

# ***IP CAMERA***

User Manual

Version 2.3

**For models:  
050862**

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## **Chapter 1: Introduction**

### **Section 1. Features**

IP Camera is a compact stand-alone web-server capable of remote video surveillance. It can be accessed from anywhere in the world via a standard browser by entering the IP, account and password. Each system can simultaneously support any two combinations of USB PC cameras be it regular, infrared or pan-tilt. With its built-in web-server, IP camera can stream video images directly to the Internet without have to go through a computer. IP Camera features a Windows-based software that allows the user to archive streaming video directly into the hard-drive. The same software also allows the user to monitor multiple cameras on one screen.

Features:

- Built-in Web Server
- 10/100Mbps Fast Ethernet Network Access
- Support Any Java-Enabled Web Browser
- LCD display shows the IP address, Subnet Mask and Gateway
- 32-Bit RISC CPU
- 1MB Flash Memory
- 8MB Dynamic Memory
- Support Up to 30 Remote Viewers for each camera
- Allow Up to 8 User Accounts and Passwords
- 5.3VDC 1A Maximum
- Operating Temperature: 0°C ~ 60°C
- Operating Humidity: 10% ~ 90%
- Dimensions: 48mm x 63mm x 21m
- Weight: 75g
- For Indoor Use. Protective housing required for outdoor use.
- Network Protocol: HTTP, TCP/IP, UDP, SMTP, PPPoE, Dynamic DNS, DNS Client, SNTP, BOOTP, DHCP, FTP, SNMP
- Support All USB PC Camera with VIMICRO ZC0301 Plus processor built-in
- Resolution available: 640x480 (VGA), 352x288 (CIF), 320x240 (QVGA), 176x144 (QCIF), 160x120 (QQVGA).
- Frame Rate: Up to 15fps in 640x480, Up to 20fps in 320 x 240.
- Motion JPEG streaming video
- 2 USB Ports for PC Cameras
- USB 1.1 & 2.0 compliant
- Can combine with two different PC cameras
- Support Pan/Tilt and Infrared USB PC Camera

### **Section 2. IP Camera as a Remote Surveillance System**

Once IP Camera is installed, the user can check any of the connected PC cameras using a standard web browser. The user can monitor and control these cameras simply by entering the IP address of the IP Camera into a Web Browser from

anywhere in the world. For instance, the user can be in Australia but is able to monitor his factory production in China, and if he likes, check on his branch office located in Singapore, all simultaneously.

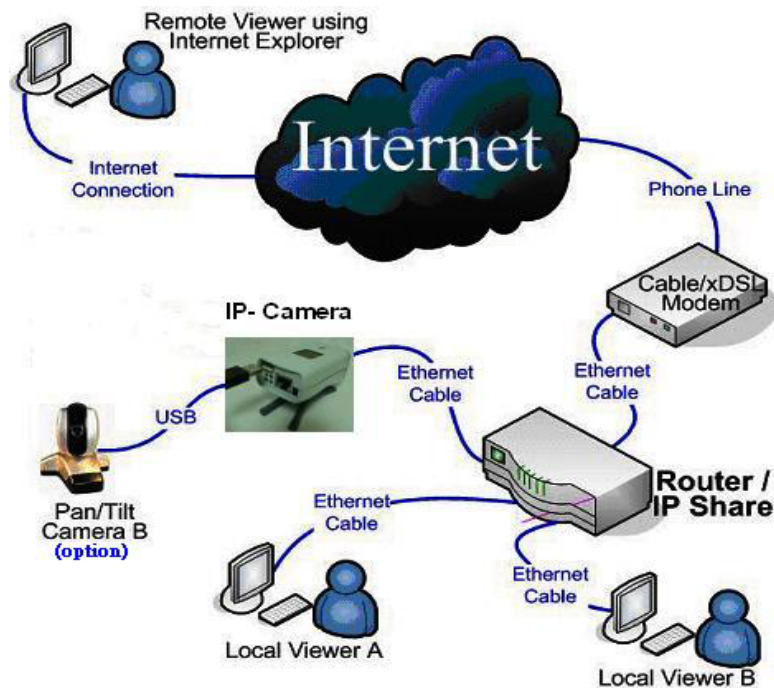


Fig.1. IP Camera Network Diagram

### Section 3. Package Contents

Your IP Camera package should contain the following items;

1. IP Camera,
2. Quick Installation Guide
3. Utility CD, which contains;
  - a. Utility: to configure IP address, update the firmware, etc.
  - b. iMultiMonitor: Windows platform to monitor multiple IP Camera.
  - c. Time Server: Time adjustment utility.
  - d. Adobe Acrobat 5.0 Reader.
  - e. User manual, and
  - f. Camera Windows Driver
4. 5.3V DC Adapter
5. USB Camera (option)



Fig.2. IP Camera Back View



Fig.3. IP Camera Front View

LED Status Indicators on IP Camera		
Light color	Signal definition	Condition description
Green	Power state	On: Normal power
Red	Error Condition	On: Error condition occurred
Orange	Logon state	On: When there is user logon and receive the image.
Yellow	USB data activity	Flash when there is data transmit/receive on the USB.

Fig.4. IP Camera Status LED Indicator

Light indicators on IP Camera LAN Port LED	
Light color	Condition description
Green	On: Internet correspond speed is 100M Flash: Data transmitting/receiving
Yellow	On: Internet correspond speed is 10M Flash: Data transmitting/receiving

Fig.5. IP Camera LAN LED Indicators

## Chapter 2: Installation Procedure

Before you start using IP Camera, you will need to set-up both the hardware and software. The following is a flow chart on the installation procedure:

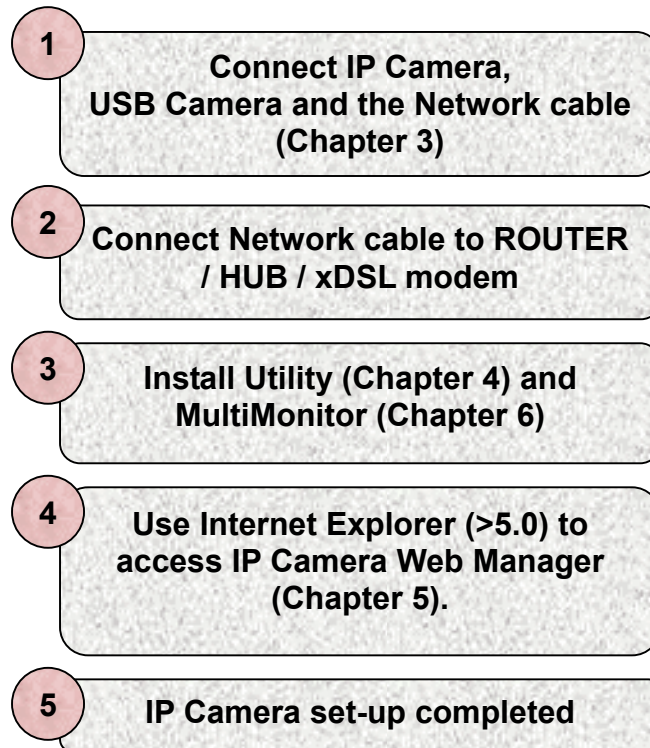


Fig.6. IP Camera installation flowchart

## Chapter 3: IP Camera, USB Camera and the Network

The following details the installation procedure for IP Camera.

### Section 1. Installation Procedure

Step 1:

Connect the IP Camera to LAN by using the Ethernet UTP port.



Step 2:

Connect DC power adapter output into IP Camera socket, and plug the DC power input into the wall socket



Step 3:

The LCD will display the IP, Subnet Mask and Gateway IP. Use a WEB browser to login into the IP Camera IP address.

The  icon on the LCD shows that a USB camera is connected.





Plug in the USB camera (Option). Plug the connector into IP Camera extension USB port, to serve as another IP Cam.



**Warning:**

Please make sure the input Voltage and Frequency of the DC power adapter (DC 5.3V) is correct before plugging into the power outlet!

## Chapter 4: Using Utility to Setup IP & Update Firmware

### Section 1. Installing Utility

1. Insert the enclosed Utility CD into the CD-ROM drive. Utility CD setup will auto run. The following menu will show up. Click on the buttons on the left to install the programs you want.



- ☞ **Utility** - This is a program that helps the user perform quick installation. It will detect the current configuration and take the user through the necessary network setup.
  - a. Click the 'Utility' button to commence installation.
  - b. After the step by step installation is completed, the Utility group will appear in Windows 'Start' → Utility 'Program Group'. Click this to start the program.



Fig.7. Utility Group

- ☞ **MultiMonitor** - This is a windows based program designed to allow user to control a large number of IP Camera websites located either in a LAN or on a WAN.
- ☞ **Read User's Manual** - Click to read IP Camera's User Manual. You will need Adobe Acrobat Reader v5.0 or higher.
- ☞ **Adobe Acrobat Reader v5.0** - This will install Acrobat Reader v5.0 on your local hard drive.
- ☞ **Sun Java / ActiveX** - Install Sun Java for viewing the video image by Java, or install the OCX for viewing by ActiveX.

## Section 2. Using Utility

The Utility main menu is shown below. The selection menu is located on the left. The Serial Number, current Firmware and IP Address of every connected to the LAN will be displayed on the table to the right.



Fig.8. Utility Main Menu

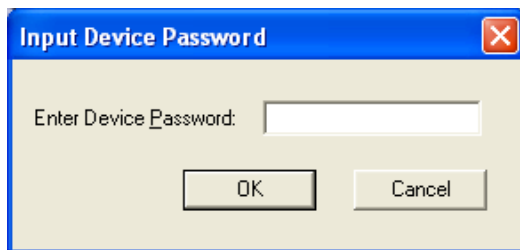
For first time users, the Device Password will be enabled and the IP address hidden until its setup and configuration has been completed.

## 2.1 Setup Wizard

Use “Setup Wizard” to take you through the basic configurations necessary to start using IP Camera.

1. Click to highlight the IP Camera on the right that you want to configure.
2. Click on “Setup Wizard”.

**First**, to begin Utility will request for the “Input Device Password” when you click “Setup Wizard”.

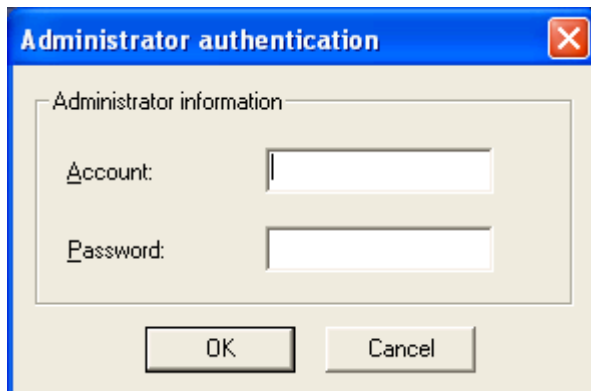


User must enter the master password (as shown on IP Camera unit & freeware CD) to enter “Setup Wizard”; or “Launch IP Camera”, or “IP Configuration”. You may also delete the need for a device password once you enter “IP Configuration” under “Advanced”.

**WARNING:**

Do not lose this password. If the password is lost, you can not access the device to make changes. If you lose this password, you’ll have to contact your reseller for the Master password.

**Second**, Utility will request for “Administrator authentication” after you have passed the “Input Device Password”.

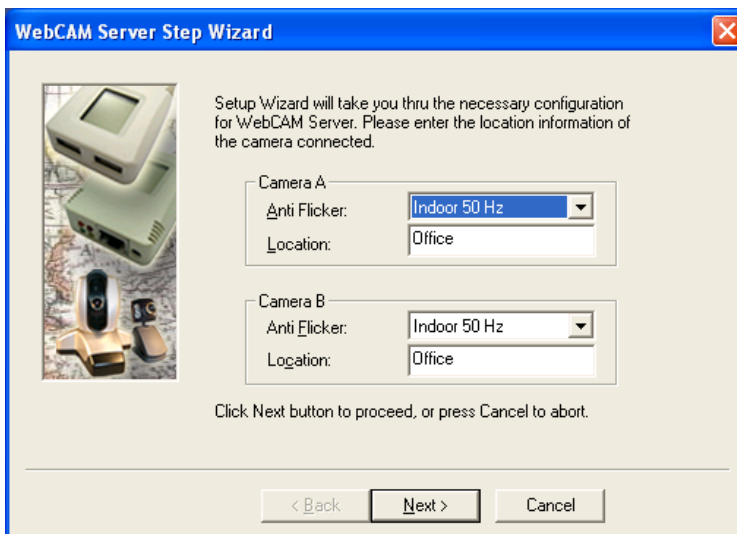


To enter, user must input “admin” [in small caps] for Account name and the authentication key (as shown on freeware CD) for Password. Subsequently, the user may change the Account name and Password in the “Setup Wizard”.

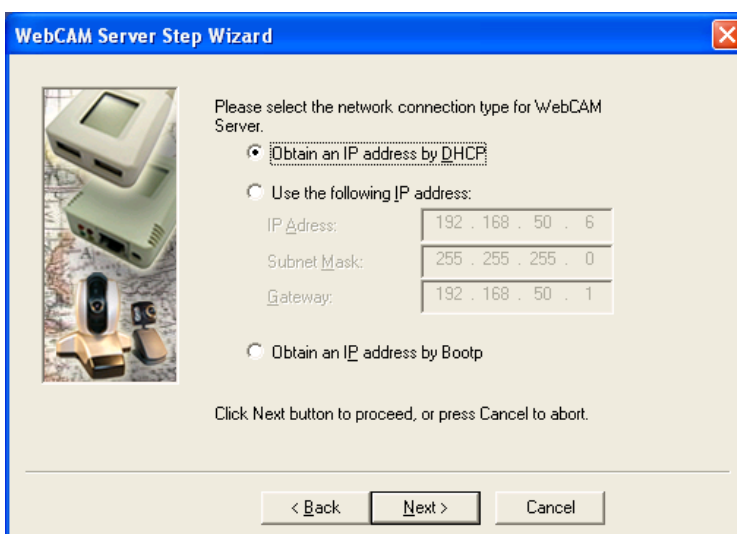
**WARNING:**

Do not lose your passwords (as attached on the IP Camera unit and freeware CD). It is required every time you “reset” your IP Camera either thru “About” section of the webpage, or via the manual reset button. If you lose these passwords, you’ll have to contact your reseller for the master password.

- Once you have entered the necessary information for “Input Device Password” and “Administrator authentication”, “Setup Wizard” will initiate to take you through the installation.



- Enter the necessary camera configurations. Choose the appropriate frequency (Indoor 60 Hz, Indoor 50 Hz or Outdoor) to prevent flickering on the video feed. Enter a name for the camera in the “Location” box to easily identify it.
- Click “Next >” to configure the Network Connection.



“Obtain an IP address by DHCP”

Choose this if you do not know your basic Network Configurations

“Use the following IP Address”

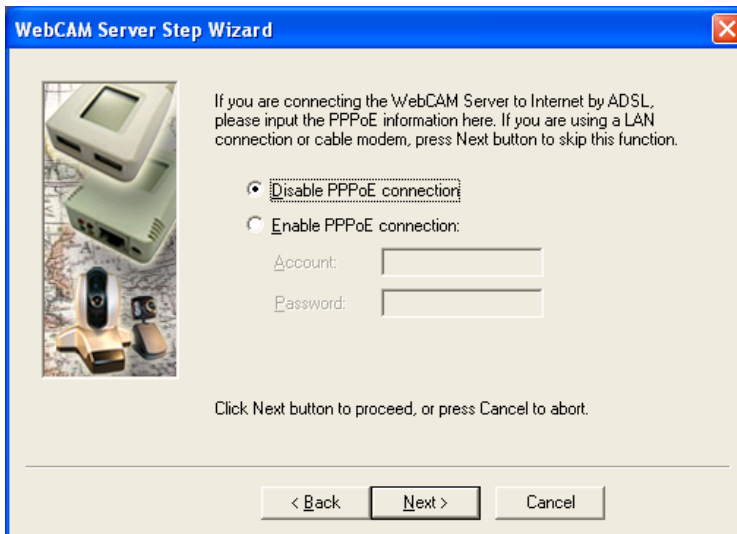
Enter an appropriate internal IP Address, Subnet Mask and Gateway for IP Camera (Refer to Appendix C for an explanation of IP Addresses)

“Obtain an IP address by Bootp”

Allow IP Camera to obtain an IP address using Bootp protocol.

6. Click “Next >” to proceed to xDSL/Cable modem setup.

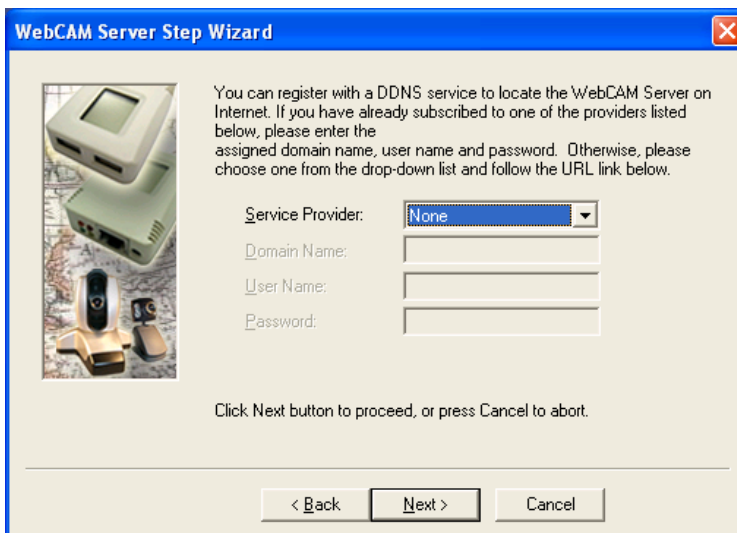
This section has to be configured to allow IP Camera to access the Internet through an xDSL service provider.



Select “Enable PPPoE connection” and enter your account and password details as provided by your internet service provider (“ISP”).

Otherwise, leave it at the default “Disable PPPoE connection”

7. Click “Next >” to proceed with DDNS setup



You will need to setup this section if you are using a Dynamic IP

**WebCAM Server Step Wizard**

You can register with a DDNS service to locate the WebCAM Server on Internet. If you have already subscribed to one of the providers listed below, please enter the assigned domain name, user name and password. Otherwise, please choose one from the drop-down list and follow the URL link below.

Service Provider:

Domain Name:

User Name:

Password:

For detailed information and to subscribe to dyndns.org, please go to <http://www.dyndns.org/>  
Click Next button to proceed, or press Cancel to abort.

< Back   Next >   Cancel

If you do not already have a Domain Name registered with your ISP, select from one of the 4 Free DDNS service providers (zive.org, dhs.org, dyndns.org or myddns.org). Follow the link to the respective free service providers to register a Domain Name and obtain a User Name and Password. Enter these details in the boxes provided

8. Click "Next >" to change your administrator account and password information.
- 9.

**WebCAM Server Step Wizard**

To ensure privacy, please set the following administrator account and password to WebCAM Server. Note: If this is left empty, WebCAM Server can be accessible and viewed by the public.

Account:

Password:

WARNING: Do not lose the administrator account and password. Once set, you will not be able to configure WebCAM Server without the administrator account and password.

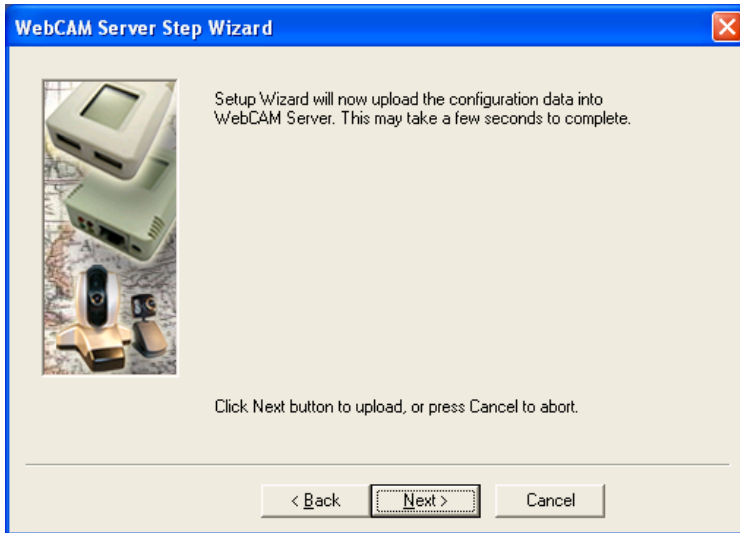
Click Next button to proceed, or press Cancel to abort.

< Back   Next >   Cancel

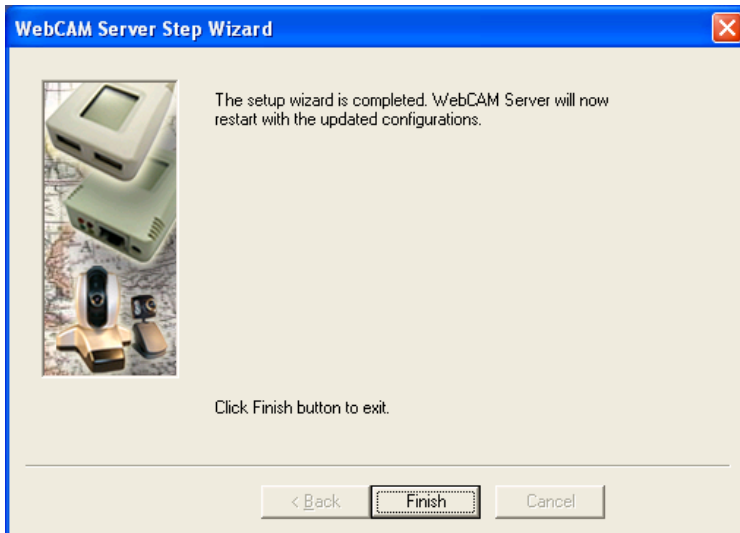
An administrator account is necessary to ensure privacy. The user may revert to default settings, or if you do not set one, just delete the account and password and click "Next".

**WARNING:** Do not lose the administrator account and master password. Once set, you will not be able to re-configure IP Camera after reset without the administrator account and password. To reset the IP Camera account password, you will need to re-install the firmware using Utility.

10. Click “Next >” to upload these configuration to IP Camera.



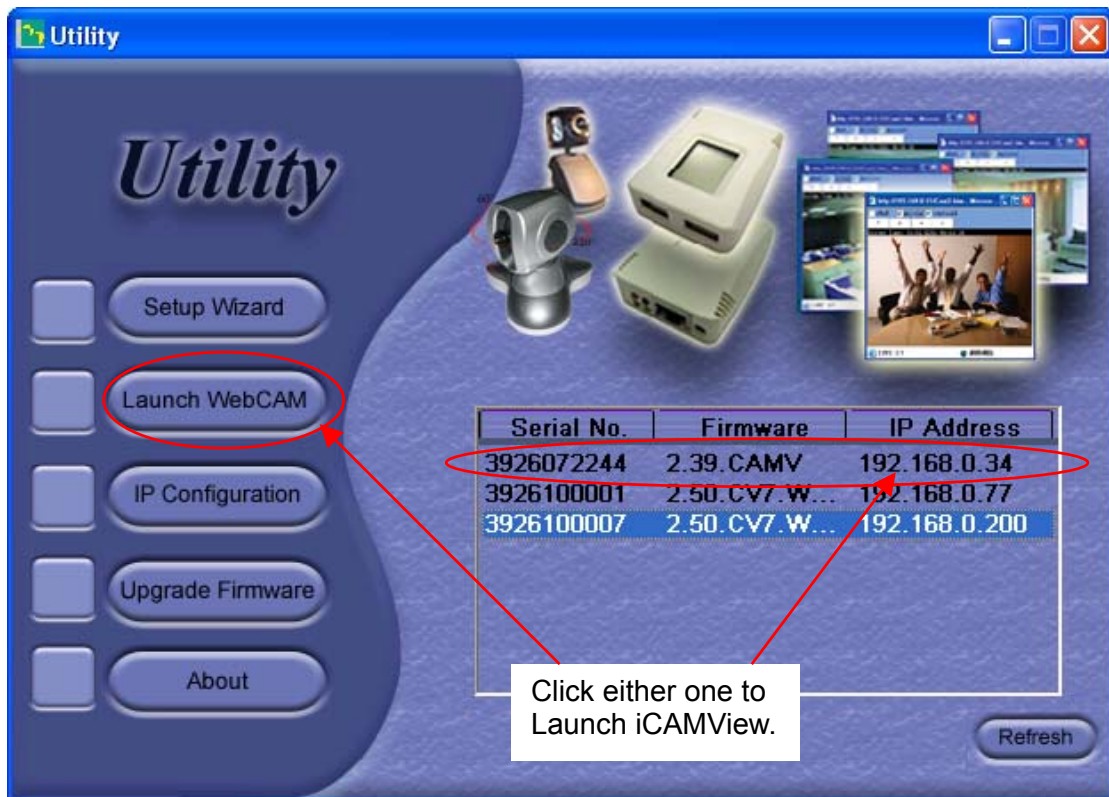
11. Click “Next >” to save and restart IP Camera with the new configurations.





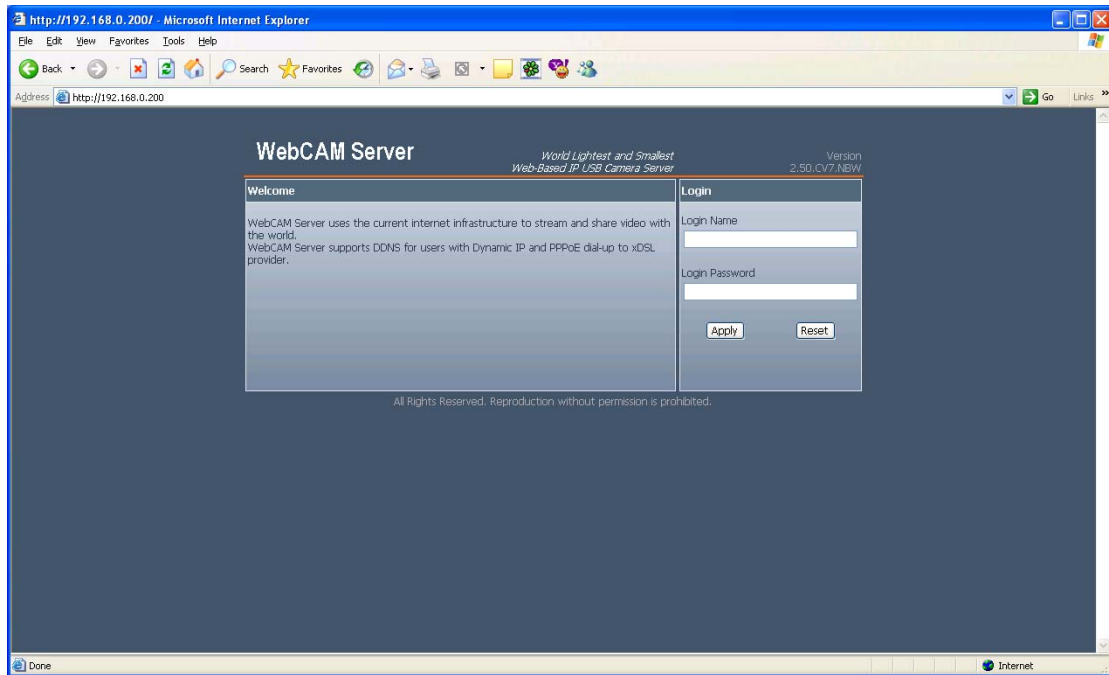
## 2.2 Launch IP Camera

Once you have finished with the above Setup Wizard, either click “Launch IP Camera” or double click on the IP Camera listed on the table to launch it.

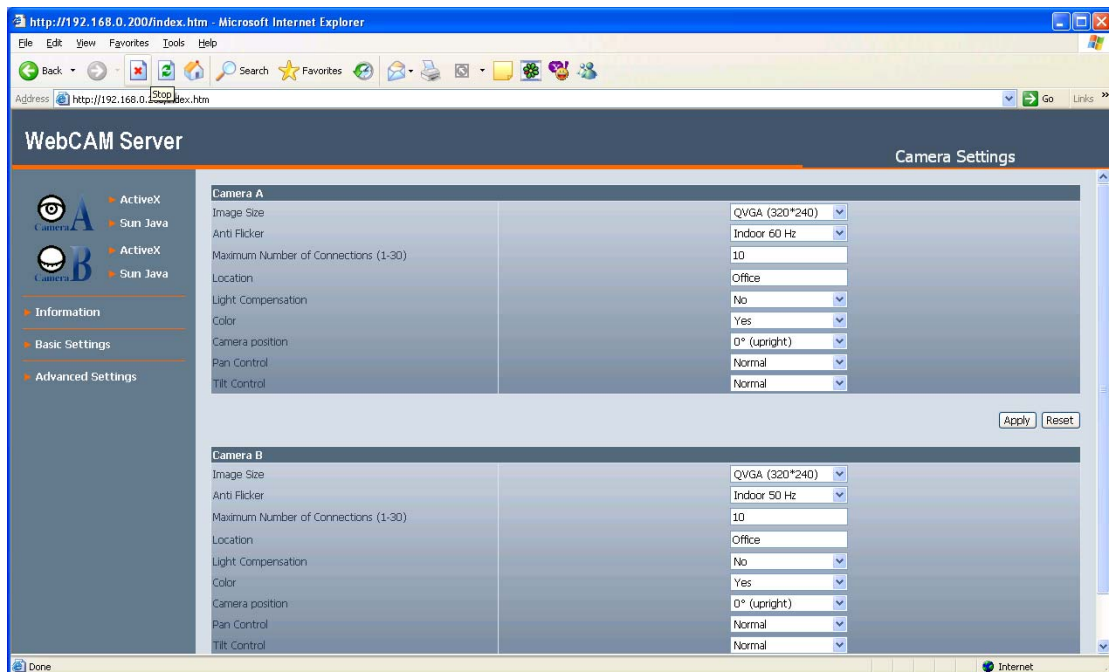


Once you have done the above, the IP Camera login screen will appear.

Key in the account name and password entered earlier (if you did not configure one, then revert to the default name “admin” and key in the Master password, OR just press ENTER or click on the “Apply” button, if the account name and password was not set and have been deleted).



The IP Camera webpage will appear. Click ActiveX for Camera A to view the video images.



### 2.3 IP Configuration

This section allows you to determine IP address configuration for IP Camera.

Select the IP Camera on the right display screen, and then click “IP Configuration”. This will bring up the IP Address Configuration window. There are two tabs;

- IP Address
- Advanced (for port setting configuration)

### 2.3.1 IP Address

Use this section to set the IP Address of IP Camera.

When using IP Camera for the first time, it is advisable to choose the “Using Static IP Address” option. For this option, the user will have to enter an IP Address, Subnet Mask and Gateway of their choice (refer to Appendix C for IP address explanation).

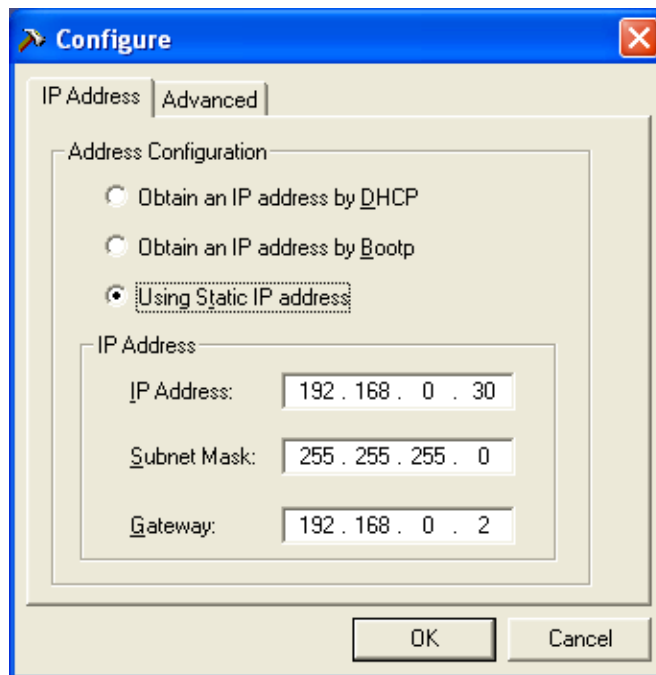


Fig.9. IP Configuration: Set an IP Address for IP Camera

Once the IP Address is set, you will be able to connect to IP Camera webpage by entering this IP Address into a standard browser.

“Obtain an IP address by DHCP or BOOTP”

The IP address, Subnet Mask and Gateway is acquired directly and assigned automatically by the system.

### 2.3.2 Advanced

This section sets security password against unauthorised access to devices through Utility.

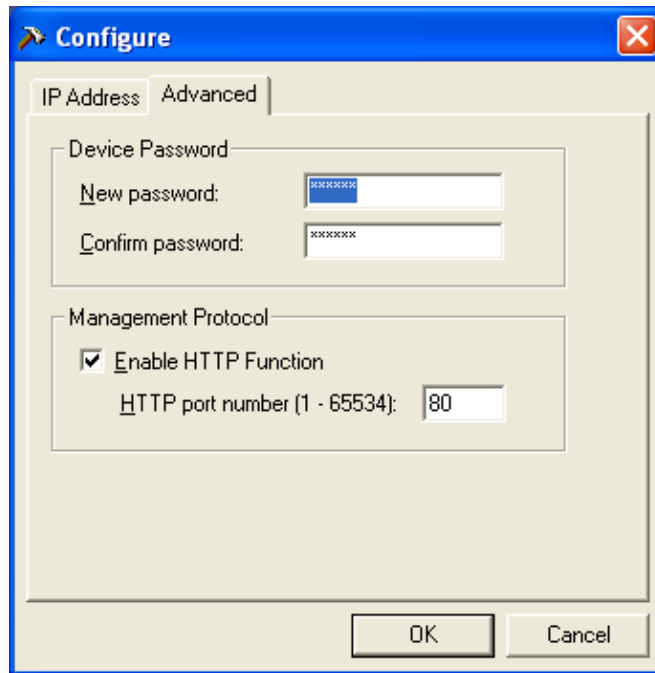


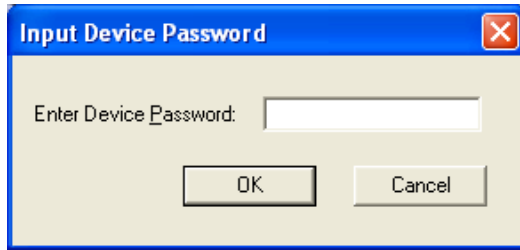
Fig.10. IP Configuration: IP Camera Advanced settings

**i. Device Password**

Use this to set an access password to the individual device. Once set, the user must enter the password to access the device. In addition, the IP Address will not be shown on the right display panel of Utility.



Utility will request for the “Input Device Password” when you click either “Setup Wizard”, “Launch IP Camera” or “IP Configuration”



**WARNING:**

Do not lose this master password. If the password is lost, you can not access the device to make changes. If you lose this password, you'll have to contact your reseller for the master password.

To remove the password, you must first enter a valid "Input Device Password", go to "Device Password" and delete the entries, click "OK".

**ii. Management Protocol**

The administrator can determine the parameter settings when providing access via HTTP (web) to IP Camera. For security reasons, the administrator can choose to use either an open or advanced port setting to control these access.

The default values are set to port number 80 for HTTP.

Once the HTTP port number is set to another port (other than 80), the full IP Address must be entered in order to access the Website.

*For example:*

- ☞ If a value of 61 is set as the HTTP port number, then `http://192.168.0.177:61` must be entered as the web address in order to access IP Camera website.

Uncheck to disable this function.

## 2.4 About

Click on this button to show software and version details.

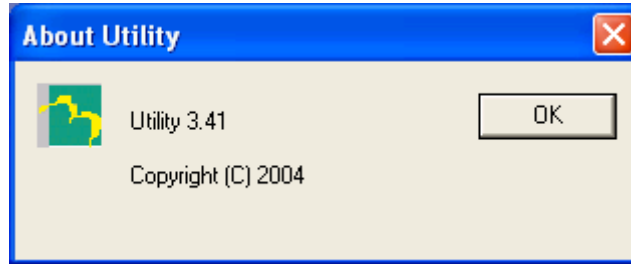


Fig.11. About Utility

## 2.5 Refresh

Utility automatically searches for any IP Cameras connected to the LAN. However, the user can do a manual search by clicking the “Refresh” icon located at the bottom right of the menu.





## Section 2. IP Camera Web Manager Interface

The IP Camera webpage main menu is divided into two sections. The selection menu on the left and display menu on the right. The selection menu consists of the following options:

### 2.1 Web-Camera Selection

### 2.2 Information

### 2.3 Basic Settings

### 2.4 Advanced Settings

### 2.5 Viewing images using a PDA / Web Enabled Phone



Fig.14. IP Camera Main Menu

When using IP Camera for the first time, you must set the following to ensure that IP Camera works smoothly;

- Set the necessary parameters in the "Configuration" menu. In particular, the "Anti Flicker" under "Camera Settings" should be set to 50Hz or 60Hz (change this to 60Hz or 50Hz / Outdoor if video output continues to flicker).
- That the USB PC camera lens is adjusted for best results.

By default the above Camera Settings page is displayed when you login.



## 2.1 Web-Camera Selection

Click on either “ActiveX” or “Sun Java” from Camera A or B to view the camera images.

By default the first USB camera connected to IP Camera will be denote as “Camera A”

Click “Camera B” to view camera B.

**Note:** ActiveX can only function on Windows platform and a plug-in has to be installed on the client's computer. If this is prohibited for safety reasons you will have to use Sun Java to view the video feed. Sun Java also allows users who are not using Windows based Operating System to view the video feed.



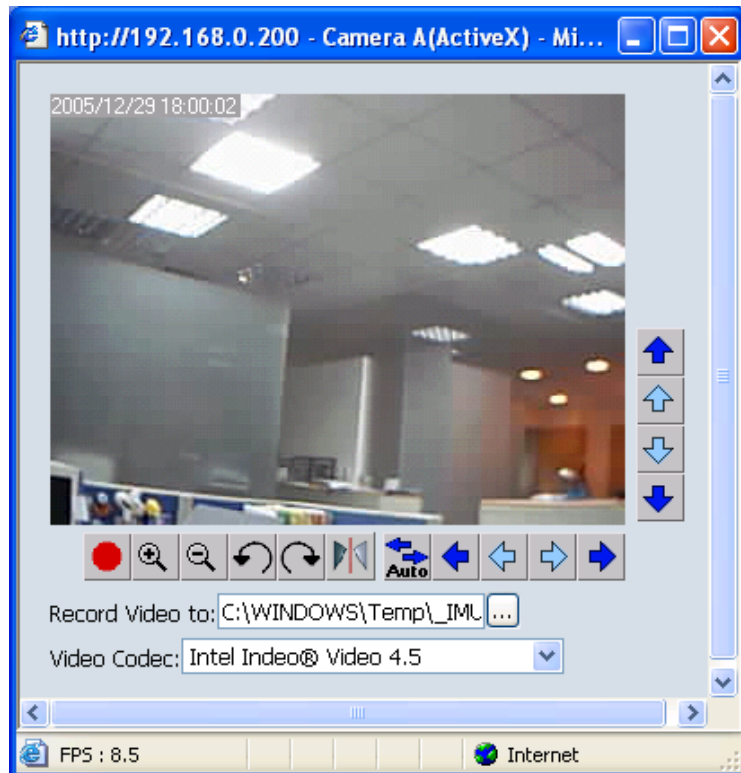
Once you click on “Camera A” the following image will appear.

Make sure to adjust the USB camera lens for best picture results.


Click on the controls along the Window to control the camera.

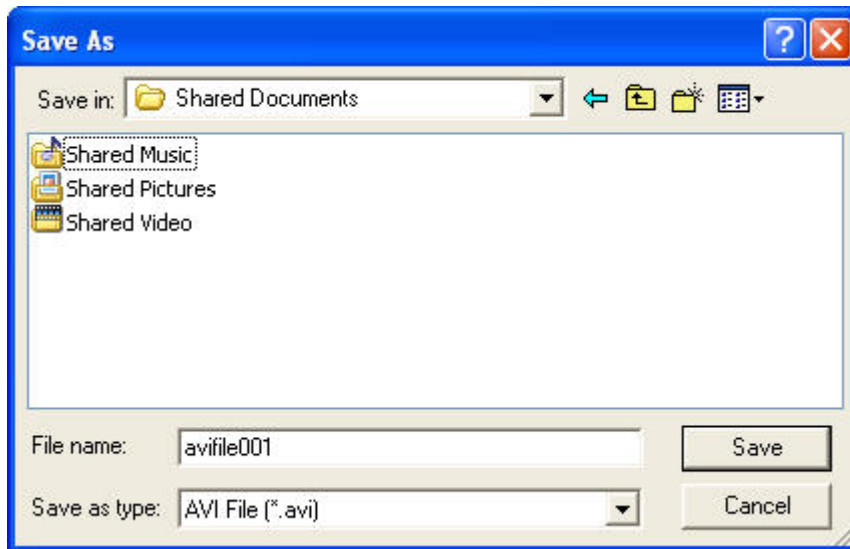
### Note:

The pan and tilt controls will only work with Pan Tilt cameras.











Click  to record the current image to the selected directory, e.g. C:\WINDOWS\Temp

To change the saved location and filename. Click  and the “Save As” window will pop up. Choose an alternate location and filename. Click the “Save” button to confirm changes.



To change Video Codec, click 

**Note:** The availability of Codec depends on whether the individual user has it installed on the PC or not. Download and install Windows Media Player 10 to enable MPEG4 codec.

	Digital Zoom In, Digital Zoom Out
	Rotate Left, Rotate Right
	Flip the image vertically.
	Auto Pan the camera
	Pan Left by 5 deg / Pan Left by 1 deg.
	Pan Right by 1 deg / Pan Right by 5 deg.
	Tilt Up by 5 deg / Tilt Up by 1 deg.
	Tilt Down by 1 deg / Tilt Down by 5 deg.

## 2.2 Information

The "Information" tab contains the following subsections;

- 2.2.1 System Status,
- 2.2.2 Current Connections and
- 2.2.3 Event Log.

### 2.2.1 System Status

This section displays all the information relating to IP Camera.

#### i. System Information

This section shows IP Camera System Information such as the Hardware and Firmware Version, the serial number, current / local System Time, the system name, contact, location and uptime. These values are either provided by IP Camera or set by user.

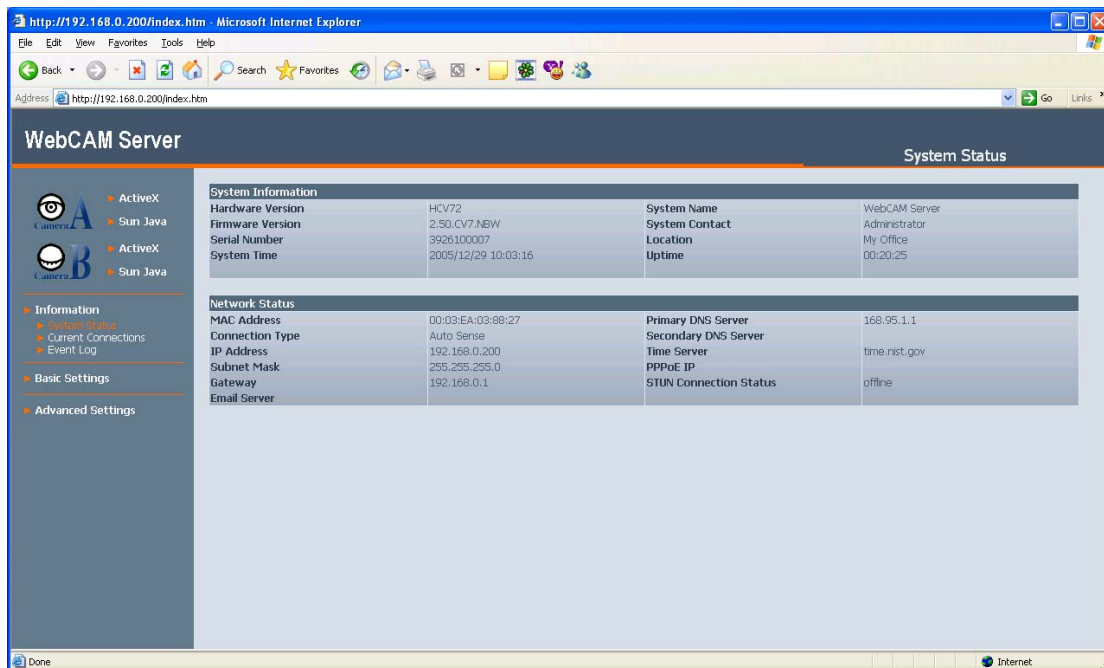


Fig.15. IP Camera System Status

## ii. System Information

This section shows IP Camera Network settings. The MAC Address is unique to every IP Camera. All the other values are set by the user in Setup Wizard.

### 2.2.2 Current Connections

This section will show all the users currently viewing either Camera A or Camera B. It also lists, the login time, and total bytes received. The user has an option to block the IP or even disable the account of any errant viewer (The administrator privilege will be required for this feature). A total of 10 connections can be displayed at the same time.

**Note:** If you do not have Administrator's privilege, the IP and Account details will be hidden.

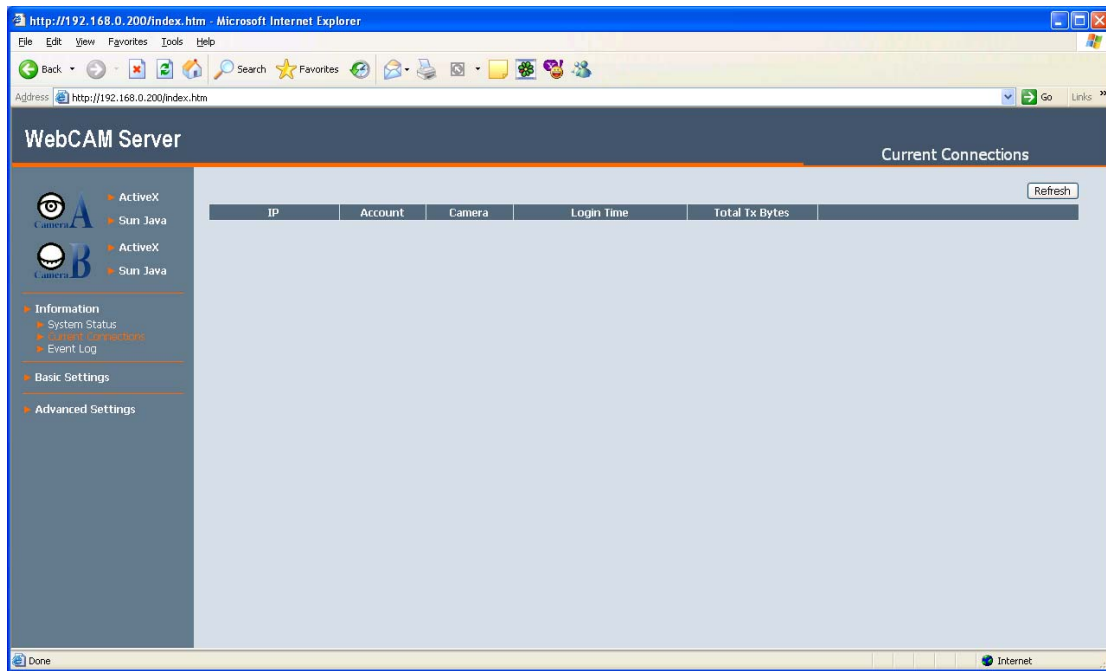


Fig.16. IP Camera Current Connections

### 2.2.3 Event Log

This section will keep a record of all events that occurred in IP Camera. The user can Refresh, Clear or Save the log file. There is also an option to sort the logs according to “Level” or “Type”. IP Camera can log up to 2,000 events

**Note:** If you do not have Administrator privilege, the User Name and IP will be hidden.  
 "Camera A: user \*\*\*\*\* connected from IP: \*.\*.\*"

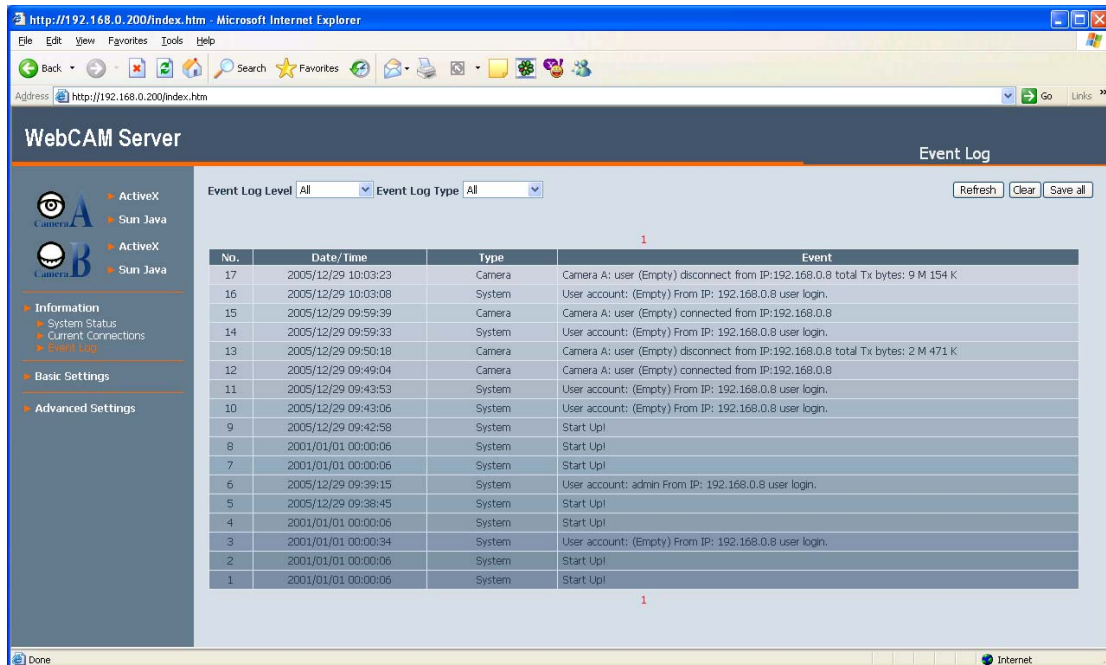


Fig.17. IP Camera Event Log

### 2.3 Basic Settings

Please ensure that each of the following option is set correctly. Otherwise, IP Camera may not work properly.

### 2.3.1 Camera Settings

### 2.3.2 Network

### 2.3.3 Account Settings

### 2.3.1 Camera Settings

Use this section to set up the USB camera.

#### i. Setting up Camera A (Similar with Camera B)

Camera A	
Image Size	QVGA (320*240)
Anti Flicker	Indoor 60 Hz
Maximum Number of Connections (1-30)	10
Location	Office
Light Compensation	No
Color	Yes
Camera position	0° (upright)
Pan Control	Normal
Tilt Control	Normal

Apply Reset

Fig.18. Individual Camera Configuration

#### "Image Size"

User can select an image size between QQVGA (160\*120), QCIF (176\*144), QVGA (320\*240), CIF (352\*288), VGA (640\*480).

#### "Anti Flicker"

Choose between 50Hz, 60Hz or Outdoors. Note: If you do not choose the right frequency, the image will flicker or lines will appear on the images.

#### "Maximum Number of Connections (1-30)"

Use this to limit the number of users that can connect to this camera.

#### "Location"

Enter a suitable location / name of your choice for the camera.

#### "Light Compensation"

Choose "Yes" and IP Camera will increase the lighting of the image. This is useful when monitoring indoors.

Choose "No" if you do not want IP Camera to adjust the light and view the images as is.

#### "Color"

Choose "Yes" for color and "No" for black and white display.

#### "Camera Position"

Choose from the automatic "0 degree (upright)", to 90, 180 (upside down), and 270 degree position of the camera. This is to facilitate the ability to reposition the camera in any way the user desires.

**“Pan Control”**

Choose from “Normal” or “Reverse”. This is to set the mirror function of the camera and fix the image the way the user desires each time the user logs on to view.

**“Tilt Control”**

Choose from “Normal” or “Reverse”. This is to set the image to its right side up. Similar to the “Pan Control” function.

Click “Apply” to save changes. Otherwise, all changes will be lost.

**2.3.2 Network**

This option determines the IP Camera Network settings.

**i. IP Address**

These items were all setup earlier in Setup Wizard. Enter new addresses and click “Apply” to change.

IP Address	
IP Address	192.168.50.6
Subnet Mask	255.255.255.0
Gateway	192.168.50.1
Obtain an IP address*	Using DHCP

Fig.19. IP Camera IP Address Settings

**“IP Address”**

This item determines IP Camera IP Address.

**“Subnet Mask”**

This item sets IP Camera Subnet Mask. The value is normally 255.255.255.0

**“Gateway”**

This item is to set IP Camera Gateway.

**“Obtain an IP address”**

This allows the user to choose either to set IP Camera IP Address manually or via DHCP. IP Camera will reboot after the above settings have been changed.

**ii. DNS Server IP**

DNS Server IP	
Primary DNS Server IP	168.95.1.1
Secondary DNS Server IP	

Fig.20. IP Camera IP DNS Server IP

**“Primary DNS Server IP”**

This item sets IP Camera primary DNS Server IP address.

**“Secondary DNS Server IP”**

This item sets IP Camera secondary DNS Server IP address. IP Camera will use the secondary DNS Server IP address if the Primary DNS Server IP address is not working.

### iii. Port Number



The screenshot shows the 'Port Number' settings page. It has a title bar 'Port Number'. Below it, there are two rows of settings. The first row is 'Http Port number\*' with a text input field containing '80'. The second row is 'Communication to Camera Port number\*' with a text input field containing '9001'.

Fig.21. IP Camera Port Settings

#### “HTTP Port Number”

This determines the port from which the webpage is accessible thru your Router. By default the port number is 80.

#### “Communication to Camera Port Number”

This determines the port from which the video images is streamed thru your Router. By default the port number is 9001.

### iv. Ethernet



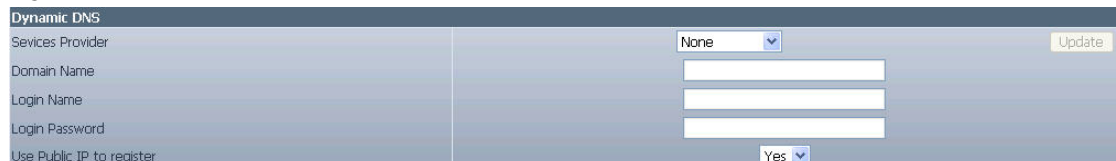
The screenshot shows the 'Ethernet' settings page. It has a title bar 'Ethernet'. Below it, there is one row of settings: 'Connection Type\*' with a dropdown menu showing 'Auto Sense'.

Fig.22. IP Camera Ethernet Settings

#### “Connection Type”

This item sets the communication speed between IP Camera and the Network. IP Camera will reboot after “Connection Type” is changed.

### v. Dynamic DNS



The screenshot shows the 'Dynamic DNS' settings page. It has a title bar 'Dynamic DNS'. Below it, there are five rows of settings: 'Services Provider' with a dropdown menu showing 'None' and an 'Update' button; 'Domain Name' with a text input field; 'Login Name' with a text input field; 'Login Password' with a text input field; and 'Use Public IP to register' with a dropdown menu showing 'Yes'.

Fig.23. IP Camera Dynamic DNS Settings

#### “Service Provider”

The IP Camera can be configured to register the current IP to a dynamic DNS provider. This will enable you to locate IP Camera’s IP every time the IP changed due to an ADSL connection redial. Before you use this function, you will have to register with either one of these five service providers;

- None (Select this to disable the DDNS function)
- dhs.org
- dyndns.org
- myddns.com
- zive.org

Click on “Update” to get latest list of Service Providers.

#### “Domain Name”

Enter the Domain Name you have created from one of the five websites.

**“Login Name”**

Enter your login name for the above domain name. You only have to configure once.

**“Login Password”**

Enter your password. You only have to configure once.

**“Use Public IP to register”**

Choose “Yes” or “No”. IP Camera will automatically send the WAN IP to the DDNS server. This ensures that DDNS is notified of your current Dynamic IP.

**vi. PPPoE**

Use this option to allow IP Camera to directly dial-up using your xDSL modem and connect to the Internet. Once set-up, IP Camera will be able to stream the video images directly to the Internet without going through a router.



Fig.24. IP Camera PPPoE setting

**“When Connection should be made”**

The user has a choice of;

- Disabled : Default setting. IP Camera does not dial in
- Connect always : IP Camera will automatically dial in.

**“Login Name”**

Enter the login name assigned by your ISP.

**“Login Password”**

Enter the password assigned by your ISP.

**2.3.3 Account Settings**

This section allows you to set up to Eight (8) user account with different permissions for IP Camera.

**i. User Account****“User Name”**

Determine the username of visitors who can log in. The administrator can set up to 32 case sensitive character names.

**“Password”**

Set a password for the visitor’s account. The administrator can set up to 32 case sensitive passwords.

**“Permission”**

Determine the permission level to one of “Administrator”, “Operator”, “Viewer” or “No Access”



Administrator:	An Administrator has full access including write permission to all sections. Only an Administrator can see the “User Name” and IP details or set the “Permit Hours” for Camera viewing to Operator or Viewer accounts.
Operator:	This permission level allows the user access to IP Camera menus, but without the permission to amend them.
Viewer:	This permission level allows the user to access IP Camera at specific time as set in “Permit Hours” for seeing camera. The user does not have write permission and can only access the “Camera” and “Information” section.
No Access:	This is to revoke either of the above two permission levels given to a user. This disables the user account.

**WARNING:** If you did not setup the Administrator account in Setup Wizard; you **MUST** now set an Administrator permission level **BEFORE** setting either “Operator”, “Viewer” or “No Access”. Failure to do so will result in you being locked out of IP Camera Web Manager!

#### “IP Filter”

Visitor can only login from the IP address specified here for security consideration. You can restrict a user access only from 192.168.1.0/24 by setting up “192.168.1.\*”. Otherwise, leave it as “\*.\*.\*” to allow the user to login from any place.

User Name	Password	Permission	IP Filter	Max. FPS	Viewing Hour
<input type="text"/>	<input type="password"/>	Administrator	*.*.*	10	Configure
<input type="text"/>	<input type="password"/>	No Access	*.*.*	10	Configure
<input type="text"/>	<input type="password"/>	No Access	*.*.*	10	Configure
<input type="text"/>	<input type="password"/>	No Access	*.*.*	10	Configure
<input type="text"/>	<input type="password"/>	No Access	*.*.*	10	Configure
<input type="text"/>	<input type="password"/>	No Access	*.*.*	10	Configure
<input type="text"/>	<input type="password"/>	No Access	*.*.*	10	Configure
<input type="text"/>	<input type="password"/>	No Access	*.*.*	10	Configure

Apply Reset

Fig.25. IP Camera User Account Settings

#### “Max FPS”

This allows the administrator to determine the frames per second (“FPS”) allocated to each type of account. By limiting the FPS, the administrator can manage the limited bandwidth available. The administrator can set a figure between 1 to 20 and unlimited FPS.

#### “Viewing Hours”

When the Permission level is set to either “Operator” or “Viewer”, the Administrator can configure and determine the time to which either permission level can access the camera.

Click “Configure” to bring up the following window. You can set up to 4 different Permit Hours (in 24hr format). Click “Apply” to save and “Close” to exit.

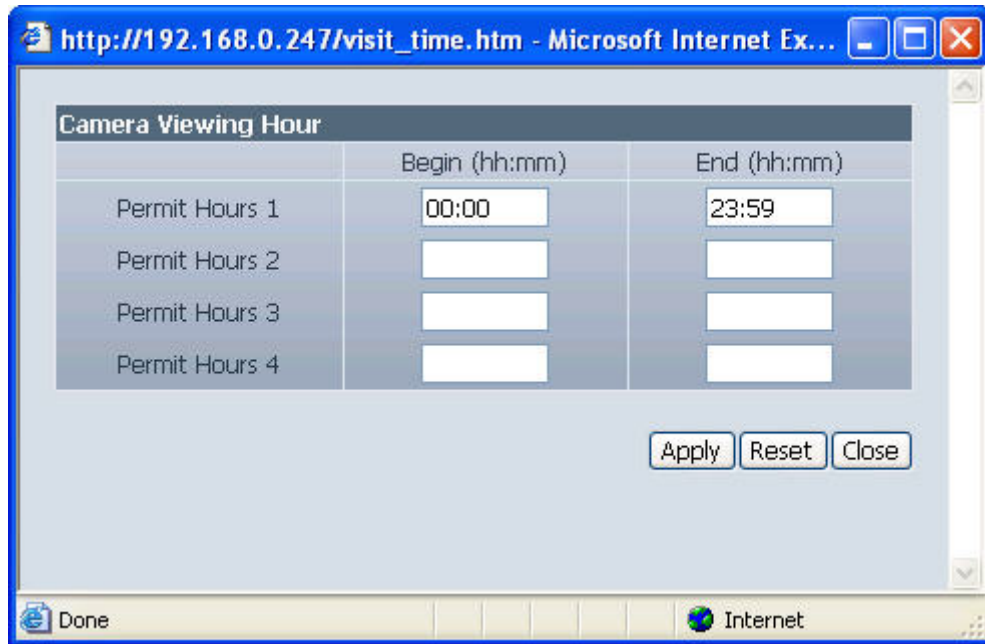


Fig.26. IP Camera Permit Hours Configuration

## 2.4 Advanced Settings

Please ensure that each of the following option is set correctly. Otherwise, IP Camera may not work properly.

- 2.4.1 Event Notification
- 2.4.2 Motion Detection
- 2.4.3 Image Recording
- 2.4.4 Email / FTP
- 2.4.5 System Settings
- 2.4.6 Language
- 2.4.7 About

### 2.4.1 Event Notification

This section determines the type of event an email is sent by IP Camera. IP Camera can send notifications to up to 8 email recipients.

**Note:** You must have Administrator privilege to edit this section.



Fig.27. IP Camera Event Notification Page

### i. Event Notification

#### “Send Email”

To activate Event Notification, you will need to set “Send Email” to “Yes”. Select “No” if you do not wish to send out any notification.



#### “Email Server”

A valid “Email Server” with username and password (if authentication is required) must be made available for this feature to work. If you do not have this setup, or wish to change the settings, click on “Edit”.

#### “Email Address Book”

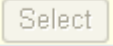
There must be at least one valid email address in the address book. The default email is just a sample. If you wish to add or delete entries in your address book, click “Edit”.

#### “Recipients”

IP Camera can send email notification to up to 8 valid email accounts. To add an email to the recipient list, click . To remove, click .

#### “Events”

This section determines the events that the selected recipients will be notified of by email. There are three types of events, Information, Warning and Error.

Click  to select from the list of events you wish these recipients to be notified of.

Information	Yes	No
Start up	<input checked="" type="radio"/>	<input type="radio"/>
PPPoE connection successful	<input checked="" type="radio"/>	<input type="radio"/>
Registration with DDNS server completed	<input checked="" type="radio"/>	<input type="radio"/>
User logged in to view camera	<input checked="" type="radio"/>	<input type="radio"/>
User logged out from camera	<input checked="" type="radio"/>	<input type="radio"/>
Image recording of camera A	<input checked="" type="radio"/>	<input type="radio"/>
Image recording of camera B	<input checked="" type="radio"/>	<input type="radio"/>
Warning	Yes	No
Server address can not be resolved	<input checked="" type="radio"/>	<input type="radio"/>
Connection with Email server failed	<input checked="" type="radio"/>	<input type="radio"/>
Connection with FTP server failed	<input checked="" type="radio"/>	<input type="radio"/>
FTP server has no response	<input checked="" type="radio"/>	<input type="radio"/>
FTP server connection closed abnormally	<input checked="" type="radio"/>	<input type="radio"/>
Connection with DDNS server failed	<input checked="" type="radio"/>	<input type="radio"/>
DDNS server has no response	<input checked="" type="radio"/>	<input type="radio"/>
DDNS server connection closed abnormally	<input checked="" type="radio"/>	<input type="radio"/>
Connection with time server failed	<input checked="" type="radio"/>	<input type="radio"/>
Motion detect camera A	<input checked="" type="radio"/>	<input type="radio"/>
Motion detect camera B	<input checked="" type="radio"/>	<input type="radio"/>
Error	Yes	No
Server address was not specified	<input checked="" type="radio"/>	<input type="radio"/>
Authorization failed, cannot login to Email server	<input checked="" type="radio"/>	<input type="radio"/>
Invalid username or password entered for FTP server	<input checked="" type="radio"/>	<input type="radio"/>
FTP server no such file or directory	<input checked="" type="radio"/>	<input type="radio"/>
Invalid username or password entered for DDNS server	<input checked="" type="radio"/>	<input type="radio"/>
Registration with DDNS server failed	<input checked="" type="radio"/>	<input type="radio"/>
DDNS domain name does not exist	<input checked="" type="radio"/>	<input type="radio"/>

Fig.28. IP Camera Event Selection List

By default, all the events are selected; you must click “Apply” to activate them. Close the window to return to the Event Notification Page. Click “Apply” to save your settings.

IP Camera will send you the following email notification depending on which event you have selected.

**Note:** The image recording and motion detection notification function here will send an email notification WITHOUT any pictures attached. For email notification with images, the administrator has to setup the Image Recording Page and Motion Detection Page under Advanced Settings.

Samples;

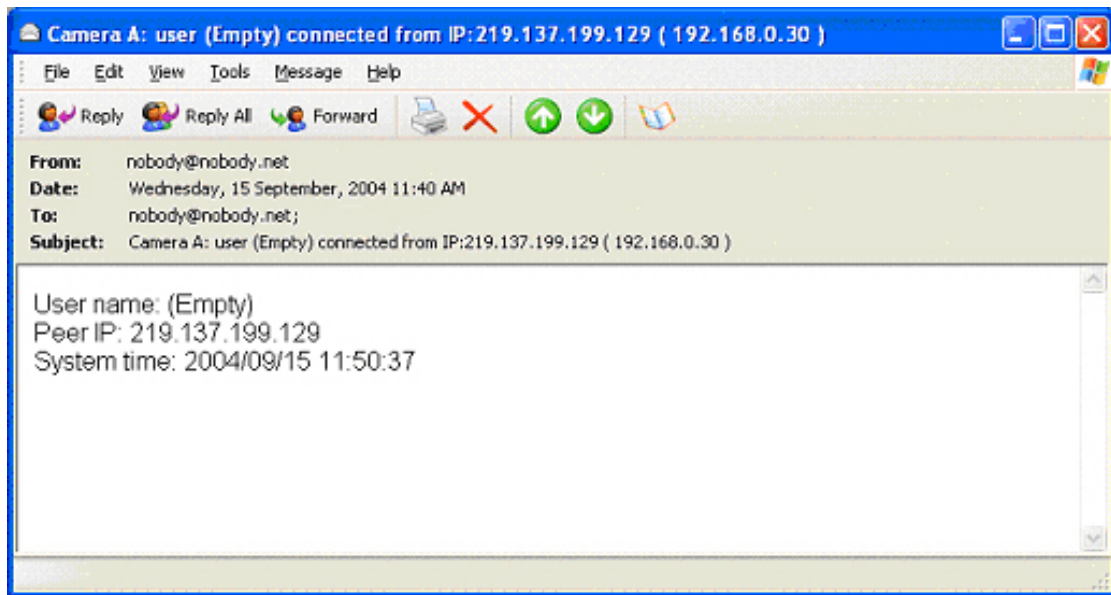


Fig.29. IP Camera Event : User Login Details (Date, Time, Camera & IP)

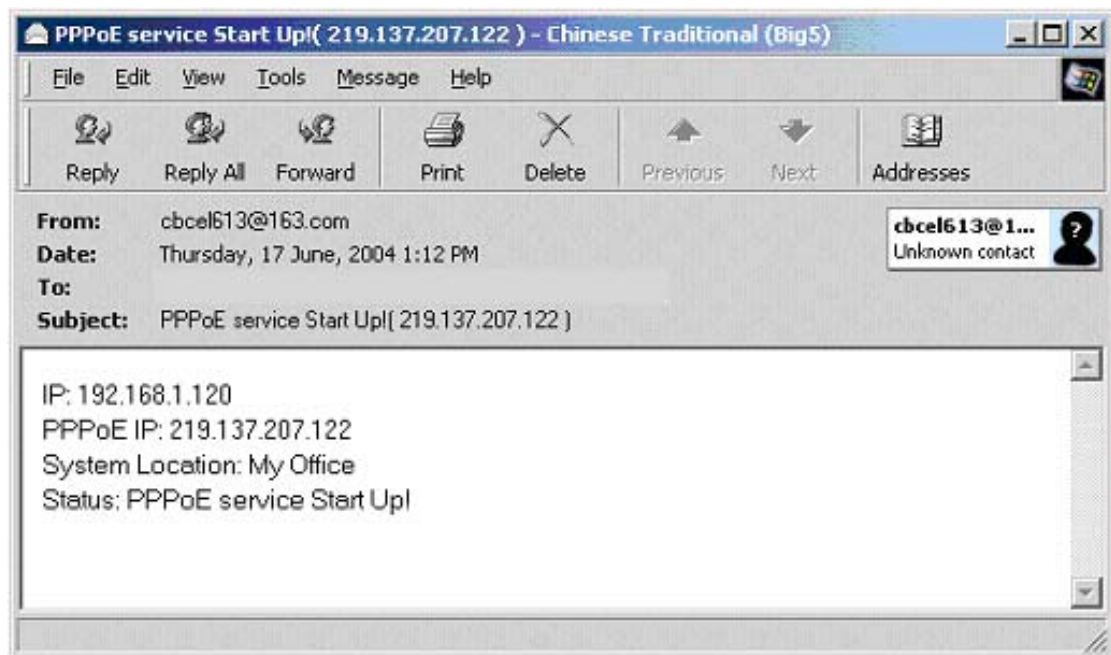


Fig.30. IP Camera Event : PPPoE Connect Successful



Fig.31. IP Camera Event : Camera A or B Motion Detected

## 2.4.2 Motion Detection

This page allows the administrator to set motion detection functions for the cameras.

### i. Camera A (or Camera B)

“Enable”

To activate motion detect, the administrator has two options;

- a. “Always On” or
- b. “On Schedule”, the administrator can set up to 4 different time slots for motion detection.

“Detection Sensitivity”

This will determines level of change before motion capture is triggered.

“Send image every”

Select a value between 1 to 5 seconds.

“Stop sending emails after ## email(s) or image idle for ## second(s)”

IP Camera will stop sending on the lower of the two conditions. You can set between 1, 3, 5, 7 and 10 seconds. Emails can be set from 1 to 99999 pieces, or 0 for stop sending email only when image idle occurred.

“Schedule”

If set to “On Schedule” in the above section, the administrator can then input the four preferred schedule time slots for motion detection. Time must be entered in 24hr format.

Fig.32. IP Camera Motion Detection Page

**“Send to FTP Server”**

This option allows the administrator to send and store the motion detected images on a FTP site. This is useful for future reference and recording purpose. Click “Yes” to activate.

**“ftp://<empty>/<folder>”**

This box allows the administrator to determine the file location within the FTP site. If you have not entered a FTP server, the above will be left <empty>.

To setup the FTP server, click “Edit” to go to the Email / FTP Page. Once you have entered the FTP server, login name and password, click “Apply” and then Click on “Motion Detect” to return here.

Enter a directory or folder name in <folder>. Click “Apply” when done.

**“System Defined / User Defined”**

The administrator can also determine to either have the system automatically assign the filenames for the pictures saved. Or assign these filenames.

**“Filename”**


Give the motion detected JPG images a standard filename prefix, to be followed by looping number suffix.

**“Loop from ## to ##”**

This will determine the number of suffixes preceding the above filename. Once the last number is reached, the first file will be replaced by the most current image.

**“Digits”**

This will determine the number of digits assignable for the above number suffix. The administrator can choose to assign between 1 to 6 digits.

Click  for an example.

#### “Send Email”

To send an email notification of Motion Detection with image, choose “Yes”, otherwise choose “No”

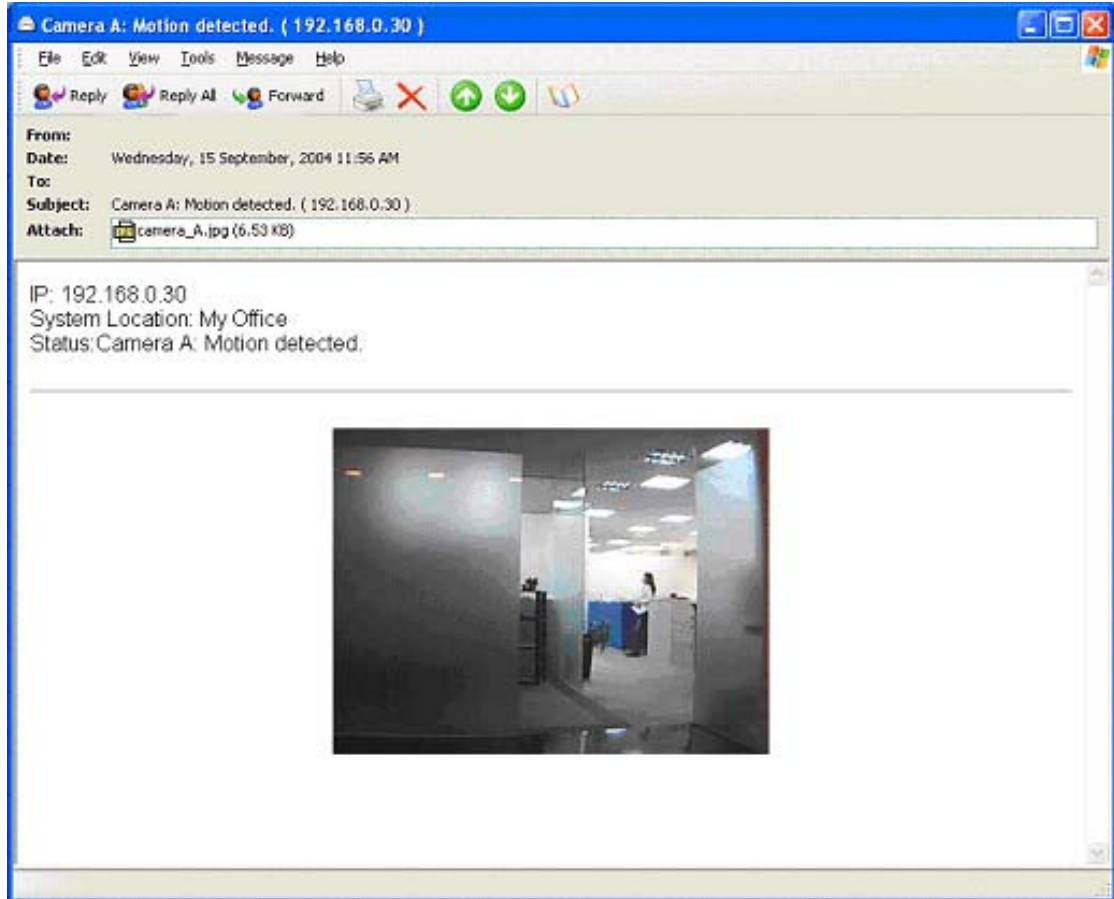







Fig.33. IP Camera Motion Detect Email Notification

#### “Email Server”

The administrator will have to set this up. Otherwise, click “Edit” to go to the Email / FTP Page to make the necessary configuration. Click on Motion Detection to return here.

#### “Recipient” & “Email Address Book”

The administrator can determine who shall receive email notification. To add to the recipient list, either double click on the email in the address book or click . To add all the email address at once, click . To remove an entry click , or  to remove all entries from the recipient list.

Click  to confirm and save the above settings.



### 2.4.3 Image Recording

Image recording allows the user to receive an image to either their email account or to a FTP server. The images will be sent over a predetermined interval and a certain period.

Fig.34. IP Camera Image Recording Page

#### i. Camera A (or Camera B)

“Begin – End (hh:mm)”

The administrator can determine up to 2 time slots when Image Recording is active. The time is in 24hrs format.

“Send image every ## minute(s)”

The administrator can determine the exact interval at which IP Camera capture and send an image. Choose among 1, 3, 5, 7 and 10 minutes.

“Send to FTP Server” & “Send Email”

This is similar to the function available in Motion Detection Page. Please refer to section 2.4.2 for details.

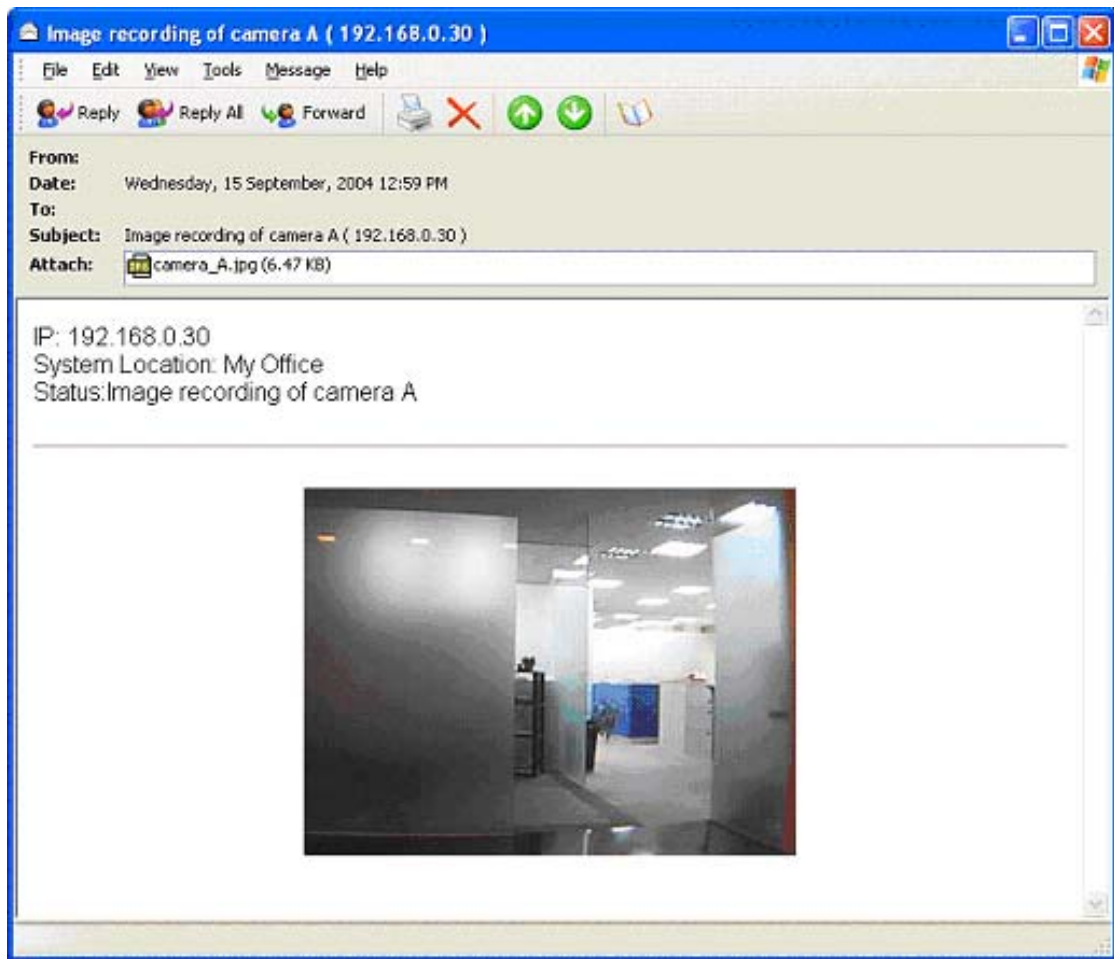


Fig.35. IP Camera Email of Image Recorded

#### 2.4.4 E-mail / FTP

This section sets up the necessary Email and FTP server information. The administrator will have to enter a valid Account Name and Password to the Email server and/or FTP server. This information is necessary to allow email notification and ftp file sending features in Advanced Settings.

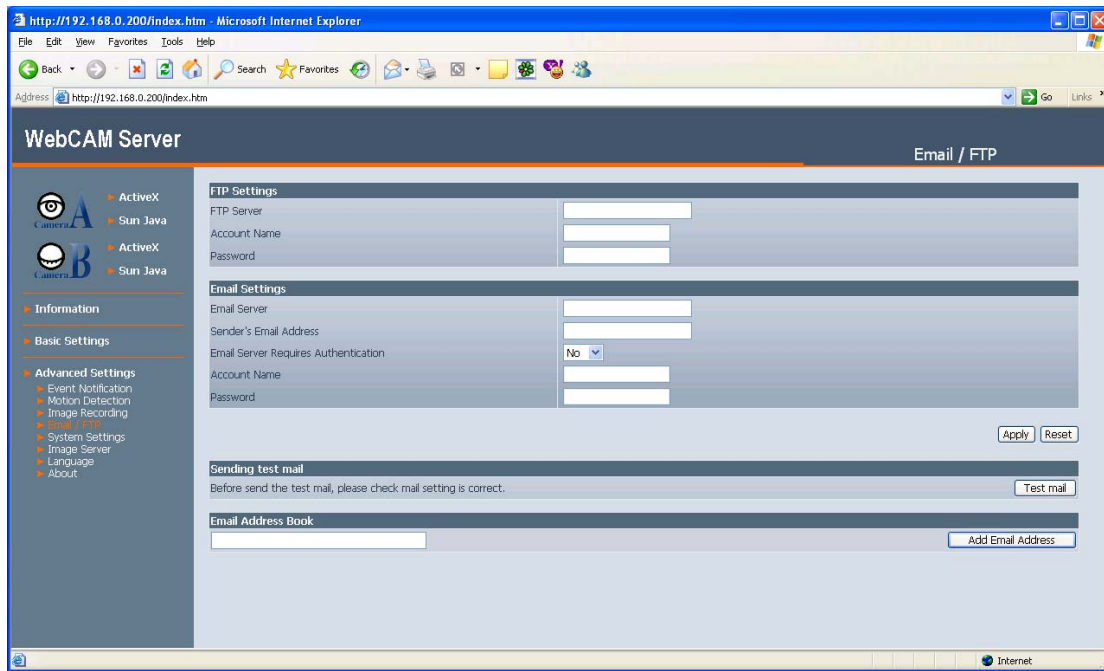


Fig.36. IP Camera Email / FTP Page

#### i. **FTP Settings**

##### “FTP Server”

The administrator will have to enter the FTP server address here.

##### “Account Name”

Enter the FTP account name here.

##### “Password”

Enter the corresponding password.

Click “Apply” to save the above settings.

#### ii. **Email Settings**

##### “E-mail Server”

The administrator will have to enter the Email server address here.

##### “Sender’s Email Address”

This will determines IP Camera’s Email address.

##### “Email Server Requires Authentication”

If set to “YES”, the administrator will have to provide the account name and password in order to access the Email server. Otherwise, enter “NO”.

##### “Account Name”

Enter the account name or login name to the Email server.

“Password”

Enter the password for the above account name.

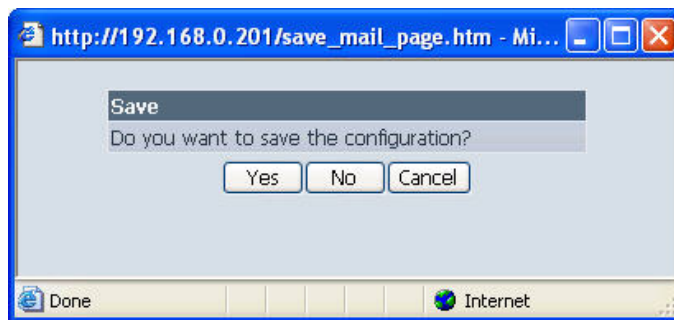
Click “Apply” to save the above changes.

### iii. Sending Test Mail

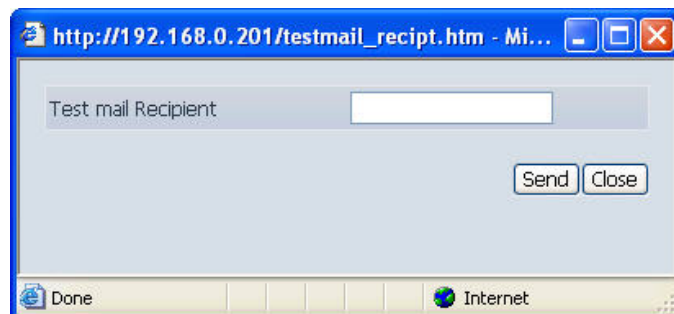


Fig.37. IP Camera test mail function

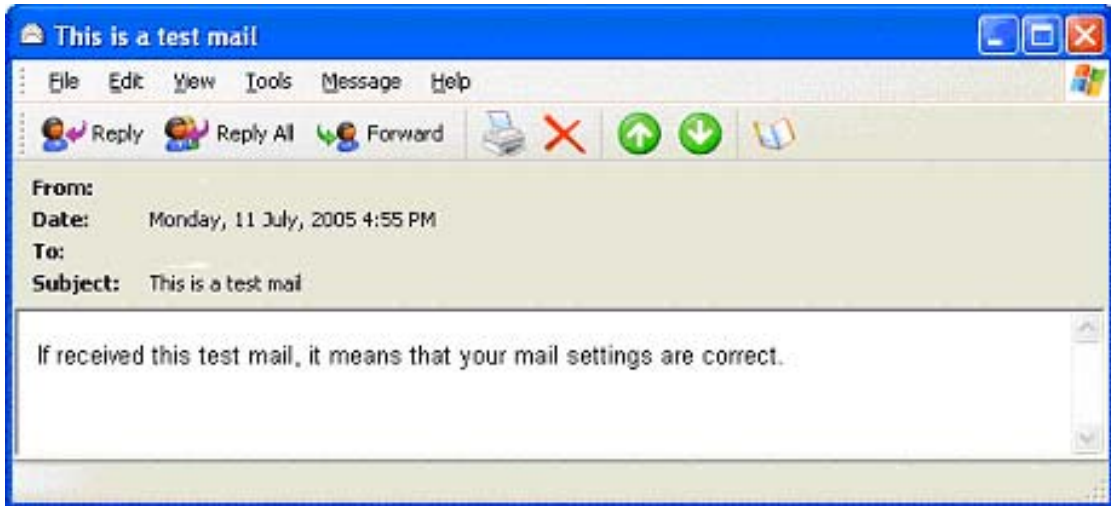
You must have the “Email Setting” section configured to proceed with “Test Mail”. Once that is done click “Test Mail” and the following will appear.



Click “Yes” to confirm sending and the following window will appear.



Enter the “Test mail Recipient” email address and click “Send”. If the Test Mail is successful, you’ll receive the following email message;



iv. **Email Address Book**

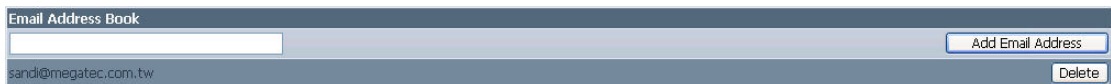
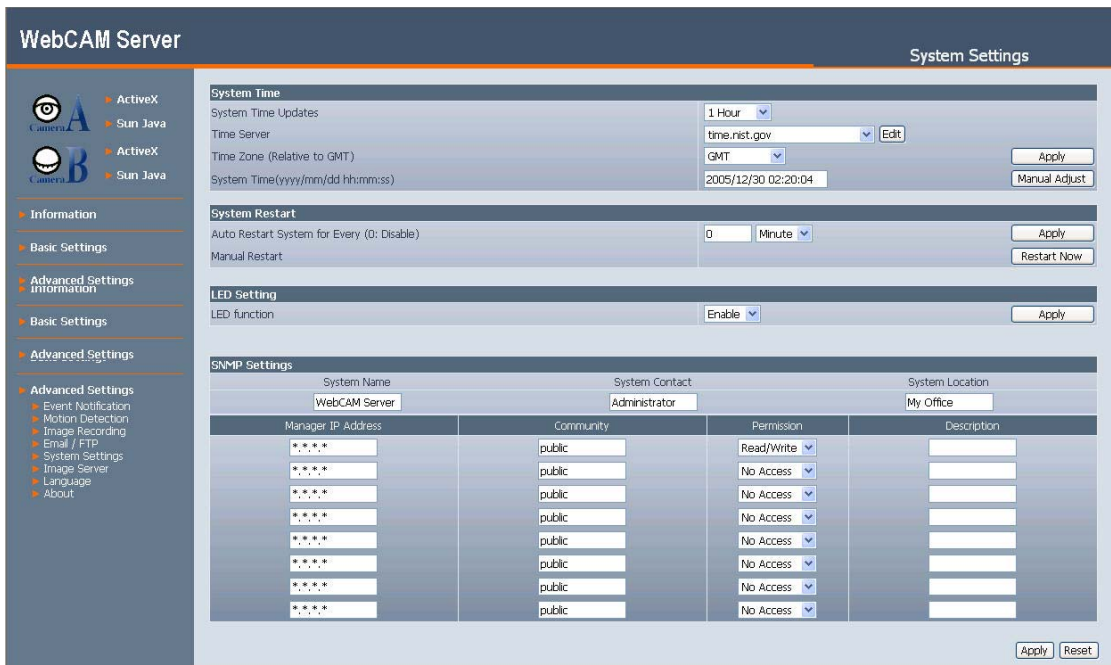


Fig.38. IP Camera E-mail Address Book Entry

Enter an Email address in the box provided and click “Add Email Address”. The new email address will be added to the list. The administrator can store up to 20 email addresses here. To delete an Email address, just press “Delete”.

**2.4.5 System Settings**

This page allows the administrator to set IP Camera SNMP settings so it can be used by a NMS (Network Management System) like MultiMonitor.



i. **System Time**

<b>System Time</b>	
System Time Updates	1 Hour
Time Server	time.nist.gov <input type="button" value="Edit"/>
Time Zone (Relative to GMT)	GMT
System Time (yyyy/mm/dd hh:mm:ss)	2005/12/09 09:3
<input type="button" value="Apply"/> <input type="button" value="Manual Adjust"/>	

Fig.39. System Time

**“Time Between Automatic Updates”**

The administrator can set an interval for time synchronization. Select either 1, 3, 12 hours or 1, 10 & 30 days.

**“Time Server”**

Choose the nearest Time Server to your IP Camera location. The administrator can choose from the list of a maximum of 30 Time Servers.

To add a new Timer Server the administrator must first make space by deleting some Time Servers. Once this is done, the add dialog box will appear as below. Click “Back” to return to the System Settings Page.

**“Time Zone (Relative to GMT)”**

Select the appropriate time zone for your area. Click “Apply” to save.

**“System Time (yyyy/mm/dd hh:mm:ss)”**

This section is to manually set IP Camera System Time. The format is pre-determined to: yyyy/mm/dd hh:mm:ss. Click “Manual Adjust” to save any manual changes.

**ii. System Restart**

<b>System Restart</b>	
Auto Restart System for Every (0: Disable)	0 Minute
Manual Restart	<input type="button" value="Restart Now"/>
<input type="button" value="Apply"/>	

Fig.40. Auto Restart setting

**“Auto Restart System Every”**

The administrator can choose to restart IP Camera at certain intervals (choose between minutes and hours only). This will ensure that IP Camera will work smoothly. Click “Apply” to save changes.

**“Manual Restart”**

Click “Restart Now” to restart the system immediately.

**iii. LED Settings**

<b>LED Setting</b>	
LED function	Enable
<input type="button" value="Apply"/>	

**“LED function”**

The administrator can enable or disable the LED (except the Power LED) on IP Camera here. Click “Apply” to save settings.

**iv. SNMP Settings**

SNMP Settings			
System Name		System Contact	System Location
WebCAM Server		Administrator	My Office
Manager IP Address	Community	Permission	Description
*. *.*.*	public	Read/Write	
*. *.*.*	public	No Access	
*. *.*.*	public	No Access	
*. *.*.*	public	No Access	
*. *.*.*	public	No Access	
*. *.*.*	public	No Access	
*. *.*.*	public	No Access	
*. *.*.*	public	No Access	

Apply Reset

#### "System Name"

This is to give IP Camera a name identifiable in a SNMP network.

#### "System Contact"

This is to give the administrator a name.

#### "System Location"

This is to set IP Camera location.

#### "Manager IP Address"

This set the IP address where the administrator can manage IP Camera from. It is valid for up to 8 IP addresses. To manage IP Camera from any IP addresses leave it as \*.\*.\*.\*.

#### "Community"

This is to set a Community name for NMS. The community name has to be the same as that set in NMS.

#### "Permission"

This is to set the administrator's authority. Options are Read, Read/Write, and No Access.

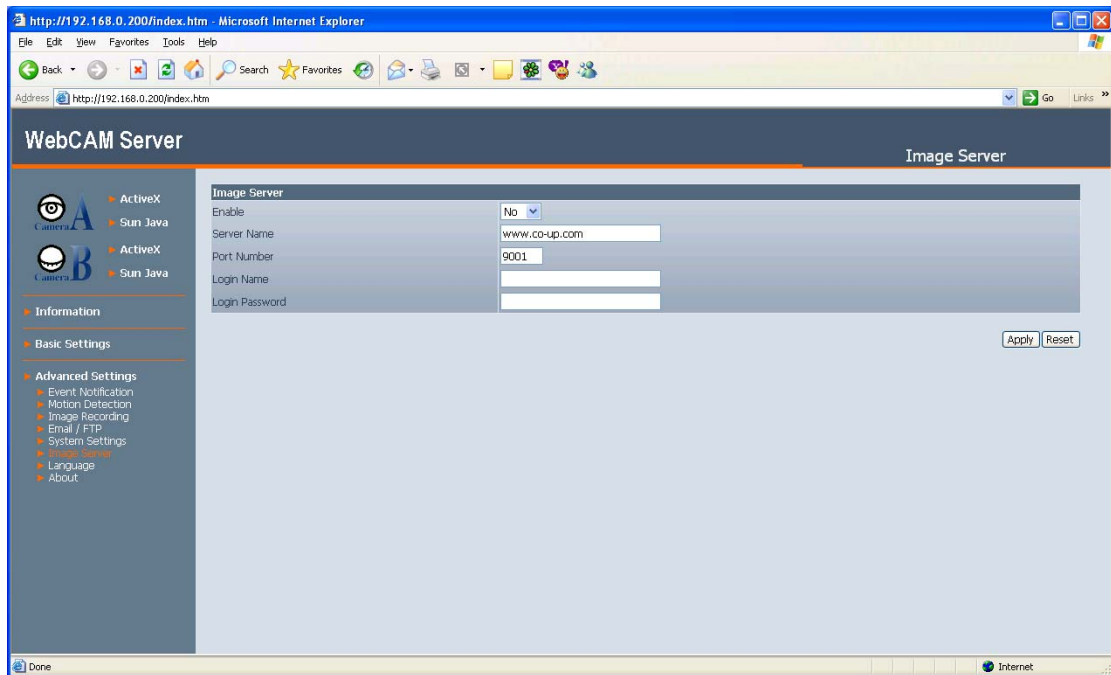
#### "Description"

This is for an administrator to make notes.

### 2.4.6 Image Server

The Image Server allows the user to view his camera directly from the internet without having to set-up DDNS or Router's NAT. All the user has to do is log on to the Server's webpage and register for free.

Once a username and password is registered and confirmed. The user can log into this Server from anywhere in the world and access his camera.



#### “Enable”

Choose “Yes” to enable this feature or “No” to disable.

#### “Server Name”

The current default web server is set to www.co-up.com

#### “Port Name”

This is the default port for image stream. User can change this UDP Port to their desired or designated port number. If you intend to change, it must be done prior to logging onto the Image Server.

#### “Login Name”

Enter your login name for your image server account. You only have to configure this once.

#### “Login Password”

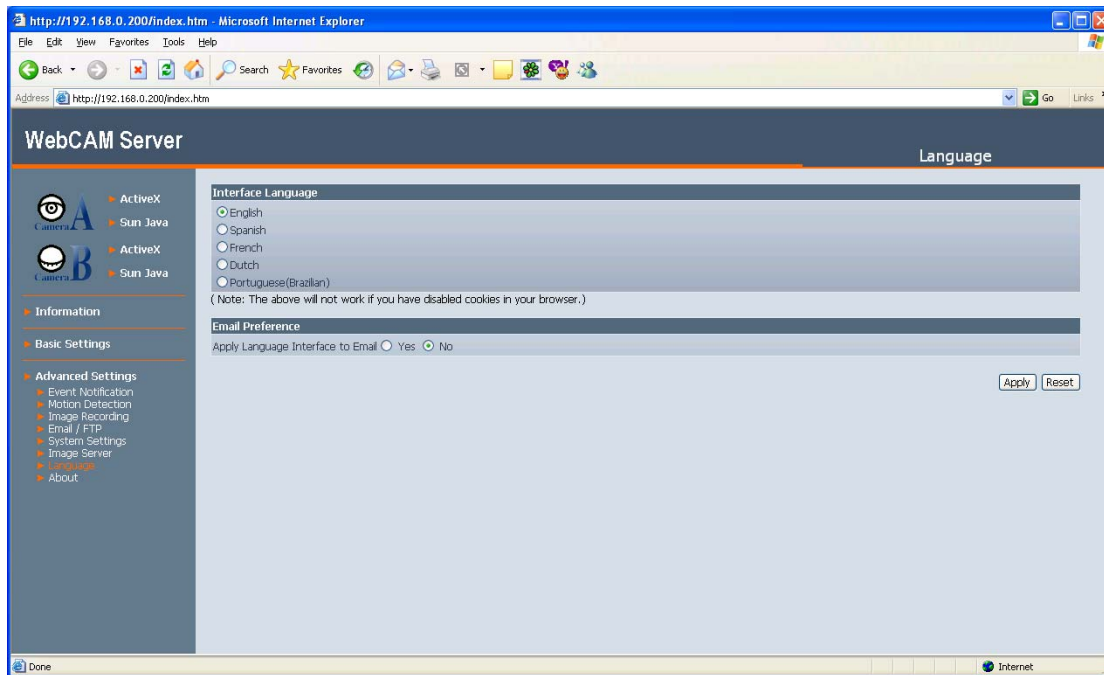
Enter your password. You only have to configure this once.

Click “Apply” to confirm all changes.

## 2.4.7 Language

Use this section is to set IP Camera Interface language.





**i. Interface Language**

At the moment, the user can choose between; English, Spanish, French, Dutch, and Portuguese.

**ii. Email Preference**

Check “yes” or “no” to apply the selected language to the email configured to be sent on schedule.

### 2.4.8 About

The administrator can use this section to check firmware information, save/restore settings, upgrade firmware and see manufacturer’s details.

**i. About**

This section gives crucial information about IP Camera’s Firmware Version, Hardware Version and Serial Number. These are required information for service calls.

**ii. Save / Restore Settings**

“Save current Configuration”

Click “Save” to save the current settings and configuration to your PC. The text file will have a default format of YYYY\_MMDD\_####.cfg. The administrator can change this, if necessary.

“Restore previous configuration”

This function is only available if a setting has been saved initially. Browse to the location where the file is saved and click “Restore”

“Reset to factory default”

This function will reset all settings to its default value.

**WARNING:**

Remember to save the desired settings and configurations before resetting to factory default. After this “Reset”, the user will have to go through the initial securities again; the “Input Device Password”, the “Administrator authentication”, and the IP Camera web login.

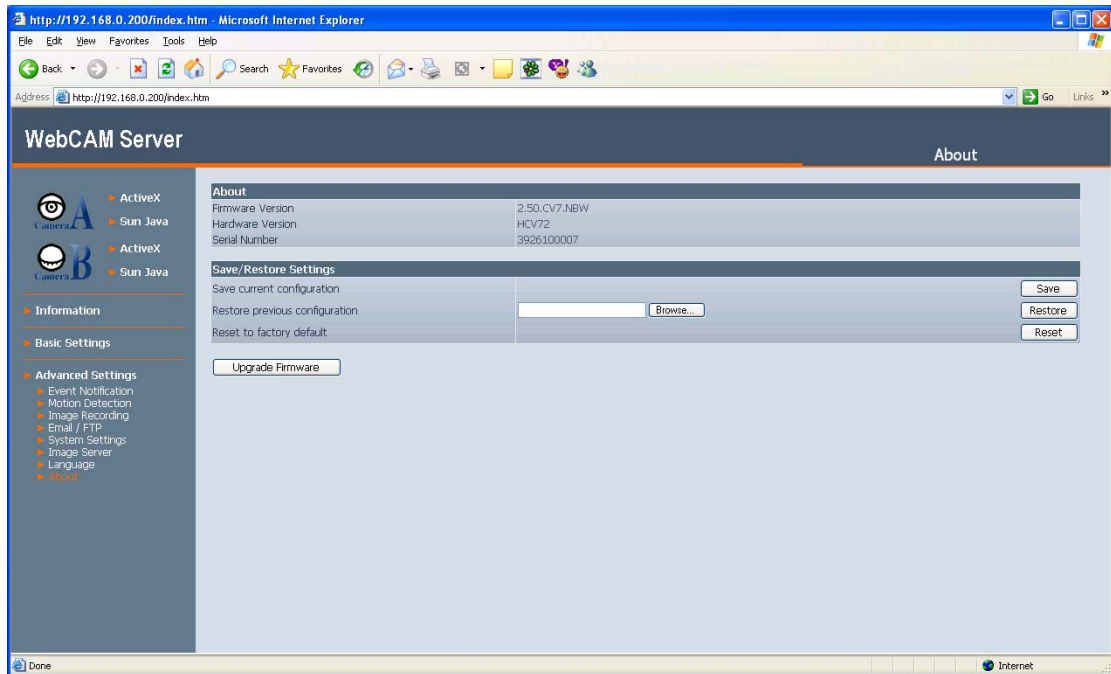


Fig.41. IP Camera About Page

**“Upgrade Firmware”**

Click to check for the latest firmware. IP Camera will automatically download and install the latest firmware



Fig.42. IP Camera checking for latest firmware to upgrade

**2.5 Viewing images using PDA / Web enabled mobile phone**

You can view images from your PDA or mobile phone if it has GRPS and a web browser. Type <http://xxx.xxx.xxx.xxx/image.cgi> (where xxx is your IP address or Domain name)

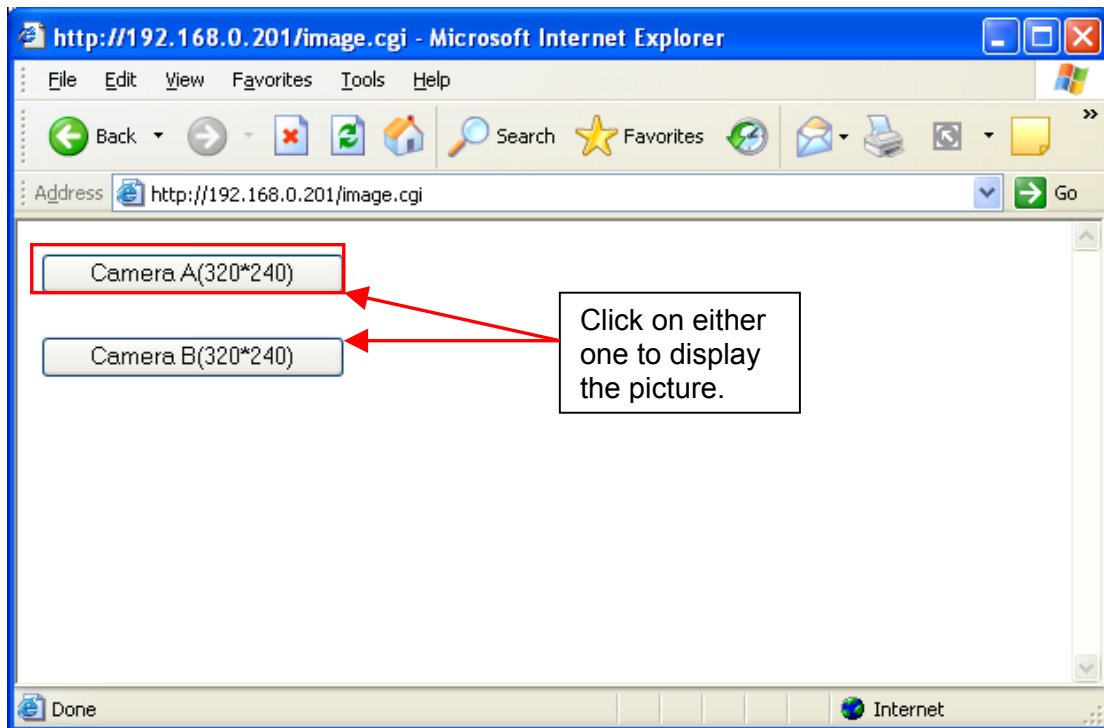


Fig.43. Accessing IP Camera via PDA

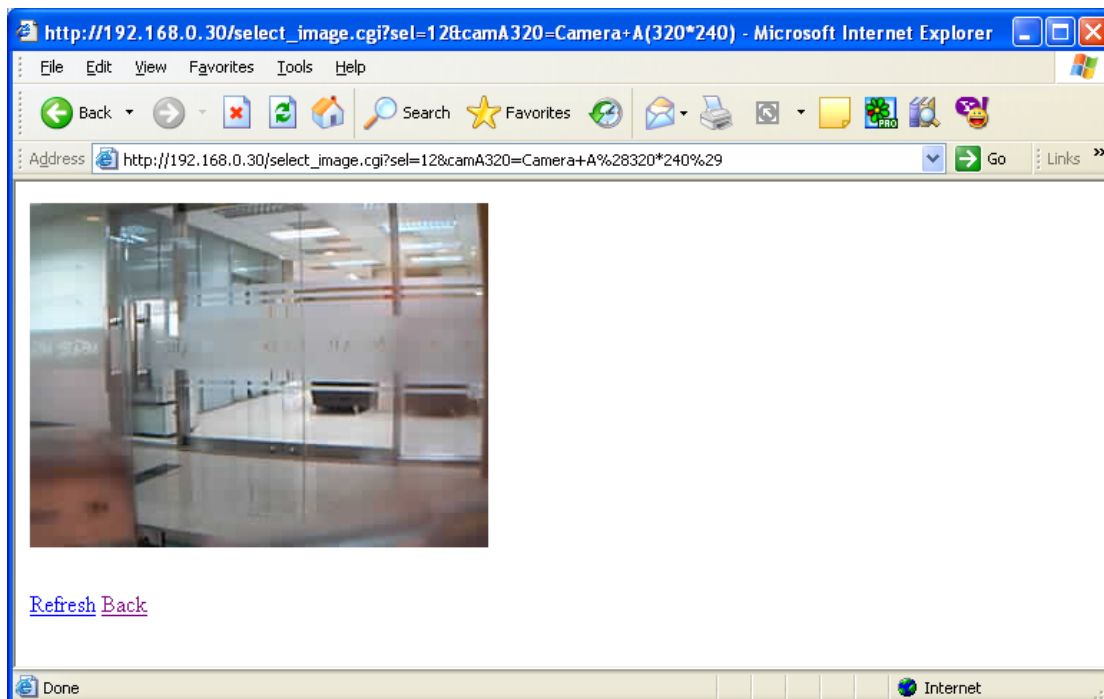


Fig.44. IP Camera image

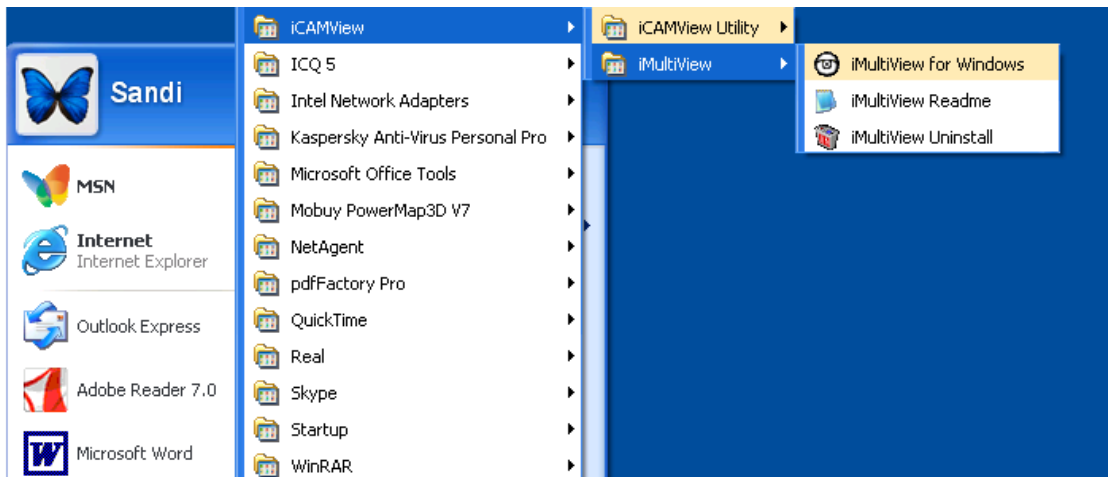
The images are being displayed one at a time. To send the next picture, simply click "Refresh".

## Chapter 6: MultiMonitor

MultiMonitor is a program to manage multiple IP Cameras in a network. It is able to detect the IP's of all the IP Cameras installed, and display them in a list form for easy management.

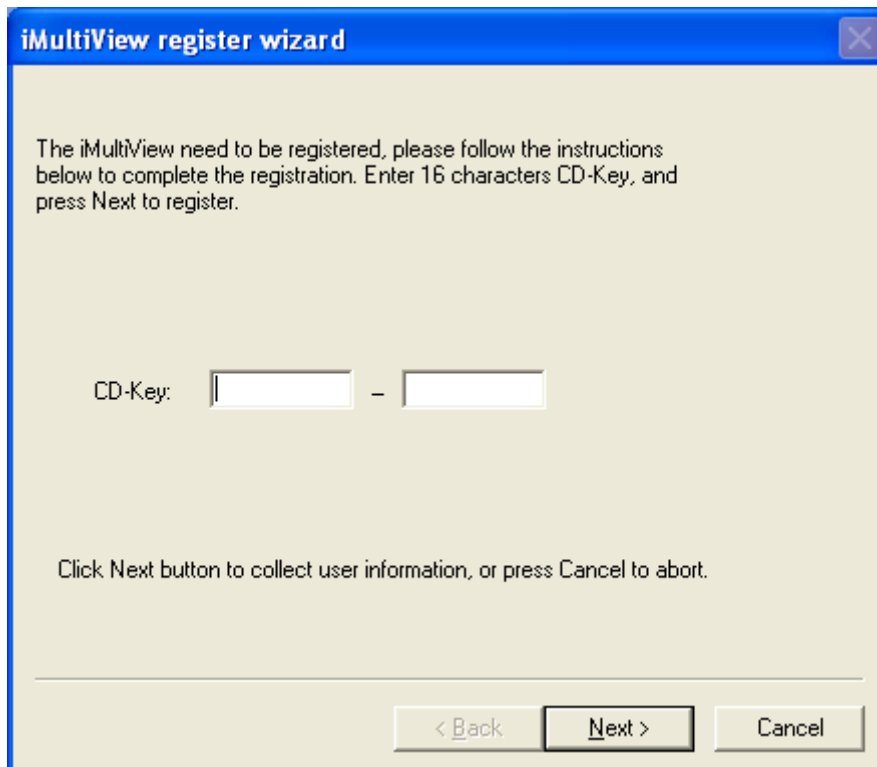
### Section 1. Installing MultiMonitor

- ❶ Click on setup.exe and follow the installation wizard
- ❷ After installation, there will be a **IP Camera group in the Windows Start group**
- ❸ Click "iMultiMonitor" → "iMultiMonitor for Windows" to start using iMultiMonitor.

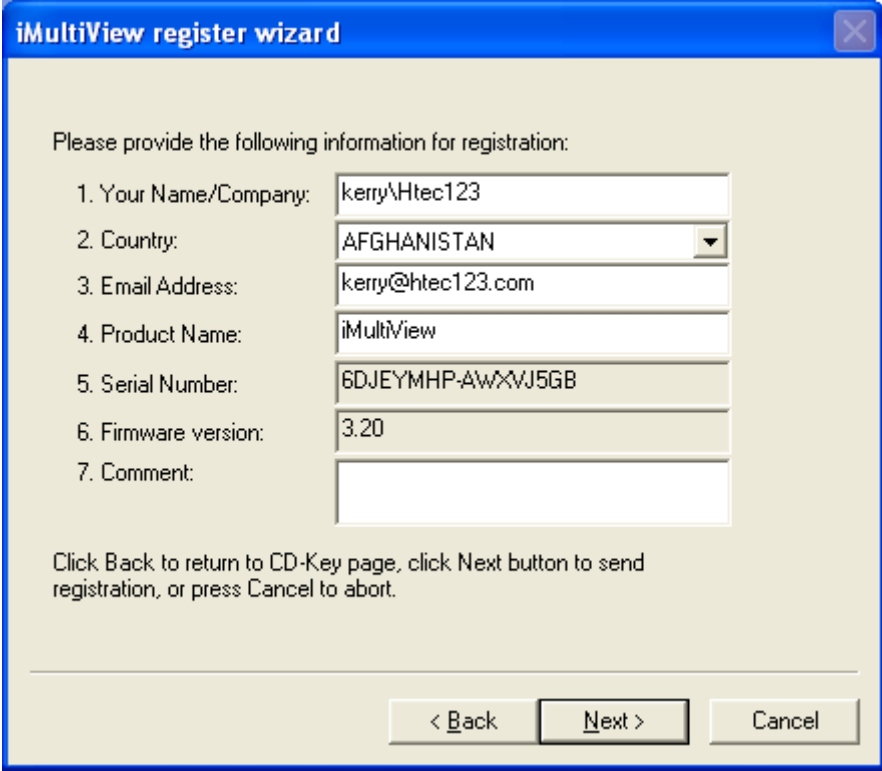


### Section 2. Using MultiMonitor

After the MultiMonitor program start up the MultiMonitor register wizard shown below will be displayed.



Follow through the step to step register wizard. Fill out the necessary information as shown below.



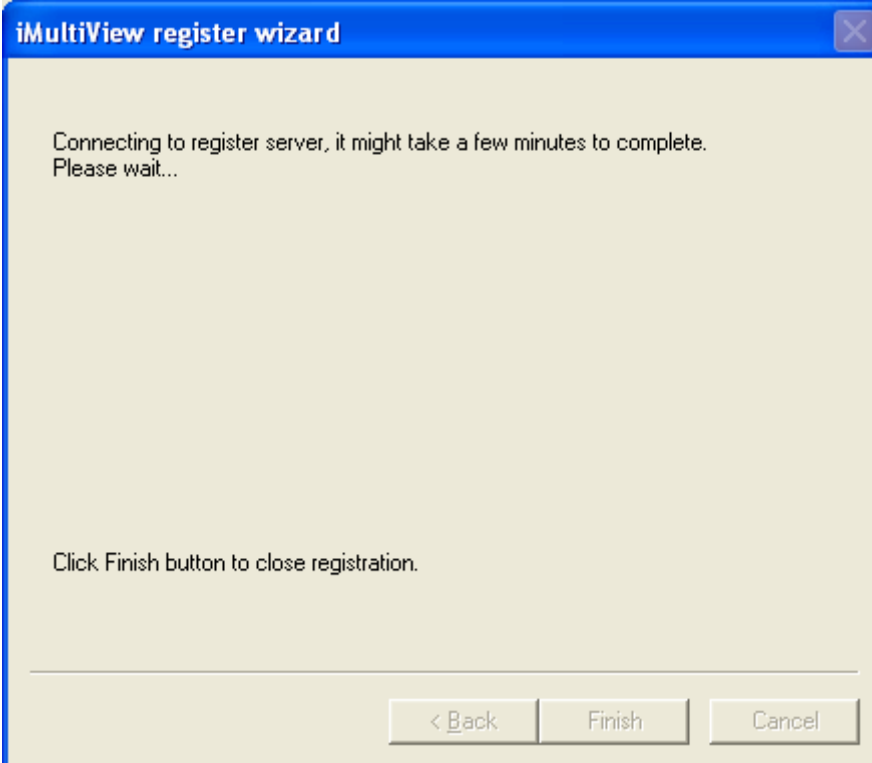
**iMultiView register wizard**

Please provide the following information for registration:

1. Your Name/Company:	kerry\Htec123
2. Country:	AFGHANISTAN
3. Email Address:	kerry@htec123.com
4. Product Name:	iMultiView
5. Serial Number:	6DJEYMHP-AWXXVJ5GB
6. Firmware version:	3.20
7. Comment:	

Click Back to return to CD-Key page, click Next button to send registration, or press Cancel to abort.

< Back   Next >   Cancel

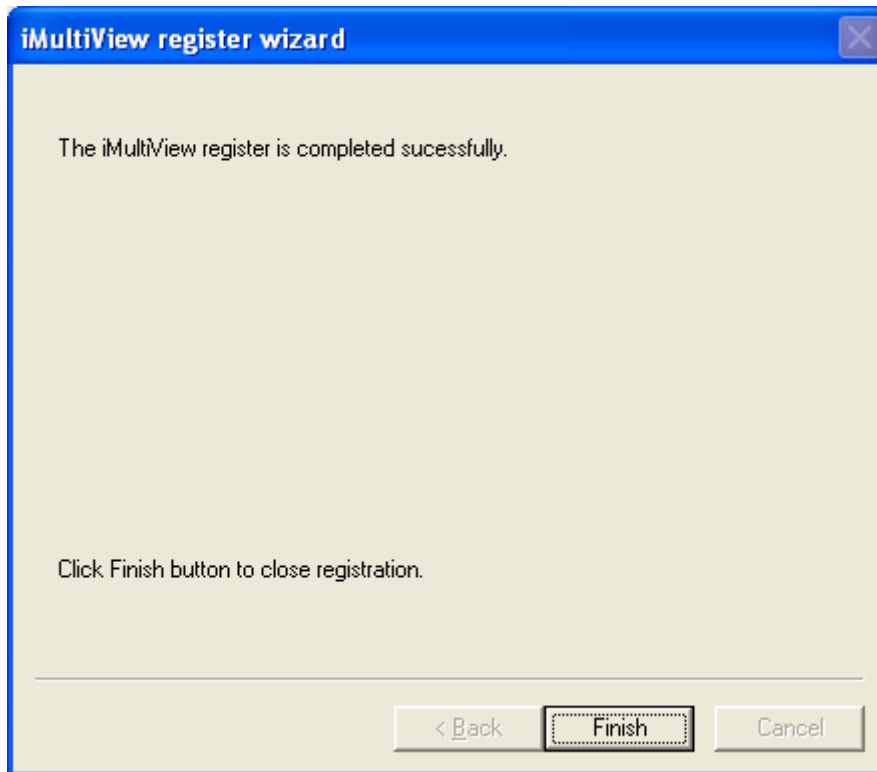


**iMultiView register wizard**

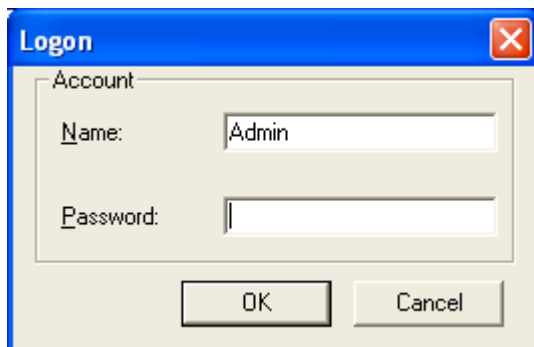
Connecting to register server, it might take a few minutes to complete.  
Please wait...

Click Finish button to close registration.

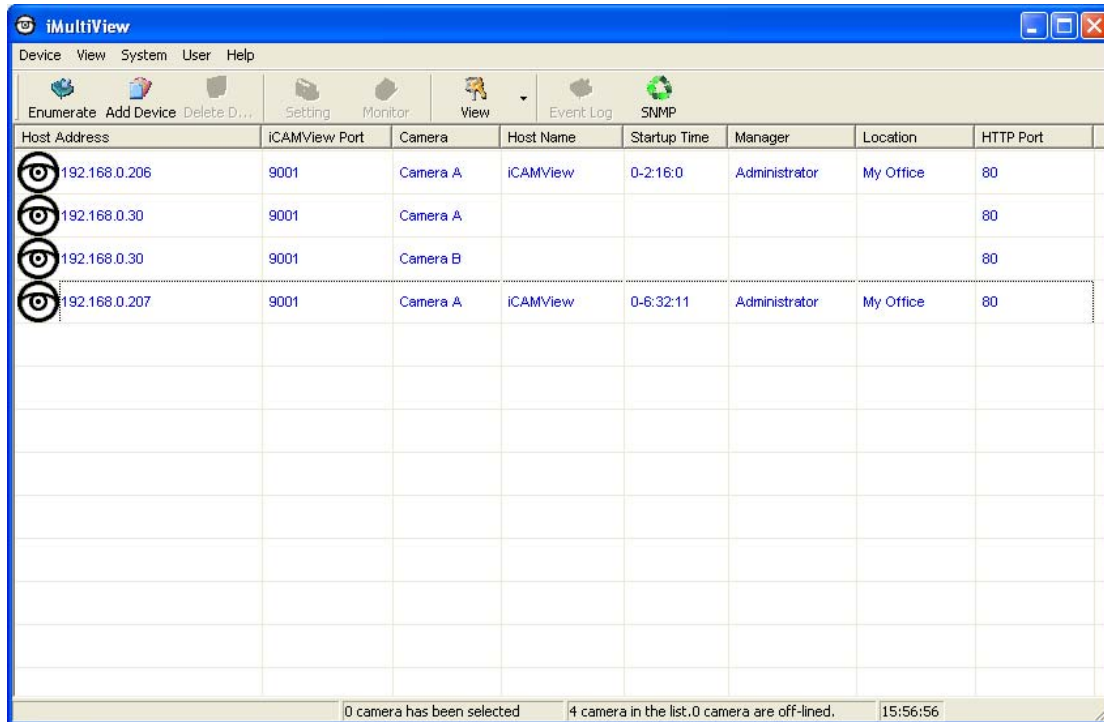
< Back   Finish   Cancel



Once the register is complete, the below window will pop up. It is the default security Logon. Once user accounts have been set, account name and password will be required to enter MultiMonitor.



Just click "OK", and MultiMonitor will start and the below window will open.



## 2.1 Device



: Start MultiMonitor and press the “Enumerate” button, MultiMonitor will start a search for all the IP Camera on the network and list them in the main window.

Once detected, the following will show in the main window:

Host Address	iCAMView Port	Camera	Host Name	Startup Time	Manager	Location
192.168.0.30	9001	Camera A				

This shows that the camera is online and active.

Host Address	iCAMView Port	Camera	Host Name	Startup Time	Manager	Location
192.168.0.30	9001	Camera A				

This shows that the camera is off-line



Manually adds the IP Camera to be monitored.

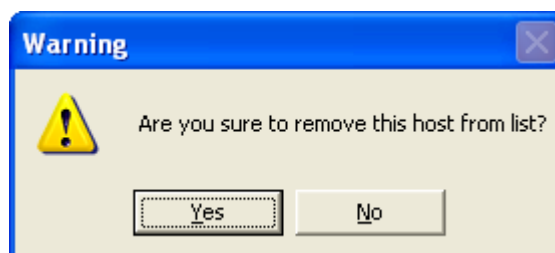
“Access by IP Camera Address”

Enter either the WEB, without the www (Example: megateccn.myddns.com) or LAN IP of IP Camera (example: 192.168.0.30)

“Remote Port”

This is IP Camera’s UDP port.

“Access by Image Server”. Enter the information as set in Section 2.4.6.



Highlight the IP Camera to be deleted from MultiMonitor’s list. Click “Yes” to confirm deletion of selected IP Camera.





The 'Setting' dialog box has tabs for General, Camera, Motion Detect, Email, and SNMP. The 'Camera' tab is active. It contains two radio button options:

- Access by iCAMView Address:** This option is selected. It includes fields for 'Host Address' (192.168.0.30) and 'Remote Port' (9001).
- Access by Image Serve:** This option is unselected. It includes fields for 'Image Server Address', 'Image Server port' (0), 'iCAMView Name', 'User Account', and 'User Password'.

Buttons for 'OK' and 'Cancel' are at the bottom right.

Use this function to change IP Camera Address & Port Number.

**Display the current Camera settings.**

The 'Add iCAMView' dialog box has tabs for General, Camera, Motion Detect, Email, and SNMP. The 'Camera' tab is active. It is divided into two sections:

- Camera:** Includes a 'Camera Select' dropdown menu (set to 'Camera A'), and text input fields for 'Account' and 'Password'.
- Image:** Includes a dropdown for 'Image Zoom' (100%), a dropdown for 'Camera Rotation' (Normal), a spinner for 'Maximum frame per second' (10.00 FPS), and two checkboxes: 'Mirror the Image' (unchecked) and 'Put Date/Time information on image' (checked).

Buttons for 'OK' and 'Cancel' are at the bottom right.

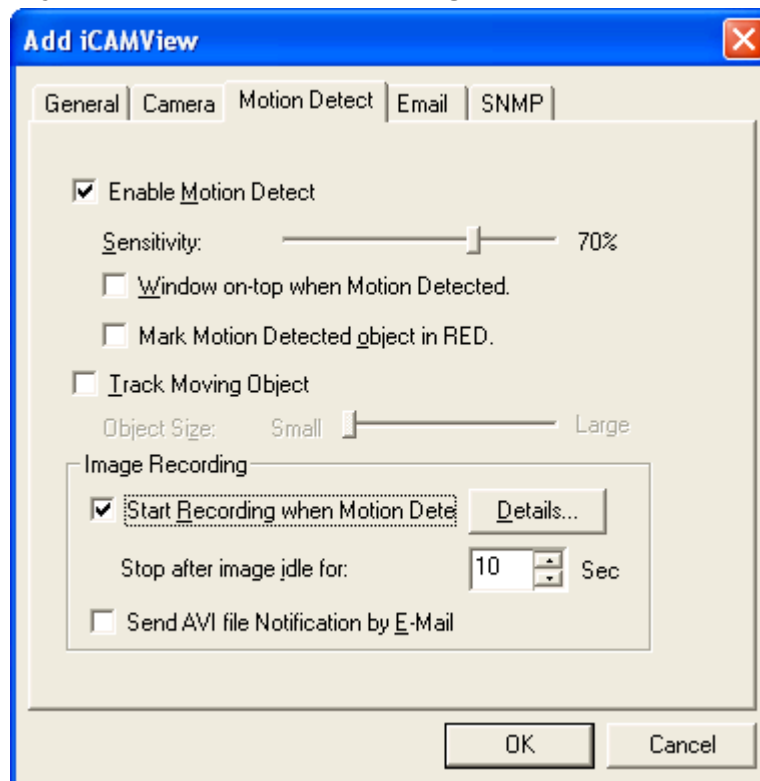
Camera Select: Select either camera A or B

Account: If you have setup user account, the information must be entered here. Otherwise access will be denied.

Password: Enter the above account password.

Image Zoom:	Resize the window to between 25% and 200%
Camera Rotation:	Use this function to keep the camera up-right.
Mirror the Image:	To mirror the image.
Maximum frame per second:	Select from 0.01 fps to a maximum of 30.00 fps.
Put Date/Time information on image	To have the date and time displayed on captured images.

### Display the Motion Detection Settings.



Enable Motion Detect: Click the checkbox to enable Motion Detection.

**Note:** This feature requires the Camera Window be active to work. Click "Monitor" to activate the Window.

Sensitivity:	Choose from 0% to 100% (very sensitive)
Window on-top when Motion Detected	Automatically displays camera window on top of all other windows/applications once motion is detected.
Mark Motion Detected object in RED	Choose this option to highlight in RED which object is being tracked.
Track Moving Object	Choose this option to calibrate approximate size of object to be tracked.

## Image Recording

Click “Start Recording when Motion Detected” to enable the feature.  
Click the “Details..” button for the following options;

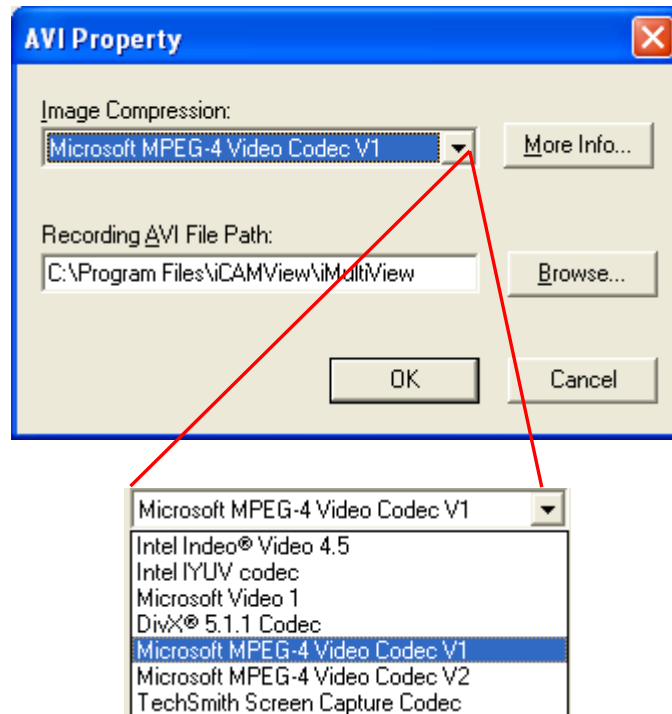


Image  
Compression:

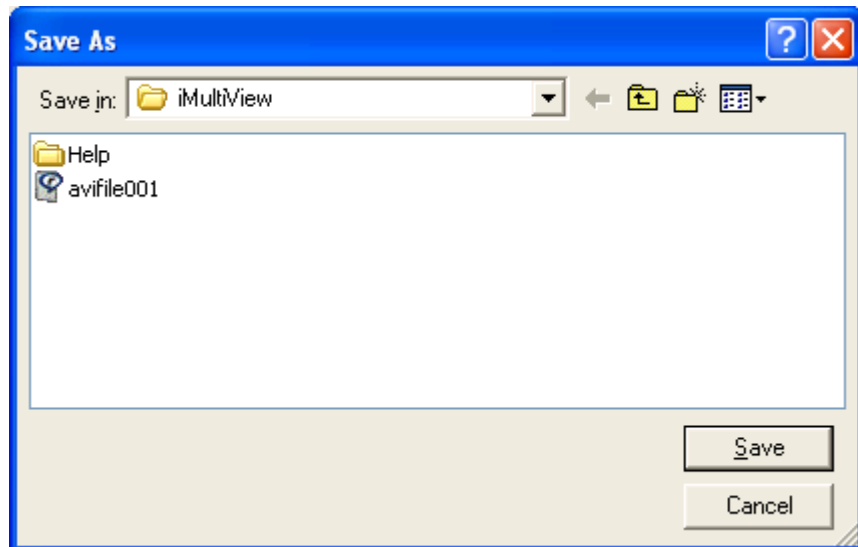
Choose from the list of available compressions.

**Note:** This list is dependent on the Codec that is available or already installed on the local PC. To record in MPEC-4, make sure you install or upgrade to Windows Media Player v10.

Recording AVI File  
Path

Location where the file will be recorded to. By default, it is recorded to C:\Program Files\IP Camera\iMulti/Monitor.

Click “Browse” to change the file location.



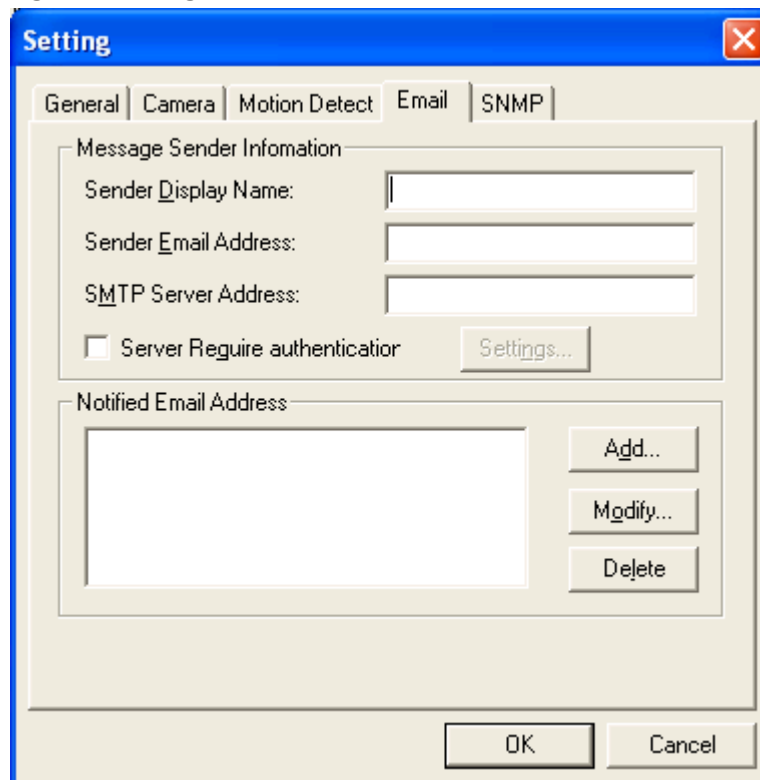
Recorded files are save using the following file extension;  
*avifile[three digit numerical sequence].*

**Note:** Use the “Detail View” to check the record stop time. You can change the display view or add a new folder here.

Stop after idle for:      Set the value between 1 to 100 seconds

Send AVI file              Send an AVI file via email in the event any  
 Notification by            motion is detected.  
 Email:

### Configure Settings for Email Notification



You will need to enter the correct “Message Sender Information” in

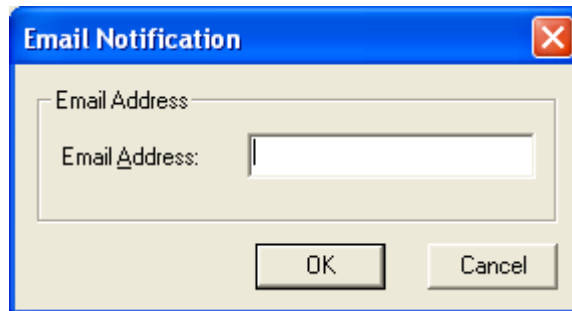
order for IP Camera to send emails.

### Server Require Authentication

Click “settings...” then enter your Account Name and Account Password if your Server Requires Authentication.

### Notified Email Address

Click “Add...” and enter a new Email address below

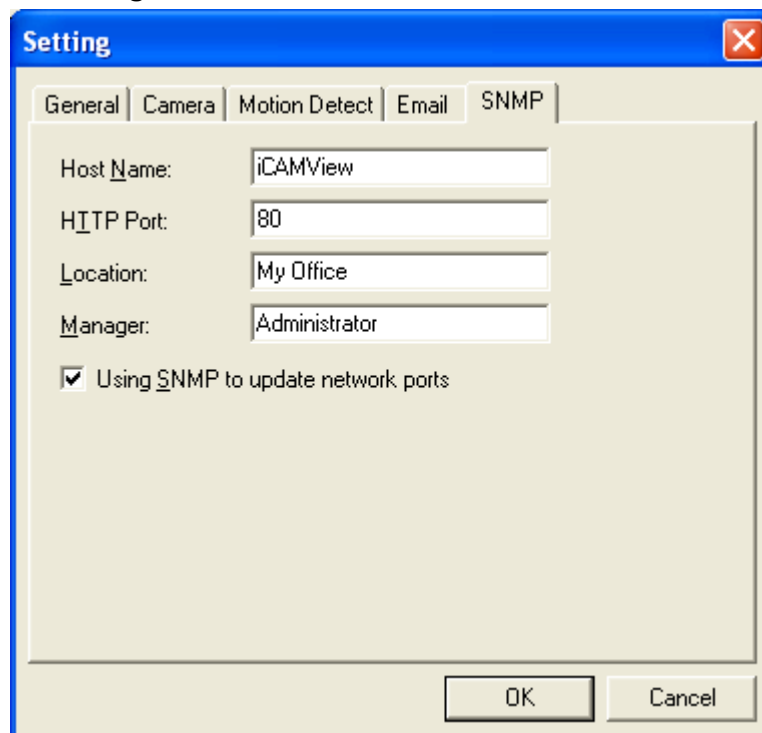


The dialog box is titled "Email Notification" and has a close button (X) in the top right corner. It contains a text input field labeled "Email Address:" with a cursor inside. Below the input field are two buttons: "OK" and "Cancel".

Click “Modify...” to modify the entered Email Address

Click “Delete” to remove an email address from the notification list.

### SNMP Settings



The dialog box is titled "Setting" and has a close button (X) in the top right corner. It has five tabs: "General", "Camera", "Motion Detect", "Email", and "SNMP". The "SNMP" tab is selected. The settings are as follows:

- Host Name: iCAMView
- HTTP Port: 80
- Location: My Office
- Manager: Administrator
- Using SNMP to update network ports

At the bottom right are "OK" and "Cancel" buttons.

Host Name: Provide a Name to identify this device.

HTTP Port: Enter the HTTP port assigned for IP Camera.

Location: Provide a location for SNMP manager to track device.

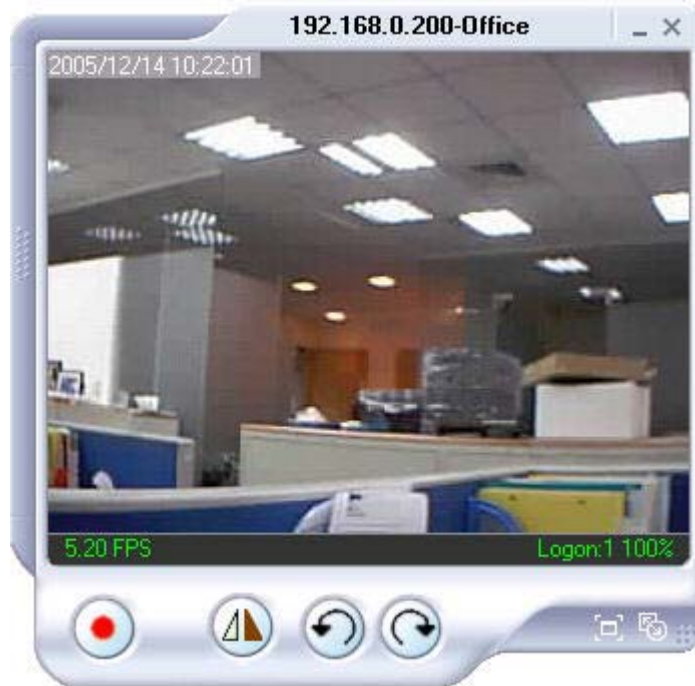
Manager: Enter a manager's name for identification.

**“Using SNMP to update network ports”**

Check this box if you want MultiMonitor to automatically update the HTTP port as set in the IP Camera (Basic Settings→Network→Port Number→Http port number) or utility (IP Configuration→Advanced→Management Protocol)



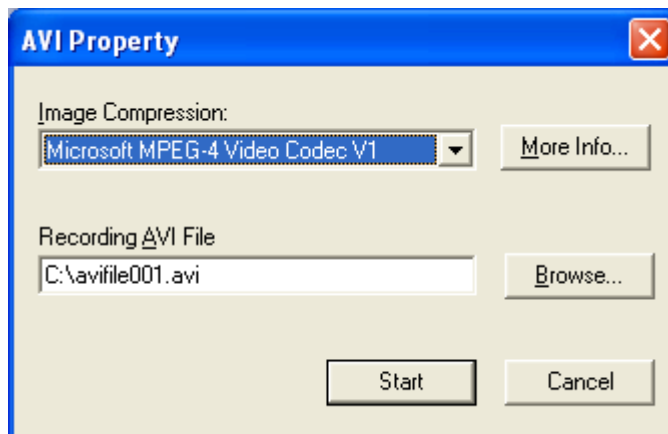
: Highlight the IP Camera in the main windows display, and click “Monitor” to view the video stream.



Move the cursor over the edges of the picture and it will turn into an arrow. Click and hold to pan / tilt the camera (if the camera supports this function)



Click this button to record the current image on screen. A window will come up, click “Start” to start recording to the default file and location.





Flip the image vertically

Rotate Left, Rotate Right

Click this to bring up the Setting windows.

Click this to switch to full screen view. Double click to switch back to current view.

Click and drag to resize the window and it's contents.

Date and Time display of live streaming video.



Click the left side of the viewing window to bring out more control features.



Click on this icon to active two functions;

**a. Custom window zoom** – use this to zoom to your chosen window size.

On the video window, **LEFT** click, hold and drag to the desired window zoom size. A thin line will outline the chosen window size.



Release to accept and the program will auto adjust. Increase the Resolution for a better image.



Click the depressed button to go back to the original window size.

**b. Custom update Window** -- use this if you want to monitor only a specific area within the viewing window.

On the video window, **RIGHT** click, hold and drag to the desired window zoom size. A thin line will outline the chosen window size.



Release and a smaller window is shown. Video in this smaller window will be updated while those outside are 'frozen'.



Click the depressed button to go back to the original window size. Or use the horizontal zoom bar (see below).



Click and drag the green knob along the horizontal bar to zoom in an out. Zoom range from 1 time to 16 times.

Click and drag the green knob along the horizontal bar to change the current image resolution. Resolution range from 320x240 low/mid/high quality, to 640x480 low/mid/high quality.

Clicking once will cause the camera to pan left by 1 deg.

Click and hold and the camera will pan increasingly faster to the left.





Clicking once will cause the camera to pan right by 1 deg.  
Click and hold and the camera will pan increasingly faster to the left.



Click once to tilt the camera up by 1 deg.  
Click and hold and the camera will tilt increasingly faster upwards.



Click once to tilt the camera down by 1 deg.  
Click and hold and the camera will tilt increasingly faster downwards.

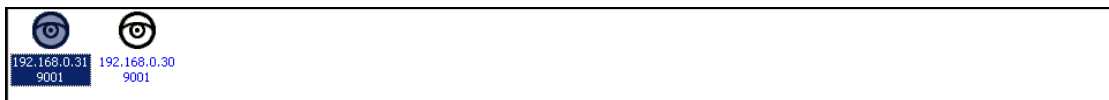


Auto Pan (if camera which support this function)

## 2.2 View



: Switch between Large or Small icon view



Large icon display

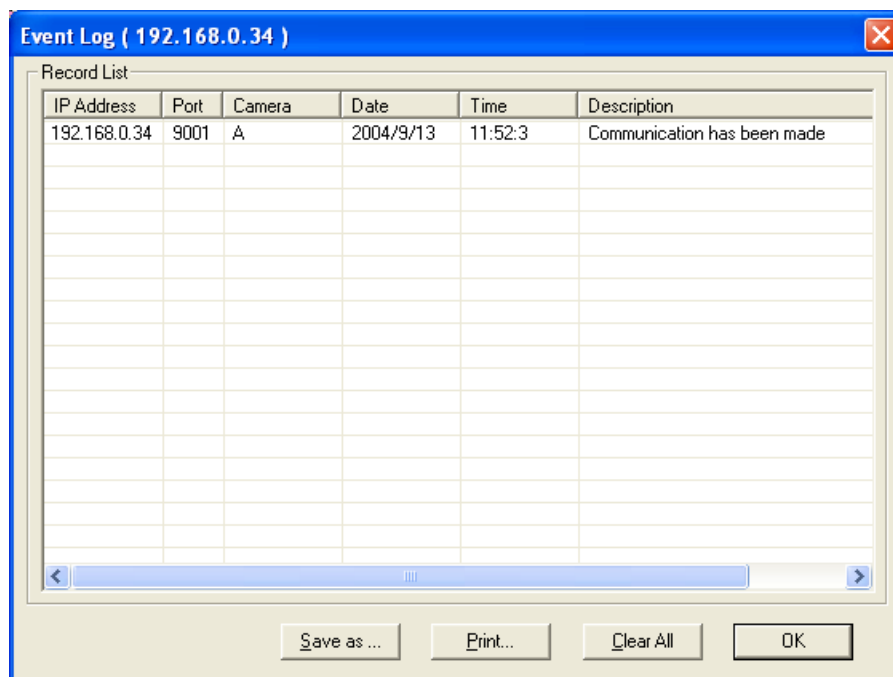
Ip Address	Port	Camera	Host Name	Startup Time	Manager	Location
192.168.0.31	9001	Camera A	CamView	3-22:3:8	Administrator	My Office
192.168.0.30	9001	Camera A	CamView	4-21:32:6	Administrator	My Office1

Small icon display

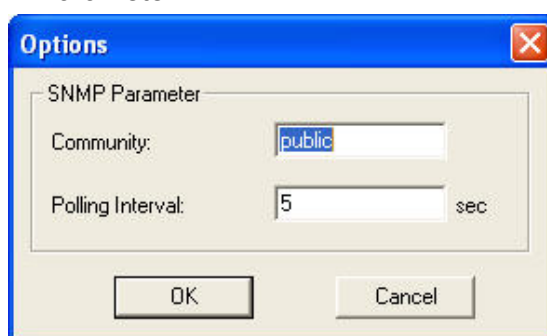
## 2.3 System



: Display the Event Log (IP address, Port, date, Time, description of event) of the selected IP Camera.

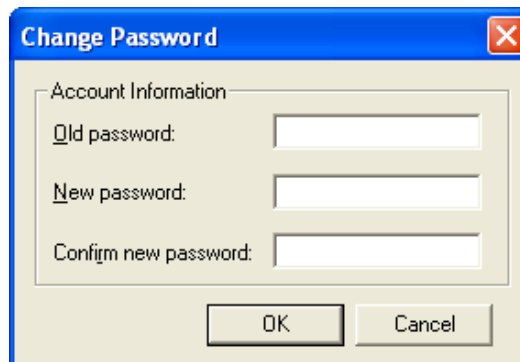


: Set the SNMP Parameter.

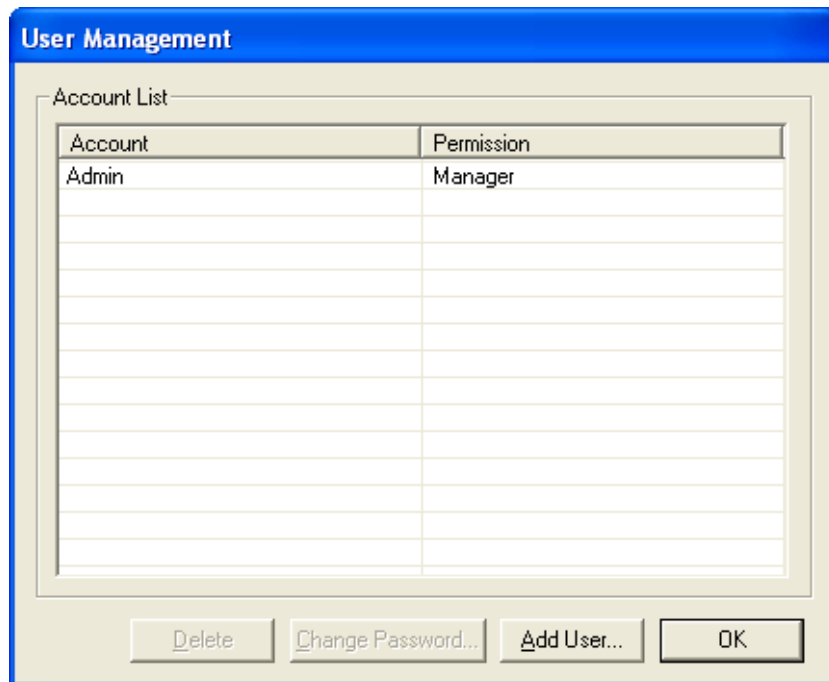


## 2.4 User

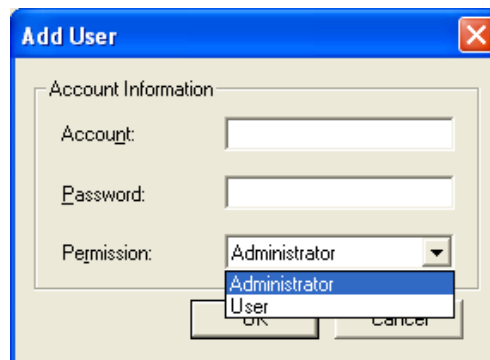
**Change Password** : “Change Password...” Use this feature to change the current User login password to MultiMonitor. Both “Administrator” or “User” can change their own Account passwords.



“Account Management...” Use this section to Add, Delete or Change the Password of an Account.



Click “Add User...” There is no limit to the number of Account that can be added.



**Note:** The first account is set to “Admin” with “Administrator” permission. This cannot be changed or deleted.

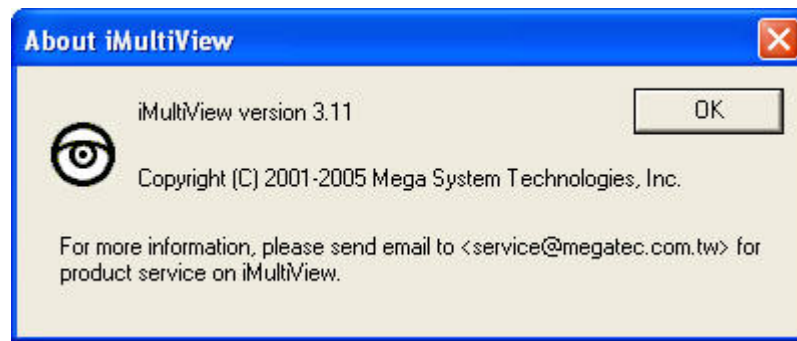
**Account:** Enter the preferred account name (max of 10 characters). The Account name cannot be edited.

**Password:** Enter a password (max of 10 characters). The password is case sensitive and can be left blank.

**Permission:** Choose “Administrator” or “User”.  
An “Administrator” can change, see, add or delete any of the information in MultiMonitor.  
A “User” is not able to Add, Delete or Change Settings of a camera.

## 2.5 Help

Help : Display MultiMonitor version, Copyright information and product service contact.



## 2.6 Drag-and-Drop Feature

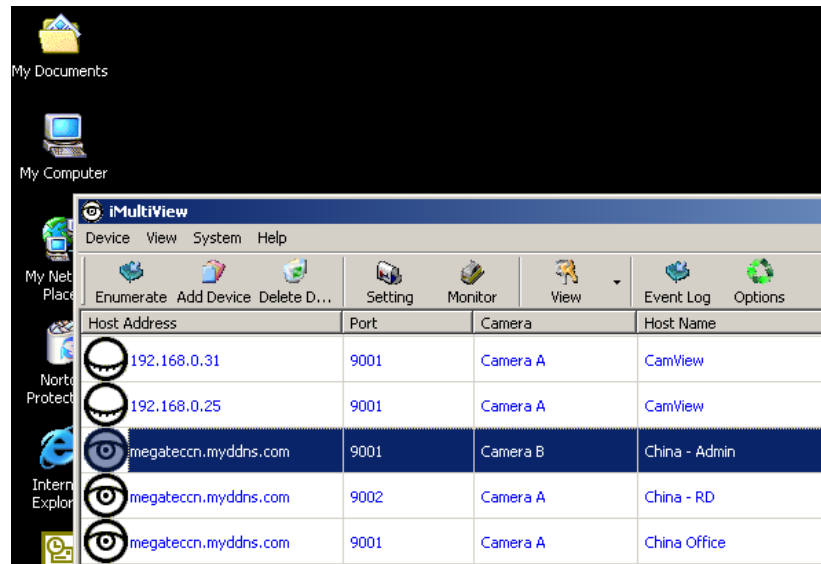
MultiMonitor also feature a “Drag-and-Drop to Desktop” feature. Double click the icon on your desktop to view the images immediately. Useful if you are monitoring multiple cameras at a time.

### Step 1:

Select the camera location of your choice.

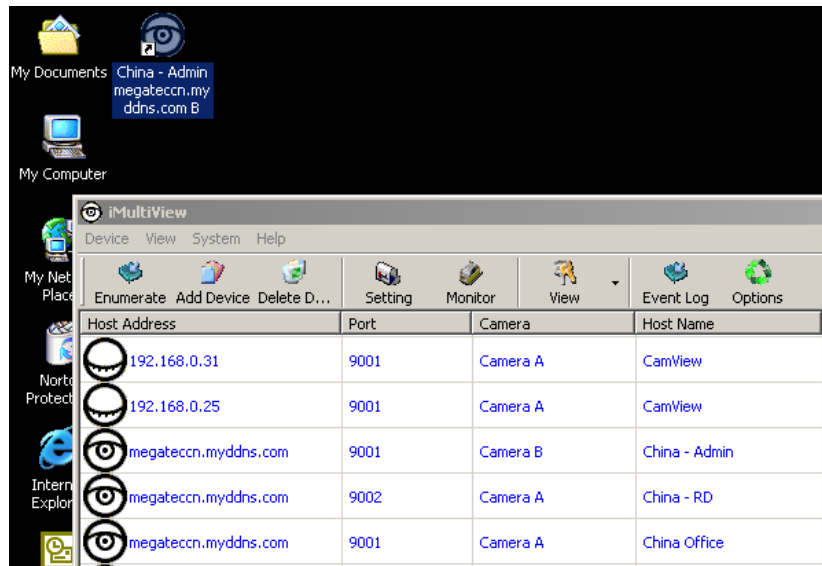
### Step 2:

Left click, hold and drag it onto the desktop.

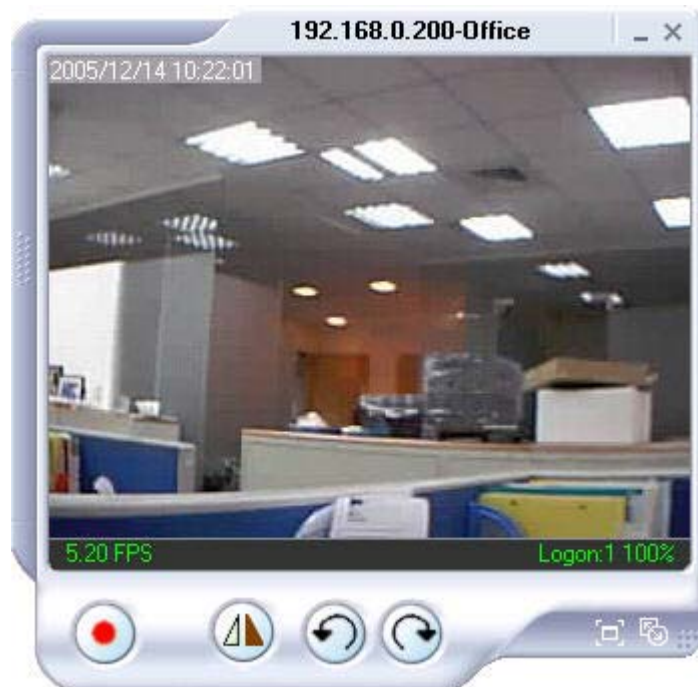


**Step 3:**

Release the mouse button anywhere on the desktop and a new desktop icon is created there.

**Step 4:**

Double click on the icon on the desktop, to view the images.



## Appendix A: Router Configuration

The following section describes the initial configuration of the router and port forwarding for your router. If your router is not listed here, please refer to the manufacturer's website for assistance with configuring your router to work with IP Camera.

### Port Forwarding for IP Camera

IP Camera requires certain ports to be open on your router to allow other computers on the Internet to "see" it on your internal network. Normally, your router will have the less common ports disabled or blocked by the router's built-in firewall. In order for the IP Camera applications to work properly and not be blocked, the firewall settings need to be configured. In each instance there will be a trigger port and incoming port(s), where traffic on the trigger port tells the Firewall to open the incoming ports. The IP Camera require that TCP Port 80 and UDP 9001 (default settings) be opened to the Internet. TCP Port 80 is used for accessing the camera's homepage and UDP Port 9001 is used for authentication and video streaming.

If your Internet service Provider blocks port 80/9001, you'll need to reconfigure your camera and router to other ports such as 81/9002, 82/9003, etc. To change the port settings on the camera, you'll need to use Utility.

Follow the steps below to configure your router, depending on the router manufacturer and model. If your particular router manufacturer or model is not listed below, please contact your router manufacturer for further assistance in configuring the router.

The Following Router manufacturers and models are included in this document:

Brand	Model	Description
3Com	3C857-US	OfficeConnect Cable/DSL Gateway
	3CRWE52196	OfficeConnect Wireless Cable/DSL Gateway
Belkin	F5D6230-3	Wireless Cable/DSL Gateway Router
	F5D7230-4– 54g	Wireless DSL/Cable gateway Router
D-Link	DI-604/DI-614+/DI-624	-
	DI-704/704P	-
	DI714	-
	DI-714P+	-
Dell	TrueMobile 2300	-
	Wireless Broadband Router	-
Linksys	BEFSR41	EtherFast Cable/DSL Router
	BEFSX41	Instant Broadband EtherFast Cable/DSL Firewall Router with 4-Port Switch/VPN EndPoint
	BEFW11S4	Wireless Access Point Router with 4-Port Switch – Version 2
Microsoft	MN-100	Wired Base Station

	MN-500	Wireless Base Station
NETGEAR	RP614	Web Safe Router
	MR814	Wireless Router
	MR314	Cable/DSL Wireless Router
	FVS318	ProSafe VPN Firewall
Proxim	ORiNOCO BG-2000	-
	Broadband Gateway	
Siemens	SpeedStream 2602	2-Port DSL/Cable Router
	SpeedStream 2623	Wireless DSL/Cable Router
	SpeedStream 2604	4-port DSL/Cable Router
	SpeedStream 2624	Wireless DSL/Cable Router
SMC	SMC2404WBR	Barricada Turbo 11/22 Mbps Wireless Cable/DSL Broadband Router
	SMC7004VBR	Barricada Cable/DSL Broadband Router
	SMC7004CWBR	Barricada Wireless Cable/DSL Broadband Router
	SMC7004AWBR	Barricade 4-port 11Mbps Wireless Broadband Router

3Com (<http://www.3com.com>)

3C857-US – OfficeConnect Cable/DSL Gateway

3CRWE52196 – OfficeConnect Wireless Cable/DSL Gateway

1. Log into your router using your router IP.
2. On the main page, select **Firewalls** on the left side of the page.
3. Select the **Virtual Servers** tab at the top of the page.
4. Click **New** on the right side of the page to open the Virtual Server Settings dialog box.
5. Type in the camera's IP address in the Server IP address text box. (Look on the IP Camera IP address LCD display for the last 3 digits of the camera's IP address.)
6. Under Local Service, select **Custom**.
7. Under Custom Service Name, type in: **IP Camera**.
8. Under Specify Custom Service Ports, type in: **80, 9001**.
9. Click **Add** to save the settings. The IP Camera should now be configured to work with your router and be accessible from the internet.



Belkin (<http://www.belkin.com>)

F5D6230-3 – Wireless Cable/DSL Gateway Router

1. Log into your router using your router IP.
2. On the main page, select **Virtual Server** on the left side of the page under the Security section.

3. Enter the following information on the page:

Line #1:

Private IP: Type in the **camera's IP address**. (Look on the IP Camera IP Address LCD display for the last 3 digits of the camera's IP address)

Private Port: 80

Type: TCP

Public Port: 80

Line #2

Private IP: Type in the **camera's IP address**. (Look on the IP Camera IP Address LCD display for the last 3 digits of the camera's IP address)

Private Port: 9001

Type: UDP

Public Port: 9001

4. Click **Enter** to save the settings. The IP Camera should now be configured to work with your router and be accessible from the internet.

F5D7230-4 – 54g Wireless DSL/Cable gateway Router

1. Log into your router using your router IP.
2. On the main page, select **Firewall** on the left side of the page.
3. Under Firewall, select **Virtual Servers**.

4. Enter the following information on the page:

Line #1

Enable: Checked in

Description: IP Camera - Webpage

Internet Port: 80 to 80

Type: TCP

Private IP address: Type in the **camera's IP address**. (Look on the IP Camera Address LCD display for the last 3 digits of the camera's IP address)

Private Port            80 to 80

Line #2

Enable:                Checked in

Description:         IP Camera – Camera

Internet Port:        9001 to 9001

Type:                  UDP

Private IP address:   Type in the **camera's IP address**. (Look on the IP Camera Address LCD display for the last 3 digits of the camera's IP address)

Private Port            9001 to 9001

5. Click **Apply Changes** to save the settings. The IP Camera should now be configured o work with your router and be accessible from the internet.

D-Link (<http://www.dlink.com>)

DI-604/DI – 614+/DI-624

1. Log into your router using your router IP.
2. On the main page, click on **Advanced** at the top of the page.
3. On the left side of the page, click on **Virtual Server**. Note: Make sure DMZ host is disabled. If DMZ is enabled, it will disable all Virtual Server entries.

4. Enter the following information on the page:

Enable/Disable: Enabled  
Name: IP Camera - Webpage  
Private IP: Type in the **camera's IP address**, for example: 192.168.0.5  
Protocol Type: TCP  
Private Port: 80  
Public Port: 80  
Schedule: Always

5. Click **Apply** to save the settings.

6. Enter the following information on the page:

Enable/Disable: Enabled  
Name: IP Camera - Webpage  
Private IP: Type in the **camera's IP address**, for example: 192.168.0.5  
Protocol Type: UDP  
Private Port: 9001  
Public Port: 9001  
Schedule: Always

7. Click **Apply** to save the settings. IP Camera should now be configured to work with your router and be accessible from the internet.

DI-704/704P

1. Log into your router using your router IP.
2. On the main page, click on **Advanced** at the top of the page.
3. On the **Virtual Server** page, enter the following information;

For ID#1:  
Service Port: 80  
Service IP: Type in the **camera's IP address**, for example: 192.168.0.5

Enabled/Disabled: Enabled

For ID#2

Service Port: 9001

Service IP: Type in the **camera's IP address**, for example: 192.168.0.5

Enabled/Disabled: Enabled

4. Save your settings. IP Camera should now be configured to work with your router and be accessible from the internet.

DI714

1. Log into your router using your router IP.

2. On the main page, click on **Advanced** at the top of the page.

3. Click on **Virtual Server Settings** on the left side of the page.

4. Enter the camera's IP address into the Internal IP field. Under Service, select **All** and then click **Submit** to save your settings. IP Camera should now be configured to work with your router and be accessible from the internet.

DI-714P+

1. Log into your router using your router IP.

2. On the main page, click on **Advanced** at the top of the page.

3. On the left side of the page, click **Virtual Server**.

4. Enter the following information on the page:

For ID#1:

Service Port: 80

Service IP: Type in the **camera's IP address**, for example: 192.168.0.5

Enabled/Disabled: Enabled

For ID#2

Service Port: 9001

Service IP: Type in the **camera's IP address**, for example: 192.168.0.5

Enabled/Disabled: Enabled

5. Click **Apply** to save your settings. IP Camera should now be configured to work with your router and be accessible from the internet.

Dell (<http://www.dell.com>)

TrueMobile 2300 Wireless Broadband Router

1. Log into your router using your router IP.
2. On the main page, click on **Advanced Settings** at the top of the page.
3. Go to the Port Forwarding section and select Custom Port Forwarding Settings.
4. Check the **Enable** box.
5. Enter the desired name or description in the **Service Name** field such as **IP Camera Web**.
6. In the **Incoming Ports** field, specify port **80** in both boxes.
7. In the **Destination IP Address** field, enter the IP address of IP Camera
8. In the **Destination MAC Address** field, enter the MAC address of IP Camera. You can find the camera's MAC address by either looking at the MAC address sticker on the bottom of the camera or by utilizing setup utility to display the MAC address.

Linksys (<http://www.linksys.com>)

BEFSR41 – EtherFast Cable/DSL Router

BEFSX41 – Instant Broadband EtherFast Cable/DSL Firewall Router with 4-Port Switch/VPN EndPoint

BEFW11S4 – Wireless Access Point Router with 4-Port Switch – Version 2

1. Log into your router using your router IP.
2. On the router's main page, click on **Advanced** at the top of the page.
3. On the next page, click on **Forwarding**.

4. Enter the following information on the page:

Line #1:

Customized Applications: IP Camera – Webpage

Ext. Port: 80 to 80

Protocol: TCP

IP Address: Type in the **camera's IP address**, for example:  
192.168.0.5

Enable: Checked in

Line #2:

Customized Applications: IP Camera – Camera

Ext. Port: 9001 to 9001

Protocol: UDP

IP Address: Type in the **camera's IP address**, for example:  
192.168.0.5

Enable: Checked in

5. Click on **Apply** to save the settings. IP Camera should now be configured to work with your router and be accessible from the internet.

Microsoft (<http://www.microsoft.com/hardware/broadbandnetworking>)

MN-100 – Wired Base Station

MN-500 – Wireless Base Station

1. Log into your router using your router IP.
2. Open the Base Station Management Tool, and then click **Security**.
3. On the Security menu, click **Port Forwarding**, and then click **Set up persistent port forwarding**.
4. In the Enable checkbox, check in the checkbox.
5. In the Description box, type a description of the server field such as: **IP Camera Web**.
6. In the Inbound port boxes, type in: **80 – 80**. (i.e. from Port 80 to Port 80)
7. In the Type box, select the protocol as **TCP**.
8. In the Private IP address box, type in the **IP Address** of the IP Camera network camera. For example, type in: 192.168.0.5.
9. In the Private port boxes, these values are automatically filled in from Step 6 and should already show **80 – 80**.
10. On the next empty line, repeat steps 4-9, except this time the Description should be **IP Camera Cam** and the Inbound/Private port boxes should be **9001 – 9001** (UDP). The protocol and private IP address should be the same.
11. Click **Apply** to save the changes you have made. IP Camera should now be configured to work with your router and be accessible from the internet.

NETGEAR (<http://www.netgear.com>)

RP614 – Web Safe Router

MR814 – Wireless Router

1. Log into your router using your router IP.
2. Click **Advanced -> Port Forwarding** on the left side of the page.
3. Click Add Customer Service.
4. Enter the following information on the page:  
Service Name: IP Camera – Web  
Starting Port: 80  
Ending Port: 80  
Server IP Address: Type in the **camera's IP address**, for example:  
192.168.0.5
5. Click **Apply** to save the settings.
6. Enter the following information on the page:  
Service Name: IP Camera – Cam  
Starting Port: 9001  
Ending Port: 9001  
Server IP Address: Type in the **camera's IP address**, for example:  
192.168.0.5
7. Click **Apply** to save the settings. IP Camera should now be configured to work with your router and be accessible from the internet.

MR314 – Cable/DSL Wireless Router

1. Log into your router using your router IP.
2. Click **Advanced** on the left side of the page.
3. Click **Ports**.
4. Enter the following information on the page:  
Line #1:  
Starting Port: 80  
Ending Port: 80  
Server IP Address: Type in the **camera's IP address**, for example:  
192.168.0.5



Line #2:

Starting Port: 9001

Ending Port: 9001

Server IP Address: Type in the **camera's IP address**, for example:  
192.168.0.5

5. Click **Apply** to save the settings. IP Camera should now be configured to work with your router and be accessible from the internet.

FVS318 – ProSafe VPN Firewall

1. Log into your router using your router IP.

2. On the main page, click on **Add Service** on the left side of the screen.

3. Click Add Customer Service.

4. In the **Name** field enter a name for the camera, for example: **IP Camera Web**:

Type: TCP

Start Port: 81

Finish Port: 81

5. Click **Apply** to save the settings.

6. There is a bug in the NETGEAR FVS318 1.4 firmware that does not record any entry that uses port 80. If you intend to use port 80, you will initially need to enter 81 for the Start and Finish port, and then edit the entry to port back to 80. Click on **Add Service** on the left side of the screen.

7. In the **Service Table** window select IP Camera Web and click **Edit Service**.

8. Change the **Start** and **Finish** port to **80**. Click **Apply**.

9. On the main page, click on **Add Service** on the left side of the screen and then click **Add Custom Service**. In the **Name** field enter a name for the camera, for example: **IP Camera Cam**.

Type: UDP

Start Port: 9001

Finish Port: 9001

10. Click **Apply** to save the settings.

11. On the main page, click on **Ports** at the side of the screen.

A. Click **Add**.

B. For Service Name select: IP Camera Web

C. Action: **ALLOW always**

- D. Local Server Address: Enter the IP address of the camera
- E. WAN Users Address: **Any**
- F. Click **Apply**.

12. Click Add again.

- A. For Service name select: **IP Camera Cam**
- B. Action: ALLOW always
- C. Local Server Address: Enter the IP address of the camera
- D. WAN Users Address: **Any**
- E. Click **Apply**.

13. Exit the router setup program. IP Camera should now be configured to work with your router and be accessible from the internet.

Proxim (<http://www.proxim.com>)

ORiNOCO BG-2000 Broadband Gateway

1. Log into your router using your router IP.
2. On the router's main page, click on **Setup** at the top of the page.
3. On the left side of the page, click on **Advanced settings -> Port Forwarding**.
4. Check in the checkbox for **Enable Port Forwarding**.
5. Click **New** on the right side of the page.
6. Enter the following information on the page:

Global Port:	80
Local Address:	Type in the <b>camera's IP address</b> , for example: 192.168.0.5
Local Port:	80
Type:	TCP
7. Click **Save** to save the settings.
8. Click **New** on the right side of the page.
9. Enter the following information on the page.

Global Port:	9001
Local Address:	Type in the <b>camera's IP address</b> , for example: 192.168.0.5
Local Port:	9001
Type:	UDP
10. Click **Save** to save the settings.
11. Click **Restart** on the left side of the page to restart your router. IP Camera should now be configured to work with your router and be accessible from the internet.

Siemens (<http://www.speedstream.com>)

SpeedStream 2602 – 2-Port DSL/Cable Router

SpeedStream 2623 – Wireless DSL/Cable Router

SpeedStream 2624 – Wireless DSL/Cable Router

1. Log into your router using your router IP.
2. After you are logged in, click on **Advanced Setup -> Virtual Servers**.
3. Enter the following information on the page:

Line #1:

Private IP:	Type in the <b>camera's IP address</b> , for example: 192.168.0.5 (Look at IP Camera's IP Address LCD display for the last 3 digits of the camera's IP address)
Private Port:	80
Type:	TCP
Public Port:	80

Line #2

Private IP:	Type in the <b>camera's IP address</b> , for example: 192.168.0.5 (Look at IP Camera's IP Address LCD display for the last 3 digits of the camera's IP address)
Private Port:	9001
Type:	UDP
Public Port:	9001

4. Click **Enter** to save the settings. IP Camera should now be configured to work with your router and be accessible from the internet.

SpeedStream 2604 – 4-port DSL/Cable Router

1. Log into your router using your router IP.
2. After you are logged in, click on **Advanced Setup -> Virtual Servers**.
3. Under the Properties section, there are a few entries you'll need to add. Check in the checkbox for **Enable**.
4. Under the first box, next to the Enable checkbox, type in: **IP Camera Web**.
5. Under PC (Server), select your camera or the camera's IP address from the list. If the camera is not listed, select the link titled "My PC is not listed."
6. Leave Protocol as **TCP**.

7. Under Internal Port No type in: **80**
8. Under External Port No type in: **80**
9. Click on **Add** to save these settings.
10. Under the first box, next to the Enable checkbox, type in: **IP Camera Cam**.
11. Under PC (Server), select your camera or the camera's IP address from the list. If the camera is not listed, select the link titled "My PC is not listed."
12. Leave Protocol as **TCP**.
13. Under Internal Port No type in: **9001**
14. Under External Port No type in: **9001**
15. Click on **Add** to save these settings. IP Camera should now be configured to work with your router and be accessible from the Internet.

SMC (<http://www.smc.com>)

SMC2404WBR – Barricada Turbo 11/22 Mbps Wireless Cable/DSL Broadband Router

SMC7004VBR – Barricada Cable/DSL Broadband Router

SMC7004CWBR – Barricada Wireless Cable/DSL Broadband Router

1. Log into your router using your router IP.
2. After you are logged in, click **NAT** on the left side of the page.
3. Click on **Virtual Server** on the left side of the page.
4. Enter the following information on the page:

Line #1:

Private IP:                                   Type in the **camera's IP address**, for example:  
192.168.0.5 (Look at IP Camera's IP Address LCD  
display for the last 3 digits of the camera's IP address)

Private Port:                               80

Type:                                        TCP

Public Port:                               80

Line #2

Private IP:                                   Type in the **camera's IP address**, for example:  
192.168.0.5 (Look at IP Camera's IP Address LCD  
display for the last 3 digits of the camera's IP address)

Private Port:                               9001

Type:                                        UDP

Public Port:                               9001

5. Click **Apply** to save the settings. IP Camera should now be configured to work with your router and be accessible from the Internet.

SMC7004AWBR – Barricade 4-port 11Mbps Wireless Broadband Router

1. Log into your router using your router IP.
2. Click on **Virtual Server** on the left side of the page.
3. Enter the following information on the page:

For ID #1:

Service Port:                               80

Private IP:                                   Type in the **camera's IP address**, for example:  
192.168.0.5 (Look at IP Camera's IP Address LCD  
display for the last 3 digits of the camera's IP address)

Enable:                                      Checked in

For ID #2:

Service Port: 9001

Private IP: Type in the **camera's IP address**, for example:  
192.168.0.5 (Look at IP Camera's IP Address LCD  
display for the last 3 digits of the camera's IP address)

Enable: Checked in

4. Click **Save** to save the settings. IP Camera should now be configured to work with your router and be accessible from the Internet.

## Appendix B: IP Address, Subnet and Gateway

This section discusses Communities, Gateways, IP Addresses and Subnet masking

### Communities

A community is a string of printable ASCII characters that identifies a user group with the same access privileges. For example, a common community name is “public.” For security purposes, the SNMP agent validates requests before responding. The agent can be configured so that only trap managers that are members of a community can send requests and receive responses from a particular community. This prevents unauthorized managers from viewing or changing the configuration of a device.

### Gateways

Gateway, also referred to as a router, is any computer with two or more network adapters connecting to different physical networks. Gateways allow for transmission of IP packets among networks on an Internet.

### IP Addresses

Every device on an Internet must be assigned a unique IP (Internet Protocol) address. An IP address is a 32-bit value comprised of a network ID and a host ID. The network ID identifies the logical network to which a particular device belongs. The host ID identifies the particular device within the logical network. IP addresses distinguish devices on an Internet from one another so that IP packets are properly transmitted.

IP addresses appear in dotted decimal (rather than in binary) notation. Dotted decimal notation divides the 32-bit value into four 8-bit groups, or octets, and separates each octet with a period. For example, 199.217.132.1 is an IP address in dotted decimal notation.

To accommodate networks of different sizes, the IP address has three divisions – Classes A for large, B for medium and C for small. The difference among the network classes is the number of octets reserved for the network ID and the number of octets reserved for the host ID.

Class	Value of First Octet	Network ID	Host ID	Number of Hosts
A	1-126	First octet	Last three octets	16,387,064
B	128-191	First two octets	Last two octets	64,516
C	192-223	First tree octets	Last octet	254

Any value between 0 and 255 is valid as a host ID octet except for those values the InterNIC reserves for other purposes

Value	Purpose
0, 255	Subnet masking
127	Loopback testing and interprocess communication on local devices
224-254	IGMP multicast and other special protocols.



### Subnetting and Subnet Masks

Subnetting divides a network address into sub-network addresses to accommodate more than one physical network on a logical network.

For example:

A Class B company has 100 LANs (Local Area Networks) with 100 to 200 nodes on each LAN. To classify the nodes by its LANs on one main network, this company segments the network address into 100 sub-network addresses. If the Class B network address is 150.1.x.x, the address can be segmented further from 150.1.1.x through 150.1.100.x

A subnet mask is a 32-bit value that distinguishes the network ID from the host ID for different sub-networks on the same logical network. Like IP addresses, subnet masks consist of four octets in dotted decimal notation. You can use subnet masks to route and filter the transmission of IP packets among your sub-networks. The value "255" is assigned to octets that belong to the network ID, and the value "0" is assigned to octets that belong to the host ID.

For the example above, if you want all the devices on the sub-networks to receive each other's IP packets, set the subnet mask to 255.255.0.0. If you want the devices on a single sub-network only to receive IP packets from other devices on its own sub-network, set the subnet mask to 255.255.255.0 for the devices on the sub-network.

Subnet Mask	Routing and Filtering
0.0.0.0	IP packets are transmitted to all devices.
255.0.0.0	IP packets are only transmitted to devices that are IP that's first octet matches the sender's IP address's first octet.
255.255.0.0	IP packets are only transmitted to devices that are IP that's first two octets match the sender's IP address's first two octets.
255.255.255.0	IP packets are only transmitted to devices that are IP that's first three octets match the sender's IP address's first three octets.

## Appendix C: Glossary

The Glossary section defines the terms used in this User Manual

Term	Definition
Ethernet	Local Area Network technology, originally developed by Xerox Corporation, can link up to 1,024 nodes in a bus network. Ethernet provides raw data transfer in a rate of 10 megabits/sec. with actual throughputs in 2 to 3 megabits/sec. using a baseband (single-channel) communication technique. Ethernet uses carrier sense multiple access collision detection (CSMA/CD) that prevents network failures when two devices attempt to access the network at the same time. LAN hardware manufacturers use Ethernet protocol; their products may not be compatible.
Gateway	A computer that attaches to a number of networks and routes packets between them. The packets can be different protocols at the higher levels.
IP	Internet Protocol – The TCP/IP standard protocol defines the IP datagram as the unit of information passed across a network.
IP Address	Internet Protocol Address – A 32-bit address assigned to hosts participating in a TCP/IP network. The IP address consists of network and host portions. It is assigned to an interconnection of a host to a physical network.
MAC	Medium Access Control - The network layer between the physical and the data link layers. Specifically, the physical (hardware) address exists in this layer.
MIB	Management Information Base – The database, i.e. set of variables maintained by a gateway running SNMP
NMS	Network Management Station
OID	Object Identifier – The variables defined in a MIB
Router	A computer that manages traffic between different network segments or different network topologies. It directs the destination IP address. The network media can be different, but the higher-level protocols must be the same.
SNMP	Simple Network Management Protocol – A standard protocol used to monitor IP hosts, networks, and gateways. SNMP defines a set of simple operations that can be performed on the OIDs of the MIBs managed by the monitored Agents. It employs the UDP/IP transport layer to move its object between the Agents and the NMS
TCP/IP	Transmission Control Protocol/ Internet Protocol – A protocol suite used by more than 15 million users with a UNIX association and widely used to link computers of different kinds.