



LevelOne

User Manual

FCS-1091

Day/Night PoE IP Network Camera

WCS-1090

11b/g Wireless Day/Night IP Network Camera

Ver. 1.0.0-0711

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.



Table of Contents

CHAPTER 1 INTRODUCTION.....	1
Overview	1
Physical Details - FCS-1091/WCS-1090.....	4
Package Contents	6
CHAPTER 2 BASIC SETUP	7
System Requirements.....	7
Installation - FCS-1091/WCS-1090.....	8
Setup using the Windows Wizard	9
CHAPTER 3 VIEWING LIVE VIDEO	12
Overview	12
Requirements.....	12
Connecting to a Camera on your LAN.....	12
Connecting to a Camera via the Internet.....	14
Viewing Live Video	16
Setting the Focus.....	17
CHAPTER 4 ADVANCED VIEWING SETUP.....	18
Introduction	18
Adjusting the Video Image	18
Controlling User Access to the Video Stream	22
Making Video available from the Internet.....	23
Viewing Live Video via the Internet	26
Motion Detection Alerts.....	27
CHAPTER 5 WEB-BASED MANAGEMENT.....	29
Introduction	29
Connecting to FCS-1091/WCS-1090	29
Welcome Screen.....	30
Administration Menu.....	31
System Screen	32
Network Screen.....	34
Wireless Screen (WCS-1090 Only)	37
DDNS Screen	40
IP Filter Screen.....	42
I/O Port Screen	43
Video & Audio Screen.....	45
Video Access Screen	48
User Database Screen.....	50
Motion Detection Screen.....	52
E-Mail Screen	53
FTP Screen.....	55
Instant Messaging Screen	56
Event Trigger Screen	58
Maintenance Screen	60
Status Screen.....	62
Log Screen.....	64
CHAPTER 6 TROUBLESHOOTING.....	65
Overview	65
Problems.....	65

APPENDIX A SPECIFICATIONS	68
FCS-1091/WCS-1090.....	68
Regulatory Approvals	68
Copyright Notice.....	70
APPENDIX B STREAMING VIDEO/AUDIO SOLUTION	87
Overview	87
Streaming Video/Audio through Internet Camera.....	87

Chapter 1

Introduction

1

This Chapter provides details of the FCS-1091/WCS-1090's features, components and capabilities.

Overview

The FCS-1091/WCS-1090 has an Integrated Microcomputer and a high quality Sony Progressive CCD Image-Sensor, enabling it to display high quality live streaming video over your wired LAN, the Internet, and for the WCS-1090, an 802.11g Wireless LAN.

Using enhanced MPEG-4 technologies, the FCS-1091/WCS-1090 is able to stream high quality video and two-way audio directly to your PC. The high compression capabilities of MPEG-4 reduce network bandwidth requirements to amazingly low levels.

A convenient and user-friendly surveillance software-IP CamSecure Lite 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.

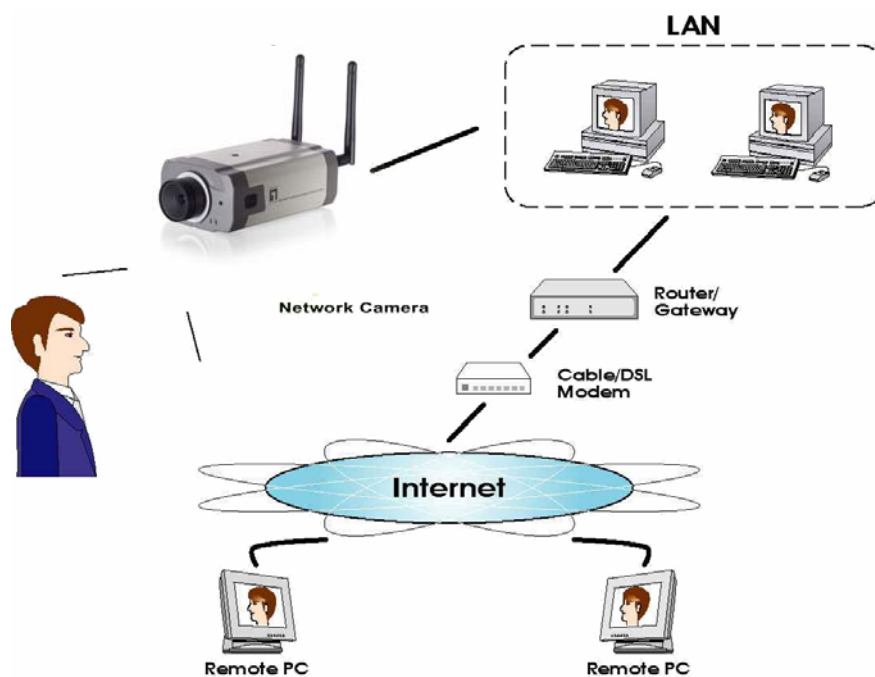


Figure 1: FCS-1091/WCS-1090

Features

- **Dual Stream Live Video to Multiple Users.** The MPEG4 and JPEG encoders built into the camera generate a ready-to-view video stream. Just connect to the camera using your Web browser or the provided Camera Wizard to view live video.

- **Night/Day Switch Support.** Supporting IR-cut filter, the FCS-1091/WCS-1090 can get better video quality even in the nighttime.
- **Suitable for Home, Business or Public Facilities.** Whether for Home, Business or Public Facility surveillance, the FCS-1091/WCS-1090 has the features you need.
- **Multi-Protocol Support.** Supporting TCP/IP networking, SMTP (E-mail), HTTP and other Internet related protocols, the FCS-1091/WCS-1090 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-1091/WCS-1090 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-1091/WCS-1090 will compare consecutive frames to detect changes caused by the movement of large objects. Motion detection alarm can be triggered via e-mail, FTP, instant messaging and/or an external alarm device.
- **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-1091/WCS-1090 can send its log data to your Syslog Server.
- **Audio Support.** You can listen as well as look! Audio is encoded with the video if desired. You can use either the built-in microphone or an external microphone.
- **IP Filter.** Use the IP Filter to block/accept access to the IP addresses.
- **User-definable HTTP/HTTPS port number.** This allows Internet Gateways to use "port mapping" so the FCS-1091/WCS-1090 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-1091/WCS-1090. 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-1091/WCS-1090.
- **NTP (Network-Time-Protocol) Support.** NTP allows the FCS-1091/WCS-1090 to calibrate its internal clock from an Internet Time-Server. This ensures that the time stamp on Video from the FCS-1091/WCS-1090 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. User authentication is not required if the Multicast feature is enabled.
- **Password-Protected Configuration.** Configuration data can be password protected, so that it only be changed by the FCS-1091/WCS-1090 Administrator.

Wireless Features (WCS-1090 only)

- **Standards Compliant.** The WCS-1090 complies with the IEEE802.11g (DSSS) specifications for Wireless LANs.
- **Supports both 802.11b and 802.11g Standards.** The WCS-1090 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-1090 supports either wired and wireless transmission.
- **WEP Support.** Full WEP support (64/128 Bit) on the Wireless interface is provided.
- **WPA/WPA2-Personal Support.** The WPA/WPA2-Personal standard is also supported, allowing advanced encryption of wireless data.

Physical Details - FCS-1091/WCS-1090

Front - FCS-1091/WCS-1090

CS Mount Lens	Adjust focus manually by turning the front lens clear. You also 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. There is also a connection for an external microphone on the rear. Connecting an external microphone will disable the built-in microphone.
Power LED (Amber)	On - Power on. Off - No power. Blinking - The <i>Power</i> LED will blink during start up. This will take 15 to 20 seconds.
Network LED (Green)	On - Wireless or LAN connection is detected. Off - Wireless or LAN connection is not detected Blinking - Data is being transmitted or received via the LAN or Wireless connection.

Rear - FCS-1091/WCS-1090

Antenna	For WCS-1090, attach the supplied antenna here. The antenna is adjustable; best results are usually obtained with the antenna positioned vertically.
Reset Button	<p>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.</p> <ul style="list-style-type: none">• WPS PBC Mode. For the WCS-1090, when pressed and released (less then 3 seconds), the FCS-1091/WCS-1090 will be in the WPS PBC mode (Auto link mode).• WPS Pin Code Mode. For the WCS-1090, when pressed and held for over 3 seconds, the FCS-1091/WCS-1090 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-1091/WCS-1090 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.

LAN port

Use a standard LAN cable to connect your FCS-1091/WCS-1090 to a 10/100BaseT hub or switch.

**Note:**

- Attaching 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.

Power Input

Connect the supplied 12V power adapter here. Do not use other power adapters; doing so may damage the camera.

GPIO

The GPIO terminal block includes 2 input ports and 2 output ports.

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 which are designed to be used with PCs are usually compatible with this microphone input.

SPKR out

If required, an external speaker can be attached here.

Package Contents

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

1. FCS-1091/WCS-1090
2. Power adapter (WCS-1090 only)
3. Antennae (WCS-1090 only)
4. Lens
5. Camera Stand
6. Allen Wrench
7. CD Manual/Utility
8. Quick Installation Guide

CS Mount Lens

The following list contains the CS Mount lens which have been tested on the FCS-1091/WCS-1090:

LevelOne

CAS-1000A

CAS-1000B

TOPICA

0416-M1

0816-M1

TP-0550WOE

TP-0560WOE

Computar

T2Z3514CS-2

SpaceCom

TV308DC-2

TAV2712DC

Pentax

C70220DCPS

Kowa

LMVZ38A-IR

Fujinon

YV2.8x2.8LA-SA2L

Tamron

13VG308AS

13VG2812AS

12VG412ASIR

12FM04CST

13VM308ASIR

13FM04IR

Chapter 2

Basic Setup



This Chapter provides details of installing and configuring the FCS-1091/WCS-1090.

System Requirements

- To use the wired LAN interface, a standard 10/100BaseT hub or switch and network cable is required.
- To use the Wireless interface on the WCS-1090, 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

ESSID: ANY

Wireless Security: Disabled

Domain: USA

Channel No.: Auto

Installation - FCS-1091/WCS-1090

1. Assemble the Camera

Attach the lens to the FCS-1091/WCS-1090. On the WCS-1090, screw the antenna to the rear mounting point, and set the antenna to the upright position to improve wireless reception.

2. Connect the LAN Cable

Connect the FCS-1091/WCS-1090 to a 10/100BaseT hub or switch, using a standard LAN cable.



For WCS-1090, 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 FCS-1091/WCS-1090 with appropriate settings. Then you can unplug the LAN cable and power off the camera. The WCS-1090 will be in wireless interface when you power on the camera again.

3. Power Up

Since FCS-1091 is a PoE IP camera, it could work without attaching to power outlet as long as it connects to PoE switch.

Connect the supplied 12V power adapter to the FCS-1091/WCS-1090 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-1091/WCS-1090* in Chapter 1.

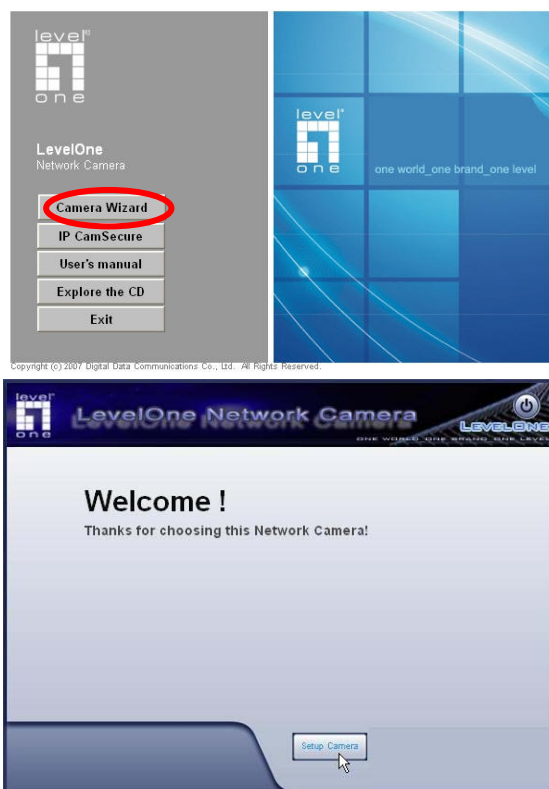
Setup using the Windows Wizard


Initial setup should be performed using the supplied Windows-based setup Wizard. This program can locate the FCS-1091/WCS-1090 even if its IP address is invalid for your network. You can then configure the FCS-1091/WCS-1090 with appropriate TCP/IP settings for your LAN.

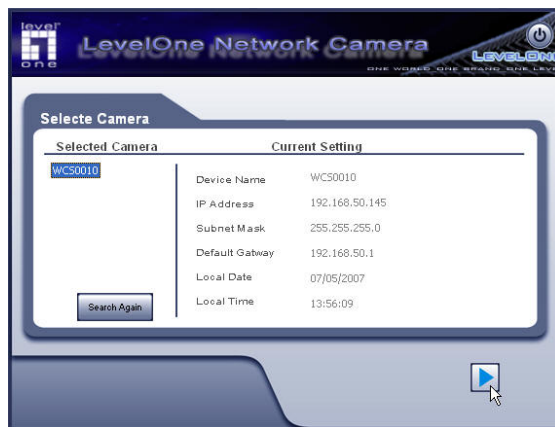
Subsequent administration can be performed with your Web browser, as explained in **Chapter 5 - Web-based Management**.

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.



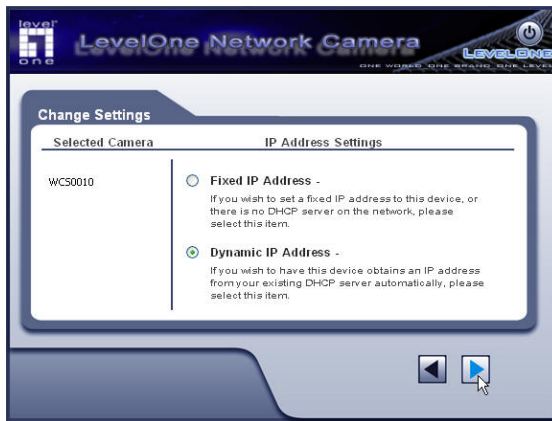
3. The screen will list all the Network Cameras on the LAN. Select the desired camera from the list on the left. The settings for the camera will be displayed on the right, then click .



4. 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.

5. 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.

6. 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 DHCP Server.

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

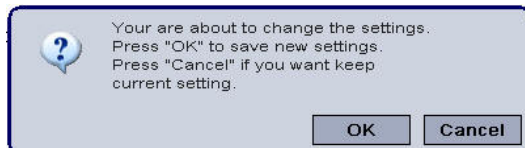
- Enter an unused **IP Address** from within the address range used on your LAN.
- The **Subnet Mask** and **Default Gateway** fields must match the values used by PCs on your LAN.
- The **Primary DNS** address is required in order to use the E-mail alert or Dynamic DNS features. Enter the DNS (Domain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

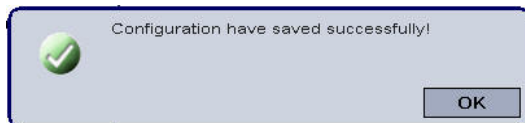
- The screen displays all details of the Network Camera. Click  if the settings are correct, or click  to modify any incorrect values.



- 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



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-1091/WCS-1090, you need to meet the following requirements:

- Windows 98/98SE, Windows 2000, Windows XP, Windows Vista.
- Internet Explorer 5.5 or later.

Connecting to a Camera on your LAN

To establish a connection from your PC to the FCS-1091/WCS-1090:

1. Use the Camera Wizard to get the IP address of the FCS-1091/WCS-1090.
2. Start Internet Explorer.
3. In the Address box, enter "HTTP://" and the IP Address of the FCS-1091/WCS-1090.
4. When you connect, the following screen will be displayed.

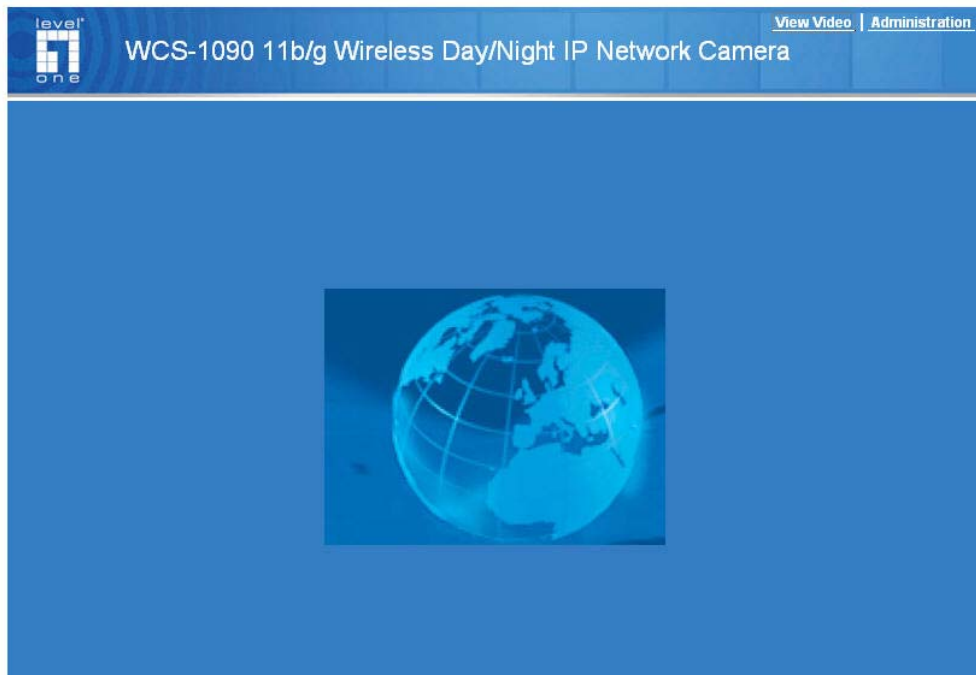


Figure 2: Home Screen

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-1091/WCS-1090 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-1091/WCS-1090 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.

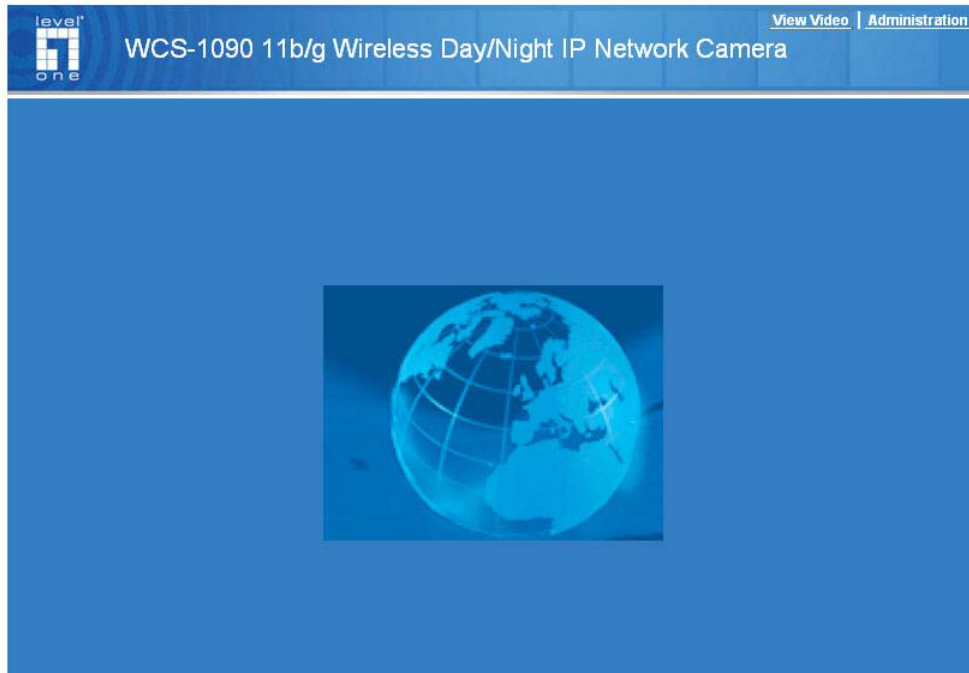


Figure 4: Home Screen

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-1091/WCS-1090 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 be able to view the live video stream in its own window, as shown below.

Adjust focus manually by turning the front lens until the video becomes clear.

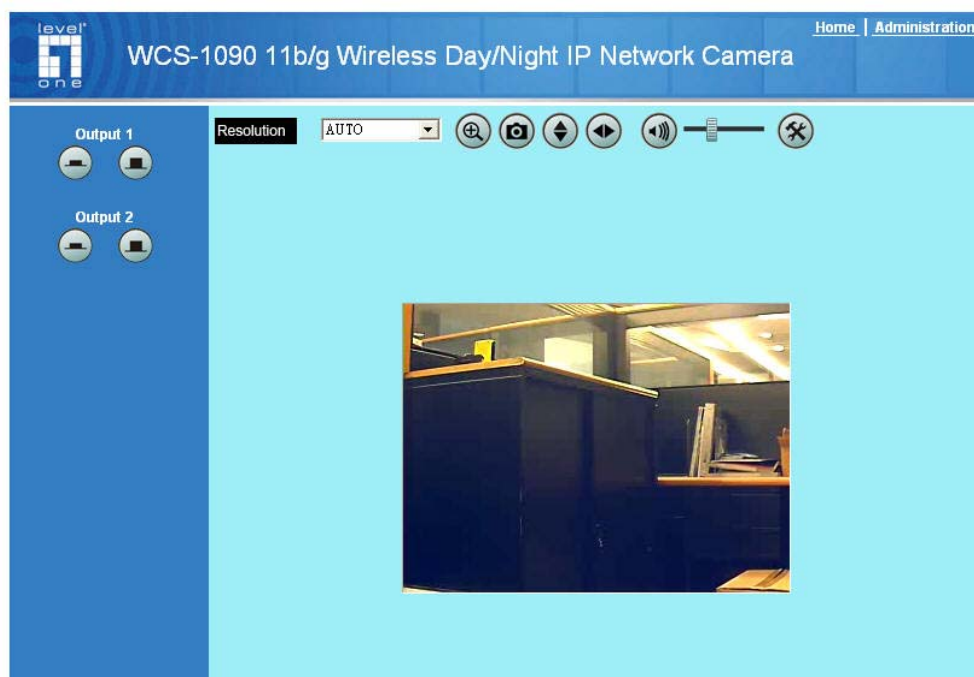


Figure 6: View Video Screen

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.



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



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



Resolution. Select the desired video resolution format.



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.



Audio Upload. This icon is displayed when the Speaker (Audio & Video screen) is enabled. Use this slider to adjust the volume.



Volume. Use this slider to adjust the volume.



Setup. Select the desired setup format from the pop-up menu.

Setting the Focus

After viewing the live video, you need to adjust focus manually by turning the front lens until the video becomes clear.

Chapter 4

Advanced Viewing Setup



This Chapter provides information about the optional settings and features for viewing video via the FCS-1091/WCS-1090. 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-1091/WCS-1090 Administrator can adjust the Video image. Settings are provided for:

- **Resolution** - Select the desired resolution format. The larger sizes require greater bandwidth.
- **Video quality** - This determines the degree of compression applied to the Video stream. Higher quality requires greater bandwidth.
- **Frame Rate** - Select the max frame rate to determine the bandwidth required by the video stream.
- **Power Line frequency** - Select 50Hz or 60Hz power line frequency, as used in your region. The correct setting will improve the picture quality under florescent lighting.
- **White Balance** - Select the correct white balance for your environment.
- **Brightness** - Adjust the brightness of the image.
- **Sharpness** - Select the desired option for the sharpness.
- **Contrast** - Select the desired option for the contrast. You can select a contrast value between -3 and 3.
- **Microphone** - If enabled, audio can be included in the video stream.
- **Time Stamp** - If enabled, the 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.
- **Day/Night Switch** - If enabled, the FCS-1091/WCS-1090 can get better video quality even in the nighttime.

To Adjust the Video Image:

1. Connect to the Web-based interface of the FCS-1091/WCS-1090. (See **Chapter 5 - Web-based Management** for details.)
2. Select *Video & Audio*. You will see a screen like the example below.

The screenshot shows the web interface for the WCS-1090 11b/g Wireless Day/Night IP Network Camera. The top navigation bar includes links for Home, View Video, and Logout. The left sidebar contains a menu with categories: Setup, Video & Audio, Event, Administration, and Maintenance. The main content area is titled 'Video & Audio' and contains several sub-sections:

- MPEG-4 Settings:** Resolution (320*240), Video Quality Control (Constant Bit Rate, Fixed Quality), and Max Frame Rate (30 fps).
- MJPEG Settings:** Resolution (320*240), Fixed Video Quality (Normal), and Max Frame Rate (30 fps).
- Mobile Settings:** Enable Mobile Streaming (checkbox).
- Video Adjustments:** Power Line Frequency (60Hz), White Balance (Auto), Brightness (Normal), Sharpness (Normal), and Contrast (Normal).
- Options:** Enable Microphone (checked), Enable Speaker (checkbox), Enable Time Stamp (checkbox), Enable Text Display (checkbox), and Audio Type (G.726).
- Day/Night Switch:** Switching Method (Auto).

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

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	Select the desired Maximum frame rate for the video stream.

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 frame rate for the video stream.
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 frame rate for the video stream. The default maximum frame rate is set to 15 fps.
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.
Contrast	Select the desired option for the contrast. You can select a Contrast 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 feature by checking this checkbox.
Time Stamp	If enabled, the current time will be displayed on the Video image.
Text Overlay	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.

Day/Night Switch	
Auto	The camera automatically switches to night mode when it detects low-light conditions.
Schedule	Choose the desired time to switch to night mode by checking this box. Select the desired Start Time and End Time on a 24-hour schedule.
Day Mode	Enable Day switch. Use this to get better video quality during the daytime.
Night Mode	Enable Night switch. Use this to get better video quality during the nighttime.



For environments that have IR illuminators, we suggest setting the camera in Night Mode.

Controlling User Access to the Video Stream

By default, anyone can connect to the FCS-1091/WCS-1090 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-1091/WCS-1090. (See **Chapter 5 - Web-based Management** for details.)
2. Select *Video Access*.
3. Set the desired options for **Access**.

Access

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

The screenshot displays the web interface for the WCS-1090 11b/g Wireless Day/Night IP Network Camera. The top navigation bar includes links for Home, View Video, and Logout. A left sidebar lists various configuration categories: Setup, System, Network, Wireless, DDNS, IP Filter, I/O Port, Video & Audio, Event, and Administration. The 'Video Access' option under the 'Video & Audio' category is selected and highlighted. The main content area is titled 'WCS-1090 11b/g Wireless Day/Night IP Network Camera' and contains the following settings:

- User Access:** ☒ Enable Security Checking
- Video Access:** ☒ Enable Scheduled Video Access
- Access Schedule:** A large empty rectangular box for viewing the current schedule, with a 'Delete' button below it.
- Add New Schedule:** Fields for configuring a new schedule:
 - Day:** A dropdown menu currently set to 'Every day'.
 - Start Time:** Two dropdown menus for hours and minutes, both set to '00', followed by '(hh:mm)'.
 - End Time:** Two dropdown menus for hours and minutes, both set to '00', followed by '(hh:mm)'.
 - Buttons:** 'Add' and 'Clear' buttons are located below the time fields.
- Bottom Buttons:** 'Save', 'Cancel', and 'Help' buttons are located at the bottom of the configuration area.

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-1091/WCS-1090 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-1091/WCS-1090. The Router/Gateway uses the *Port Number* to determine which incoming connections are intended for the FCS-1091/WCS-1090.

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-1091/WCS-1090. If necessary, check the user manual for your Router/Gateway for further details.

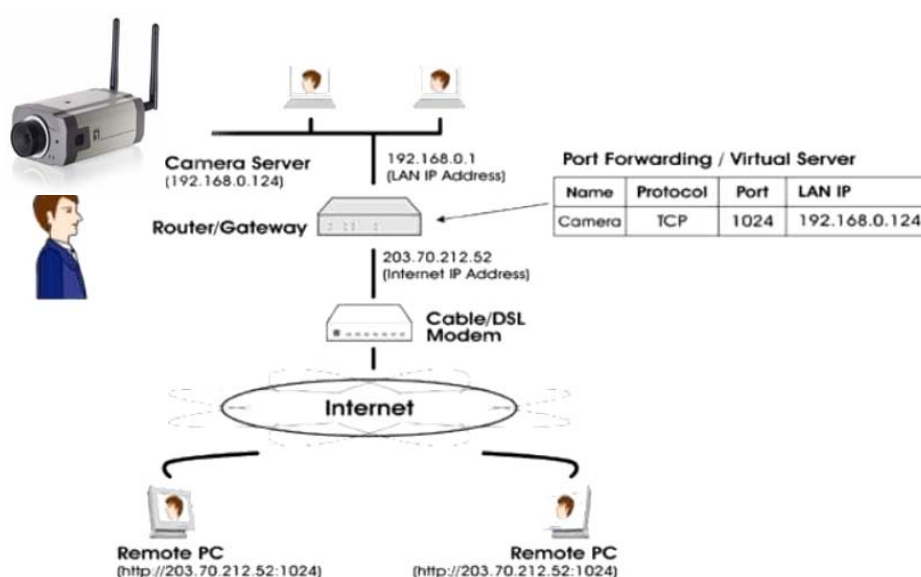


Figure 9: Connecting via the Internet



The "Port" for the *Port Forwarding / Virtual Server* entry above is the "Secondary Port" number specified on the *Network* screen of the FCS-1091/WCS-1090.

FCS-1091/WCS-1090 Setup

The FCS-1091/WCS-1090 configuration does NOT have to be changed, unless:

- You wish to change the port number from the default value (1024).
- You wish to use the DDNS (Dynamic DNS) feature of the FCS-1091/WCS-1090.

HTTP Port Configuration

Normally, HTTP (Web) connections use port 80. Since the FCS-1091/WCS-1090 uses HTTP, but port 80 is likely to be used by a Web Server, you can use a different port for the FCS-1091/WCS-1090. 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-1091/WCS-1090's **Network** screen, as shown below.

level one
WCS-1090 11b/g Wireless Day/Night IP Network Camera

Home | View Video | Logout

Setup

System

Network

Wireless

DDNS

IP Filter

I/O Port

Video & Audio

Video & Audio

Video Access

User Database

Event

Motion Detection

E-Mail

FTP

Instant Messaging

Event Trigger

Administration

Maintenance

Status

Log

IP Address: ☒ Obtain an IP address automatically (DHCP)
☐ Use the following IP address

DNS Server Address: ☒ Obtain DNS server address automatically
☐ Use the following DNS server address

Secondary Port: ☐ Enable HTTP Secondary Port (1024-65535)
☐ Enable HTTPS Secondary Port (1024-65535)

RTP/RTSP: RTSP Port: (554,1024-65535)
RTP Data Port: (mobile phone only)
Max RTP Data Packet: bytes (400-1400)

Multicast RTP/RTSP: ☐ Enable Multicast

Video Address:
Video Port: (1024-65534; Even Value)
Audio Address:
Audio Port: (1024-65534; Even Value)
Time to Live: (1-255)

UPnP: ☒ Enable Discovery
☐ Enable Traversal (Port Mapping)

QoS: ☐ Enable QoS Mode (for Video and Audio)

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-1091/WCS-1090.

level one

Home | View Video | Logout

WCS-1090 11b/g Wireless Day/Night IP Network Camera

Setup

☒ Enable DDNS

Service Provider: DynDNS.org Web Site

Domain (Host) Name:

Account/E-Mail:

Password/Key:

Check WAN IP Address: Every 24 Hrs

Starting at 12 Hour(s) 00 Minute(s)

System

Network

Wireless

DDNS

IP Filter

I/O Port

Video & Audio

Video & Audio

Video Access

User Database

Event

Motion Detection

E-Mail

FTP

Instant Messaging

Event Trigger

Administration

Maintenance

Status

Log

Save Cancel Help

Figure 11: DDNS Screen

3. Operation is then automatic:
 - The FCS-1091/WCS-1090 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-1091/WCS-1090 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-1091/WCS-1090 is 1024.

Motion Detection Alerts

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

The FCS-1091/WCS-1090 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.

To Use Motion Detection Alerts

Using the Web-based interface on the FCS-1091/WCS-1090, select the *Motion Detection* screen, then configure this screen as described below.

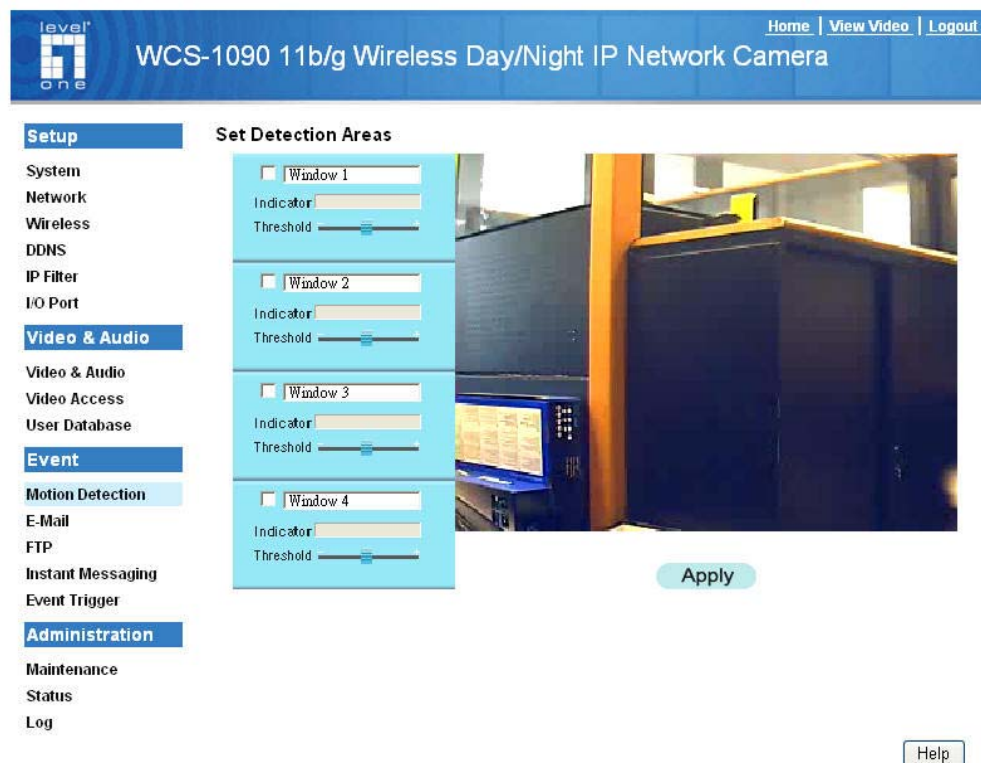


Figure 12: Motion Detection

1. Enable the *Motion Detection* feature.
2. Set the 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 *Event Trigger* screen to have alerts sent
 - Enable *Trigger Event* and check the box of *Motion Detection*.

- Select the desired options for sending the alerts.

Chapter 5

Web-based Management



This Chapter provides Setup details of the FCS-1091/WCS-1090's Web-based Interface. This Chapter is for the Camera Administrator only.

Introduction

The FCS-1091/WCS-1090 can be configured using your Web Browser. The FCS-1091/WCS-1090 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-1091/WCS-1090

- If using only your Web Browser, use the following procedure to establish a connection from your PC to the FCS-1091/WCS-1090:
- Once connected, you can add the FCS-1091/WCS-1090 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-1091/WCS-1090.
2. Start your WEB browser.
3. In the *Address* box, enter "HTTP://" and the IP Address of the FCS-1091/WCS-1090.
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.

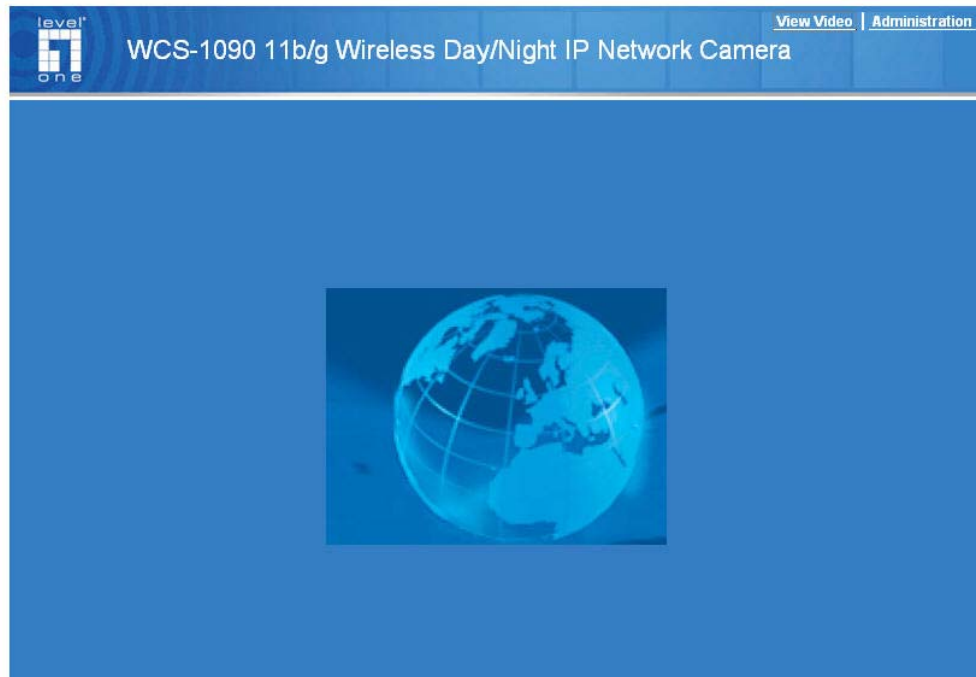


Figure 13: Welcome Screen

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-1091/WCS-1090.

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

Setup

- System
- Network
- Wireless
- DDNS
- IP Filter
- I/O Port

Video & Audio

- Video & Audio
- Video Access
- User Database

Event

- Motion Detection
- E-Mail
- FTP
- Instant Messaging
- Event Trigger

Administration

- Maintenance
- Status
- Log

System Screen

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

Figure 14: System Screen

Data - System Screen

System Settings	
Device ID	This displays the name for the FCS-1091/WCS-1090.
Description	This field is used for entering a description, such as the location of the FCS-1091/WCS-1090.
Date & Time	
Date Format	Choose the desired format from the drop-down list.
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.

Timezone	<p>Choose the Timezone 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-1091/WCS-1090 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-1091/WCS-1090 contacts the NTP Server.</p> <p>Select the desired options.</p>
LED Operation	<p>If Disabled, the LED of the FCS-1091/WCS-1090 will be in off state.</p>

Network Screen

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

level one

Home | View Video | Logout

WCS-1090 11b/g Wireless Day/Night IP Network Camera

Setup

System

Network

Wireless

DDNS

IP Filter

I/O Port

Video & Audio

Video & Audio

Video Access

User Database

Event

Motion Detection

E-Mail

FTP

Instant Messaging

Event Trigger

Administration

Maintenance

Status

Log

IP Address: ☒ Obtain an IP address automatically (DHCP)
☐ Use the following IP address

DNS Server Address: ☒ Obtain DNS server address automatically
☐ Use the following DNS server address

Secondary Port: ☐ Enable HTTP Secondary Port (1024-65535)
☐ Enable HTTPS Secondary Port (1024-65535)

RTP/RTSP: RTSP Port: (554,1024-65535)
RTP Data Port: (mobile phone only)
Max RTP Data Packet: bytes (400-1400)

Multicast RTP/RTSP: ☐ Enable Multicast

Video Address:
Video Port: (1024-65534; Even Value)
Audio Address:
Audio Port: (1024-65534; Even Value)
Time to Live: (1-255)


UPnP: ☒ Enable Discovery
☐ Enable Traversal (Port Mapping)

QoS: ☐ Enable QoS Mode (for Video and Audio)

Figure 15: Network Screen

Data - Network Screen

Network	
Obtain an Address Automatically	If selected, the FCS-1091/WCS-1090 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	<p>If selected, you must assign the following data to the FCS-1091/WCS-1090.</p> <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-1091/WCS-1090 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	<p>Primary DNS server - Use the same value as PCs on your LAN. Normally, your ISP will provide this address.</p> <p>Secondary DNS server - This is optional. If entered, this DNS will be used if the Primary DNS does not respond.</p>
Secondary Port	<ul style="list-style-type: none"> • HTTP Secondary Port - 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. • HTTPS Secondary Port - 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. <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <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> </div> </div>
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 sending packet. Enter the desired value between 400 and 1400.</p>
Video Address	Enter the address of video.
Video Port	Enter the desired value (between 1024 to 65534) in the field provided. The number you entered must be even values.
Audio Address	Enter the address of the audio.
Audio Port	Enter the desired value (between 1024 to 65534) in the field provided. The number you entered must be even values.
Time to Live	Enter the desired length of time, if the packets fail to be delivered to their destination within. The Time to Live you entered must be in-between 1 to 255.
UPnP	
Enable Discovery	If enabled, the FCS-1091/WCS-1090 will broadcast its availability through UPnP. UPnP compatible systems such as Windows XP will then be able to detect the presence of the FCS-1091/WCS-1090.
Enable Traversal	If enabled, HTTP connections (from your Web Browser or the Viewer and Recorder utility) can use secondary port instead of port 80 (the standard HTTP port) to access the camera.


QoS	
Enable QoS Mode	If enabled, the throughput level (for Video and Audio) is guaranteed through QoS (Quality of Service).


Wireless Screen (WCS-1090 Only)

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

Figure 16: Wireless Screen

Data - Wireless Screen

Wireless Network	
Network Type	Select the network type of wireless communication used by the FCS-1091/WCS-1090.
SSID	This must match the value used by other devices on your wireless LAN.  Note! The SSID is case sensitive.
Domain	Select your domain from the drop-down list.

Channel No	<ul style="list-style-type: none"> • In Infrastructure mode, you cannot set the Channel. The FCS-1091/WCS-1090 will use the Channel set on the Access Point. • For Ad-hoc mode, select the Channel you wish to use on your FCS-1091/WCS-1090. This should match the Channel used on the other Wireless Stations. • If you experience interference (shown by lost connections and/or slow data transfers) you may need to experiment with different channels to see which 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>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 Characters) • 128 Bit Keys (26 Hex Characters) • 64 Bit Keys (5 ASCII Characters) • 128 Bit Keys (13 ASCII Characters)
Passphrase	<p>Enter a word or group of printable characters in the Passphrase box and click the "Generate Keys" button to automatically configure the WEP Key(s). If encryption strength is set to 64 bit, then each of the four key fields will be populated with key values. If encryption strength is set to 128 bit, then only the selected WEP key field will be given a key value.</p>
WEP Keys	<ul style="list-style-type: none"> • Use the radio buttons to select the default key. • Enter the key value you wish to use. Other stations must have the same key values. • Keys must be entered in Hex. Hex characters are the digits (0 ~ 9) and the letters A ~ F. • Click <i>Clear Keys</i> to set the Keys to be blank.

WPA/WPA2 Personal	
Shared Key	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.

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-1091/WCS-1090 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-1091/WCS-1090 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.

level one

Home | View Video | Logout

WCS-1090 11b/g Wireless Day/Night IP Network Camera

Setup

☒ Enable DDNS

Service Provider: DynDNS.org Web Site

Domain (Host) Name:

Account/E-Mail:

Password/Key:

Check WAN IP Address: Every 24 Hrs

Starting at 12 Hour(s) 00 Minute(s)

System

Network

Wireless

DDNS

IP Filter

I/O Port

Video & Audio

Video & Audio

Video Access

User Database

Event

Motion Detection

E-Mail

FTP

Instant Messaging

Event Trigger

Administration

Maintenance


Status

Log

Save Cancel Help

Figure 17: DDNS Screen

Data - DDNS Screen

DDNS	
DDNS Enable/Disable	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 or the E-mail address for the DDNS account.
Password/Key	Enter the password/key 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> <div> 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.</div>

IP Filter Screen

This screen is displayed when the *IP Filter* option is clicked.

level one WCS-1090 11b/g Wireless Day/Night IP Network Camera

Home | View Video | Logout

Setup

System

Network

Wireless

DDNS

IP Filter

I/O Port

Video & Audio

Video & Audio

Video Access

User Database

Event

Motion Detection

E-Mail

FTP

Instant Messaging

Event Trigger

Administration

Maintenance

Status

Log

IP Filter: Disable

Single IP Address 1:

Single IP Address 2:

Single IP Address 3:

Single IP Address 4:

Single IP Address 5:

Single IP Address 6:

Single IP Address 7:

Single IP Address 8:

Single IP Address 9:

Single IP Address 10:

Save Cancel Help

Figure 18: IP Filter Screen

Data - IP Filter Screen

IP Filter	
IP Filter	The IP Filter feature allows administrators to control FCS-1091/WCS-1090 access by filtering IP address. Select the desired option from the drop-down list.
Single/Range	Enter an IP address or a range of IP addresses you would like to allow or deny.

I/O Port Screen

The FCS-1091/WCS-1090 supports 2 input ports and 2 output ports. This screen is displayed when the *I/O Port* menu option is clicked.

level one

WCS-1090 11b/g Wireless Day/Night IP Network Camera

Home | View Video | Logout

Setup

System

Network

Wireless

DDNS

IP Filter

I/O Port

Video & Audio

Video & Audio

Video Access

User Database

Event

Motion Detection

E-Mail

FTP

Instant Messaging

Event Trigger

Administration

Maintenance

Status

Log

Input Ports

#	Current State	Triggered When...
1	Low	Low
2	Low	Low

Output Ports

#	Current State	Default State	Manual Trigger	Action When Triggered
1	High	High	ON maps to High	None
2	High	High	ON maps to High	None

Save Cancel Help Refresh

Figure 19: I/O Port Screen

Data - I/O Port Screen

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

Action When Triggered	If an event is happened, it will trigger the event alerting.
------------------------------	--

Video & Audio Screen

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

Figure 20: Video & Audio Screen

Data - Video & Audio Screen

MPEG-4 Settings	
Resolution	Select the desired video resolution format. The default resolution is set to 320*240.
Video Quality Control	<ul style="list-style-type: none"> Constant Bit Rate: Select the desired bit rate. Fixed Quality: Select the desired option. The default fix quality is set to Normal.
Max. Frame Rate	Select the desired Maximum frame rate for the video stream.

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 frame rate for the video stream.
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.
Contrast	Select the desired option for the contrast. You can select a Contrast 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 feature by checking this checkbox.
Time Stamp	If enabled, the current time will be displayed on the Video image.
Text Overlay	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.

Day/Night Switch	
Auto	The camera automatically switches to night mode when it detects low-light conditions.
Schedule	Choose the desired time to switch to night mode by checking this box. Select the desired Start Time and End Time on a 24-hour schedule.
Day Mode	Enable Day switch
Night Mode	Enable Night switch



For environments that have IR illuminators, we suggest setting the camera in Night Mode.

Video Access Screen


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

The screenshot shows the 'Video Access' configuration screen for a Level One WCS-1090 11b/g Wireless Day/Night IP Network Camera. The interface includes a sidebar menu with the following categories: Setup, System, Network, Wireless, DDNS, IP Filter, I/O Port, Video & Audio, Event, and Administration. The 'Video & Audio' category is expanded, showing 'Video & Audio', 'Video Access' (selected), 'User Database', and 'Event'. The main content area is divided into two sections: 'Access Schedule' and 'Add New Schedule'. The 'Access Schedule' section contains a table with a 'Delete' button. The 'Add New Schedule' section contains fields for 'Day' (set to 'Every day'), 'Start Time' (00:00 (hh:mm)), and 'End Time' (00:00 (hh:mm)), along with 'Add' and 'Clear' buttons. At the bottom of the main area are 'Save', 'Cancel', and 'Help' buttons.

Figure 21: Video Access Screen

Data - Video Access Screen

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.
---------------------------------	--

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. <div>  <p>Note that regardless of which setting is chosen, the Administrator can ALWAYS access the camera and view live video.</p> </div>
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 New Schedule	
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.

level one WCS-1090 11b/g Wireless Day/Night IP Network Camera

Home | View Video | Logout

Setup
System
Network
Wireless
DDNS
IP Filter
I/O Port

Video & Audio
Video & Audio
Video Access
User Database

Event
Motion Detection
E-Mail
FTP
Instant Messaging
Event Trigger

Administration
Maintenance
Status
Log

Existing Users

Edit Delete Delete All

User Properties

User Name:

User Password:

Confirm Password:

Control Level: ☒ Viewer ☐ Operator

Add Clear

Save Cancel Help

Figure 22: 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. The camera can let you save up to 20 cameras in the database.
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.
Control Level	Select the desired control level for the user you plan to add. (* Operator level allows user to switch day/night vision and to trigger output ports manually)
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.

Motion Detection Screen

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

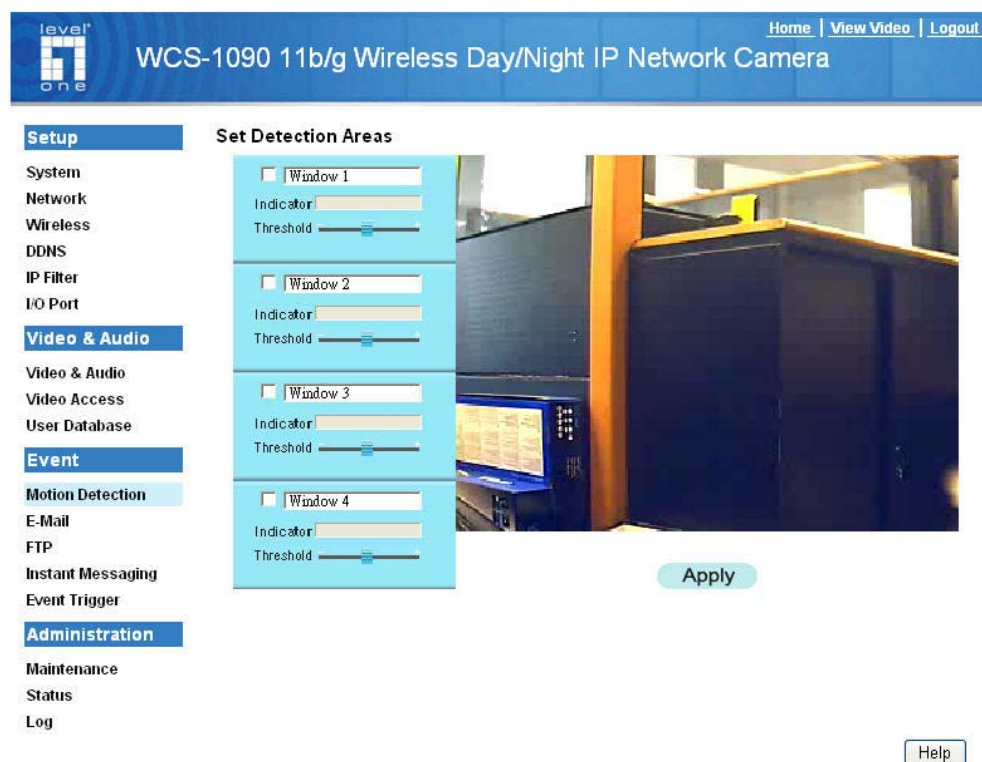



Figure 23: Motion Detection Screen

Data - Motion Detection Screen

Motion Detection	
Set Detection Areas	<p>You can set the full screen or areas of the video image to be examined.</p> <p> 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.</p>
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.

Primary SMTP Server

SMTP Server Address:

Authentication:

SMTP Login name:

SMTP Password:

POP server name:

Show "From" as: (E-Mail Address)

Secondary SMTP Server

☐ Secondary SMTP (enable this if the camera can not connect to the primary SMTP)

SMTP Server Address:

Authentication:

SMTP Login name:

SMTP Password:

POP server name:

Show "From" as: (E-Mail Address)

E-Mail Setup

☐ E-Mail Address #1:

☐ E-Mail Address #2:

☐ E-Mail Address #3:

Subject:

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.

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.
Show "From" as	Enter the E-Mail address to be shown in the "From" field when the E-mail is received.

FTP Screen

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

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.

Instant Messaging Screen

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

Figure 26: Instant Messaging Screen

Data - Instant Messaging Screen

Jabber	
Enable	Enable this checkbox to use Jabber, which is a free Instant Messaging (IM).
Server Address	Enter the address of your Jabber Server.
Login ID	Enter your login ID for the Jabber account.
Password	Enter your password for the Jabber account.
Send To	The log will be sent to the e-mail address you specified here.
Message	Enter the message you wish to attach with the sending log.
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	<p>Select the desired method of form data encoding.</p> <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.

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-1091/WCS-1090, 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	
Enable	Check to perform all of the event(s) that were configured and scheduled.
Interval	Select the desired option for the events interval. (* "0" = No Delay)
Trigger by	<ul style="list-style-type: none"> Input 1 / 2 - This describes the states that the input(s) must be in for an event to be triggered. Only one input can be used, also note that the states for all the inputs used must be reached before the event will be triggered. Motion Detection - Movement in a motion detection window can be used to trigger events.
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.) Output 1 / 2 - If checked, the output port(s) state will be activated as configured. (Output port(s) must be configured on the I/O Port page.) Instant Messaging - 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"> Overwrite/Replace oldest video file Check to overwrite/replace the oldest video clip with the current recording when detecting device's SDRAM is full. 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	Enter 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 upgrade the Firmware. When the upgrade is finished, the FCS-1091/WCS-1090 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.
Buttons	
Defaults	Click <i>Defaults</i> button to reload the default settings of the camera.
Restart	Click <i>Restart</i> button to restart the camera.

Status Screen

[Home](#) | [View Video](#) | [Logout](#)

WCS-1090 11b/g Wireless Day/Night IP Network Camera

Setup

System

Network

Wireless

DDNS

IP Filter

I/O Port

Video & Audio

Video Access

User Database

Event

Motion Detection

E-Mail

FTP

Instant Messaging

Event Trigger

Administration

Maintenance

Status

Log

System
 Device Name: WCS10900CB207
 Description:
 F/W version: V1.0.01

Network
 MAC Address: 00:c0:02:0c:b2:07
 IP Address: 192.168.50.158
 Network Mask: 255.255.255.0
 Gateway: 192.168.50.1

Wireless
 WSC PIN Code: 08320070
 Network Type: Infrastructure
 SSID: camera
 Channel: N/A
 Security: WEP
 Signal Strength: N/A

MPEG-4
 Resolution: 320*240
 Video Quality: Normal
 Frame Rate: 30

MJPEG
 Resolution: 320*240
 Video Quality: Normal
 Frame Rate: 30

Figure 29: Status Screen

Data - Status Screen

System	
Device Name	This shows the name of the FCS-1091/WCS-1090.
Description	This shows the description of the FCS-1091/WCS-1090, such as location.
F/W version	The version of the current firmware installed.
Network	
MAC Address	The current IP address of the FCS-1091/WCS-1090.
IP Address	The IP Address of the FCS-1091/WCS-1090.
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	
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 data shown on screen.

Log Screen

This screen displays a log of system activity.

level one

WCS-1090 11b/g Wireless Day/Night IP Network Camera

Home | View Video | Logout

Setup

- System
- Network
- Wireless
- DDNS
- IP Filter
- I/O Port

Video & Audio

- Video & Audio
- Video Access
- User Database

Event

- Motion Detection
- E-Mail
- FTP
- Instant Messaging
- Event Trigger

Administration

- Maintenance
- Status
- Log**

```

11/12/2007 15:12:43 HTTP: Streaming end (HTTP: 192.168.50.137,
administrator).
11/12/2007 15:11:41 HTTP: Streaming start (HTTP: 192.168.50.137,
administrator).
11/12/2007 15:06:53 HTTP: Streaming end (HTTP: 192.168.50.137, anonymous).
11/12/2007 15:06:38 HTTP: Streaming start (HTTP: 192.168.50.137, anonymous).
11/12/2007 15:06:32 HTTP: Streaming end (HTTP: 192.168.50.137, anonymous).
11/12/2007 15:04:21 HTTP: Streaming start (HTTP: 192.168.50.137, anonymous).
11/12/2007 14:56:13 NTP: Synchronization OK.
11/12/2007 14:56:06 DHCP: Lease renewal successful.
11/12/2007 14:55:56 Network: Lan activated.
  
```

Refresh Clear Log

☐ Enable Syslog Service

Syslog Server Address

Save Cancel Help

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



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-1091/WCS-1090 and some possible solutions to them. If you follow the suggested steps and the FCS-1091/WCS-1090 still does not function properly, contact your dealer for further advice.

Problems

Problem 1: I can't connect to the FCS-1091/WCS-1090 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-1091/WCS-1090. Use the Camera Wizard to configure the FCS-1091/WCS-1090 with a valid IP address.

Problem 2: The Camera Wizard doesn't list any FCS-1091/WCS-1090s.

Solution 2: Check the following:

- The FCS-1091/WCS-1090 is installed, LAN connections are OK, it is powered ON and startup is complete.
- Ensure that your PC and the FCS-1091/WCS-1090 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-1091/WCS-1090, 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 FCS-1091/WCS-1090 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-1091/WCS-1090 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-1091/WCS-1090, 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* setting on the **Video Image** screen. Video created with the lower settings will contain less detail; this is the trade-off for using less bandwidth.

Problem 9 I turned on the auto launch after startup option of camera utility, but it's blocked and takes no action under Windows Vista. How can I make it work?

Solution 9

Windows Vista has the built-in ability to automatically reduce the potential of security breaches in the system. It does that by automatically enabling a feature called UAC (User Account Control). With the UAC on, applications will be blocked from launching during system startup. That would also block the camera utility. However, you could turn off the UAC by the following steps:

1. Select *Start - Control Panel - Account and Family settings*.
2. Click "Add or remove user account".
3. Select the desired user account.
4. Click "Go to the main User Account page"
5. Select "Change security settings" in the "Make changes to your user account" screen.
6. Unselect "Turn on User Account Control (UAC) to make your computer more secure".
7. Click *OK*. You will be prompted to reboot your computer.

Appendix A

Specifications



FCS-1091/WCS-1090

Model	FCS-1091/WCS-1090
Dimensions	80mm (W) * 50mm (H) * 132mm (D)
Operating Temperature	0° C to 40° C
Storage Temperature	-20° C to 70° C
Network Protocols:	TCP/IP, DHCP, SMTP, NTP, HTTP, HTTPS, UPnP, FTP, RTP, RTSP
Network Interface:	1 Ethernet 10/100BaseT (RJ45) LAN connection
Wireless interface	IEEE 802.11b/802.11g compatible, Infrastructure/Ad-hoc mode, WEP/WPA/WPA2-Personal security support, roaming support
LEDs	2
Power Adapter	12V/1A DC External
Lens	CS/M Type, 6mm/F1.6 Fixed Focus Lens

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-1091/WCS-1090 and the Ethernet FCS-1091/WCS-1090 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.

Copyright Notice

Many software components are covered by the GNU GPL (General Public License). Some are covered by other Licenses as listed in the table below.

Details of each applicable license are contained in the following section.

No Warranty

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

FCS-1091/WCS-1090 copyright information

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

tthttpd.c - tiny/turbo/throttling HTTP server

Copyright ?1995,1998,1999,2000,2001 by Jef Poskanzer <jef@mail.acme.com>
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

ntp-4.1.71 license

Copyright (c) David L. Mills 1992-2001

Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appears in all copies and that both the copyright notice and this permission notice appear in supporting documentation, and that the name University of Delaware not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. The University of Delaware makes no representations about the suitability this software for any purpose. It is provided "as is" without express or implied warranty.

Libupnp-1.2.1 License

Copyright (c) 2000 Intel Corporation. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither name of Intel Corporation nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL INTEL OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

cron license

Copyright (c) 1989 The Regents of the University of California. All rights reserved.

This code is derived from software contributed to Berkeley by Paul Vixie.

Redistribution and use in source and binary forms are permitted provided that the above copyright notice and this paragraph are duplicated in all such forms and that any documentation, advertising materials, and other materials related to such distribution and use acknowledge that the software was developed by the University of California, Berkeley. The name of the University may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

GNU General Public License

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.

51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE

Terms And Conditions For Copying, Distribution And Modification

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a

"work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) 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; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code 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.

If distribution of executable or 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 counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program

at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

Lesser GNU General Public License

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.

51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

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.

GNU LESSER GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it

may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) The modified work must itself be a software library.

b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(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.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered

independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

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.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

- a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

All the source code of LevelOne GPL products are uploaded to <http://www.level1.com>
All the users can download freely.

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 = 1 (Very low)

2 (Low)

3 (Normal)

4 (High)

5 (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>