LevelOne

FCS-1000

IP Network Camera

WCS-2000

Wireless IP Network Camera

User's Manual

VERSION 1.0

Table of Contents

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Chapter 1
Introduction

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

Overview

The LevelOne IP 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 WCS-2000, an 802.11b Wireless LAN.

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

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 and Microsoft Media Player, on a variety of software platforms.

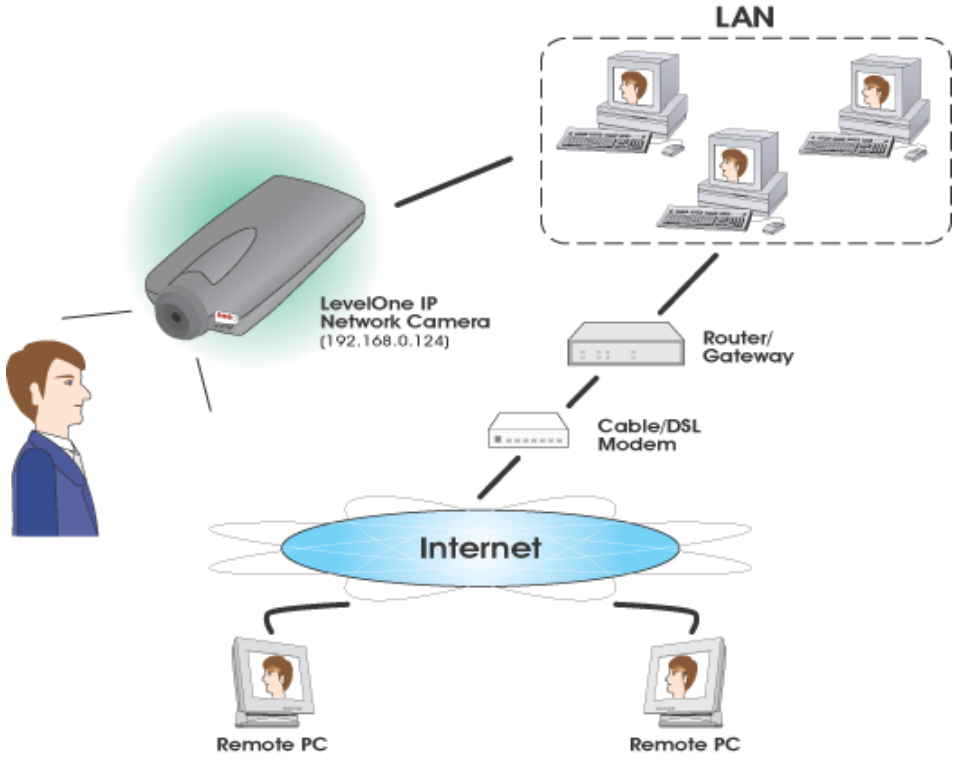

Figure 1: LevelOne IP Network Camera

Features

- ***Standalone Design.*** The LevelOne IP 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.

- ***Suitable for Home, Business or Public Facilities***. Whether for Home, Business or Public Facility surveillance, or just for entertainment and fun, the LevelOne IP Network Camera has the features you need.
- ***Multi-Protocol Support.*** Supporting TCP/IP networking, SMTP (E-mail), HTTP and other Internet related protocols, the LevelOne IP 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 LevelOne IP 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 will capture a short video and send it to your E-mail address when motion is detected. The LevelOne IP 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.

Internet Features

- ***User-definable HTTP port number***. This allows Internet Gateways to use "port mapping" so the LevelOne IP Network Camera and a Web Server can share the same Internet IP address.
- ***DDNS Support.*** In order to view video over the Internet, users must know the Internet IP address of the gateway used by the LevelOne IP 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 LevelOne IP Network Camera.
- ***NTP (Network-Time-Protocol) Support.*** NTP allows the LevelOne IP Network Camera to calibrate its internal clock from an Internet Time-Server. This ensures that the time stamp on Video from the LevelOne IP 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 20 users can be entered.
- ***Password-Protected Configuration***. Configuration data can be password protected, so that it only be changed by the LevelOne IP Network Camera Administrator.

Wireless Features (WCS-2000 only)

- ***Standards Compliance***. The IEEE 802.11b standard is fully supported. Gain the advantages of mobility, flexibility and high-speed by using IEEE 802.11b wireless LAN technology.
- ***Wired and Wireless Network Support.*** The WCS-2000 supports both wired and wireless transmission.
- ***WEP Support***. Full WEP support (64/128 Bit) on the Wireless interface is provided.

Physical Details

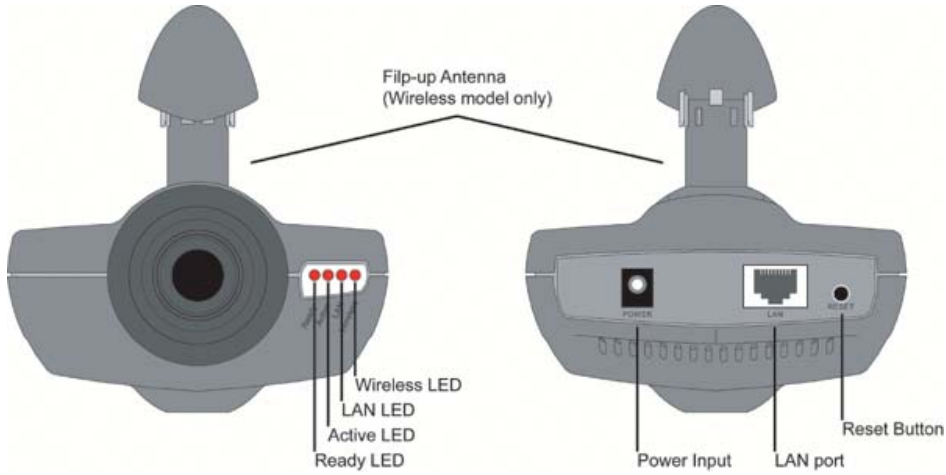

Figure 2: LevelOne IP Network Camera

Front-mounted LEDs

Ready	**On** - Power on.
	Off - No power.
	Blinking - The *Ready* LED will blink during start up. This will take 15 to 20 seconds.
Active	**Off** - Idle.
	Blinking - LevelOne IP Network Camera is providing a live video stream to at least one viewer.
LAN	**On** - LAN port is active.
	Off - LAN port is not available.
	Blinking - Data is being transmitted or received via the LAN port.
Wireless (WCS-2000 only)	**On** - Wireless interface is active.
	Off - Wireless interface is not available.
	Blinking - Data is being transferred via the Wireless interface.

Rear Panel

Power Input	Connect the supplied power adapter here.
LAN port	Use a standard LAN cable to connect your LevelOne IP Network Camera to a 10/100BaseT hub or switch.
Reset Button	This button has two (2) functions: • **Restore Default IP Address**. When pressed and released, the LevelOne IP Network Camera will reset its IP address to the default value • **Restore Default IP Address, Administrator ID, and Administrator password**. When pressed and held or 3 seconds, the *IP address*, *Administrator ID*, and *Administrator*

Password settings will be set to their default values.

- IP address: 192.168.0.99
- Administrator ID: administrator
- Administrator Password: null (no password)

Note: After this procedure is completed, all LEDs will blink three times to confirm that the reset was completed successfully.

Package Contents

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

1. The LevelOne IP Network Camera
2. Installation CD-ROM
3. Quick Installation Guide
4. Power adapter
5. Base, Stand and Swivel Connector
6. Extender Unit
7. Mounting Screws

Chapter 2
Basic Setup

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

System Requirements

- To use the LAN interface, a standard 10/100BaseT hub or switch and network cable is required.
- To use the Wireless interface on the WCS-2000, other Wireless devices must be compliant with the IEEE802.11b specifications. All Wireless stations must use compatible settings.

Installation

Figure 3: LevelOne IP Network Camera Installation

1. Mount the Camera on the supplied Base and Stand.

Join the Base, stand and swivel connector to the camera, as shown in the diagram above.

2. Connect the LAN Cable

Connect the LevelOne IP Network Camera to a 10/100BaseT hub or switch.

For the WCS-2000, this disables the Wireless Interface, because only one interface can be active. The LAN interface is recommended for initial configuration.

The default Wireless settings for the WCS-2000 are:

Mode: Infrastructure
Channel: 11
ESSID: wireless
WEP: Disabled

3. Adjust the Antenna

On the WCS-2000, flip the top-mounted Antenna to the upright position to improve wireless reception.

4. Power Up

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

4. Check the LEDs

- The *Ready* LED will turn on briefly, then start blinking. It will blink during startup, which takes 15 to 20 seconds.
  After startup is completed, the *Ready* LED should remain ON.
- The *Active* LED should be OFF.
  It will flash when anyone is viewing live video.
- Either the *LAN* LED OR the *Wireless* LED should be ON.

For more information, refer to *Front-mounted LEDs* in Chapter 1.

Setup

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

Subsequent administration can be performed with your Web browser, as explained in *Chapter 3 - Web-based Administration*.

Setup Procedure

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

Figure 4: Welcome Screen

2. Click the *Setup* button to start the setup Wizard.
3. The next screen will list all the LevelOne IP Network Cameras on your LAN. An example screen is shown below.

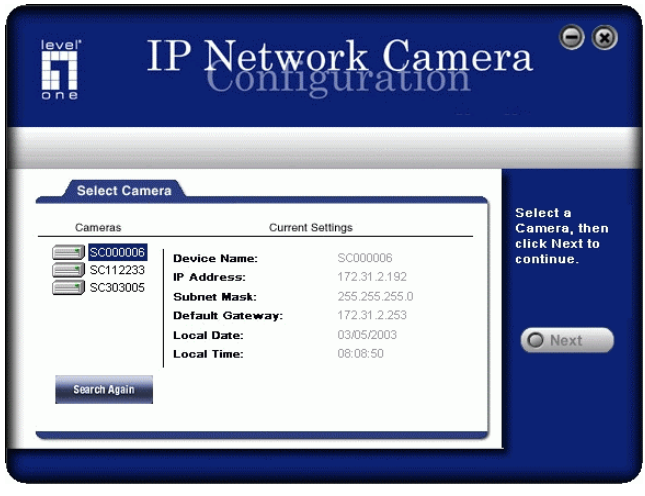

Figure 5: Camera List Screen

4. 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.
5. Click *Next* to continue.
6. If the *Administrator ID* and *Password* have been set, you will be prompted to enter them, as shown below. Enter the *Administrator ID* and *Password* set on the ***User*** screen.

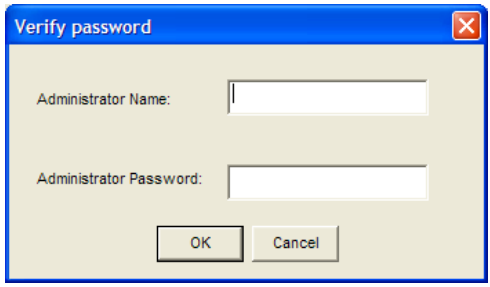

Figure 6: Password Dialog

By default, the Administrator ID and password are blank. However, you should assign a name and password, on the "User" screen of the Web interface. The Web interface can be accessed via the "Web UI" button on the final screen of the Wizard.

7. On the following screen, shown below, choose *Fixed IP* or *Dynamic IP*.
   - *Fixed IP* is recommended, and can always be used.
   - *Dynamic IP* can only be used if your LAN has a DCHP Server.

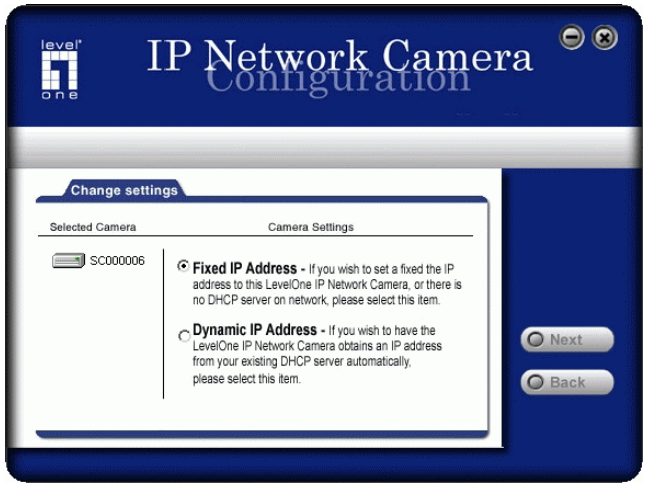

Figure 7: Fixed or Dynamic IP Selection

8. Click *Next* to continue.
   - If *Dynamic IP Address* was selected, you will then see the screen shown in *Figure 9: Camera Settings*.
   - If you selected *Fixed IP Address*, the following screen will be displayed.

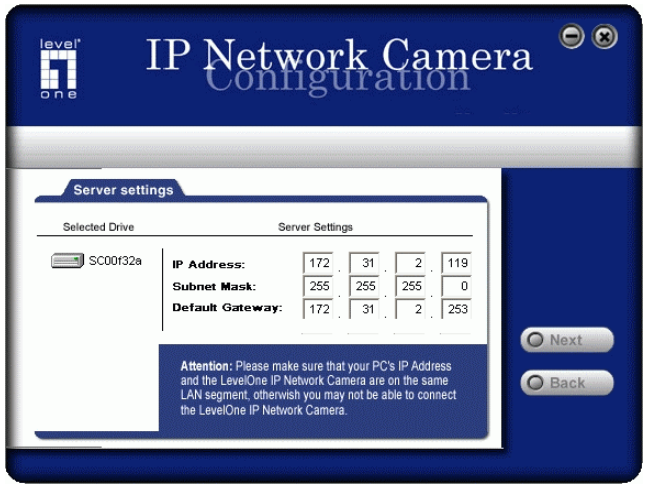

Figure 8: TCP/IP Settings

9. Enter the desired *IP address* values:
   - 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.
   - Click *Next* to continue.

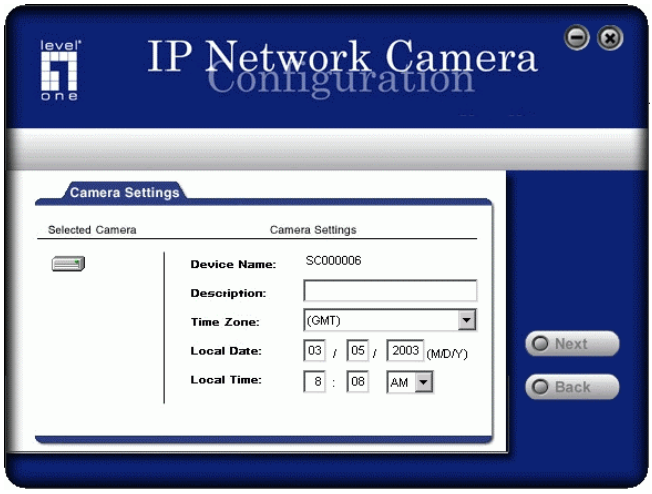

Figure 9: Camera Settings

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

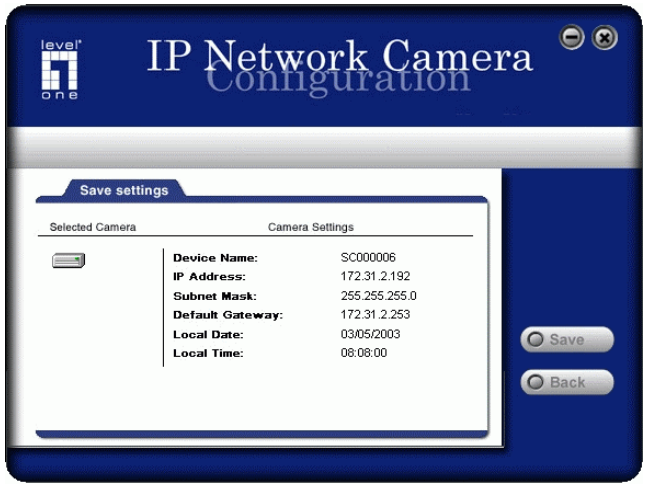

Figure 10: Save Screen

11. This screen displays all details of the LevelOne IP Network Camera.
    Click *Save* if the settings are correct, or click *Back* to modify any incorrect values.
12. After clicking *Save*, you will see the screen below.

Note!

You can click the *Web UI* button to connect to the camera using your Web Browser.

Using the *Web UI* is required in order the change the Wireless settings for the WCS-2000, on the *Network* screen. The default Wireless settings for the WCS-2000 are:

Mode: Infrastructure
Channel:11
ESSID: wireless
WEP: Disabled

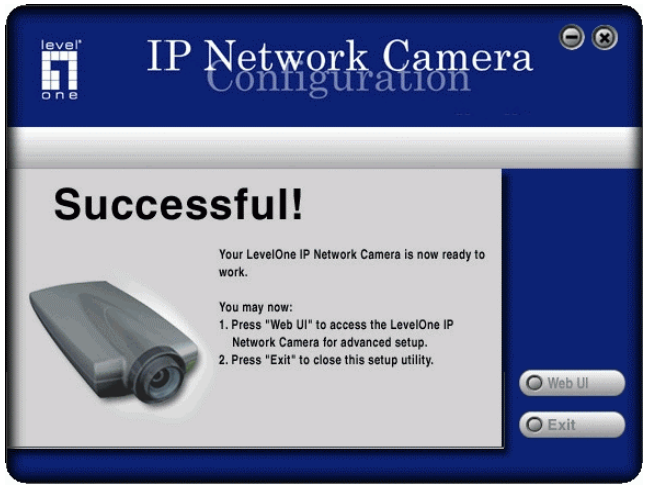

Figure 11: Final Screen

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

Chapter 3
Setup for Viewing

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

Introduction

After finishing setup via the Windows-based Wizard, the LevelOne IP Network Camera can immediately be used by all users on your LAN.

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/E-mail* feature

Adjusting the Video Image

If necessary, the LevelOne IP Network Camera Administrator can adjust the Video image. Settings are provided for:

- **Image size** - Select 320 x 240 or 160 x 120. The larger size requires greater bandwidth.
- **Image quality** - This determines the degree of compression applied to the Video stream. Higher quality requires greater bandwidth.
- **Exposure** - Adjust the brightness of the image, if the *Auto-Exposure* does not give satisfactory results.
- **Color Adjustment** - Red, Green, Blue intensity can be adjusted.
- **Time Stamp** - If enabled, the date/time will be displayed on the Video image.
- **Text Overlay** - If enabled, up to 20 characters can be superimposed on the Video image. This is useful for identifying the camera.

To Adjust the Video Image:

1. Connect to the Web-based interface of the LevelOne IP Network Camera. (See ***Chapter 4 - Web-based Management*** for details.)
2. On the *Administration* menu, select *Image*. You will see a screen like the example below.

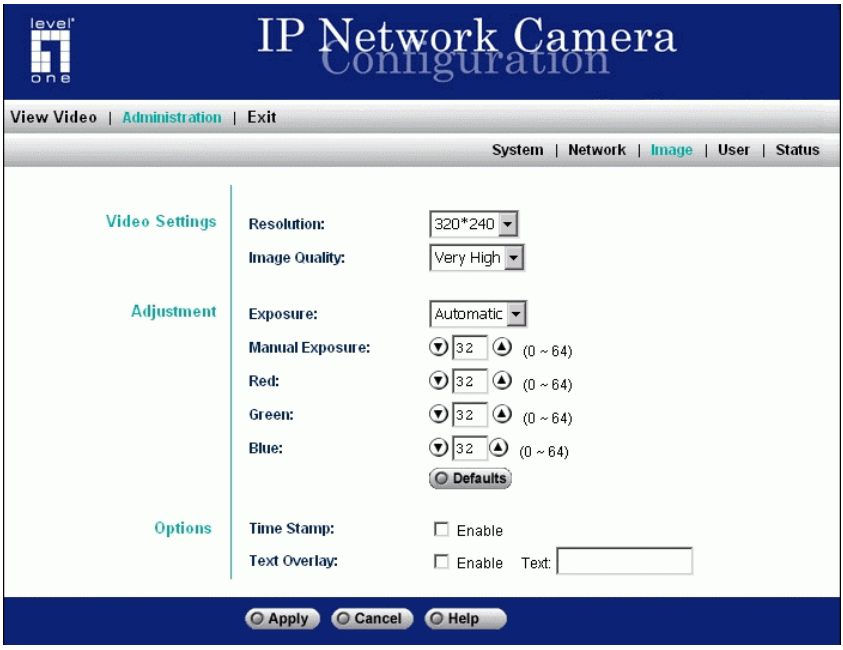

Figure 12: Image Screen

3. Make the required adjustments, and save your changes.

Controlling User Access to the Video Stream

By default, all users can connect to the LevelOne IP Network Camera and view live Video.

If desired, you can limit access to known users, by requiring each user to login to the LevelOne IP Network Camera with their individual username and password.

To Enable this feature:

1. Connect to the Web-based interface of the LevelOne IP Network Camera. (See ***Chapter 4 - Web-based Management*** for details.)
2. On the *Administration* menu, select *User*.
3. Select the setting *Allow access by Only users in database*, as shown below.

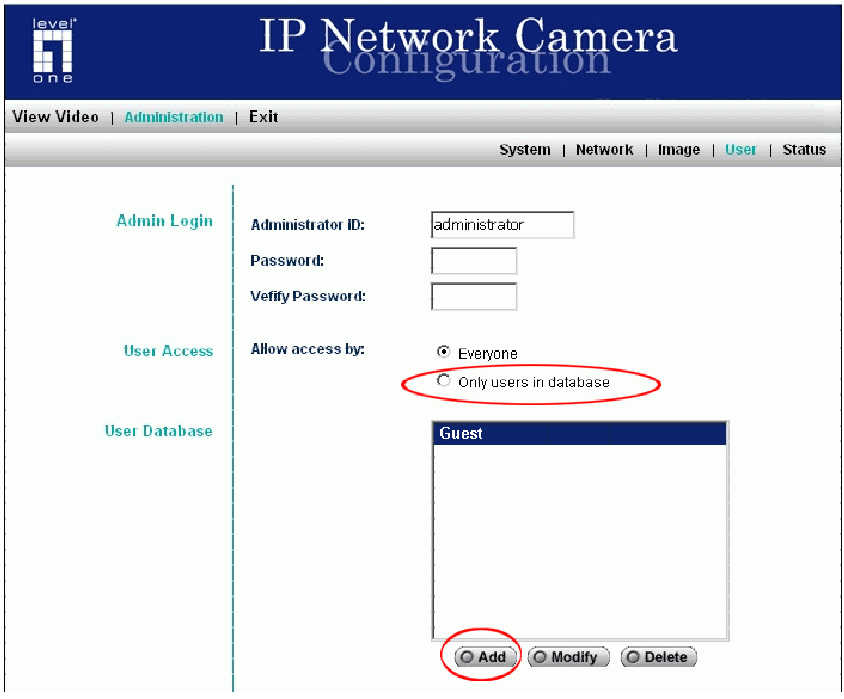

Figure 13: User Screen

4. To add users to the database, click the *Add* button, and enter the name and password for each user.

Operation

- When each user connects, they will be prompted for their username and password. They must enter the name and password defined on the User screen above.
- If using the Windows Viewing/Recording utility, the username and password can be entered into the program, so that users do not need to provide the login data each time.

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 LevelOne IP Network Camera available via the Internet.

LevelOne IP Network Camera Setup

The LevelOne IP Network Camera configuration does NOT have 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 LevelOne IP Network Camera.

Second Port Configuration

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

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

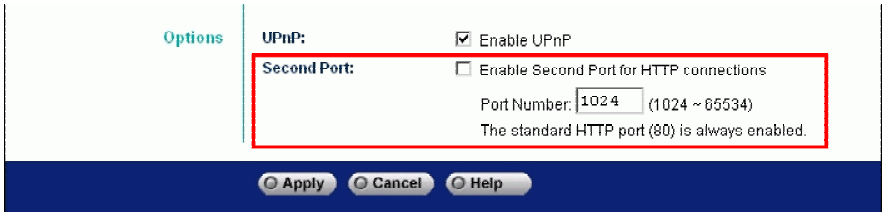

Figure 14: Network Screen

The *Network* screen is part of the Web-based Administration interface. See ***Chapter 4 - Web-based Management*** for further details on using this interface.

Viewers need to know this port number in order to connect and view live Video, so you must inform viewers of the current 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 ***Network*** screen of the LevelOne IP Network Camera.

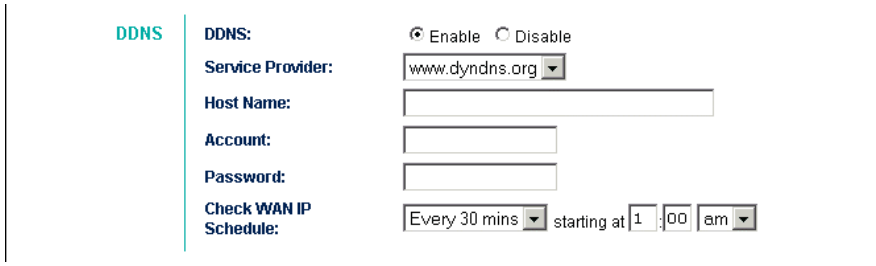

Figure 15: DDNS Settings - Network Screen

3. Operation is then automatic:
   - The LevelOne IP Network Camera will then 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 your LAN using the Domain Name allocated by the DDNS service provider.

Router/Gateway Setup

Your Router or Gateway must be configured to pass incoming TCP (HTTP) connections (from Viewers) to the LevelOne IP Network Camera. The Router/Gateway use the *Port Number* to determine which incoming connections are intended for the LevelOne IP 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 LevelOne IP Network Camera. If necessary, check your Router/Gateway's user manual to check how to perform this configuration.

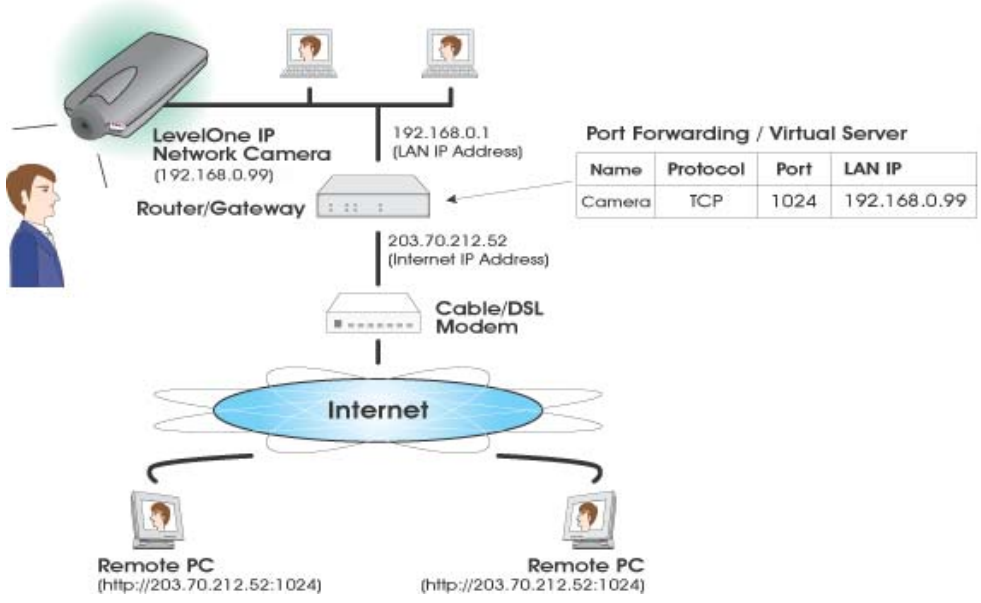

Figure 16: Connecting via the Internet

Note!

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

Viewing via the Internet

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

Using the Windows Viewing/Recording Utility

If using the Windows Viewing/Recording Utility, the details of the LevelOne IP Network Camera must be entered on the *Internet* tab of the *Add Camera* screen.

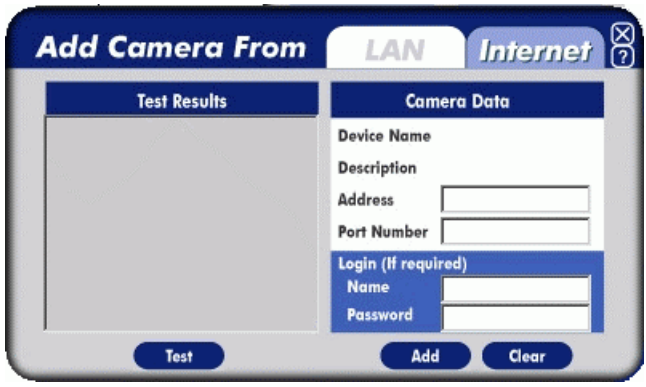

Figure 17: Add Camera from Internet

You can then select the camera in the *Cameras* list on the main screen, and click *View* to establish a connection and view live video.

See ***Chapter 5 - Viewing and Recording*** for full details on using the Windows Viewing/Recording utility.

Using your Web Browser

If using your Web browser, you need to enter EITHER the Internet IP address OR the Domain name, AND the correct port number, of the LevelOne IP Network Camera.

Enter the address of the LevelOne IP Network Camera, 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 "Second Port" number on the LevelOne IP Network Camera is `1024`.

Example - Domain Name:

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

Where the Router/Gateway's Internet Domain name (using DDNS in this example) is `mycamera.dyndns.tv` and the "Second Port" number on the LevelOne IP Network Camera is `1024`.

See ***Chapter 5 -Viewing and Recording*** for further details of viewing Video using either the Windows Viewing/Recording utility or your Web Browser.

Motion Detection/E-mail Alerts

The *Motion Detection* feature will capture a short video and send it to your E-mail address when motion is detected.

The LevelOne IP 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.

To Use Motion Detection/E-mail Alert

1. Using the Web-based interface on the LevelOne IP Network Camera, select the *User* screen.
2. Configure the *Alerts* section shown below.

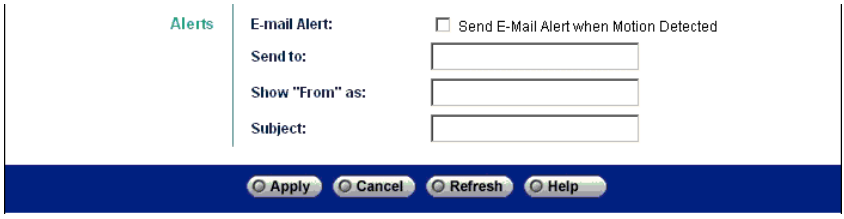

Figure 18: Motion Detection/E-mail Alert

- Check the box *Send E-mail Alert when Motion Detected*.
- Enter the destination E-mail address in the *Send to*: field.
- Enter a valid E-mail address in the *Show "From" as* field. The SMTP (Simple Mail Transport Protocol) Server associated with this E-mail address is used to send the mail.
- Enter a suitable *Subject* for the E-mail
- Save (Apply) your changes.

Chapter 4
Web-based Management

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

Introduction

The LevelOne IP Network Camera can be configured using your Web Browser. The LevelOne IP 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 the previous chapter.

Connecting to LevelOne IP Network Camera

- If you have run the Windows-based setup Wizard, the final screen provided a button *Web UI*. Clicking this button will immediately connect to the LevelOne IP Network Camera, using your Web Browser.
- If using only your Web Browser, use the following procedure to establish a connection from your PC to the LevelOne IP Network Camera:
- Once connected, you can add the LevelOne IP Network Camera to your Browser's *Favorites* or *Bookmarks*.

Connecting using your Web Browser

1. Start your WEB browser.
2. In the *Address* box, enter "HTTP://" and the IP Address of the LevelOne IP Network Camera, as in this example, which uses the LevelOne IP Network Camera's default IP Address:

   ```
   HTTP://192.168.0.99
   ```

3. If the *Administrator ID* and *Password* have been assigned, you will then be prompted for a username and password. Enter the name and password you assigned.

Welcome Screen

When you connect, the following screen will be displayed.

Figure 19: Welcome Screen

The menu options available from this screen are:

- **View Video** - View live Video using your Web Browser.
- **Administration** - Access the Administration menu.
- **Exit** - Terminate the connection to the LevelOne IP Network Camera.

These options are explained in the following sections.

View Video Screen

This screen is displayed when the *View Video* menu option is selected.

Figure 20: View Video Screen

- If using Internet Explorer on Windows, you may see a prompt regarding an "ActiveX control", like the example below.
  You must allow this ActiveX control in order to view the Video. Click "Yes".

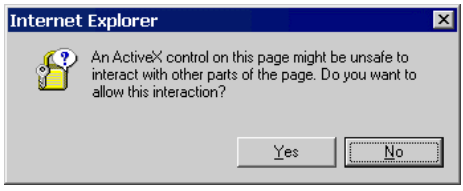

Figure 21 ActiveX Prompt

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

Using the "Connect" Option

The *Connect* feature on this screen allows you to connect to another LevelOne IP Network Camera. To use this feature:

1. Enter the IP address of the other LevelOne IP Network Camera in the *Enter new Camera IP Address* field.
2. Click the *Connect* button
3. A new browser window will open, and connect to the IP address you entered.

Administration Menu

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

The ***Administration*** menu contains the following options:

- **System** - Description, Date & Time
- **Network** - All network and Wireless settings
- **Image** - Adjust the Video image
- **Users** - Administrator login, user database, and Motion Detection/E-mail alerts.
- **Status** - Current Status information.

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.

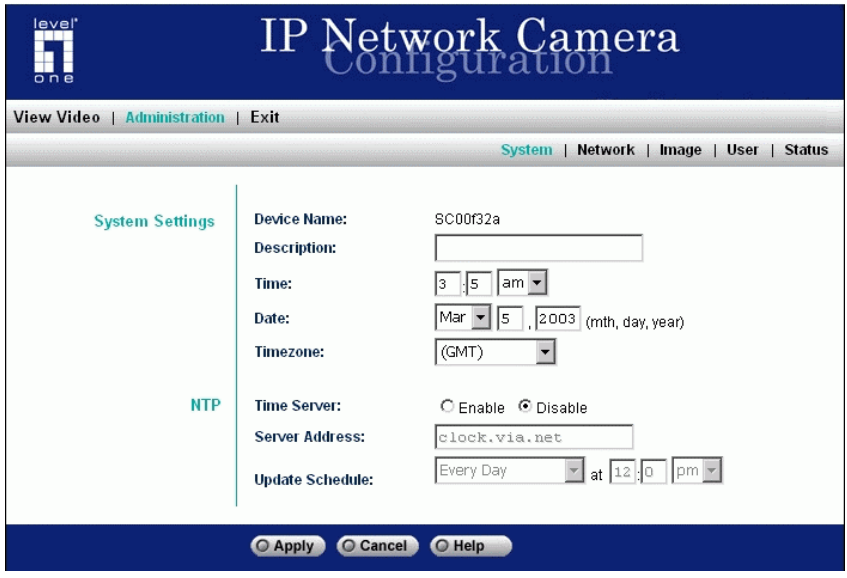

Figure 22: System Screen

Data - System Screen

System Settings	
Device Name	This displays the name for the LevelOne IP Network Camera.
Description	This field is used for entering a description, such as the location of the LevelOne IP Network Camera.
Time	Enter the current time.
Date	Enter the current date.
Timezone	Choose the timezone for your location from the drop-down list.

NTP (Network Time Protocol)	
Time Server	Enable or disable the Time Server feature as required. If Enabled, the LevelOne IP Network Camera will contact a Network Time Server at regular intervals and update its internal timer.
Server Address	Enter the address for the desired NTP server.
Update Schedule	The Schedule determines how often the LevelOne IP Network Camera contacts the NTP Server. Select the desired options.

Network Screen

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

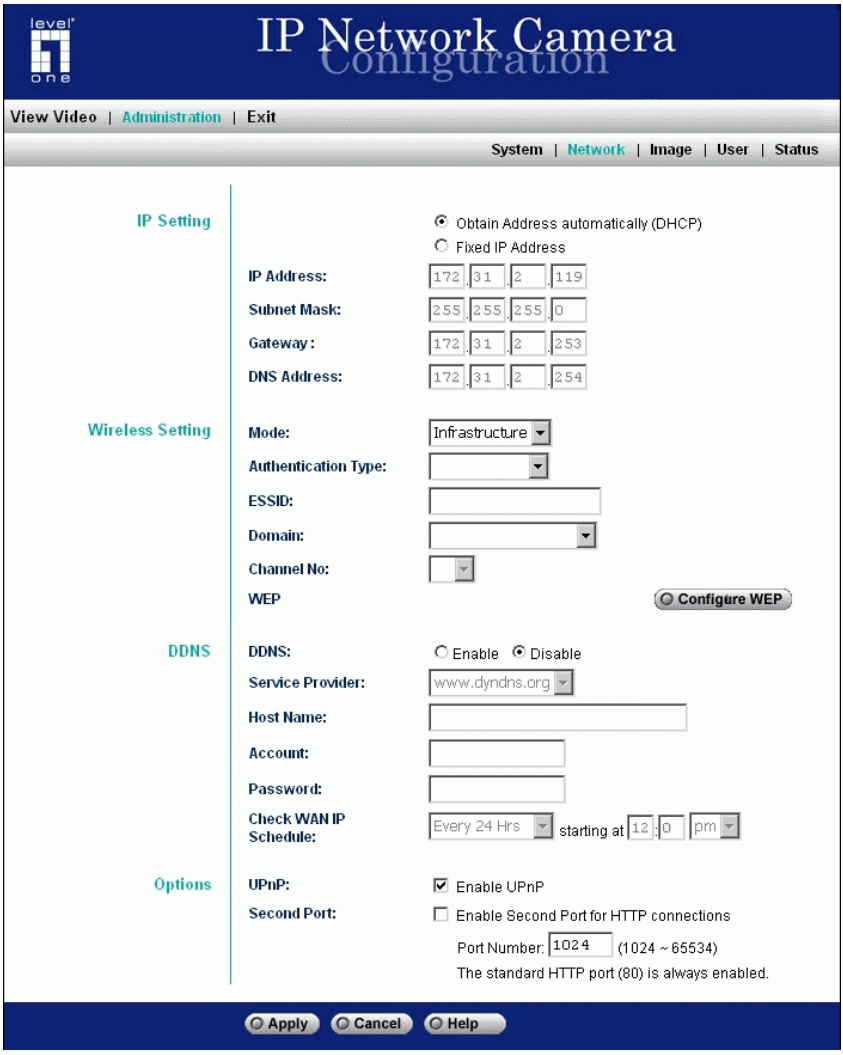

Figure 23: Network Screen

Data - Network Screen

IP Setting	
Obtain Address Automatically	If selected, the LevelOne IP 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. The fields below can then be ignored.
Fixed IP Address	If selected, you must assign the following values to the LevelOne IP Network Camera. • **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. • **Gateway** - Use the same value as PCs on your LAN. • **DNS Address** - Use the same value as PCs on your LAN.
Wireless Setting (WCS-2000 only)	
Mode	The *Connection Mode* determines the type of wireless communication used by the LevelOne IP Network Camera. • If you have an Access Point, select *Infrastructure*. • Otherwise, select *Ad-hoc*.
Authentication Type	Select the appropriate value - *Open System* or *Shared Key*, as used on your LAN. **Note:** In *Infrastructure* mode, either setting will normally work, since most Access Points can use both methods.
ESSID	This must match the value used by other devices on your wireless LAN. **Note! The ESSID is case sensitive.**
Channel No.	• In *Infrastructure* mode, this setting is ignored. The LevelOne IP Network Camera will use the Channel set on the Access Point. • For *Ad-hoc* mode, select the Channel you wish to use on your LevelOne IP 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.
WEP	This shows the current WEP setting. • This must match other Wireless stations on your LAN. • Click the *Configure WEP* button to change the WEP settings if required.
DDNS	
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. See the following section for further details on using DDNS.
Service Provider	Choose a service provider from the list.

Host Name	Enter the host name (Domain Name) allocated to you by the DDNS Server provider.
Account	Enter the login name for the DDNS account.
Password	Enter the password for the DDNS account.
Check WAN IP Schedule	Set the schedule for checking if the Internet IP address has changed. If the IP address has changed, the DDNS Server will be notified.
Options	
UPnP	Enable UPnP support if required. If Enabled, the LevelOne IP Network Camera will broadcast its availability using UPnP. UPnP compatible systems such as Windows XP will then be able to detect the presence of the LevelOne IP Network Camera.
Second Port	Enable this feature if required. If enabled, then HTTP connections (using your Web Browser or Media Player) can use this port number instead of the standard HTTP port 80. • If you already have a Web Server on your LAN, then you should enable the Second Port, and use this port number instead of port 80. • If enabled, enter the desired port number to use for connections to the LevelOne IP Network Camera. The default is 1024.

Using 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, 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 ***Network*** screen above must be correct.
- The LevelOne IP 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 Schedule* determines how often the LevelOne IP 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.

WEP Screen (WCS-2000 only)

This screen is accessed by clicking the *Configure WEP* button on the *Network* screen. An example WEP screen is shown below.

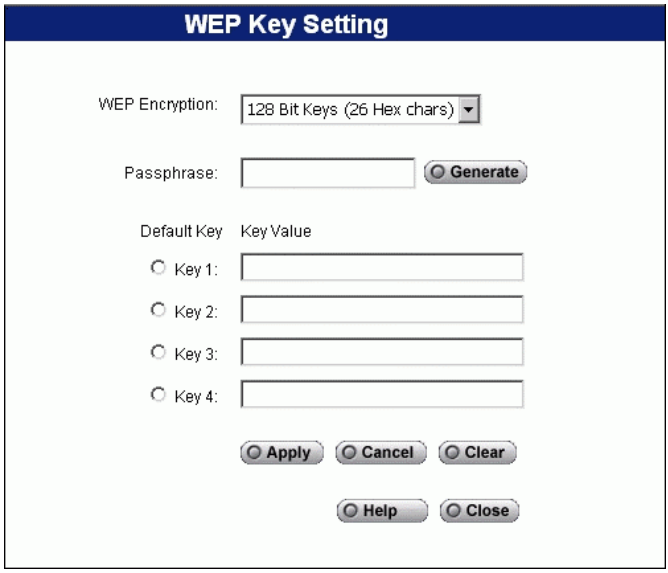

Figure 24: WEP Screen

Data - WEP Screen

WEP Encryption	
WEP Encryption	Select the option used on your Wireless LAN. • **None** - This is the default. If selected, data is NOT encrypted before being transmitted. • **64 Bit Encryption** - If selected, data is encrypted, using the default key, before being transmitted. You must enter a default key. Other Wireless stations must be set to use 64 Bit Encryption, and have the same Key value in the same position in their key table. • **128 Bit Encryption** - If selected, data is encrypted, using the default key, before being transmitted. You must enter a default key. Other Wireless stations must be set to use 128 Bit Encryption, and have the same Key value in the same position in their key table.
Passphrase	The *Passphrase* feature will generate a Key from the phrase you enter, which may be easier than entering keys in Hex (0~9 and A~F). To use the *Passphrase* feature, enter the desired Passphrase in the field provided, and click the *Generate* button.
Default Key	Select a key to be used as the default key.
Key Value	If WEP Encryption is used, you must enter at least one key value, for the *Default Key*. All transmissions are encrypted using the *Default Key*. Other wireless stations must use the same key value in the same position in their key table. (It does not have to be selected as the default key.)

	The other key values are optional, and are used only for decrypting data. This allows you to use different keys for transmitting and receiving, if required. When inputting a key value, follow these rules: • For 64 Bit Encryption, keys must be 10 characters. • For 128 Bit Encryption, keys must be 26 characters. • Keys must be entered in Hex. Hex characters are A ~ F, and 0 ~ 9.

Image Screen

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

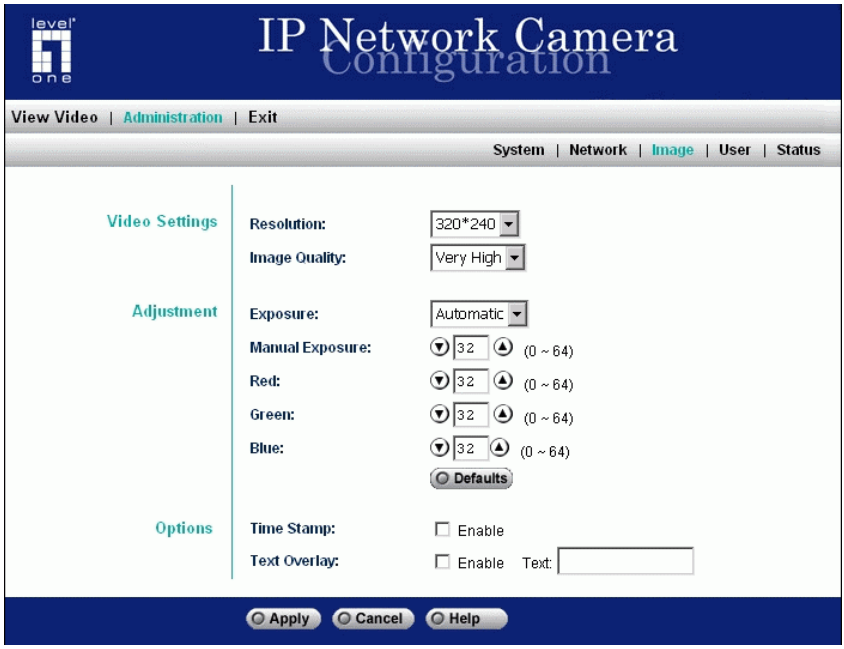

Figure 25: Image Screen

Data - Image Screen

Video Settings	
Resolution	Select the desired video resolution format. A larger size requires more bandwidth.
Image Quality	Select the desired image quality. Higher quality requires more bandwidth.
Adjustment	
Exposure	Select *Automatic* or *Manual* as required.
Manual Exposure	If *Manual Exposure* is selected, this field controls the exposure of the Video image. Adjust it to the desired value. If using *Automatic Exposure*, this field has no effect.
Red, Green, Blue	Adjust these color settings to the preferred values.
Options	
Time Stamp	Enable the check box if you want the time to be displayed on the Video image.
Text Overlay	If you want some text to be displayed on the Video image, enable the check box and enter the desired text. This feature is often used when multiple camera are installed, to identify each camera.

User Screen

This screen is displayed when the *User* option on the *Administration* menu is clicked.

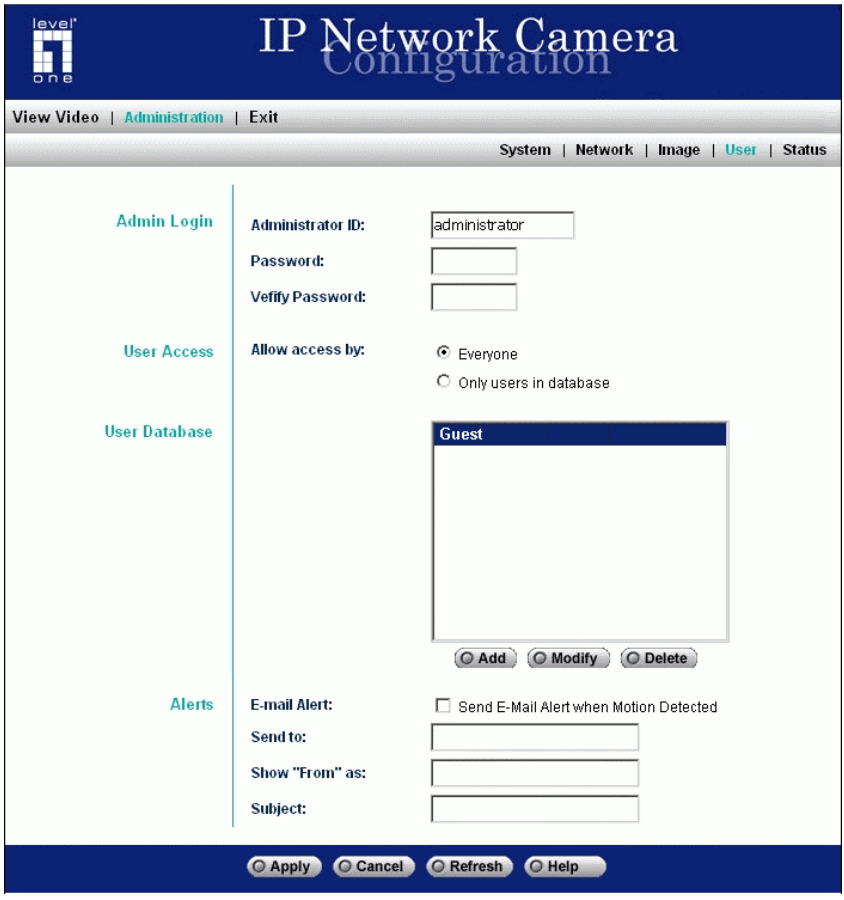

Figure 26: User Screen

Data - User Screen

Admin Login	
Administrator ID	Enter the name for the Administrator login. Spaces, punctuation, and special characters must NOT be used in the name. When you connect to the LevelOne IP Network Camera, you will be prompted for a name and password. Enter this name to login with Administrator rights. Only the Administrator can change the configuration; other users can only view the Video.
Password	The password for the Administrator login above.
Verify Password	Re-enter the password for the Administrator, to ensure it is correct.
User Access	
Allow access by	• **Everyone** - Anyone can view the Video stream. • **Only users in database** - Allow viewing only by people in the user database. If selected, users will be prompted for a User Name and Password when they attempt to view the Video.

User Database	
User List	This lists all users who currently exist. Use the *Add*, *Delete*, and *Modify* buttons to manage this database.
Alerts	
E-Mail Alert	Enable the checkbox if you want to send an E-Mail Alert when motion is detected. **Note:** Motion detection can be triggered by rapid changes in the available lighting, as well as by moving objects. For this reason, it should only be used indoors where the available light is fairly constant.
Send to	Enter the E-Mail address for the receiver of the E-mail alert.
Show "From" as	Enter the E-Mail address to be used as the Sender. This must be a standard E-mail address, because the SMTP (Simple Mail Transport Protocol) Server used to send the mail is derived from this address.
Subject	Enter the desired text to be shown as the "Subject" for the E-Mail.

Add/Modify User Screen

This screen is displayed when the *Add* or *Modify* button on the ***User*** screen is clicked. It is used to enter details of each user.

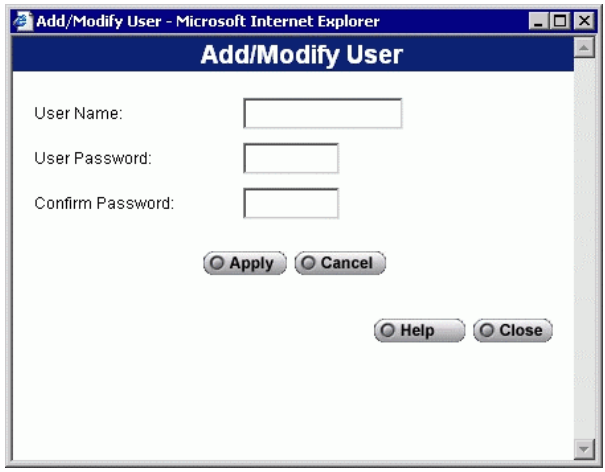

Figure 27: Add/Modify User Screen

Data - Add/Modify User

User Name	Enter the name for the user. Spaces, punctuation, and special characters must NOT be used in the name. Also, names are case-insensitive (case is ignored), so you can NOT use 2 names with the same spelling and different case.
User Password	The password for the user above.
Confirm Password	Re-enter the password, to ensure it is correct.

Status Screen

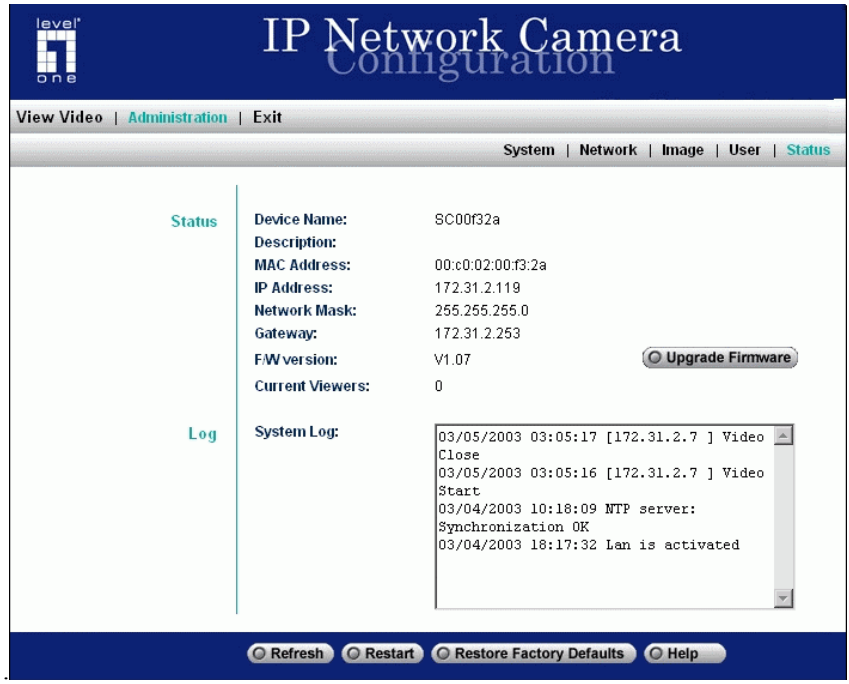

Figure 28: Status Screen

Data - Status Screen

Status	
Device Name	This is the default name for the LevelOne IP Network Camera, and cannot be changed.
Description	This displays the description you have entered.
MAC Address	The MAC address is the low-level network address, also called the *Network Adapter address* or *Physical Address*.
IP Address	The current IP address of the LevelOne IP Network Camera.
Network Mask	The network mask associated with the IP address above.
Gateway	The address of your Router or Gateway.
F/W version	The version of the Firmware (software) currently installed on your LevelOne IP Network Camera.
Current Viewers	The number of users currently viewing the video stream generated by the LevelOne IP Network Camera.
Log	
System Log	The log displays internal operations of the LevelOne IP Network Camera, and is mostly useful for troubleshooting.

Upgrade Firmware Screen

This screen is displayed when you click the *Upgrade Firmware* button on the Status screen.

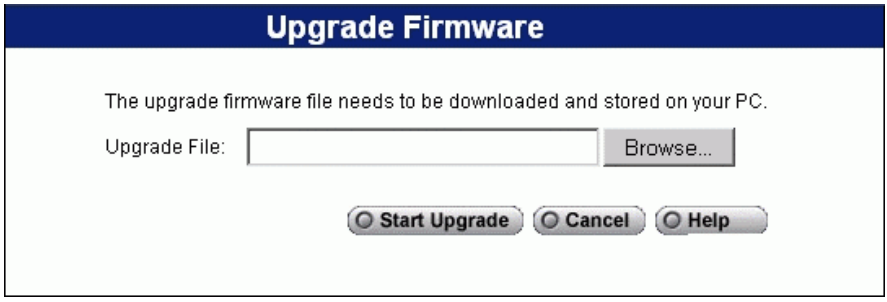

Figure 29: Upgrade Firmware Screen

This screen allows you upgrade the Firmware (software) in your LevelOne IP Network Camera. Before using this screen, your must download the upgrade file to your PC.

Then follow this procedure:

1. Click the *Browse* button, and locate the upgrade file.
2. Select this file, and click OK. The filename will then appear in the *Upgrade File* field.
3. Click the *Start Upgrade* button to transfer the file to the LevelOne IP Network Camera and start the upgrade procedure.

Note:

- The upgrade may take several minutes.
- When the upgrade is completed, the LevelOne IP Network Camera will restart. This will cause any existing connections to be terminated. Any users viewing or recording the video will see this as an error.

Chapter 5
Viewing & Recording

This Chapter describes how to view and record the live video stream generated by the LevelOne IP Network Camera.

Overview

The recommended method to view video is to use the supplied Windows Viewing/Recording utility.

Installation

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

Figure 30: Welcome Screen

2. Click the *Client Utility* button to start the installation of the Viewing/Recording Utility.
3. Follow the prompts to complete the installation.

System Tray Icon

When started, the program will create an icon in the Windows system tray on the taskbar, as shown below.

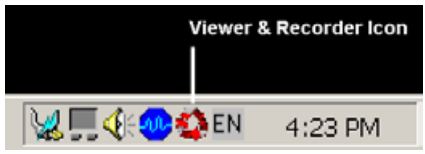

Figure 31: System Tray Icon

This Icon has the following functions:

- **Animation** - If a recording is in progress, this icon will be animated. Otherwise, it is stationary.
- **Hover** - Hovering your mouse over this icon will generate a pop-up informing you of the current status.
- **Double-click** - This will display the main screen, shown below.
- **Right Click** - This provides a menu which allows you to view program details, view the main screen, or terminate the program.

Main Screen

The main screen is displayed when the program first starts up. If you exit the program, you can return to the main screen by double-clicking the system tray icon.

Figure 32: Main Screen

Cameras - Camera List

- The *Camera List* displays all LevelOne IP Network Camera you have defined. If you have not defined any cameras, this list will be empty.
- Click the *Add Camera* button to add a LevelOne IP Network Camera. See the following section for further details.
- Once some cameras are listed, you can select one and then use the *Modify Camera*, *Delete Camera* and *View* buttons.
- To view live video, select a camera and click the *View* button.

Recordings - Current Recordings

This panel lists all recording currently in progress, whether started directly, or by the scheduled recording feature.

The *Stop* button can be used to terminate any recording currently in progress.

Adding Cameras to the Camera List

To add a camera to the *Camera List*, click the *Add Camera* button on the main screen. You will see a screen like the example below.

- The *Cameras on LAN* panel, on the left, displays all LevelOne IP Network Camera found on your LAN. This list can be updated by clicking the *Refresh* button.
- The *Camera Data* panel, on the right, displays the data for the selected camera.

Figure 33: Add Camera from LAN

To add a camera to the *Camera List* on the main screen:

1. Select a camera in the list on the left.
2. Check that the *Camera Data* shown on the right is correct. See below for details.
3. Click the *Add* button. The camera will now appear in the *Camera List* on the main screen.

Camera Data - LAN

Device Name	This is the default name for the LevelOne IP Network Camera, and cannot be changed.
Description	This displays the description entered by the LevelOne IP Network Camera Administrator.
Address	The current IP address of the LevelOne IP Network Camera.

Port Number	This will normally display "80". Only change this if requested to do so the LevelOne IP Network Camera Administrator.
Login	The camera Administrator can require that users provide a username and password before being allowed to view the live video. • If the Administrator has not enabled this option, the *Login* fields can be left blank. • Otherwise, you must enter the username and password allocated to your by Administrator.

Adding Cameras on the Internet

If the LevelOne IP Network Camera you wish to add is not on your LAN, but is available via the Internet, click the *Internet* tab. You will see a screen like the example below.

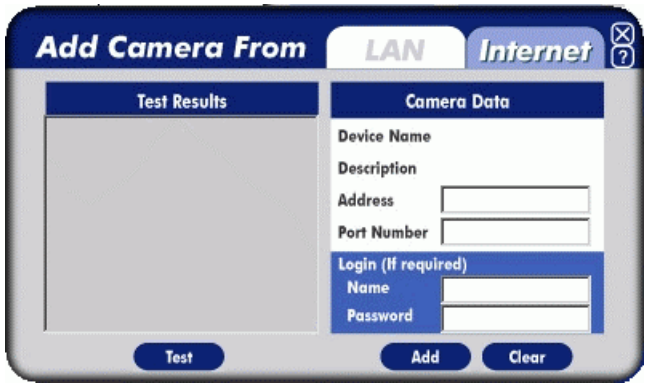

Figure 34: Add Camera from Internet

To add a camera to the *Camera List* on the main screen:

1. Enter the *Camera Data* on the panel on the right. See below for details.
2. Click the *Test* button to check that a connection and login can be performed successfully.
3. Click the *Add* button. The camera will now appear in the *Camera List* on the main screen.

Camera Data - Internet

Device Name	This is the default name for the LevelOne IP Network Camera, and cannot be changed. This field will be displayed automatically once a connection to the LevelOne IP Network Camera has been established.
Description	This displays the description entered by the LevelOne IP Network Camera Administrator. This field will be displayed automatically once a connection to the LevelOne IP Network Camera has been established.
Address	Enter the Domain Name or Internet IP address of the desired LevelOne IP Network Camera.
Port Number	Enter the port number used by the LevelOne IP Network Camera. The LevelOne IP Network Camera Administrator can advise you of the port to use. The default value is 1024.

Login	The camera Administrator can require that users provide a username and password before being allowed to view the live video. • If the Administrator has not enabled this option, the *Login* fields can be left blank. • Otherwise, you must enter the username and password allocated to your by Administrator.

Modifying an Existing Camera

You can change the settings for an existing camera by selecting it in the *Camera* List on the main screen, then clicking the *Modify Camera* button.

You will see a screen like the example below.

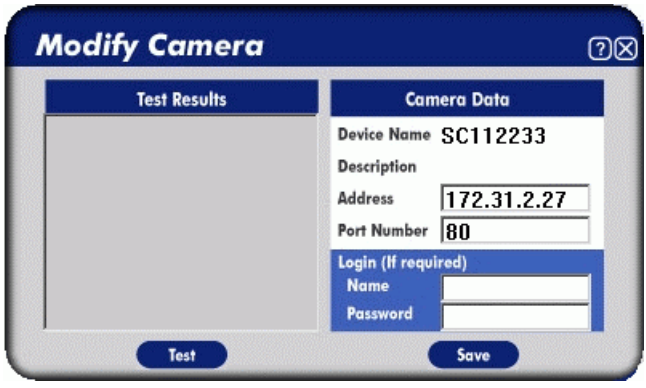

Figure 35: Modify Camera

- Data on this screen is the same as for the *Add Camera* screens.
- You can use the *Test* button to button to check that a connection and login can be performed successfully.

Viewing Live Video

To view live video, select a camera in the *Camera List* on the main screen, and click the *View* button. You will see a screen like the example below.

Figure 36 Viewing Live Video

Controls are provided to stop and start viewing, and to start recording the video stream.

Play

Record. While recording, this button will be red.

Stop

Recording Video

You can record Video while watching, or schedule recordings to occur when you are absent. Recordings are stored in a standard Microsoft ASF file format, and can be played using Microsoft Media Player.

Before doing any recording, you should review the *Recording Preferences* to ensure they are suitable for your PC.

Recording Preferences

To set the Recording Preferences, click the ***Preferences*** button below the ***Recordings*** panel on the main screen. You will see a screen like the example below.

Figure 37: Recording Preferences

If necessary, change these settings to suit your environment.

File Location	This is the Drive and Folder where recorded files will be placed. You need a drive which has large amounts (Gigabytes) of free space. Note that file names are automatically assigned, using the date and time.
Time Limit	This sets the maximum size of a recording which is started by clicking the Record button on the ***View*** screen. If the recording is not stopped manually, it will be terminated after the time period indicated here.

Live Recordings

Recordings in progress are listed in the ***Recordings*** panel of the main screen.

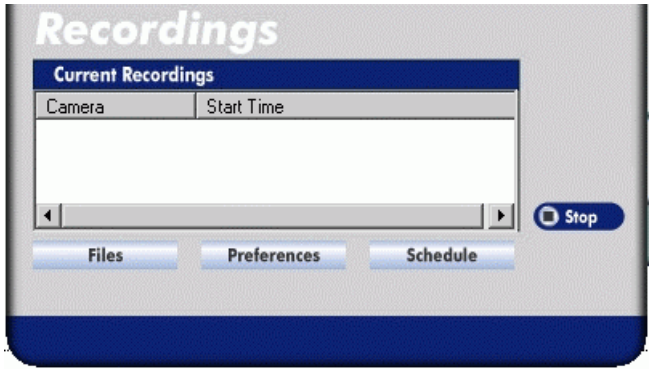

Figure 38: Recording Panel

- To **Stop** a recording in progress, select it and click the *Stop* button.
- To **Start** a Recording, click the Record button on the *View* screen.

Figure 39 Viewing Live Video

 **Record Button**. While recording, this button will be red.

Recorded Files

To view a list of all recorded files, click the ***Files*** button under the ***Recordings*** panel on the main screen.

You will see a screen like the example below.

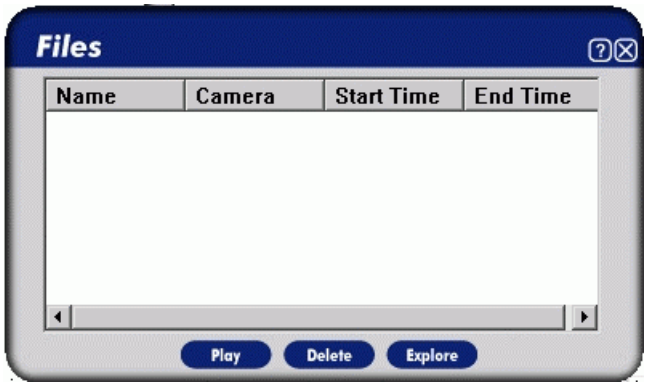

Figure 40: Recorded Files

This list shows all of the recorded files. The following operations are supported:

- **Play** - Play the selected file in Microsoft Media Player.
- **Delete** - Delete the selected file.
- **Explore** - Open the folder containing these files, using Windows Explorer.

Scheduled Recordings

Recordings can be scheduled at any time, for any known LevelOne IP Network Camera. (Of course, your PC must be on at the scheduled time.)

To use this feature, click the ***Schedule*** button under the ***Recordings*** panel on the main screen. You will see a screen like the example below.

Figure 41: Scheduled Recording List

This screen lists all scheduled recordings. For each recording, the following data is shown.

- **Camera** - The camera which will be recorded.
- **Date** - The date the recording will be made. If the recording is repeated (weekly or monthly), this is the date of the next recording.
- **Time** - The time the recording will be made.
- **Type** - Indicates if the recording is *One Time*, *Everyday*, or a particular day of the week.

If a scheduled recording is selected, the *Modify* and *Delete* buttons can be used to edit or delete the selected entry.

Schedule Definition Screen

If the *Add* or *Modify* button is clicked, a screen like the following is displayed. You can then enter or modify the details of this schedule.

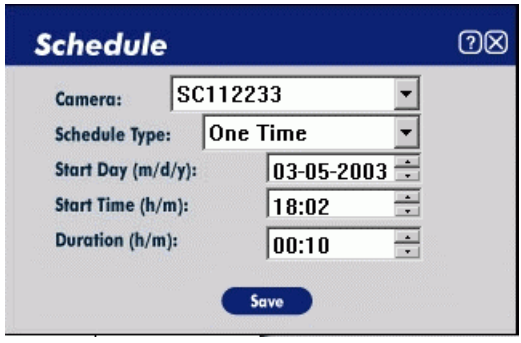

Figure 42: Schedule Definition Screen

Data - Schedule Definition

Camera	Select the camera to be used. If the desired camera is not listed, you must define by using the *Add Camera* button on the main screen.

Schedule Type	Select the desired option: • **One Time** - Only one (1) recording is made, on the specified date, at the specified time. • **Everyday** - The recording is made every day, at the specified time. The *Start Day* indicates when the first recording will be made. • **Every Sunday, Every Monday, …** - The recording is made on the specified day each week. The *Start Day* indicates when the schedule becomes active.
Start Day	Select the desired date. For a single recording, this is the day the recording will be made. For daily (Everyday) recordings, this is the starting date. For weekly recordings, this determines when the schedule becomes active.
Start Time	Select the desired start time.
Duration	Enter or select the desired duration of the recording.

Viewing with your Web Browser

The recommended method to view live video from the LevelOne IP Network Camera is use the Windows utility.

However, you can also use your Web browser if necessary.

Viewing over your LAN

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

1. Start your WEB browser.
2. In the Address box, enter "HTTP://" and the IP Address of the LevelOne IP Network Camera, as in this example, which uses the LevelOne IP Network Camera's default IP Address:

   `HTTP://192.168.0.99`
3. If the Administrator has enabled the user security feature, you will then be prompted for a username and password.
   Enter the name and password assigned to you by the LevelOne IP Network Camera administrator.
4. When you connect, the following screen will be displayed.

Figure 43: Home Screen

5. Click *View Video* to see a screen like the example below.

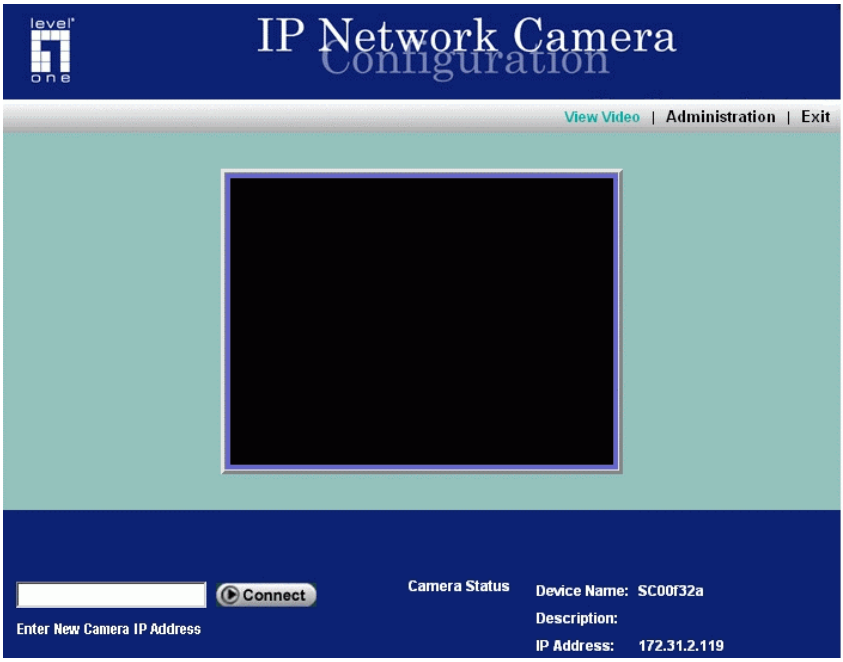

Figure 44: View Video in Browser

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

Viewing via the Internet

If LAN with the LevelOne IP Network Camera is connected to the Internet, and configured correctly, you can connect to the LevelOne IP Network Camera via the Internet.

See *Making Video available from the Internet* in Chapter 3 for details of the required LAN configuration.

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

1. Obtain the Internet address and port number of the LevelOne IP Network Camera from the Administrator.
2. Start your WEB browser.
3. In the Address box, enter the following:

   `HTTP://Internet_Address:port_number`

   Example using IP address:

   `HTTP://203.70.212.52:1024`

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

   Example using Domain Name:

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

   Where the Router/Gateway's Internet Domain name (using DDNS in this example) is `mycamera.dyndns.tv` and the "Second Port" number on the LevelOne IP Network Camera is `1024`.
4. If the Administrator has enabled the user validation feature, you will then be prompted for a username and password.
   Enter the name and password assigned to you by the LevelOne IP Network Camera administrator.
5. When you connect, the following screen will be displayed.

Figure 45: Home Screen

6. Click *View Video* to see a screen like the example below.

Figure 46: View Video in Browser

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

Note:

You need a broadband connection to view video effectively; dial-up connections are NOT recommended.

Chapter 6
Troubleshooting

This chapter covers the most likely problems and their solutions.

Overview

This chapter covers some common problems that may be encountered while using the LevelOne IP Network Camera and some possible solutions to them. If you follow the suggested steps and the LevelOne IP Network Camera still does not function properly, contact your dealer for further advice.

Problems

Problem 1: **I can't connect to the LevelOne IP Network Camera with my Web Browser to configure it.**

Solution 1: It is possible that your PC's IP address is not compatible with the IP address of the LevelOne IP Network Camera.
Use the Windows utility to configure the LevelOne IP Network Camera with a valid IP address.

Problem 2: **The Windows utility doesn't list any LevelOne IP Network Cameras.**

Solution 2: Check the following:

- The LevelOne IP Network Camera is installed, LAN connections are OK, it is powered ON and startup is complete.
- Ensure that your PC and the LevelOne IP Network Camera are on the same network segment. (If you don't have a router, this must be the case.)
- Ensure that your PC has the TCP/IP network protocol loaded. In Windows, this is done by using *Control Panel-Network*. If an entry for TCP/IP -> Network card is not listed, use *Add - Protocol - Microsoft - TCP/IP* to add it.
  You then need to select the new entry (TCP/IP -> Network card), click *Properties*, and configure the *IP Address* tab.
  - If your LAN has a DHCP Server, you can select "Obtain an IP Address automatically".
  - Otherwise, you must select "Specify an IP Address", and enter values for *IP Address*, *Subnet Mask*, and *Gateway*. All devices on your LAN must use compatible values. Remember that each device needs a **unique** IP Address, and the **same** Subnet Mask.

Problem 3 **When I try to connect to the LevelOne IP Network Camera, I get prompted for a user name and password.**

Solution 3 You SHOULD be prompted for a user name and password if trying to access the *Administration* menu.
Enter the *Administrator ID* and *Password* set on the *User* screen.

If you are just trying to view Video, the User Name/Password prompt

indicates that the Administrator has restricted access to specified users. Ask the Administrator for your User Name and Password.

Problem 4 **I can't connect to the LevelOne IP Network Camera using a Wireless connection.**

Solution 4 Check that your PC and the LevelOne IP Network Camera have compatible Wireless settings.

- Mode (Infrastructure or Ad-hoc) must be correct.
- ESSID must match.
- WEP settings must match.
- In Ad-hoc mode, the Channel should match, although this is often not required.

Problem 5 **Video quality may suddenly deteriorate.**

Solution 5 This can happen when an additional viewer connects to the LevelOne IP Network Camera, overloading the camera or the available bandwidth. The image size and quality can be adjusted to cater for the required number of viewers and the available bandwidth.

Problem 6 **The motion detection feature doesn't send me any E-mails.**

Solution 6 It may be that the SMTP (Simple Mail Transport Protocol) server used by the LevelOne IP Network Camera to send the E-mail will not accept mail from the LevelOne IP Network Camera. Try using a different SMTP server. The LevelOne IP Network Camera derives the address of the SMTP server from the E-mail address you enter in the *Show "From" as*: field.

Problem 7 **Using the motion detection feature, I receive E-mails which don't show any moving objects.**

Solution 7 The motion detection feature doesn't actually detect motion. It compares frames to see if they are different. Major differences between frames are assumed to be caused by moving 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. This feature can NOT be used if the camera is outdoors.

Appendix A
Specifications

FCS-1000

Model	FCS-1000 LevelOne IP Network Camera
Dimensions	164 mm (L) * 88 mm (W)* 53.5 mm (H) 6.4 inch (L) * 3.5 inch (W) * 2.1 inch (H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocols:	TCP/IP, DHCP, SMTP, NTP, HTTP
Network Interface:	1 Ethernet10/100BaseT (RJ45) LAN connection
Wireless interface	IEEE 802.11b compatible, WEP security support, roaming support
LEDs	3
Power Adapter	5V DC External

WCS-2000

Model	WCS-2000 LevelOne IP Network Camera
Dimensions	164 mm (L) * 88 mm (W)* 53.5 mm (H) 6.4 inch (L) * 3.5 inch (W) * 2.1 inch (H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocols:	TCP/IP, DHCP, SMTP, NTP, HTTP
Network Interface:	1 Ethernet 10/100BaseT (RJ45) LAN connection 802.11b Wireless Interface
Wireless interface	IEEE 802.11b compatible, WEP security support, roaming support
LEDs	4
Power Adapter	5V DC External
Wireless Interface	802.11b, Infrastrstructure/Ad-hoc mode, WEP support.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CE Marking Warning

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Package source codes	License
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uClinux-2.0.38.1pre7	GPL
busybox-0.61pre	GPL
tinylogin-1.00pre	GPL
inetutils-1.3.2	GPL
thttpd-2.20b-rr	See following
uClibc-0.9.5	LGPL
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Ntp-4.1.0-4.src.rpm	GPL
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Dhcpcd-1.3.20-p10	GPL
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Upnpsdk-1.0.4	GPL
ez-ipupdate-3.0.11b7	GPL

thttpd License

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Author: Noel V Aguilar

Version: 1.4

Filename: cgi-lib.h

Program Library: CGI-LIB

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`http://www.geocities.com/SiliconValley/Vista/6493/`

The web page for the library is:

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Version 2, June 1991

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