



LevelOne

User Manual

FCS-0020

P/T/Z IP Network Camera

WCS-0020

11b/g Wireless P/T/Z IP Network Camera

Ver. 1.1.0-0809

Safety

FCC

This equipment has been tested and found to comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference
- (2) This device must accept any interference received, including interference that may cause undesired operation.

CE

This equipment is in compliance with the requirements of the following regulations: EN 55 022: CLASS B

RoHS

This product is RoHS compliant.



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Chapter 1

Introduction

1

This Chapter provides details of the FCS-0020/WCS-0020's features, components and capabilities.

Overview

The FCS-0020/WCS-0020 has an Integrated Microcomputer and a high quality CMOS digital-Image-Sensor, enabling it to display high quality live streaming video over your wired or 802.11g Wireless LAN and the Internet.

Using enhanced MPEG-4 technologies, the FCS-0020/WCS-0020 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 lower 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, on a variety of software platforms.

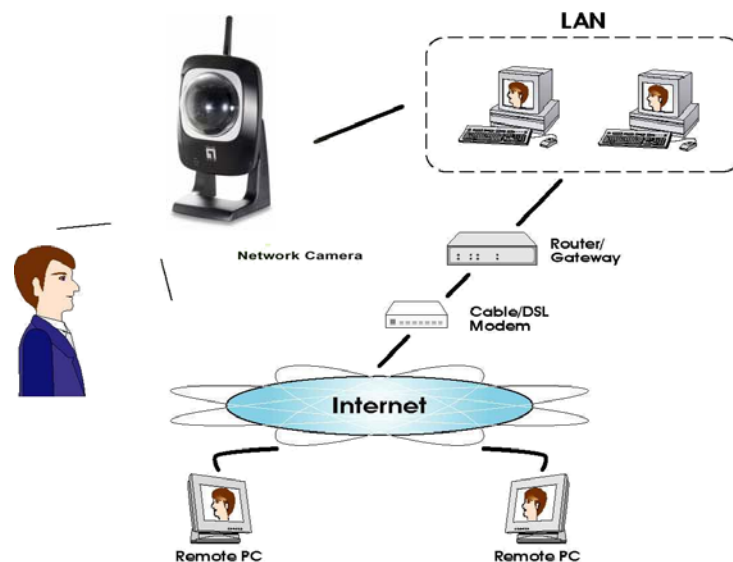


Figure 1: FCS-0020/WCS-0020

Features

- **Standalone Design.** The FCS-0020/WCS-0020 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 FCS-0020/WCS-0020 can support both MPEG4 and MJPEG video for different image compression simultaneously.
- **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 IP CamSecure Lite 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 FCS-0020/WCS-0020 has the features you need.
- **Multi-Protocol Support.** Supporting TCP/IP networking, SMTP (E-mail), HTTP and other Internet related protocols, the FCS-0020/WCS-0020 can be easily integrated into your existing network.
- **Easy Configuration.** A Camera 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 FCS-0020/WCS-0020 via the LAN or Internet.
- **Viewing/Recording Utility.** IP CamSecure Lite version is provided for viewing live video. For periods when you are absent, or for scheduled recording. Users can monitor up to 32 channels simultaneously.
- **Motion Detection.** This feature can detect motion in the field of view. The FCS-0020/WCS-0020 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 FCS-0020/WCS-0020 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 speaker.

Internet Features

- **User-definable HTTP port number.** This allows Internet Gateways to use "port mapping" so the FCS-0020/WCS-0020 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 FCS-0020/WCS-0020. 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 FCS-0020/WCS-0020.
- **NTP (Network-Time-Protocol) Support.** NTP allows the FCS-0020/WCS-0020 to calibrate its internal clock from an Internet Time-Server. This ensures that the time stamp on Video from the FCS-0020/WCS-0020 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 in the user database.
- **Password-Protected Configuration.** Configuration data can be password protected, so that it only be changed by the FCS-0020/WCS-0020 Administrator.

Wireless Features

- **Standards Compliant.** The WCS-0020 complies with the IEEE802.11g (DSSS) specifications for Wireless LANs.
- **Supports both 802.11b and 802.11g Standards.** The WCS-0020 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 WCS-0020 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.** The WCS-0020 supports WPS (Wi-Fi Protected Setup) PBC (Push Button Configuration) mode and Pin Code mode (numeric code). It makes the security feature easier to configure.

Physical Details - FCS-0020/WCS-0020

Front - FCS-0020/WCS-0020

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 - Camera is not capturing video. Blinking - Camera is capturing video
Network LED (Green)	Off - Wireless or LAN is not connected or camera is not sending/receiving data. Blinking - Data is being transmitted or received via the LAN or Wireless connection.

Rear - FCS-0020/WCS-0020

Antenna	Attach the supplied antenna here. The antenna is adjustable; best results are usually obtained with the antenna positioned vertically. (WCS-0020 only)
Power	Connect the supplied 5V power adapter here. Do not use other power adapters; doing so may damage the camera.
Speaker	If required, an external speaker can be plugged in here.
MIC IN	If required, an external microphone can be attached here. Attaching a microphone here will disable the built-in microphone on the front. Microphones designed to be used with PCs are usually compatible with this microphone input.
LAN	Use a standard LAN cable to connect your FCS-0020/WCS-0020 to a 10/100BaseT hub or switch. Note: <ul style="list-style-type: none">• 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.
Reset	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. <ul style="list-style-type: none">• WPS PBC Mode. For the Wireless IP Camera with

MPEG4/MJPEG, when pressed and released (less than 3 seconds), WCS-0020 will be in the WPS PBC mode (Auto link mode).

- **WPS Pin Code Mode.** For the Wireless IP Camera with MPEG4/MJPEG, when pressed and held for over 3 seconds, WCS-0020 will be in the WPS Pin Code mode.
- **Reset to manufacturer default value and reboot.** When pressed and held over 10 seconds, the settings of FCS-0020/WCS-0020 will be set to their default values.

Note:

After this procedure is completed, the *Power* LED 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. FCS-0020/WCS-0020
2. Power adapter
3. Antenna (WCS-0020 only)
4. Camera Stand
5. CD Manual/Utility
6. Quick Installation Guide

Chapter 2

Basic Setup

2

This Chapter provides details of installing and configuring the FCS-0020/WCS-0020.

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, other Wireless devices must be compliant with the IEEE802.11b or IEEE802.11g specifications. All Wireless stations must use compatible settings.



The default Wireless settings are:

Mode: Infrastructure

SSID: ANY

Wireless Security: Disabled

Domain: USA

Channel No.: Auto

Installation - FCS-0020/WCS-0020

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 FCS-0020/WCS-0020 to a 10/100BaseT hub or switch, using a standard LAN cable.



Note!

For the WCS-0020, 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.

The first time you connect to the camera, you should connect the LAN cable and configure the WCS-0020 with appropriate settings. Then you can unplug the LAN cable and power off the camera. The WCS-0020 will be in wireless interface when you power on the camera again.

3. Power Up

Connect the supplied 5V power adapter to the FCS-0020/WCS-0020 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 - FCS-0020/WCS-0020* in Chapter 1.

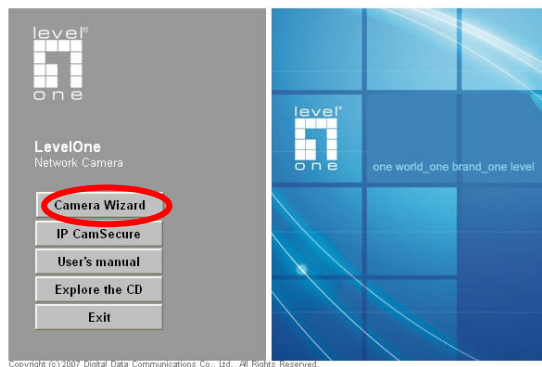
Setup using the Windows Wizard


Initial setup should be performed using the supplied Windows-based setup Wizard. This program can locate the FCS-0020/WCS-0020 even if its IP address is invalid for your network. You can then configure the FCS-0020/WCS-0020 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, select your CD-ROM drive manually to open the set up page.
2. Select **“Camera Wizard”**->**“Setup Camera”** to initiate the installation.




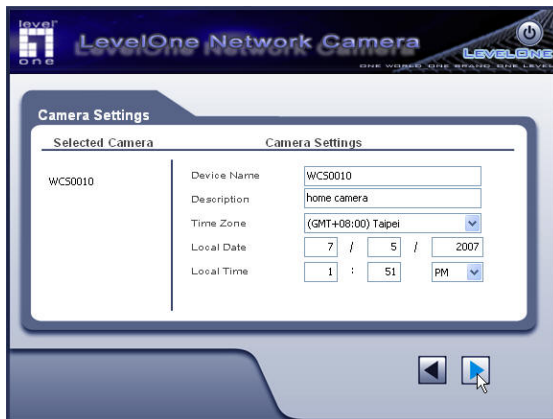
3. The screen will list all the Network Cameras on the LAN. Select the desired camera from the list on the left. The settings for the camera will be displayed on the right, then click .



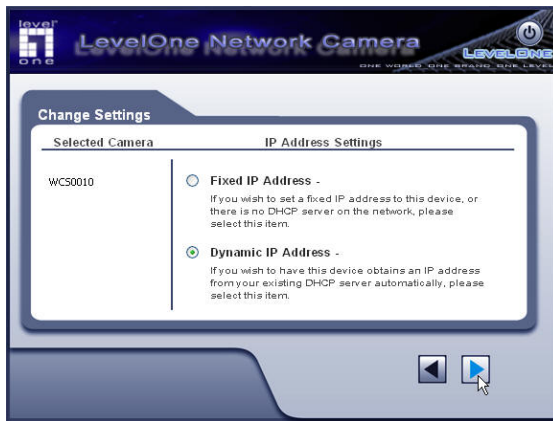
- You will be prompted to enter the *Administrator Name* and *Administrator Password*, as shown below. Enter “**administrator**” for the name, and leave the password blank. Otherwise, enter the *Administrator Name* and *Administrator Password* set on the **Maintenance** screen.



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




- On the following **IP Address Settings** screen, shown below, choose *Fixed IP Address* or *Dynamic IP Address*. Click  to continue.





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

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

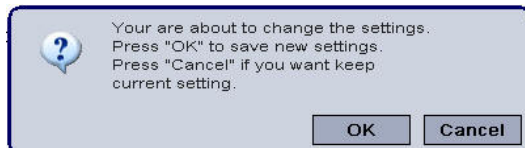
- Enter an unused **IP Address** from within the address range used on your LAN.
- The **Subnet Mask** and **Default Gateway** fields must match the values used by PCs on your LAN.
- The **Primary DNS** address is required in order to use the E-mail alert or Dynamic DNS features. Enter the DNS (Domain 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  to continue.

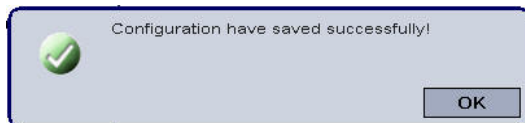
- The screen displays all details of the Network Camera. Click  if the settings are correct, or click  to modify any incorrect values.



- Click **OK** to save the new settings. Or click **Cancel** to cancel your changes,



- The configurations have been saved. Click **OK** to quit the program.



Chapter 3

Viewing Live Video

3

This Chapter provides basic information about viewing live video.

Overview

After finishing setup via the Camera Wizard, all LAN users can view live video using a variety of browsers on Windows/MAC/Linux.

For MPEG4 video: Internet Explorer in Windows.

For MJPEG video: Internet Explorer in MAC, Firefox, Mozilla, Netscape in MAC and Linux.

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 IP CamSecure. Refer to the user's manual in the software *CD* 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.
- To make Live Video from the camera available via the Internet, your Internet Gateway or Router must be configured correctly.

Requirements

To view the live video stream generated by the FCS-0020/WCS-0020, you need to meet the following requirements:

- Windows 98/98SE, Windows 2000, Windows XP/Vista.
- Internet Explorer 6 or later.

Connecting to a Camera on your LAN

To establish a connection from your PC to the FCS-0020/WCS-0020:

1. Use the Camera Wizard to get the IP address of the FCS-0020/WCS-0020.
2. Start Internet Explorer.
3. In the Address box, enter "HTTP://" and the IP Address of the FCS-0020/WCS-0020.
4. When you connect, the following screen will be displayed.

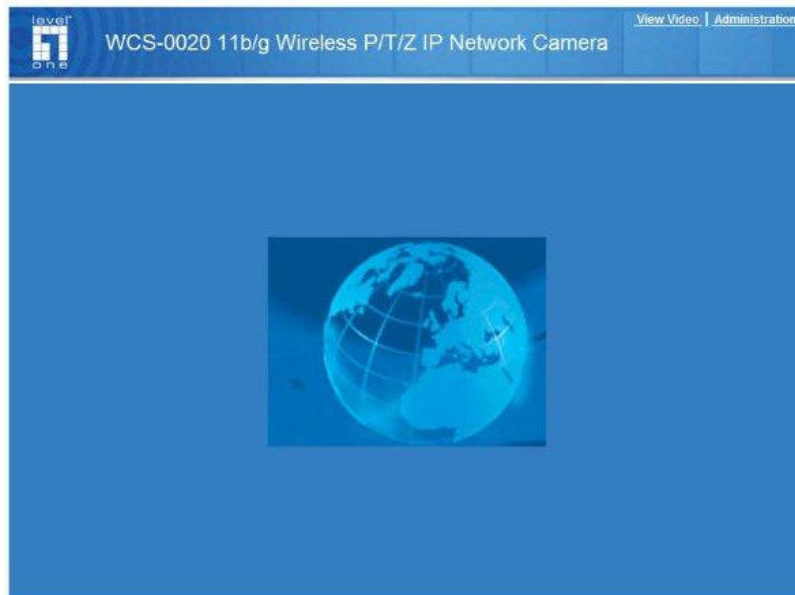


Figure 2: Home Screen

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 FCS-0020/WCS-0020 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 3: 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 FCS-0020/WCS-0020 via the Internet:

9. 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.

10. Start Internet Explorer.

11. 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.

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

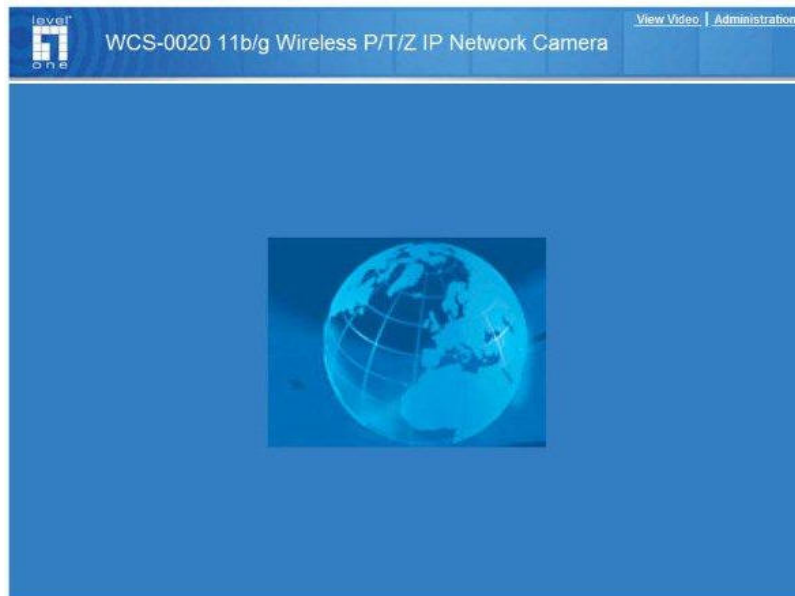


Figure 4: Home Screen

13. Click *View Video*.
14. 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 FCS-0020/WCS-0020 administrator.
15. 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 5: ActiveX OCX Prompt

16. 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 6: 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.

General Options

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



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.



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.



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



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



Preset Points. Select the desired Preset points.



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

Chapter 4

Advanced Viewing Setup



This Chapter provides information about the optional settings and features for viewing video via the FCS-0020/WCS-0020. 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 FCS-0020/WCS-0020 Administrator can adjust the Video image.

To Adjust the Video Image:

1. Connect to the Web-based interface of the FCS-0020/WCS-0020. (See **Chapter 5 - Web-based Management** for details.)
2. Select *Administration*, then *Video & Audio*. You will see a screen like the example below.

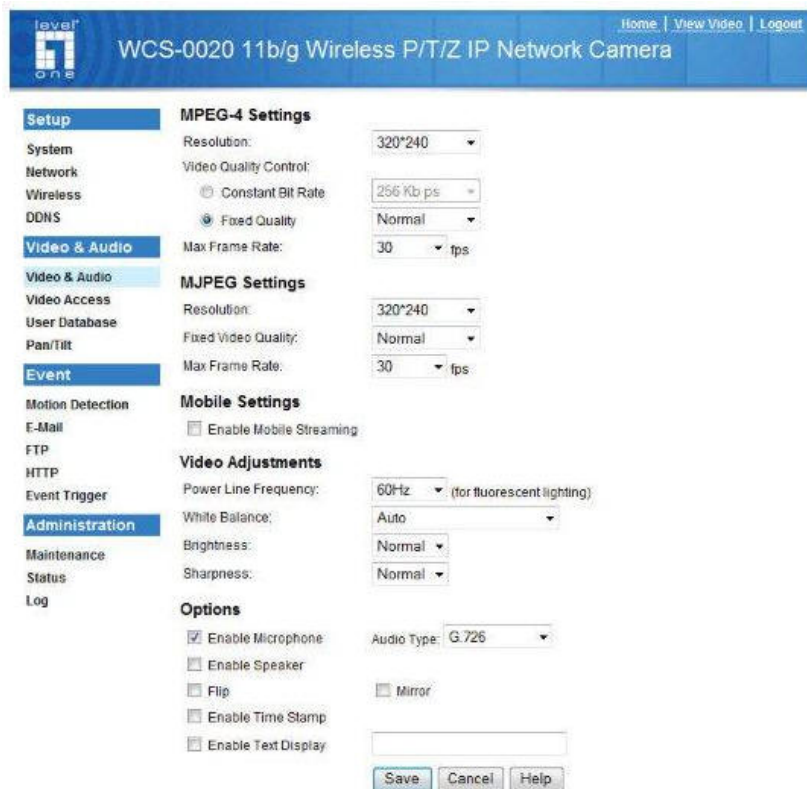


Figure 7: Video & Audio Screen

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 1.2 Mbps. • 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 Unlimited, which allows you to specify the desired frame rate.</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 Unlimited , which allows you to specify the desired frame rate.
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.
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.
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.

Controlling User Access to the Video Stream

By default, anyone can connect to the FCS-0020/WCS-0020 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 FCS-0020/WCS-0020. (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 IP CamSecure Lit. However, viewing video is still possible by logging in as the Administrator.

The screenshot displays the web interface for the WCS-0020 11b/g Wireless P/T/Z IP Network Camera. The page title is "WCS-0020 11b/g Wireless P/T/Z IP Network Camera" and includes navigation links for "Home", "View Video", and "Logout". A left sidebar menu lists various configuration categories: Setup, System, Network, Wireless, DDNS, Video & Audio (with sub-items Video & Audio, Video Access, User Database, Pan/Tilt), Event, Motion Detection, E-Mail, FTP, HTTP, Event Trigger, Administration (with sub-items Maintenance, Status, Log), and Log. The main content area is titled "Video Access" and contains the following settings:

- User Access: Enable Security Checking
- Video Access: Enable Scheduled Video Access
- Access Schedule: A large empty rectangular box for defining access schedules, with a "Delete" button below it.
- Add New Schedule: A section for creating a new schedule with the following fields:
 - Day: A dropdown menu currently set to "Every day".
 - Start Time: Two dropdown menus for hours and minutes, both set to "00", with "(hh:mm)" to the right.
 - End Time: Two dropdown menus for hours and minutes, both set to "00", with "(hh:mm)" to the right.
 - Buttons: "Add" and "Clear".
- Bottom navigation: "Save", "Cancel", and "Help" buttons.

Figure 8: 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 FCS-0020/WCS-0020 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 FCS-0020/WCS-0020. The Router/Gateway uses the *Port Number* to determine which incoming connections are intended for the FCS-0020/WCS-0020.

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 FCS-0020/WCS-0020. If necessary, check the user manual for your Router/Gateway for further details.

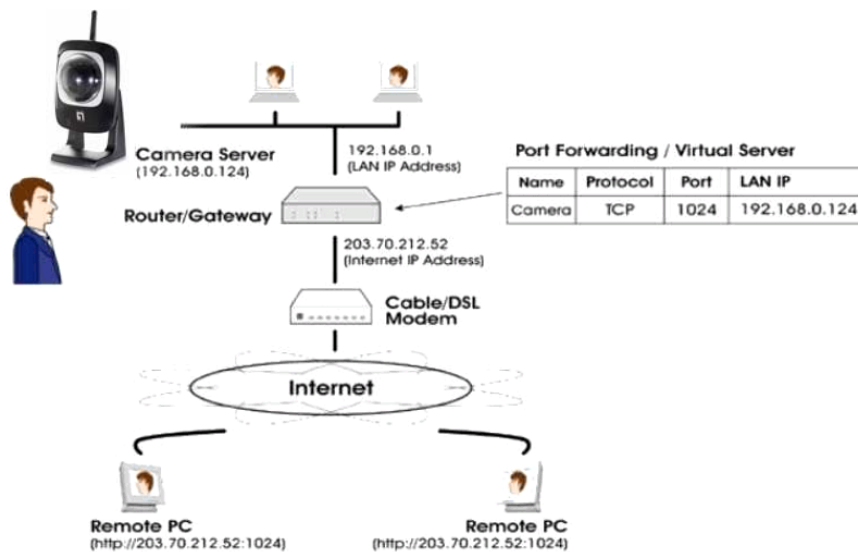


Figure 9: Connecting via the Internet



The "Port" for the *Port Forwarding / Virtual Server* entry above is the "Secondary Port" number specified on the *Network* screen of the FCS-0020/WCS-0020.

FCS-0020/WCS-0020 Setup

The FCS-0020/WCS-0020 configuration does NOT have been 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 FCS-0020/WCS-0020.

HTTP Port Configuration

Normally, HTTP (Web) connections use port 80. Since the FCS-0020/WCS-0020 uses HTTP, but port 80 is likely to be used by a Web Server, you can use a different port for the FCS-0020/WCS-0020. 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 FCS-0020/WCS-0020's **Network** screen, as shown below.

The screenshot shows the 'Network' configuration page for the WCS-0020 camera. The 'Secondary Port' is set to 1024. Other settings include RTSP Port (554), RTP Data Port (5000), and various multicast addresses and ports. The 'Enable HTTP Secondary Port' checkbox is checked.

Figure 10: 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 FCS-0020/WCS-0020.



Figure 11: DDNS Screen

3. Operation is then automatic:
 - The FCS-0020/WCS-0020 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.

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 FCS-0020/WCS-0020 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 FCS-0020/WCS-0020 is 1024.

Motion Detection Alerts

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

The FCS-0020/WCS-0020 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 Alerts

Using the Web-based interface on the FCS-0020/WCS-0020, select the *Motion Detection* screen, then configure this screen as described below.



Figure 12: 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

Web-based Management

5

This Chapter provides Setup details of the FCS-0020/WCS-0020's Web-based Interface. This Chapter is for the Camera Administrator only.

Introduction

The FCS-0020/WCS-0020 can be configured using your Web Browser. The FCS-0020/WCS-0020 must have an IP address which is compatible with your PC.

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

Connecting to FCS-0020/WCS-0020

- If using only your Web Browser, use the following procedure to establish a connection from your PC to the FCS-0020/WCS-0020:
- Once connected, you can add the FCS-0020/WCS-0020 to your Browser's *Favorites* or *Bookmarks*.

Connecting using your Web Browser

1. Use the Camera Wizard to get the IP address of the FCS-0020/WCS-0020.
2. Start your WEB browser.
3. In the *Address* box, enter "HTTP://" and the IP Address of the FCS-0020/WCS-0020.
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.

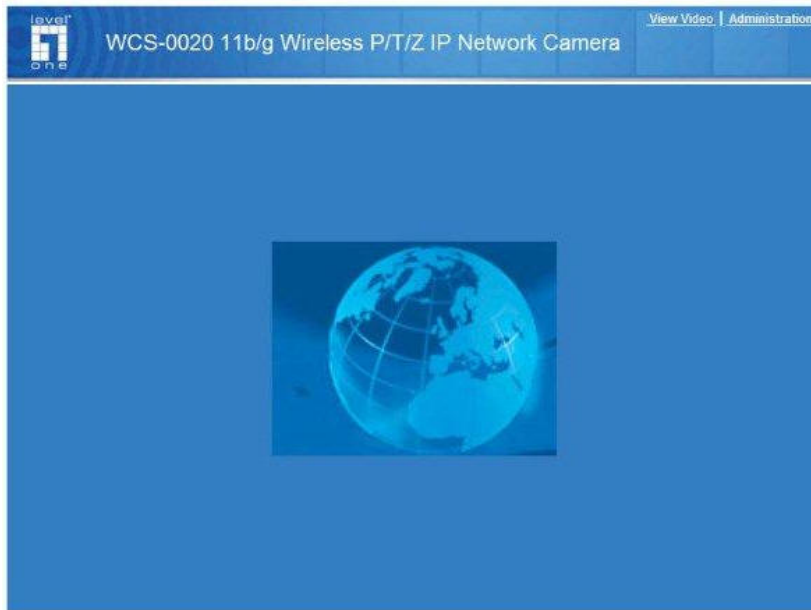


Figure 13: Welcome Screen

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 FCS-0020/WCS-0020.

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

Setup

- System
- Network
- Wireless
- DDNS

Video & Audio

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

Event

- Motion Detection
- E-Mail
- FTP
- HTTP
- 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 camera. The left sidebar has a menu with 'Administration' selected. The main content area is divided into sections: 'System Settings' (Device ID: DDC601071, Camera Name: WCS0020601071, Description: empty), 'Date & Time' (Date Format: MM/DD/YYYY, Current Date & Time: 03/04/2008 18:50:15, Time Zone: (GMT-08:00) Pacific Time (US & Canada); Tijuana, Adjust for daylight saving: unchecked), 'Network Time Protocol' (Network Time Protocol: checked, NTP Server Address: clock.via.net, Update: Every Day at 00:00 (hh:mm)), and 'LED Operation' (checked). Buttons for Save, Cancel, and Help are at the bottom.

Figure 14: System Screen

Data - System Screen

System Settings	
Device ID	This displays the name for the FCS-0020/WCS-0020.
Camera Name	Enter the desired name for the FCS-0020/WCS-0020.
Description	This field is used for entering a description, such as the location of the FCS-0020/WCS-0020.
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

Current Date & Time	<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.
Time Zone	<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>
Network Time Protocol	<p>Enable or disable the Time Server feature as required.</p> <p>If Enabled, the FCS-0020/WCS-0020 will contact a Network Time Server at regular intervals and update its internal timer.</p>
NTP Server Address	<p>Enter the address for the desired NTP server.</p>
Update	<p>The Schedule determines how often the FCS-0020/WCS-0020 contacts the NTP Server.</p> <p>Select the desired options.</p>
LED Operation	<p>Enable this if you want to use this function.</p>

Network Screen

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

The screenshot shows the 'Network' configuration page for a camera. The left sidebar contains menu items: Setup, System, Network, Wireless, DDNS, Video & Audio, Video Access, User Database, Pan/Tilt, Event, Motion Detection, E-Mail, FTP, HTTP, Event Trigger, Administration, Maintenance, Status, and Log. The main content area is divided into sections: IP Address, DNS Server Address, Secondary Port, RTP/RTSP, Multicast RTP/RTSP, UPnP, and QoS. Each section has radio buttons or checkboxes to select options and input fields for values. At the bottom, there are 'Save', 'Cancel', and 'Help' buttons.

Figure 15: Network Screen

Data - Network Screen

Network	
Obtain an IP Address Automatically	If selected, the FCS-0020/WCS-0020 will obtain its IP address and related information from a DHCP Server. Only select this option if your LAN has a DHCP Server.
Use the following IP Address	If selected, you must assign the following data to the FCS-0020/WCS-0020. <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.
Obtain DNS server address automatically	If selected, the FCS-0020/WCS-0020 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> .
Use the following DNS server address	Primary DNS server - Use the same value as PCs on your LAN. Normally, your ISP will provide this address. Secondary DNS server - This is optional. If entered, this DNS will be used if the Primary DNS does not respond.

Secondary Port	<p>This sets the port number for HTTP (Web) connections to the Camera, whether for administration or viewing video.</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>
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.

Wireless Screen (WCS-0020 Only)

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

Figure 16: Wireless Screen

Data - Wireless Screen

Wireless Network	
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 WCS-0020. <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. 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 WCS-0020 will use the Channel set on the Access Point. • For <i>Ad-hoc</i> mode, select the Channel you wish to use on your WCS-0020. 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. • 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>Normally this can be left at the default value of "Automatic." If that fails, 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 Key" 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 FCS-0020/WCS-0020 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 FCS-0020/WCS-0020 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 17: 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>

Video & Audio Screen

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

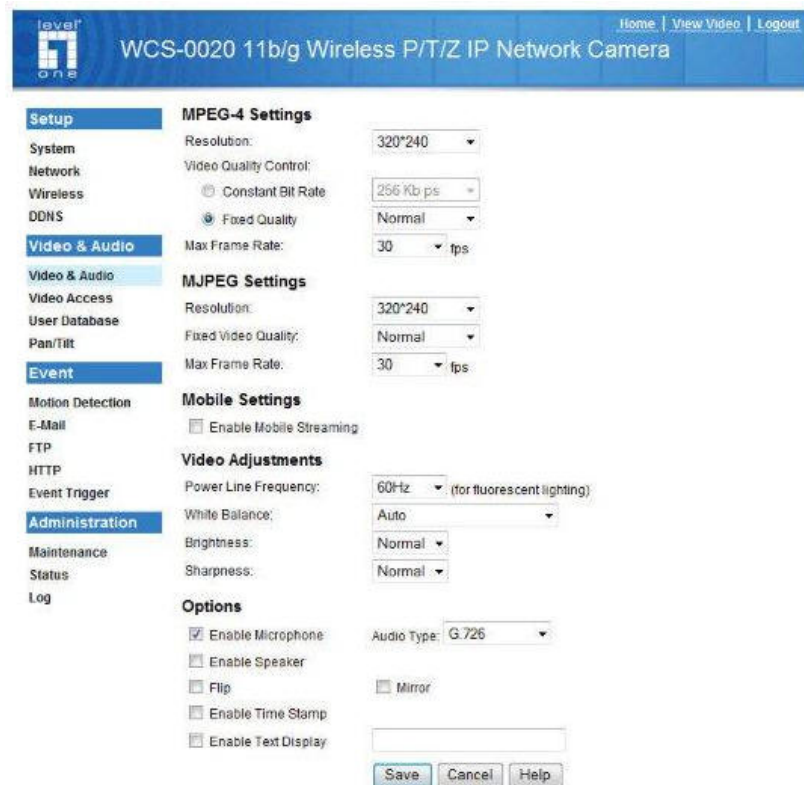


Figure 18: Video & Audio Screen

Data - Video & Audion 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 1.2 Mbps. 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 value for bandwidth is Unlimited, which allows you to specify the desired frame rate.</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 values for bandwidth is Unlimited , which allows you to specify the desired frame rate.
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.
Video Adjustments	
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.
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.

Video Access Screen

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



Figure 19: Video Access Screen

Data - Video Access Screen

User Access	
Enable Security Checking	<ul style="list-style-type: none"> If disabled - No login required, users do not have to provide a username and password when they connect to the camera to view video. If enabled - Require login, users will be prompted for a username and password when they connect to the camera to view video. The camera administrator must use the "User Database" menu option to create the desired users.
Video Access	
Enable Scheduled Video Access	<ul style="list-style-type: none"> If enabled - Camera is available during the scheduled periods, and unavailable at other times. If this option is selected, you need to define a schedule. If no schedule is defined, this option is always disabled. If disabled – The option will remain disabled until you enable it. <p>Note that regardless of which setting is chosen, the Administrator can ALWAYS access the camera and view live video.</p>

Access Schedule	
Scheduled Periods	This displays all periods you have entered into the database. If you have not entered any periods, this list will be empty.
Delete	Use the Delete button to delete the selected item in the list.
Add Period	
Day	Choose the desired option for the period.
Start Time	Enter the start time using a 24 hr clock.
End Time	Enter the end time using a 24 hr clock.
Add	Click this button to add a new period.

User Database Screen

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

Figure 20: User Database Screen

Data - User Database Screen

Existing Users	
User List	This displays all users you have entered into the User database. If you have not entered any users, this list will be empty.
Edit, Delete, Delete All	Use these buttons to manage the user database.
User Properties	
User Name	Enter the name for the user here. <ul style="list-style-type: none"> Spaces, punctuation, and special characters must NOT be used in the name. The name is case insensitive (case is ignored), so you can not have 2 names which differ only by case.
User Password	The password for this user.
Confirm Password	Re-enter the password for the user, to ensure it is correct.
Add Button	Click this button to add a new user, using the data shown on screen.

Clear Button	Use this button to clear the input fields, ready to add a new user.
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Pan/Tilt Screen

This screen is displayed when the *Pan/Tilt* option on the *Video & Audio* menu is clicked.

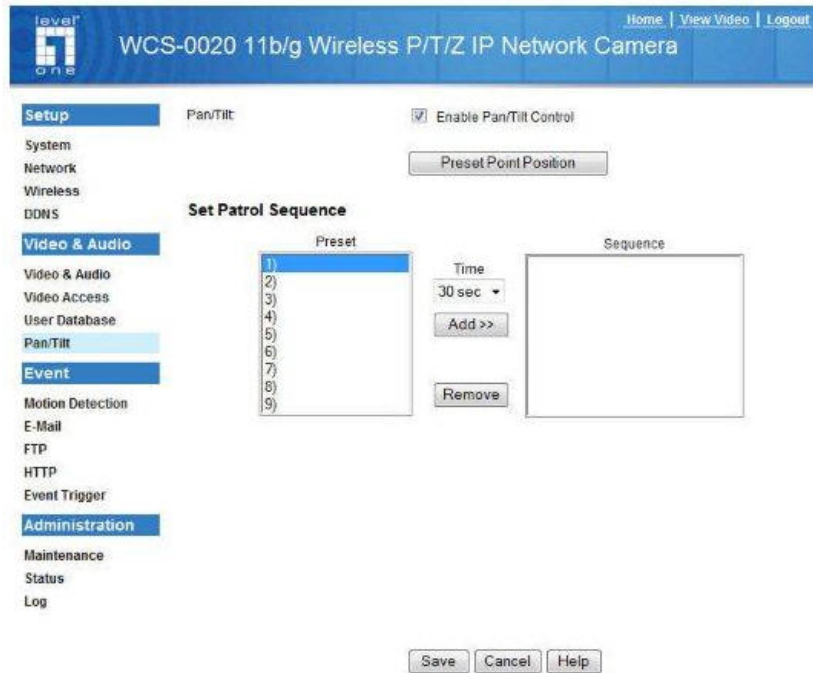


Figure 21: Pan/Tilt Screen

Data - Pan/Tilt Screen

Pan/Tilt	
Enable Pan/Tilt Control	Enable to select the desired option to control who one can use the camera's Pan/Tilt function.
Preset Point Position	Click this button to define the preset point position.

Set Patrol Sequence	
Set Patrol Sequence	<p>This feature determines how the camera will move when it is set to "Rotate". You can set a number of Preset Positions; the camera will go to the first position, then move through the list of present positions until it is finished. The camera will stop at the last position in the list.</p> <p>To create the Preset Sequence, select the desired Preset Position in the left column, and click the "Add >>" button. Repeat until the desired sequence is complete. Note that you can add the same Preset Position more than once; this can be used to make the camera stay longer at one position.</p> <p>To delete a position from the Sequence, select the desired position and click the "Remove" button.</p>
Time	<p>This determines how long the camera will stay at each position while executing the sequence. Set this to the desired value.</p>

Set Preset Position Screen

This screen is displayed when the *Preset Point Positions* button on the **Pan/Tilt** screen is clicked.

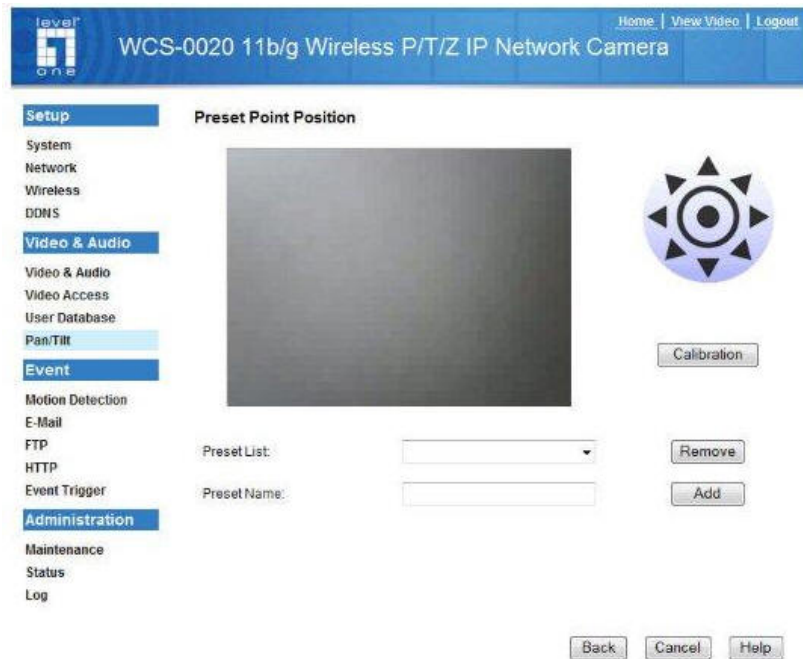


Figure 22: Preset Point Position Screen

Data - Preset Point Positions

Set Position	Set the desired position through adjusting the control panel.
Calibration	Click this button to reset the calibration of Pan/Tilt area.
Preset List	Select the desired Preset. The screen will update with the current data for the selected Preset Position.
Preset Name	Enter a suitable name for the Preset Position. If no name is entered, the preset will have a number only.

Motion Detection Screen

This screen is displayed when the *Motion Detection* option on the *Event* menu is clicked.

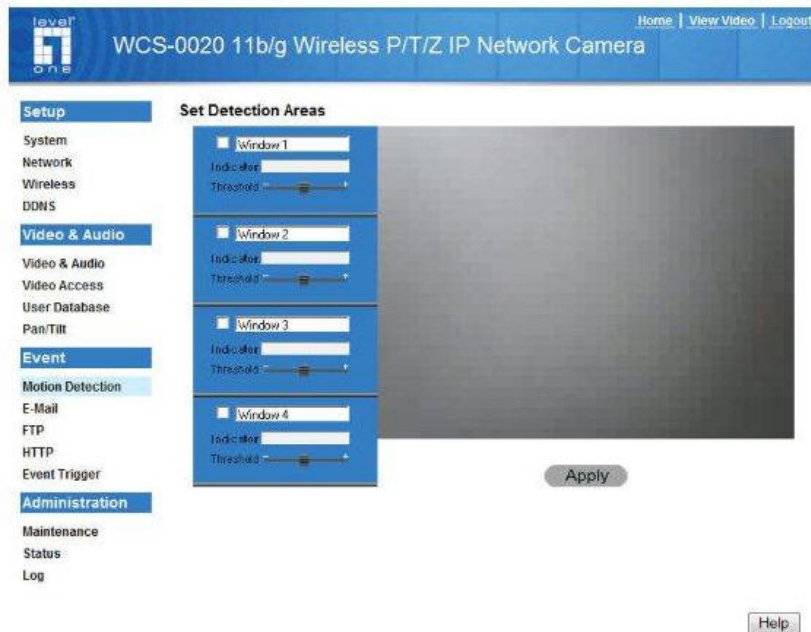


Figure 23: Motion Detection Screen

Data - Motion Detection Screen

Motion Detection	
Set Detection Areas	You can set the full screen or areas of the video image to be examined. Note: Motion detection can be triggered by rapid changes in lighting condition, as well as by moving objects. For this reason, it should only be used indoors.
Threshold	Adjust the threshold of detection for each area.

E-Mail Screen

This screen is displayed when the *E-Mail* option on the *Event* menu is clicked.

Figure 24: E-Mail Screen

Data - E-Mail Screen

Primary/Secondary SMTP Server	
SMTP Server Address	Enter the address of the SMTP (Simple Mail Transport Protocol) Server to be used to send E-Mail.
Authentication	Select the desired Authentication type for the SMTP Server.
SMTP Login name	Enter your login name for the SMTP Server.
SMTP Password	Enter your password for the SMTP Server.
POP server name	Enter the name for the POP Server.
Show "From" as	Enter the E-Mail address to be shown in the "From" field when the E-Mail is received.
Secondary SMTP	Check the box to upload to the Secondary SMTP if the camera can not connect to the primary SMTP.

E-Mail Setup	
E-Mail Address	Enter at least one (1) E-Mail address; the 2nd and 3rd addresses are optional. The E-Mail alert will be sent to the E-Mail address or addresses specified here.
Subject	Enter the desired text to be shown as the "Subject" for the E-Mail when it is received. Subject can not exceed 48 alphanumeric characters.

FTP Screen

This screen is displayed when the *FTP* option on the *Event* menu is clicked.

The screenshot shows the 'FTP' configuration screen for a Level One WCS-0020 camera. The interface includes a navigation menu on the left with categories like Setup, Video & Audio, Event, and Administration. The 'Event' menu is currently selected, and the 'FTP' option is highlighted. The main content area is divided into 'Primary FTP' and 'Secondary FTP' sections. Each section has input fields for 'FTP Server', 'Port' (set to 21), 'Login Name', 'Password', and 'File Path Name'. There are also checkboxes for 'Enable Passive Mode' and 'Secondary FTP (enable this if the camera can not connect to the primary FTP)'. At the bottom, there are 'Save', 'Cancel', and 'Help' buttons.

Figure 25: FTP Screen

Data - FTP Screen

Primary/Secondary FTP	
FTP Server	Enter the address of the FTP Server.
Port	Enter the Port of the FTP Server to be connected.
Login name	Enter your login name for the FTP Server.
Password	Enter your password for the FTP Server.
Enable Passive Mode	Check the box to enable the Passive mode feature of the FTP.
File Path Name	Enter the file path/name of the FTP.
Secondary FTP	Check the box to upload to the Secondary FTP if the camera can not connect to the primary FTP.

HTTP Screen

This screen is displayed when the *HTTP* option on the *Event* menu is clicked.

The screenshot shows the configuration interface for the camera's HTTP notification feature. The left sidebar lists various setup categories: Setup, System, Network, Wireless, DDNS, Video & Audio, Event, and Administration. The 'Event' category is expanded, and 'HTTP' is selected. The main content area is titled 'HTTP Notification' and includes a checked 'Enable' checkbox, a text input for 'URL', an optional 'Proxy Server Name' field, a 'Port Number' field set to 80, and a 'Method' dropdown menu currently set to 'POST'. At the bottom of the form are three buttons: 'Save', 'Cancel', and 'Help'.

Figure 26: HTTP Screen

Data - HTTP Screen

HTTP Notification	
Enable	Enable this checkbox to use the HTTP Notification.
URL	Enter the URL of your HTTP notification server.
Proxy Server Name	Specify the proxy server name in the provided field if the camera needs to pass through a Proxy Server to do the HTTP notification.
Port Number	Enter the port number for the proxy server.
Method	Select the desired method of form data encoding. <ul style="list-style-type: none"> • Get - It should be used if and only if the form processing is independent, which typically means a pure query form. Generally it is advisable to do so. • Post - If there are problems related to long URLs and non-ASCII character repertoires, which can make it necessary to use "POST" even for independent processing.

Event Trigger Screen

This screen is displayed when the *Event Trigger* option on the *Event* menu is clicked.

The screenshot shows the 'Event Trigger' configuration page for a WCS-0020 camera. The left sidebar contains a navigation menu with categories: Setup, Video & Audio, Event, and Administration. The 'Event' category is selected, showing sub-options like Motion Detection, E-Mail, FTP, and HTTP. The main content area is titled 'Event Trigger' and includes a 'New Schedule' section with dropdowns for 'Effective Time Frame' (set to 'Every day'), 'Start Time' (00:00), and 'End Time' (00:00). Below this are 'Add' and 'Clear' buttons. The 'Trigger Event' section has a 'Motion Detection' checkbox, radio buttons for 'Pan/Tilt Configuration' (selected: 'Disable Motion Detection if camera is in incorrect position'), an 'Interval' dropdown (set to 2), and checkboxes for 'Action(s)' (E-Mail, FTP, HTTP). At the bottom are 'Save', 'Cancel', and 'Help' buttons.

Figure 27: Event Trigger Screen

Data - Event Trigger Screen

Event Schedule	
Schedule List	<p>The Event Schedule shows all of the event types currently configured in the FCS-0020/WCS-0020, along with various information about their configuration, as listed below:</p> <ul style="list-style-type: none"> • Name - the descriptive event name set by the user. • Effective Time Frame - shows when the event at a set time will be triggered. • Trigger by - shows what kind trigger activate the event. • Action - shows what kind of the actions will be issued when the event been triggered
New Schedule	
Effective Time Frame	Choose the desired option for the period.
Start Time	Choose the desired start time using a 24 hr clock.
End Time	Choose the desired end time using a 24 hr clock.
Trigger Event	
Motion Detection	If enabled, movement in a motion detection window can be used to trigger events.

Pan/Tilt Configuration	This option is only available if your camera is fitted with a Pan/Tilt control. If available, select the desired option to resolve conflict between the Pan/Tilt and Motion Detection features.
Interval	Select the desired option for the events interval. (* "0" = No Delay)
Actions	<ul style="list-style-type: none"> • E-Mail - If checked, an E-Mail (with "Attachment") will be delivered to the SMTP server. (SMTP Server must be configured on the E-Mail page.) • FTP - If checked, an FTP upload will be activated to the FTP server. (FTP servers must be configured on the FTP page.) • HTTP - If checked, an Instant Messaging (IM) will be delivered to the Jabber server. (Jabber server must be configured on the Instant Messaging page.)
Attachment Type	<ul style="list-style-type: none"> • JPEG Image: Frame Rate - Select the desired capture rate for the JPEG image(s) here. Pre/Post Capture - Select the desired length. The snapshot(s) of the JPEG image depends on this setting, and also the file size and degree of compression. • Video: Video Format - Select the desired type for the video file. Pre/Post Capture - Select the desired length. The size of the file depends on this setting, and also the Video size and degree of compression.

Maintenance Screen

Figure 28: Maintenance Screen

Data - Maintenance Screen

Administrator Login	
Administrator ID	Enter the name for the Administrator here. Spaces, punctuation, and special characters must NOT be used in the name.
Administrator Password	The password for the Administrator.
Verify Password	Re-enter the password for the Administrator, to ensure it is correct.
Firmware Upgrade	
Upgrade File	Click the "Browse" button and browse to the location on your PC where you stored the Firmware file. Select this file.
Start	Click this button to start the Firmware. When the upgrade is finished, the FCS-0020/WCS-0020 will restart, and this management connection will be unavailable during the restart.
Clear File Name	This does NOT stop the Upgrade process if it has started. It only clears the input for the "Upgrade File" field.

Backup & Restore	
Backup Configuration File	Click <i>Backup</i> button to save the current configuration information to a text file.
Restore Configuration File	Click <i>Restore</i> button to reinitialize the camera to load the new updated software. Do this after loading the upgrade file.
Clear File Name	This does NOT stop the Restore process if it has started. It only clears the input for the "Restore Configuration File" field.
Restore Factory Defaults	Click <i>Defaults</i> button to reloads all default settings on the camera.
Restart Camera	Click <i>Restart</i> button to restarts the camera.

Status Screen

Figure 29: Status Screen

Data - Status Screen

System	
Device Name	This shows the name of the FCS-0020/WCS-0020.
Description	This shows the description of the FCS-0020/WCS-0020, such as location.
F/W version	The version of the current firmware installed.
Network	
MAC Address	The current IP address of the FCS-0020/WCS-0020.
IP Address	The IP Address of the FCS-0020/WCS-0020.
Network Mask	The network mask associated with the IP address above.
Gateway	The IP Address of the remote Gateway associated with the IP Address above.
Wireless	
WSC PIN Code	It displays the current WSC PIN code.
Network Type	This shows the Network Type currently in use (Ad-hoc or Infrastructure).

SSID	This displays the wireless SSID.
Channel	This shows the wireless channel currently used.
Security	The current security setting for Wireless connections.
Signal Strength	This shows the strength of the signal.
MPEG-4/MJPEG	
Resolution	The image size of the video stream.
Video Quality	This displays the image quality of the video stream.
Frame Rate	This displays the frame rate of the video stream.
Buttons	
Refresh	Update the log and any other data on screen.

Log Screen

This screen displays a log of system activity.

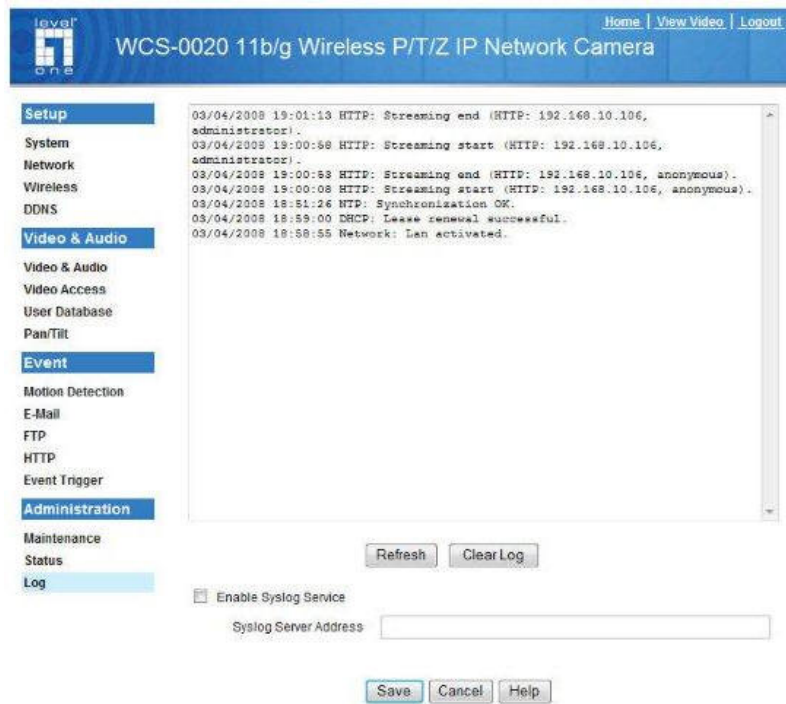


Figure 30: Log Screen

Data - Log Screen

Log	
System Log	This is a log of system activity.
Enable Syslog Service	Check the box to enable the System Log Server feature.
Syslog Server Address	Enter the address of the Syslog Server.
Refresh Button	Click this to update the data shown on screen.
Clear Log	Click this button to restart the log.

Chapter 6

Troubleshooting

6

This chapter covers the most likely problems and their solutions.

Overview

This chapter covers some common problems that may be encountered while using the FCS-0020/WCS-0020 and some possible solutions to them. If you follow the suggested steps and the FCS-0020/WCS-0020 still does not function properly, contact your dealer for further advice.

Problems

Problem 1: I can't connect to the FCS-0020/WCS-0020 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 FCS-0020/WCS-0020. Use the Camera Wizard to configure the FCS-0020/WCS-0020 with a valid IP address.

Problem 2: The Camera Wizard doesn't list any FCS-0020/WCS-0020s.

Solution 2: Check the following:

- The FCS-0020/WCS-0020 is installed, LAN connections are OK, it is powered ON and startup is complete.
- Ensure that your PC and the FCS-0020/WCS-0020 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 FCS-0020/WCS-0020, 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 *Maintenance* 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 WCS-0020 using a Wireless connection.**

Solution 4 1) If a LAN cable is connected to the LAN port, the Wireless interface is disabled. Only one interface can be active.

2) Check that your PC and the FCS-0020/WCS-0020 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 FCS-0020/WCS-0020, 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 camera to send the E-Mail will not accept mail. (This is to prevent spam being sent from the server.) Try using a different SMTP server, or contact your ISP to see if SMTP access is being blocked.

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.

Problem 8 **The image is blurry.**

Solution 8 Try cleaning the lens, or adjusting the *Video Quality Control* setting on the **Video & Audio** screen. Video created with the lower settings will contain less detail; this is the trade-off for using less bandwidth.

Appendix A

Specifications



FCS-0020/WCS-0020

Model	FCS-0020/WCS-0020
Dimensions	90mm (W) * 35mm (H) * 90mm (D)
Operating Temperature	0° C to 40° C
Storage Temperature	0° C to 40° C
Network Protocols:	TCP/IP, DHCP, SMTP, NTP, HTTP, FTP, NTP, RTP, RTSP, UPnP (Discovery only)
Network Interface:	1 Ethernet 10/100BaseT (RJ45) LAN connection
Wireless interface	IEEE 802.11b/802.11g compatible, Infrastructure/Ad-hoc mode, WEP/WPA Personal/WPA2 Personal security support, roaming support
LEDs	3
Power Adapter	5V DC External
Lens	4.57mm @F2.0 Fixed Focus lens (cell phone size) in socket type

Regulatory Approvals

FCC Statement

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 Approvals

The FCS-0020/WCS-0020 and the Ethernet FCS-0020/WCS-0020 meet the guidelines of the European Union and comply with the 99/5/EEC and RTTE 99/5EG directives, including the following standards:

- EN60950
- EN300 328-2
- EN301 489-1
- EN301 489-17

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
boot loader	GPL
ARM-Linux 2.4.19	GPL
ARM-Linux-gcc 3.3.4 library	LGPL
Busy-box	GPL
cron	Public domain (BSD & Lineo http://www.lineo.com/)
thttpd-2.25b	Public domain (http://www.acme.com/software/thttpd/)
ntp-4.1.71	Public domain (http://www.ntp.org/)
ez-ipupdate-3.0.11b7	GPL
iptables-1.3.4	GPL
stunnel	GPL
wireless_tools.26	GPL
wpa_supplicant	GPL
dhcpcd-1.3.22	GPL
DM9102 lan driver	GPL
libupnp-1.2.1	BSD

thttpd.c - tiny/turbo/throttling HTTP server

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For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a

derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

- a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)
- b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
- d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
- e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

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Appendix B

Streaming Video/Audio Solution



Overview

Streaming video is a sequence of "moving images" that are sent in compressed form over the Internet and displayed by the viewer as they arrive. With streaming, a Web user does not have to wait to download a large file before seeing the video or hearing the sound. Instead, the media is sent in a continuous stream and is played as it arrives.

Streaming Video/Audio through Internet Camera

To snapshot a JPEG image from the Internet Camera with specified resolution and quality:

[http://<ip>/img/snapshot.cgi?\[size=<value>\]&quality=<value>](http://<ip>/img/snapshot.cgi?[size=<value>]&quality=<value>)

Size = 1 (160*120)

2 (320*240)

3 (640*480)

Quality = 5 (Very low)

4 (Low)

3 (Normal)

2 (High)

1 (Very high)

To stream M-JPEG video from the Internet Camera (M-JPEG mode only)

<http://<ip>/img/mjpeg.htm>

To stream video through the RTP/RTSP protocol from Internet Camera (MPEG-4 mode only)

<rtsp://<ip>/img/media.sav>

Note: Users need to specify the desired protocol in the players.

To snapshot a JPEG image (160*120, very low quality) through a mobile phone:

<http://<ip>/img/mobile.cgi>