the White LEDs.



LED OFF. Click this to turn off the White LEDs.



Camera Patrol. Move through the Preset positions in the sequence defined by the Camera Administrator.



Camera Auto Pan. Click this to have the camera moved from left to right automatically.



Motion Detection. Click this button to have the camera moved to the Motion Detection Preset position.



Direct P/T. Use this to move the camera to the Pan/Tilt position directly.



Preset Points. Select the desired Preset points.



Move Control. Use this to move the camera to the desired position. There may a short delay after clicking the desired icon. You should wait a couple of seconds rather than click again.

Or you can drag the vertical or horizontal slider bar to have quicker movement of the Network Camera to the desired position.

Chapter 4

4

Advanced Viewing Setup

This Chapter provides information about the optional settings and features for viewing video via the Network Camera. This Chapter is for the Camera Administrator only.

Introduction

This chapter describes some additional settings and options for viewing live Video:

- Adjusting the video image
- Controlling user access to the live video stream
- Making video available from the Internet
- Using the *Motion Detection* feature

Adjusting the Video Image

If necessary, the Network Camera Administrator can adjust the Video image.

To Adjust the Video Image:

1. Connect to the Web-based interface of the Network Camera. (See *Chapter 5 - Web-based Management* for details.)
2. Select *Administration*, then *Video & Audio*. You will see a screen like the example below.

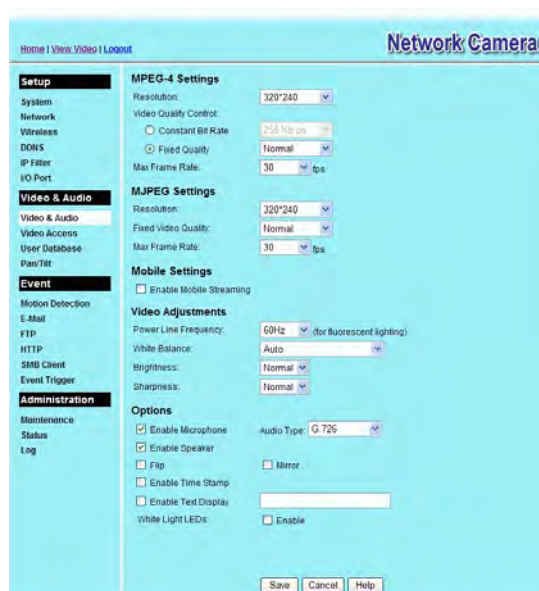


Figure 18: Video & Audio Screen

3. Make the required adjustments, as explained below, and save your changes.

MPEG-4 Settings	
Resolution	Select the desired video resolution format. The default resolution is set to 320*240.
Video Quality Control	<ul style="list-style-type: none"> • Constant Bit Rate: Select the desired bit rate. The default is set to 256 Kbps. • Fixed Quality: Select the desired option. The default fix quality is set to Normal.
Max. Frame Rate	<p>Select the desired Maximum bandwidth for the video stream. Note that you can specify EITHER the Bandwidth OR the Frame Rate, not both. If the Bandwidth is defined, the frame rate will be adjusted as necessary to achieve the specified frame rate.</p> <p>The default values for bandwidth is 30.</p>
MJPEG Settings	
Resolution	Select the desired video resolution format. The default resolution is set to 320*240.
Fixed Video Quality	Select the desired fix quality. The default fix quality is set to Normal.
Max. Frame Rate	<p>Select the desired Maximum bandwidth for the video stream. Note that you can specify EITHER the Bandwidth OR the Frame Rate, not both. If the Bandwidth is defined, the frame rate will be adjusted as necessary to achieve the specified frame rate.</p> <p>The default value for bandwidth is 30.</p>
Mobil Settings	
Enable Mobil Streaming	Enable streaming video for the mobile device by checking this checkbox.
Resolution	The default resolution is set to 160x120.
Video Quality Control	<ul style="list-style-type: none"> • Constant Bit Rate: Select the desired fix bit rate. • Fixed Quality: Select the desired option. The default fix quality is set to Normal.
Max. Frame Rate	Select the desired Maximum bandwidth for the video stream.
Access Code	Enter the 8 digit code (0~9) for accessing the live video from camera through cell phone connection.
Video Adjustment	
Power Line Frequency	Select the power line frequency (50Hz or 60Hz) used in your region, to improve the picture quality under florescent lighting.
White Balance	Select the desired option to match the current environment and lighting.
Brightness	If necessary, you can adjust the brightness to obtain a better image. For example, if the camera is facing a bright light, the image may be too dark. In this case, you can increase the brightness.
Sharpness	Select the desired option for the sharpness. You can select a Sharpness value between -3 and 3.

Options	
Microphone	Enable audio by checking this checkbox. Using Audio will increase the bandwidth requirements slightly.
Audio Type	Select the desired audio type.
Speaker	Enable speaker sound by checking this checkbox.
Flip	This setting will have the image swapped top-to-bottom.
Mirror	This setting will have the image swapped left-to-right.
Time Stamp	If enabled, the current time will be displayed on the Video image.
Text Display	Enable this setting if you want text to be displayed on the Video image, and enter the desired text - up to 20 characters. This feature is often used to identify each camera when multiple cameras are installed.
White Light LEDs	If the checkbox is enabled, the white light LEDs will be turned on when the surrounding light is below 0.5 lux and <i>Trigger Event</i> option in the event trigger screen is enabled.

Viewing the live Video on your cell phone

The live streaming of the Network Camera can even be viewed from a compatible cell phone, so you can keep an eye on things almost everywhere you go. It's just as easy as following the required steps.

To Adjust the Mobile Settings

1. Connect to the Web-based interface of the Network Camera. (See *Chapter 5 - Web-based Management* for details.)
2. Select *Administration*, then *Video & Audio*. You will see a screen like the example below.

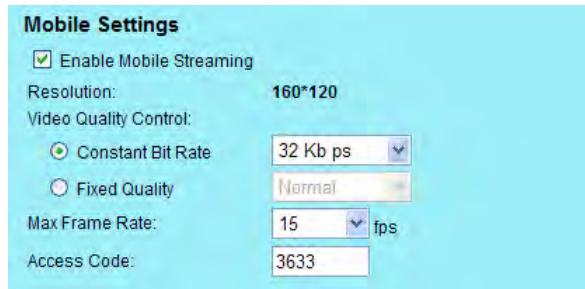


Figure 19: Mobile Settings

3. Check the checkbox of **Enable Mobile Streaming** and configure the related settings in the Mobile Settings section, as explained below. Save your changes.

Mobil Settings	
Enable Mobil Streaming	Enable streaming video for the mobile device by checking this checkbox.
Resolution	The default resolution is set to 160x120.
Video Quality Control	<ul style="list-style-type: none"> • Constant Bit Rate: Select the desired fix bit rate. • Fixed Quality: Select the desired option. The default fix quality is set to Normal.
Max. Frame Rate	Select the desired Maximum bandwidth for the video stream.
Access Code	Enter the code for accessing the live video from camera through cell phone connection.

Connecting Cell Phone to the Network Camera

A number of different mobile handsets are compatible with the Network Camera. Follow the suggested steps (steps may differ according to the mobile phone you use).

Before connecting to the cell phone, please make sure the following:

- Mobile phone should be supported by 3GPP protocol.
- Camera Web management - RTSP port number in the Network screen needs to be entered. Default is 554.
- Access code: 8 digits (0~9)

Steps :

1. Start IE
2. Select *Add Bookmark*
3. Click *Edit*
4. Enter desired value for *Subject* or leave it blank
5. Enter the camera's IP address into the Address box.
RTSP://Internet_Address/Access_code
6. Click *Play*

Controlling User Access to the Video Stream

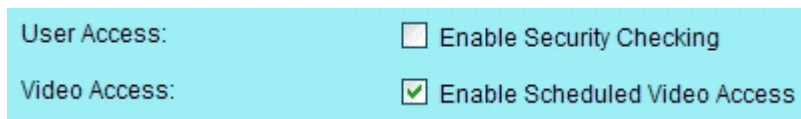
By default, anyone can connect to the Network Camera and view live Video at any time. If desired, you can limit access to scheduled times, and also restrict access to known users.

To Control User Access to Live Video:

1. Connect to the Web-based interface of the Network Camera. (See *Chapter 5 - Web-based Management* for details.)
2. Select *Administration*, then *Video Access*.
3. Set the desired options for **Access**.

Access

If the Video Access is disabled, users cannot connect using either their Web Browser or the Windows utility. However, viewing video is still possible by logging in as the Administrator.



User Access:	<input type="checkbox"/> Enable Security Checking
Video Access:	<input checked="" type="checkbox"/> Enable Scheduled Video Access

Figure 20: Controlling User Access

See *Chapter 5 - Web-based Management* for further details about using the *Video Access* and *User Database* screens.

Making Video available from the Internet

If your LAN is connected to the Internet, typically by a Broadband Gateway/Router and Broadband modem, you can make the Network Camera available via the Internet. You will need to configure your Router or Gateway to allow connections from the Internet to the camera.

Router/Gateway Setup

Your Router or Gateway must be configured to pass incoming TCP (HTTP) connections (from Internet Viewers) to the Network Camera. The Router/Gateway uses the *Port Number* to determine which incoming connections are intended for the Network Camera.

This feature is normally called *Port Forwarding* or *Virtual Servers*, and is illustrated below. The Port Forwarding/Virtual Server entry tells the Router/Gateway that incoming TCP connections on port 1024 should be passed to the Network Camera. If necessary, check the user manual for your Router/Gateway for further details.

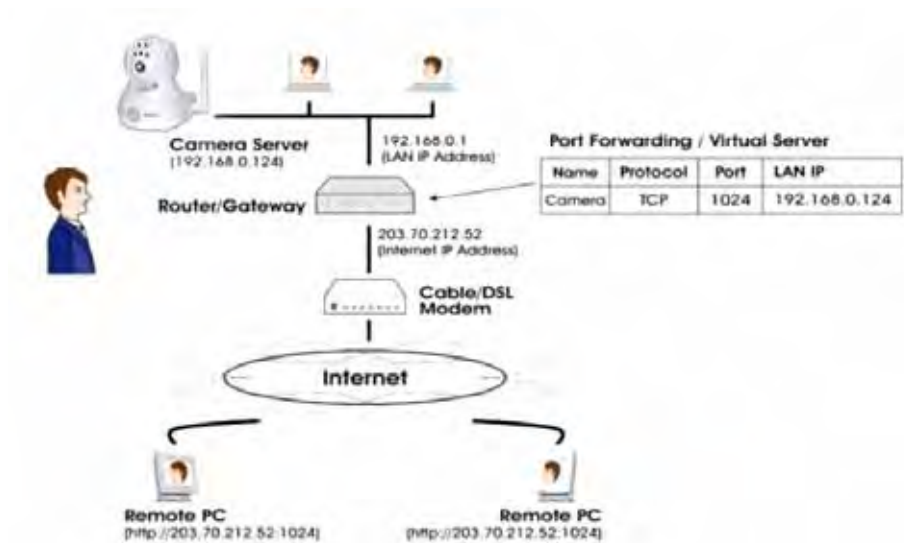


Figure 21: Connecting via the Internet



The "Port" for the *Port Forwarding / Virtual Server* entry above is the "Secondary Port" number specified on the *Network* screen of the Network Camera.

Network Camera Setup

The Network Camera configuration does NOT have to be changed, unless:

- You wish to change the port number from the default value (1024).
- You wish to use the DDNS (Dynamic DNS) feature of the Network Camera.

HTTP Port Configuration

Normally, HTTP (Web) connections use port 80. Since the Network Camera uses HTTP, but port 80 is likely to be used by a Web Server, you can use a different port for the Network Camera. This port is called the *Secondary Port*.

The default *Secondary Port* is 1024. If you prefer to use a different port number, you can specify the port number on the Network Camera's *Network* screen, as shown below.



The screenshot shows a configuration field for the 'Secondary Port'. It includes a checkbox labeled 'Enable HTTP Secondary Port' which is currently unchecked. To the right of the checkbox is a text input field containing the number '1024', followed by a range '(1024-65535)' in parentheses.

Figure 22: Network Screen

See *Chapter 5 - Web-based Management* for further details on using the *Network* screen.



Viewers need to know this port number in order to connect and view live Video, so you must inform viewers of the correct port number.

DDNS (Dynamic DNS)

Many internet connections use a "Dynamic IP address", where the Internet IP address is allocated whenever the Internet connection is established.

This means that other Internet users don't know the IP address, so can't establish a connection.

DDNS is designed to solve this problem, by allowing users to connect to your LAN using a domain name, rather than an IP address.

To use DDNS:

1. Register for the DDNS service with a supported DDNS service provider. You can then apply for, and be allocated, a Domain Name.
2. Enter and save the correct DDNS settings on the *DDNS* screen of the Network Camera.
3. Both Router and Camera should use the same port number for DDNS service.

Figure 23: DDNS Screen

4. Operation is then automatic:

- The Network Camera will automatically contact the DDNS server whenever it detects that the Internet IP address has changed, and inform the DDNS server of the new IP address.
- Internet users can then connect to the camera using the Domain Name allocated by the DDNS service provider.
Example: <http://normanyu123456789.dyndns.org:6016>
normanyu123456789.dyndns.org is domain host name. 6016 is the port number.

Viewing Live Video via the Internet

Clients (viewers) will also need a broadband connection; dial-up connections are NOT recommended.

Viewing Live Video Using your Web Browser

If using your Web browser, you need to know the Internet IP address (or the Domain name) of the camera's Router/Gateway, and the correct port number.

Enter the Internet address of the Router/Gateway, and its port number, in the *Address* (or *Location*) field of your Browser.

Example - IP address:

HTTP://203.70.212.52:1024

Where the Router/Gateway's Internet IP address is 203.70.212.52 and the "Secondary Port" number on the Network Camera is 1024.

Example - Domain Name:

HTTP://mycamera.dyndns.tv:1024

Where the Router/Gateway's Domain name is mycamera.dyndns.tv and the "Secondary Port" number on the Network Camera is 1024.

Viewing Live Video with the Viewing/Recording Utility

If using the Windows Viewing/Recording Utility, the details of the Network Camera must be entered on the *Camera Setup* screen.

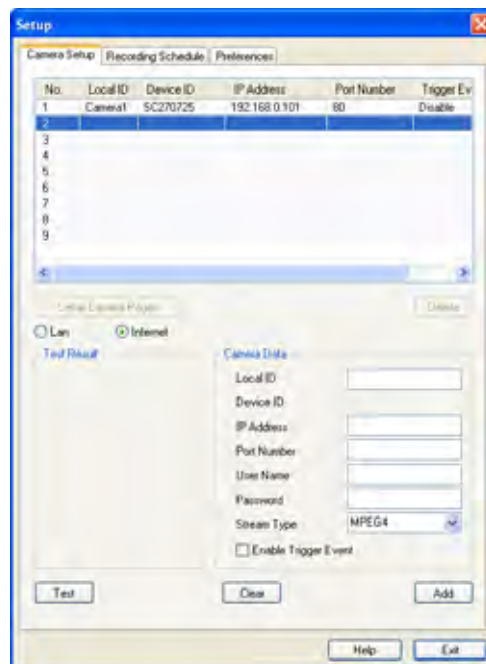


Figure 24: Add Camera from Internet

See *Chapter 6 - Window Viewing/Recording Utility* for full details on using the Windows Viewing/Recording utility.

Motion Detection Alerts

The *Motion Detection* feature can generate an Alert when motion is detected.

The Network Camera will compare consecutive frames to detect changes caused by the movement of large objects.

But the motion detector can also be triggered by:

- Sudden changes in the level of available light
- Movement of the camera itself.

Try to avoid these situations. The motion detection feature works best in locations where there is good steady illumination, and the camera is mounted securely. It cannot be used outdoors due to the sensitivity of the CMOS sensor.

Note: The Motion Detection settings can only be configured while using IE browser.

To Use Motion Detection Alerts

Using the Web-based interface on the Network Camera, select the *Motion Detection* screen, then configure this screen as described below.

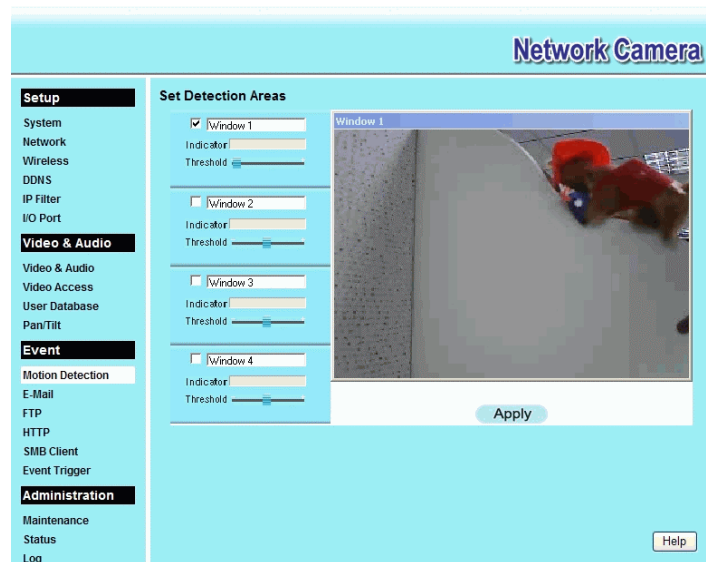


Figure 25: Motion Detection

1. Enable the *Motion Detection* feature.
2. Set the area or areas of the video image to be examined for movement. You can define up to 4 areas, and set the motion threshold individually for each area.
3. If using a schedule, define the desired schedule in *Event Trigger* screen.
4. Save your changes.
5. Select the *E-Mail* screen to have alerts sent by E-mail:
 - Enable and enter at least one (1) E-mail address
 - Select or enter the desired options for *Video Attachment*, *Show "From" as* and *Subject* fields.
 - Enter details of the SMTP Server used to send the E-mail.



Note!

If the Motion Detection feature is enabled, but E Mail is not enabled, then the only action when motion is detected is to log this event in the system log.

Chapter 5

5

Web-based Management

This Chapter provides Setup details of the Network Camera's Web-based Interface. This Chapter is for the Camera Administrator only.

Introduction

The Network Camera can be configured using your Web Browser. The Network Camera must have an IP address which is compatible with your PC.

The recommended method to ensure this is to use the supplied Windows-based Wizard, as described in *Chapter 2 - Basic Setup*.

Connecting to Network Camera

- If using only your Web Browser, use the following procedure to establish a connection from your PC to the Network Camera:
- Once connected, you can add the Network Camera to your Browser's *Favorites* or *Bookmarks*.

Connecting using your Web Browser

1. Use the Windows utility to get the IP address of the Network Camera.
2. Start your WEB browser.
3. In the *Address* box, enter "HTTP://" and the IP Address of the Network Camera.
4. You will then be prompted for a username and password.
 - If using the default values, enter **administrator** for the name, and leave the password blank.
 - Otherwise, enter the *Administrator ID* and *Administrator Password* set on the *Maintenance* screen.

Welcome Screen

When you connect, the following screen will be displayed.

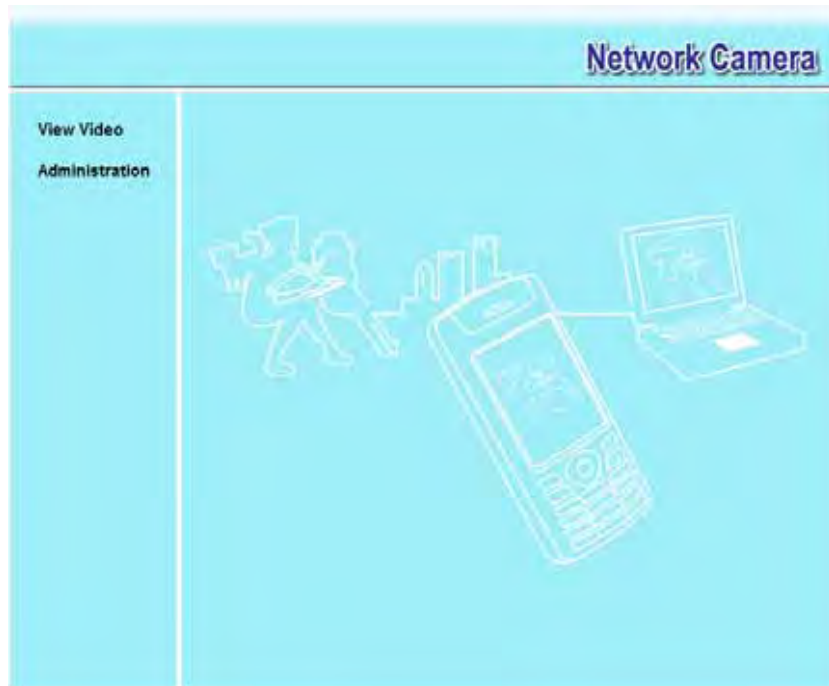


Figure 26: Welcome Screen

The menu options available from this screen are:

- **View Video** - View live Video using your Web Browser. See *Chapter 3 - Viewing Live Video* for details.
- **Administration** - Access the Administration menu.

Administration Menu

Clicking on *Administration* on the menu provides access to all the settings for the Network Camera.

The *Administration* menu contains the following options:

Setup

- System
- Network
- Wireless (Wireless Model Only)
- DDNS
- IP Filter
- I/O Port

Video Stream

- Video & Audio
- Video Access
- User Database
- Pan/Tilt

Event

- Motion Detection
- E-Mail
- FTP
- HTTP
- SMB Client
- Event Trigger

Administration

- Maintenance
- Status
- Log

System Screen

After clicking *Administration* on the main menu, or selecting *System* on the *Administration* menu, you will see a screen like the example below.

The screenshot shows the 'System Settings' page for a Network Camera. The left sidebar contains a navigation menu with the following items: Setup (System, Network, Wireless, DDNS, IP Filter, I/O Port), Video & Audio (Video & Audio, Video Access, User Database, Pan/Tilt), Event (Motion Detection, E-Mail, FTP, HTTP, SMB Client, Event Trigger), Administration (Maintenance, Status, Log). The main content area is titled 'System Settings' and includes the following fields and options:

- Device ID:** SC270725
- Camera Name:** RC8061270725-1
- Description:** test~!@#%&^&*(*)_+{}:"'<>?
- Date & Time:**
 - Date Format:** MM/DD/YYYY
 - Current Date & Time:** 09/09/2008 17:58:01 (Change)
 - Time Zone:** (GMT-12:00) International Date Line West
 - Adjust for daylight saving
- Network Time Protocol:** Enable
- NTP Server Address:** clock.via.net
- Update:** Every Day at 00:00 (hh:mm)
- Options:**
 - LED Operation:** Enable
 - Privacy Button:** Enable

Buttons for Save, Cancel, and Help are located at the bottom of the settings area.

Figure 27: System Screen

Data - System Screen

System Settings	
Device ID	This displays the ID for the Network Camera.
Camera Name	Enter the desired name for the Network Camera.
Description	This field is used for entering a description, such as the location of the Network Camera.
Date & Time	
Date Format	<p>Select the desired date format, it will also be used to display the date and time as an overlay on the video image.</p> <p>The abbreviations used to predefine the date formats are list as follows:</p> <ul style="list-style-type: none"> • YYYY-MM-DD = Year-Month-Day, e.g. 2006-01-31 • MM/DD/YYYY = Month/Day/Year, e.g. 01/31/2006 • DD/MM/YYYY = Day/Month/Year, e.g. 31/01/2006

<p>Current Date & Time</p>	<p>This displays the current date and time on the camera.</p> <p>If it's not correct, click the Change button to modify the date/time settings. This button will open a sub-screen where you have 2 options:</p> <ul style="list-style-type: none"> • Set the camera's date and time to match your PC. • Enter the correct date and time.
<p>Time Zone</p>	<p>Choose the Time Zone for your location from the drop-down list.</p> <p>If your location is currently using Daylight Saving, enable the Adjust for daylight saving checkbox.</p> <p>You must UNCHECK this checkbox when Daylight Saving finishes.</p>
<p>Network Time Protocol</p>	<p>Enable or disable the Time Server feature as required.</p> <p>If Enabled, the Network Camera will contact a Network Time Server at regular intervals and update its internal timer.</p>
<p>NTP Server Address</p>	<p>Enter the address for the desired NTP server.</p>
<p>Update</p>	<p>The Schedule determines how often the Network Camera contacts the NTP Server.</p> <p>Select the desired options.</p>
<p>LED Operation Privacy Button</p>	<p>Enable this if you want to use this function.</p> <p>If Enabled, click the <i>Privacy</i> button will stop uploading the stream without turning the camera off. Click the button one more time to continue uploading.</p>

Network Screen

This screen is displayed when the *Network* menu option is clicked.

The screenshot shows the 'Network Camera' configuration interface. On the left is a navigation menu with categories: Setup, System, Network (selected), Wireless, DDNS, IP Filter, I/O Port, Video & Audio, Video Access, User Database, Pan/Tilt, Event, Motion Detection, E-Mail, FTP, HTTP, SMB Client, Event Trigger, Administration, Maintenance, Status, and Log. The main area is titled 'Network Camera' and contains the following settings:

- Internet Connection Type: Obtain Address Automatically (DHCP)
- DNS Server Address: Obtain DNS server address automatically (selected)
- Secondary Port: Enable HTTP Secondary Port (unchecked), 1024 (1024-65535)
- RTP/RTSP:
 - RTSP Port: 554 (554, 1024-65535)
 - RTP Data Port: 5000 (mobile phone only)
 - Max RTP Data Packet: 1400 bytes (400-1400)
- Multicast RTP/RTSP:
 - Enable Multicast (unchecked)
 - Video Address: 224.2.0.1
 - Video Port: 2240 (1024-65534; Even Value)
 - Audio Address: 224.2.0.1
 - Audio Port: 2242 (1024-65534; Even Value)
 - Time to Live: 16 (1-255)
- UPnP:
 - Enable Discovery (checked)
 - Enable Traversal (Port Mapping) (unchecked)
- QoS:
 - Enable QoS Mode (for Video and Audio) (unchecked)
 - DSCP: 32 (0-63)

At the bottom are buttons for Save, Cancel, and Help.

Figure 28: Network Screen

Data - Network Screen

Network	
Internet Connection Type	<p>There are 3 connection types:</p> <ul style="list-style-type: none"> • Obtain Address Automatically (DHCP): If selected, the Network Camera will obtain its IP address and related information from a DHCP Server. Only select this option if your LAN has a DHCP Server. • Static IP Address: If selected, you must assign the following data to the Network Camera. <ul style="list-style-type: none"> • IP Address - Enter an unused IP address from the address range used on your LAN. • Subnet Mask - Use the same value as PCs on your LAN. • Default Gateway - Use the same value as PCs on your LAN. • PPPoE (PPP over Ethernet): This is the most common login method, widely used with DSL modems. Normally, your ISP will have provided some software to connect and login. This software is no longer required, and should not be used. <ul style="list-style-type: none"> • Username - The user name (or account name) provided by your ISP. • Password - Enter the password for the login name above.
Obtain DNS server address automatically	<p>If selected, the Network Camera will use the DNS address or addresses provided by the DHCP server. This option is only available if the IP address setting is <i>Obtain an IP address Automatically</i>.</p>
Use the following DNS server address	<p>Primary DNS server - Use the same value as PCs on your LAN. Normally, your ISP will provide this address.</p> <p>Secondary DNS server - This is optional. If entered, this DNS will be used if the Primary DNS does not respond.</p>
Secondary Port	<p>This sets the port number for HTTP (Web) connections to the Camera, whether for administration or viewing video.</p> <p>The secondary port can be used for DDNS, other service and when more than 2 cameras are in use.</p> <p>If enabled, you can connect using either port 80 or the Secondary port. You must enter the Secondary port number (between 1024 to 65535) in the field provided.</p> <p>Note that when using a port number which is not 80, you must specify the port number in the URL. For example, if the Camera's IP address was 192.168.1.100 and the Secondary port was 1024, you would specify the URL for the Camera as follows:</p> <p style="text-align: center;">http://192.168.1.100:1024</p>

RTP/RTSP	<p>The RTSP (Real Time Streaming Protocol), a standard for connected client(s) to control streaming data (MPEG-4) over the World Wide Web. Enter the RTSP Port number (between 1024 and 65535) in the field provided. The default RTSP Port is 554.</p> <p>The RTP (Real Time Transport Protocol), an Internet protocol for transmitting real-time data such as audio and video.</p> <p>Max RTP Data Packet field will let users limit the size of the file. Enter the desired value between 400 and 1400.</p> <p>Note: RTSP and RTP settings are for Mobil phone only.</p>
Multicast RTP/RTSP	
Enable Multicast	Enable the feature as required.
Video Address	Enter the address of video.
Video Port	Enter the desired value (between 1024 to 65534) in the field provided. The number you entered must be even values.
Audio Address	Enter the address of the audio.
Audio Port	Enter the desired value (between 1024 to 65534) in the field provided. The number you entered must be even values.
Time to Live	Enter the desired length of time, if the packets fail to be delivered to their destination within. The Time to Live you entered must be in-between 1 to 255.
UPnP	
Enable Discovery	If enabled, the Network Camera will broadcast its availability through UPnP. UPnP compatible systems such as Windows XP will then be able to detect the presence of the Network Camera.
Enable Traversal	If enabled, HTTP, RTP and RTSP ports can be opened to establish and maintain TCP/IP network connections with the camera that traverse routers using network address translation (NAT).
QoS	
Enable QoS Mode	If enabled, the throughput level (for Video and Audio) is guaranteed through QoS (Quality of Service).
DSCP	Enter the desired value of Differentiated Services Code Point (DSCP). The value must be between 0 to 63.

Wireless Screen (Wireless Model Only)

This screen is displayed when the *Wireless* menu option is clicked.

Figure 29: Wireless Screen

Data - Wireless Screen

Wireless Network	
Site Survey	Click the "Site Survey" button and select from a list of available APs.
WSC PIN Code	It displays the WSC PIN code number for the camera.
Network Type	This determines the type of wireless communication used by the Network Camera. <ul style="list-style-type: none"> • If you have an Access Point, select <i>Infrastructure</i>. • Otherwise, select <i>Ad-hoc</i>.
SSID	This must match the value used by other devices on your wireless LAN. The Default is ANY . Note! The SSID is case sensitive.
Domain	Select your region from the drop-down list.

Channel No.	<ul style="list-style-type: none"> • In <i>Infrastructure</i> mode, this setting is ignored. The Network Camera will use the Channel set on the Access Point. • For <i>Ad-hoc</i> mode, select the Channel you wish to use on your Network Camera. Other Wireless stations should use the same setting. • If you experience interference (shown by lost connections and/or slow data transfers) you may need to experiment with different channels to see which one is the best.
Security	
Security System	<p>Select the desired option, and then enter the settings for the selected method:</p> <ul style="list-style-type: none"> • Disabled - No security is used. Anyone using the correct SSID can connect to your network. This is default. • WEP - The 802.11b standard. Data is encrypted before transmission, but the encryption system is not very strong. • WPA/WPA2 Personal - Like WEP, data is encrypted before transmission. WPA is more secure than WEP, and should be used if possible. WPA Personal is the version of WPA which does NOT require a Radius Server on your LAN.
WEP	
Authentication Type	<p>Select the appropriate value - "Open System" or "Shared Key". Check your wireless card's documentation to see what method to use.</p> <p>Note: In <i>Infrastructure</i> mode, either setting will normally work, since most Access Points can use both methods.</p>
WEP Encryption	<p>Select the WEP Encryption level:</p> <ul style="list-style-type: none"> • 64 Bit Keys (10 Hex chars) • 128 Bit Keys (26 Hex chars) • 64 Bit Keys (5 ASCII chars) • 128 Bit Keys (13 ASCII chars)
Passphrase	<p>Enter a word or group of printable characters in the Passphrase box and click the "Generate Keys" button to automatically configure the WEP Key(s). If encryption strength is set to 64-bit, then each of the four key fields will be populated with key values. If encryption strength is set to 128-bit, then only the selected WEP key field will be given a key value.</p>
WEP Keys	<ul style="list-style-type: none"> • Use the radio buttons to select the default key. • Enter the key value you wish to use. Other stations must have the same key values. • Keys must be entered in Hex. Hex characters are the digits (0 ~ 9) and the letters A ~ F. • Click <i>Clear Keys</i> to set the Keys to be blank.
WPA/WPA2 Personal	
Shared Key	<p>Enter the key value. Data is encrypted using a key derived from the network key. Other Wireless Stations must use the same network key. The PSK must be from 8 to 63 characters in length.</p>

DDNS Screen

Many Internet connections use a "Dynamic IP address", where the Internet IP address is allocated whenever the Internet connection is established.

This means that other Internet users don't know the IP address, so can't establish a connection.

DDNS is designed to solve this problem, as follows:

- You must register for the DDNS service with a DDNS service provider. The DDNS Service provider will allocate a Domain Name to you upon request.
- The DDNS settings on the **DDNS** screen above must be correct.
- The Network Camera will then contact the DDNS server whenever it detects that the Internet IP address has changed, and inform the DDNS server of the new IP address. (The *Check WAN IP Address* determines how often the Network Camera checks if the Internet IP address has changed.)

This system allows other internet users to connect to you using the Domain Name allocated by the DDNS service provider.

This screen is displayed when the **DDNS** menu option is clicked.

Figure 30: DDNS Screen

Data - DDNS Screen

DDNS	
Enable DDNS	Enable or disable the DDNS function, as required. Only enable this feature if you have registered for the DDNS Service with a DDNS Server provider.
Service Provider	Choose a service provider from the list.

Web Site Button	Click this button to open a new window and connect to the Web site for the selected DDNS service provider.
Domain (Host) Name	Enter the Domain Name (Host Name) allocated to you by the DDNS Server provider.
Account/E-Mail	Enter the login name for the DDNS account.
Password/Key	Enter the password for the DDNS account.
Check WAN IP Address	<p>Set the schedule for checking if the Internet IP address has changed. If the IP address has changed, the DDNS Server will be notified.</p> <p>NOTE: If the DDNS Service provided some software to perform this IP address update or notification, you should NOT use this software. The update is performed by the camera.</p>

IP Filter

The IP Filter feature allows administrator to control network camera access by filtering IP addresses. This screen is displayed when the *IP Filter* menu option is clicked.

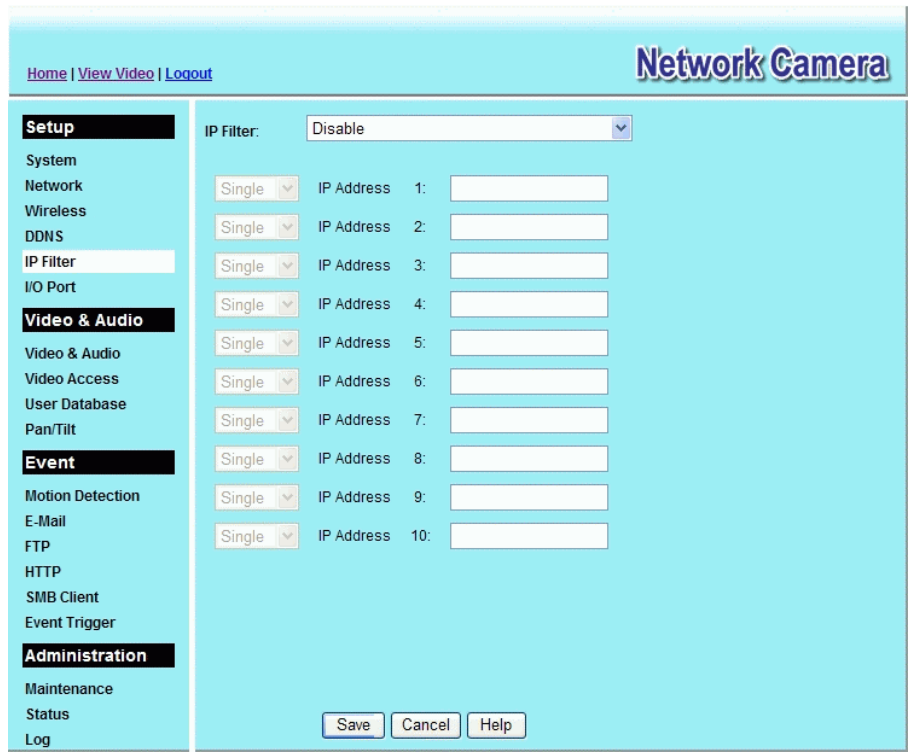


Figure 31: IP Filter Screen

Data - IP Filter Screen

IP Filter	
IP Filter	Select the desired method to perform the IP address(or addresses) filtering function.
Single/Range	Select to perform either single IP address or a range of IP addresses that you desired.
IP Address	Enter an IP address or a range of IP addresses you would like to allow or deny.

I/O Port

The Network Camera supports 1 input port and 1 output port. This screen is displayed when the *I/O Port* menu option is clicked.

Figure 32: I/O Port Screen

Data - I/O Port Screen

Input Ports	
Current State	It indicates the current state of the input port. Once the configured state is happened, it will trigger the event actions.
Triggered When...	Select the desired State: <ul style="list-style-type: none"> • High • Low • Rising • Falling
Output Ports	
Current State	It indicates the current state of the output port.
Default State	Select the desired option from the drop-down list.
Manual Trigger	Select the option to control the output state.
Action When Triggered	If an event is happened, it will trigger the event alerting.

Video & Audio Screen

This screen is displayed when the *Video & Audio* menu option is clicked.

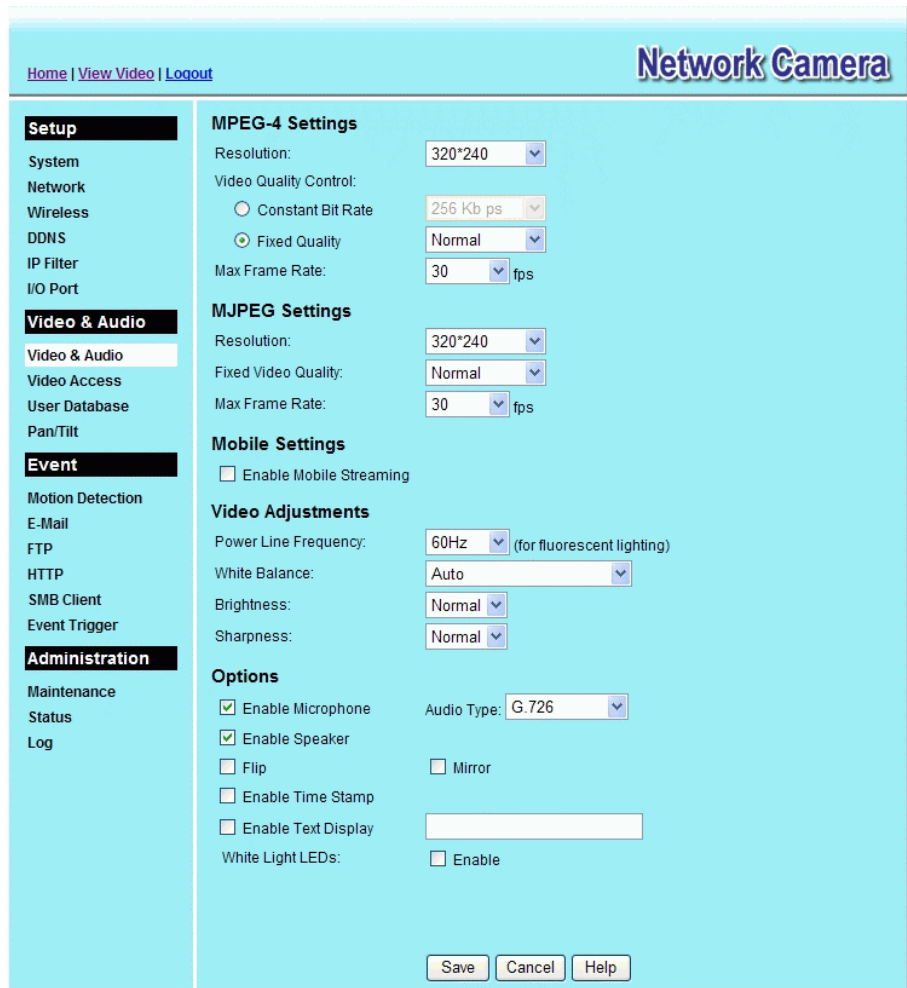


Figure 33: Video & Audio Screen

Data - Video & Audio Screen

MPEG-4 Settings	
Resolution	Select the desired video resolution format. The default resolution is set to 320*240.
Video Quality Control	<ul style="list-style-type: none"> Constant Bit Rate: Select the desired bit rate. The default is set to 256 Kbps. Fixed Quality: Select the desired option. The default fix quality is set to Normal.
Max. Frame Rate	<p>Select the desired Maximum bandwidth for the video stream. Note that you can specify EITHER the Bandwidth OR the Frame Rate, not both. If the Bandwidth is defined, the frame rate will be adjusted as necessary to achieve the specified frame rate.</p> <p>The default values for bandwidth is 30.</p>

MJPEG Settings	
Resolution	Select the desired video resolution format. The default resolution is set to 320*240.
Fixed Video Quality	Select the desired fix quality. The default fix quality is set to Normal.
Max. Frame Rate	Select the desired Maximum bandwidth for the video stream. Note that you can specify EITHER the Bandwidth OR the Frame Rate, not both. If the Bandwidth is defined, the frame rate will be adjusted as necessary to achieve the specified frame rate. The default value for bandwidth is 30 .
Mobil Settings	
Enable Mobil Streaming	Enable streaming video for the mobile device by checking this checkbox.
Resolution	The default resolution is set to 160x120.
Video Quality Control	<ul style="list-style-type: none"> • Constant Bit Rate: Select the desired fix bit rate. • Fixed Quality: Select the desired option. The default fix quality is set to Normal.
Max. Frame Rate	Select the desired Maximum bandwidth for the video stream.
Access Code	Enter the 8 digit code (0~9) for accessing the live video from camera through cell phone connection.
Video Adjustment	
Power Line Frequency	Select the power line frequency (50Hz or 60Hz) used in your region, to improve the picture quality under florescent lighting.
White Balance	Select the desired option to match the current environment and lighting.
Brightness	If necessary, you can adjust the brightness to obtain a better image. For example, if the camera is facing a bright light, the image may be too dark. In this case, you can increase the brightness.
Sharpness	Select the desired option for the sharpness. You can select a Sharpness value between -3 and 3.
Options	
Microphone	Enable audio by checking this checkbox. Using Audio will increase the bandwidth requirements slightly.
Audio Type	Select the desired audio type.
Speaker	Enable speaker sound by checking this checkbox.
Flip	This setting will have the image swapped top-to-bottom.
Mirror	This setting will have the image swapped left-to-right.
Time Stamp	If enabled, the current time will be displayed on the Video image.
Text Display	Enable this setting if you want text to be displayed on the Video image, and enter the desired text - up to 20 characters. This feature is often used to identify each camera when multiple cameras are installed.