LevelOne

WCS-2020

11g Wireless Network Camera

User's Manual

Ver. 1.10-0809

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1. Introduction

Thank you for choosing WCS-2020. This IP camera sends live video through 10/100Mbps wired network to a web browser or camera viewer across Internet anywhere in the world! This compact, self-contained unit lets you keep an eye on your home, your kids, and your workplace—whatever's important to you.

How does the Camera do all of this? Unlike standard "web cams" that require an attached PC, WCS-2020 can connect directly to a network. The MJPEG video compression produces a high quality, high-frame rate, 640 x 480 video stream.

The included Camera Viewer utility lets you record the video to your local hard drive, "live" or on a predetermined schedule.

Use the instructions in this Guide to help you integrate the Camera into your network. These instructions should be all you need to get the most out of WCS-2020.

2. Package Content

- WCS-2020
- Power Adapter
- Antenna
- Camera Stand and Bracket kit
- CD Manual/Utility
- Quick Installation Guide

If any of the above items are missing, please contact your supplier.

3. System Requirement

System requirement for PC or Notebook PC to access WCS-2020 are:

- OS System: Windows 2000, XP + SP2, Vista,Server 2003
- IE Version: 6.0.29 + SP2 or above
- CPU: Intel Pentium III 750MHz above or Intel Celeron 1GHz above
- Memory Size: 128MB (256MB recommended)
- DirectX 9.0 or above
- VGA card with fully DirectX 9.0 supported.
- VGA Card Resolution: 800 x 600 or above

4. Hardware Installation

4.1. LED and Focusing

The Camera head and its focus ring allow you to modify the aim and focus of the Camera. To adjust the Camera's focus, rotate the dark focus ring.

There are four LEDs indicating the camera status and networking status.

- **Monitoring**
  When someone is viewing the camera, the LED will light.
- **Ready**
  When the camera is power on and ready for access, the LED will light.
- **LAN**
  When the Internet Camera is linking to wired network, the LED is lighting. The LED is flashing when video is transmitted or received through wired network.
- **WLAN**
  When the Internet Camera is linking to wireless network, the LED is lighting. The LED is flashing when video is transmitted or received through wireless network.

4.2. Camera Ports

The Camera features three ports and a Reset button.

- **Power**

  The Power port is where you can connect the power adapter.

- **LAN**

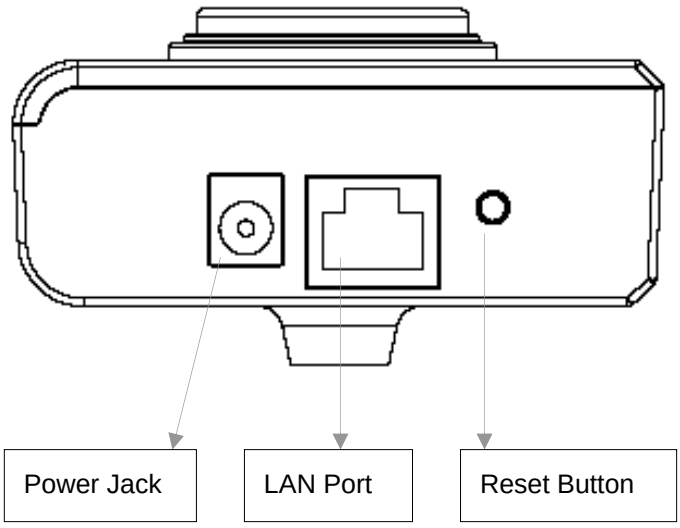
  The LAN port is where you can connect the Ethernet network cable.

- **WLAN (Antenna Connector)**

  This round connection is standard Reverse SMA connector where any antennas with Reverse SMA connector can connect to the Internet Camera..

- **Reset**

  1. If problems occur with your Internet Camera, press the reset button with a pencil tip (for less than 2 seconds) and the Internet Camera will re-boot itself, keeping your original configurations.
  2. If problems persist or you experience extreme problems or you forgot your password, press the reset button for longer than 5 seconds and the Internet Camera will reset itself to the factory default settings (warning: your original configurations will be replaced with the factory default settings).



4.3. Installation Procedure

1. Unpack WCS-2020 package and verify that all the items listed in the Chapter 2 are provided.
2. Connect WCS-2020 to your network by attached the network cable from the switch/router to the UTP port of WCS-2020.
3. Connect the power adapter to WCS-2020 and plug the power adapter to power outlet. WCS-2020 will be powered on. When WCS-2020 is ready, the Ready LED will light.
4. Make sure that you have installed correct VGA driver and DirectX 9.0 or above.

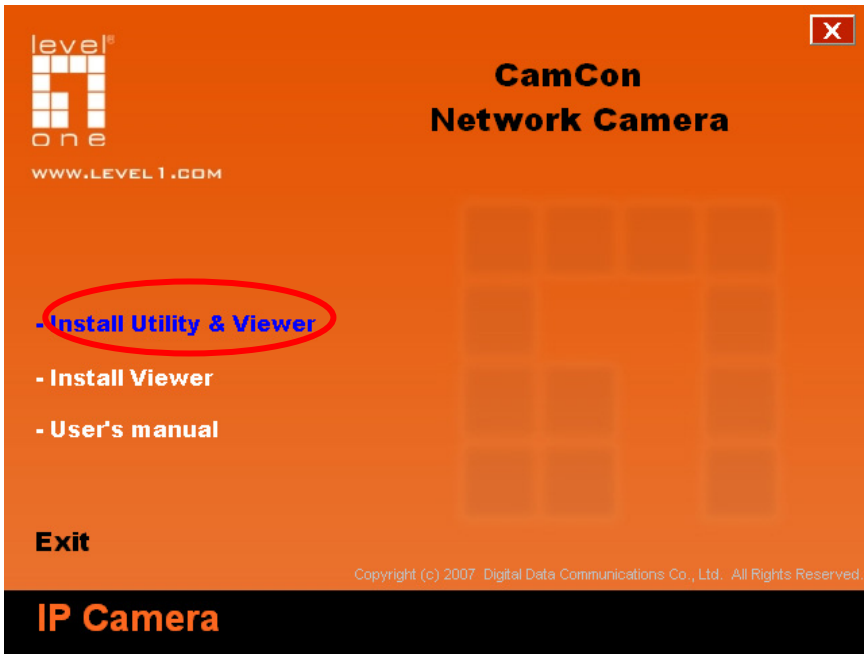
Note: It is highly recommended to use the power adapter shipped with WCS-2020, do NOT use any other power adapter from any sources.

5. Software Installation

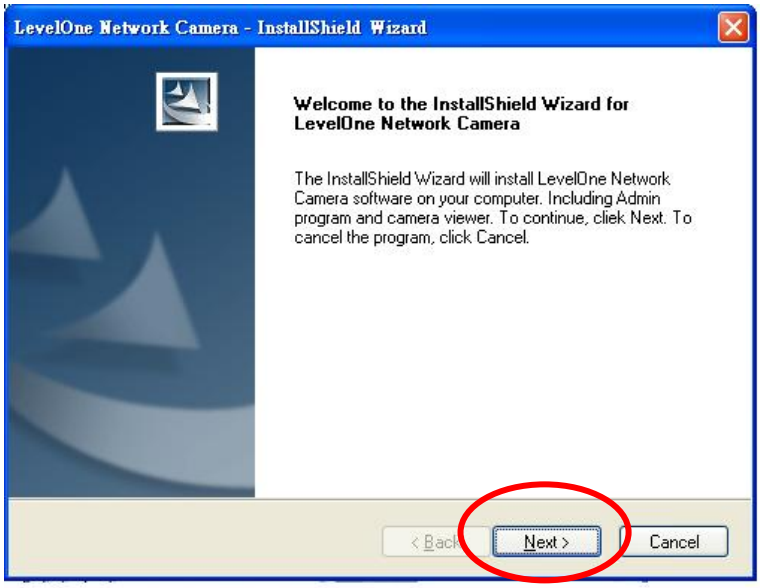
Follow the simple steps below to run the Install Wizard to guide you quickly through the Installation process. The following installation is implemented in Windows XP. The installation procedures in Windows 2000/Server 2003 are similar.

1. Insert the CD shipped along with WCS-2020 into your CD-ROM drive. The “Autorun.exe” program should be executed automatically. If not, run “Autorun.exe” manually in the CD.

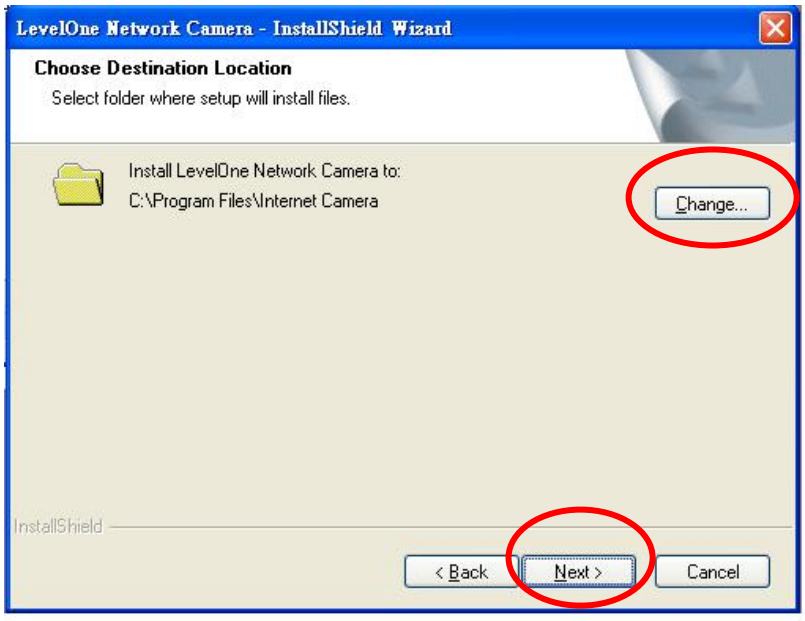
2. The Install Wizard will show four selections, select the program you want to install or click “**Exit**” to install the program later. The following installation steps are the demonstration of “**Install Utility & Viewer**”.



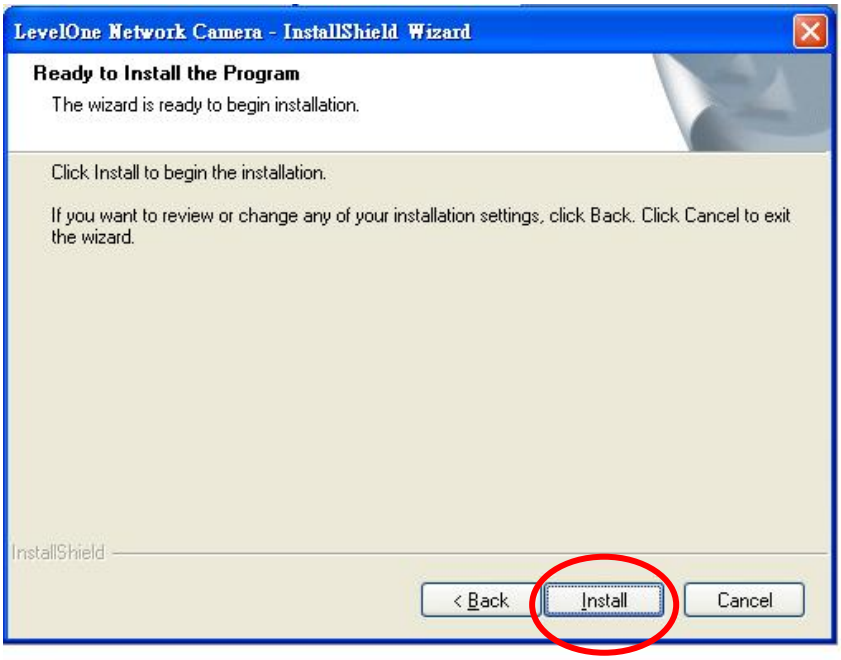
3. The system will start the installation procedures. Click “**Next**” to continue installation.



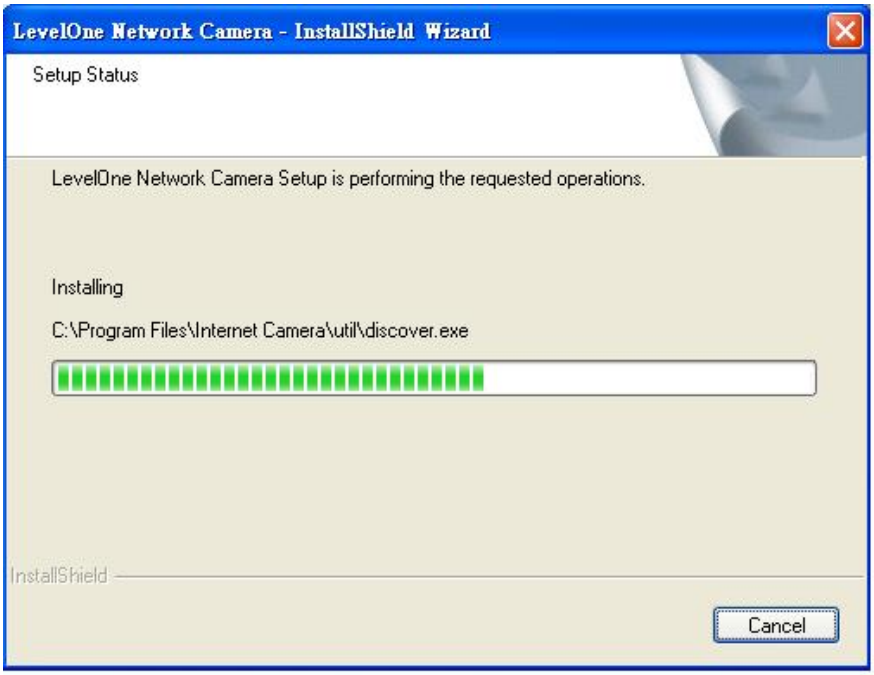
4. If you wish to install the software program in an alternate location, click “**Change**”; otherwise click “**Next**” to move on to the next step.



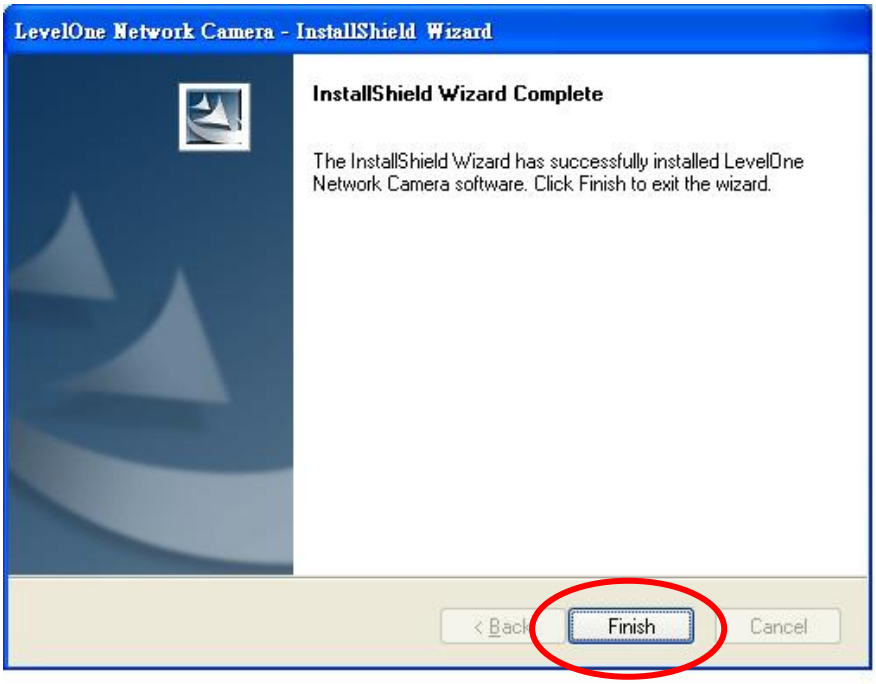
5. Click “**Install**” to start installing the program.



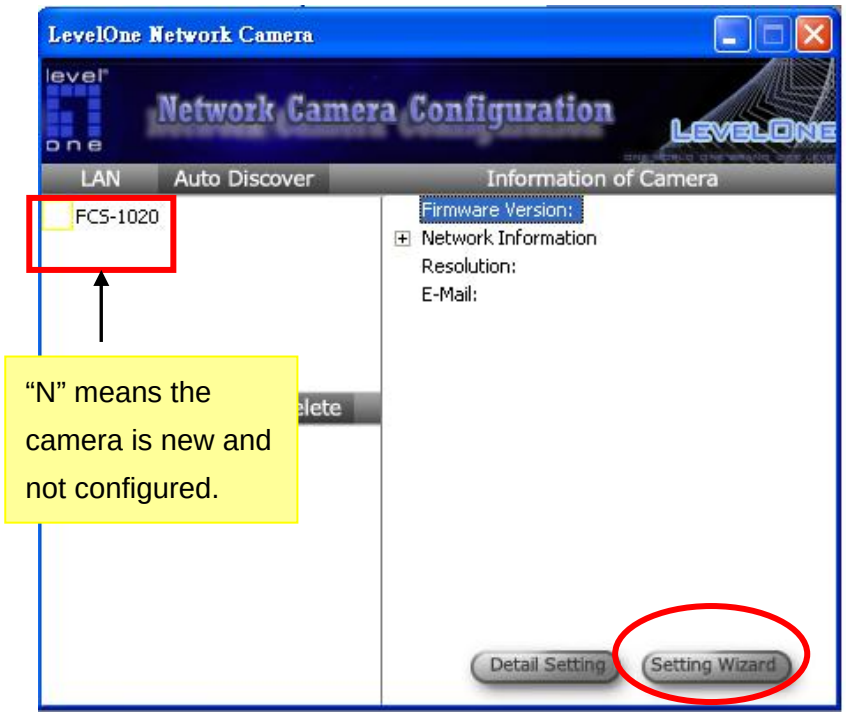
6. The system will install the program automatically.



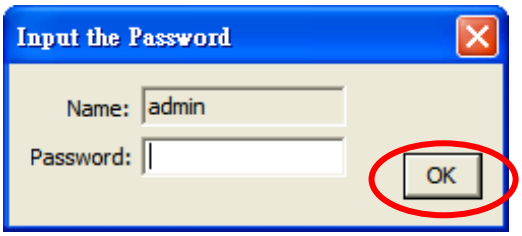
7. Click “**Finish**” to complete the software installation.



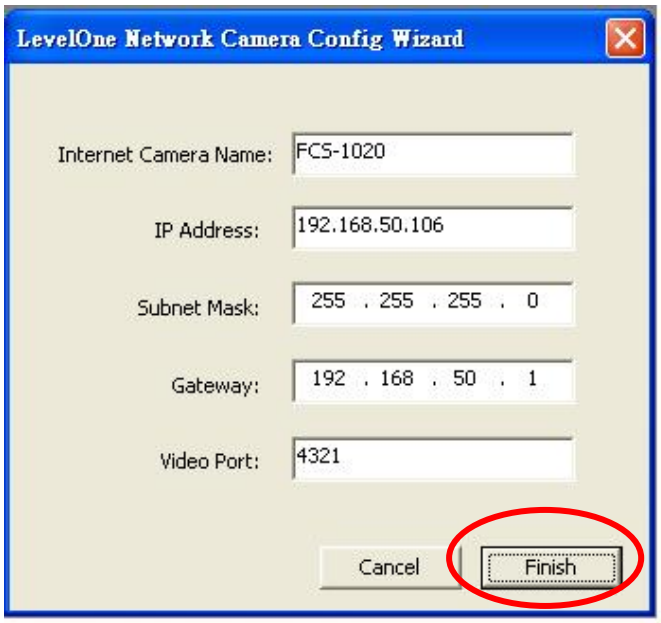
8. ”**Administrator Utility**“ will be run automatically after installation. On WCS-2020 first page, the cameras found in the network are listed in the left window. Choose the one you want to configure and click “**Setting Wizard**” to proceed.



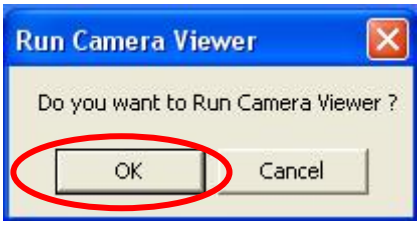
9. Please enter the default password “**1234**” and click “**OK**” to login to the IP setup page.



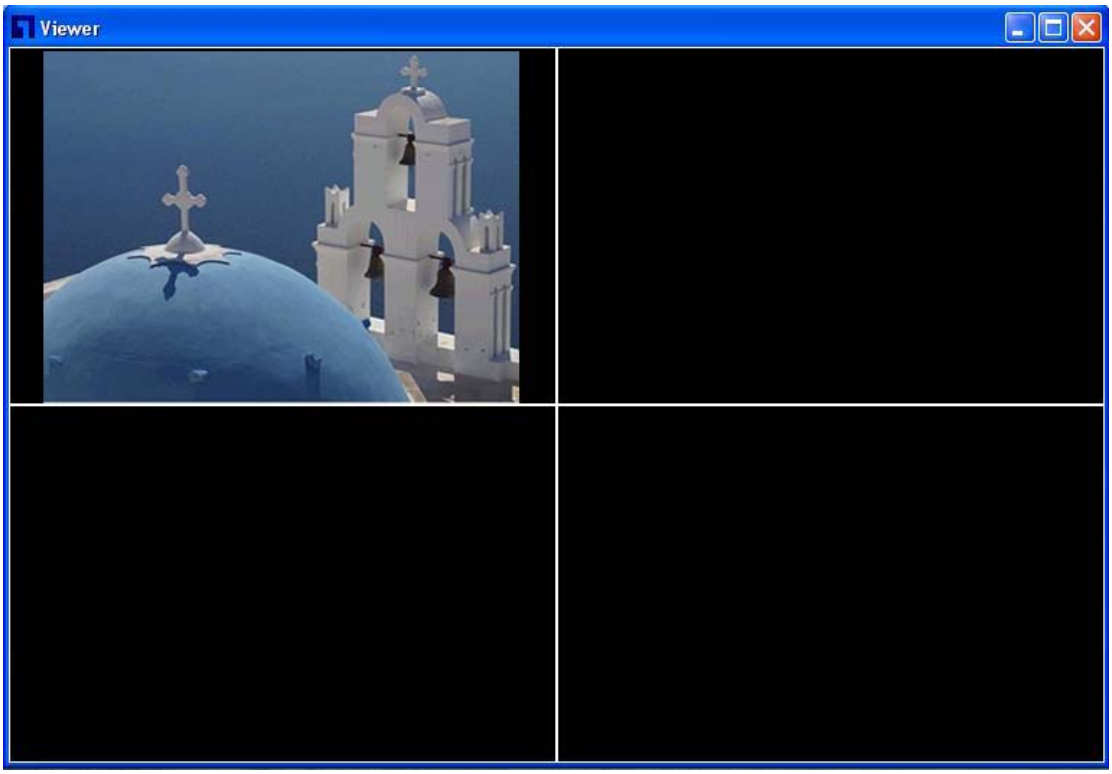
10. IP camera is working through the network (TCP/IP Protocol). The IP address and subnet mask setting must be correct, or you cannot access to the camera. The wizard program will detect the IP address status of your network automatically and suggest a free IP address for the Camera. You can accept the suggested value or enter the value manually. If you enter the value manually, please be aware that the “Subnet Mask” must be the same for both the camera and the PC. Click “**Finish**” to apply the configuration.



11. This wizard will pop up a window to ask you if you want to run the “**Camera Viewer**” and see the video of the Camera immediately. Select “**OK**” to run “**Camera Viewer**”.



12. The “**Camera Viewer**” will show the video automatically. Congratulations, you can use the camera through the network to view the video from now on.



6. Using the Administrator Utility

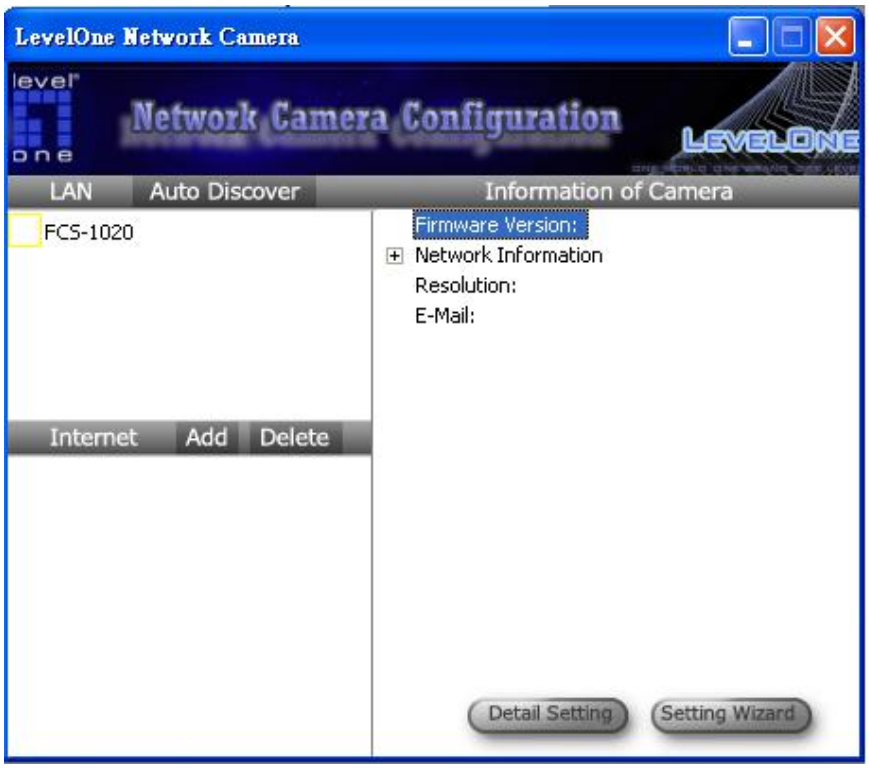
The Administrator Utility allows users to search and setup the cameras located within the Intranet or on the Internet. From the utility, users can view all the information of the selected camera; furthermore, it provides a setting wizard, which can guide users to add the camera to the network easily and promptly.

There are two ways to run the Administrator Utility as follows.

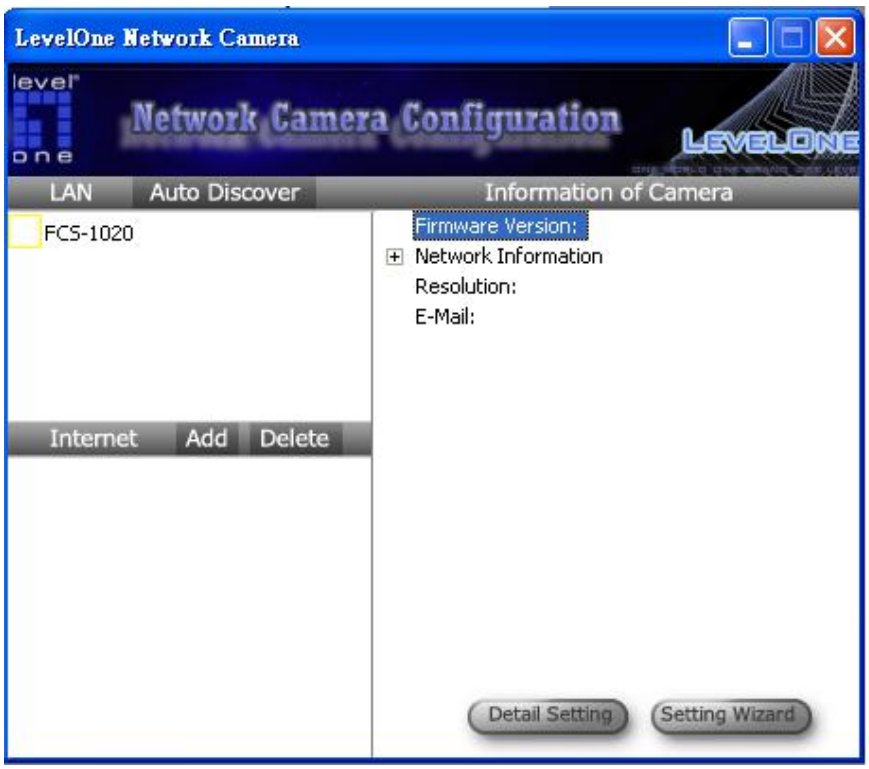
1. Click “Start”, select “\Program Files\Internet Camera\admin\admin.exe” to run the utility.
2. Double click the “IP Camera Admin” icon

to run the utility.

Once the utility is started, it will search all the cameras within the network. To do more settings, please refer to the description in the following sections.

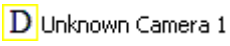


6.1. General Setting

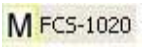


LAN	
Auto Discover	Click the button will search the camera within the network.
Camera List	The list shows the camera name and the setup status of the camera. N FCS-1020 It means the camera is in the default setting. FCS-1020 It means the camera is configured before.

Internet	
Add	Click “Add” will appear a window for you to enter the IP Address of the camera on the Internet.
Delete	Click “Delete” to delete the camera from the list.
Camera List	The list shows the camera name and the connect status of the camera.



It means the camera is disconnected or not in the Internet.



It means the camera is connected.

Information of Camera	
Camera Information	It displays all information of the selected camera. The information includes Firmware Version, Network Information, IP Address, UPnP Setting, DDNS Setting, Resolution and E-mail setting, etc.

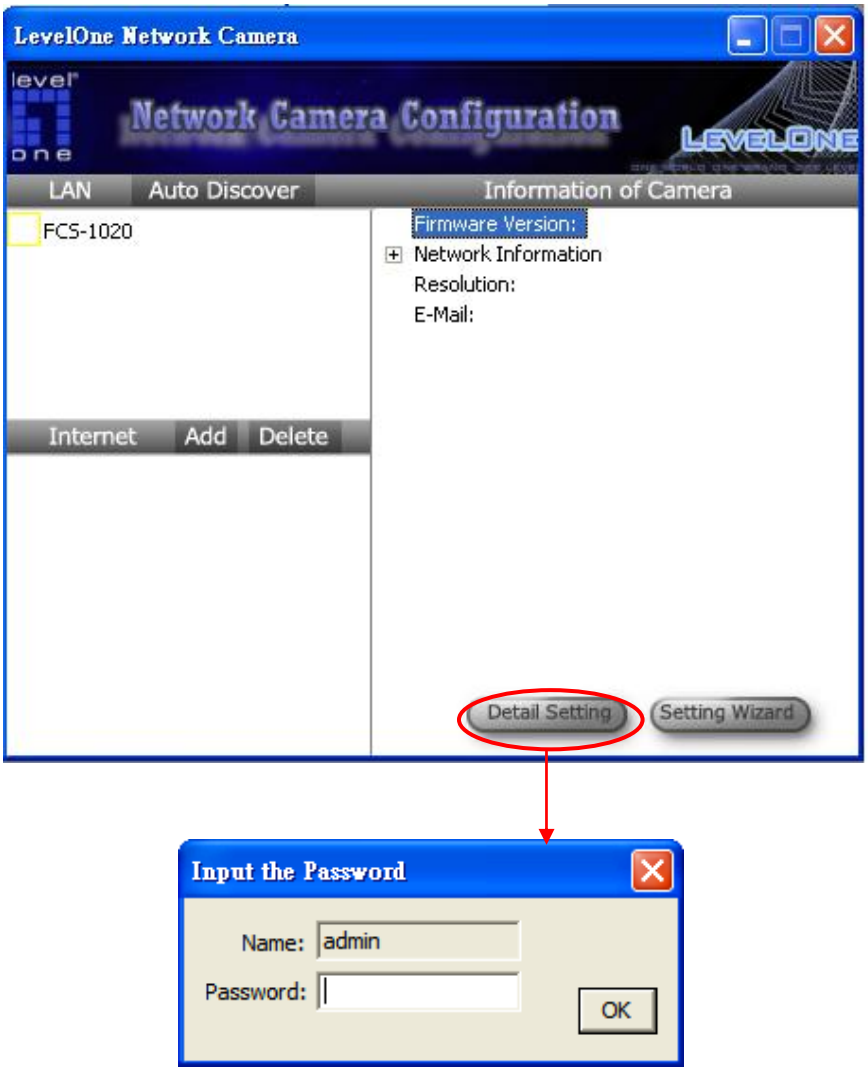
Camera Setting	
Detail Setting	Click “Detail Setting” to do more setting of the camera such as IP address, Resolution, password and firmware upgrade, etc.
Setting Wizard	Click “Setting Wizard” to setup the necessary setting for the camera.

6.2. Detail Setting

When you click the “Detail Setting”, a screen will pop up for you to enter the “Administrator Name” and “Password”. The default value is as follows.

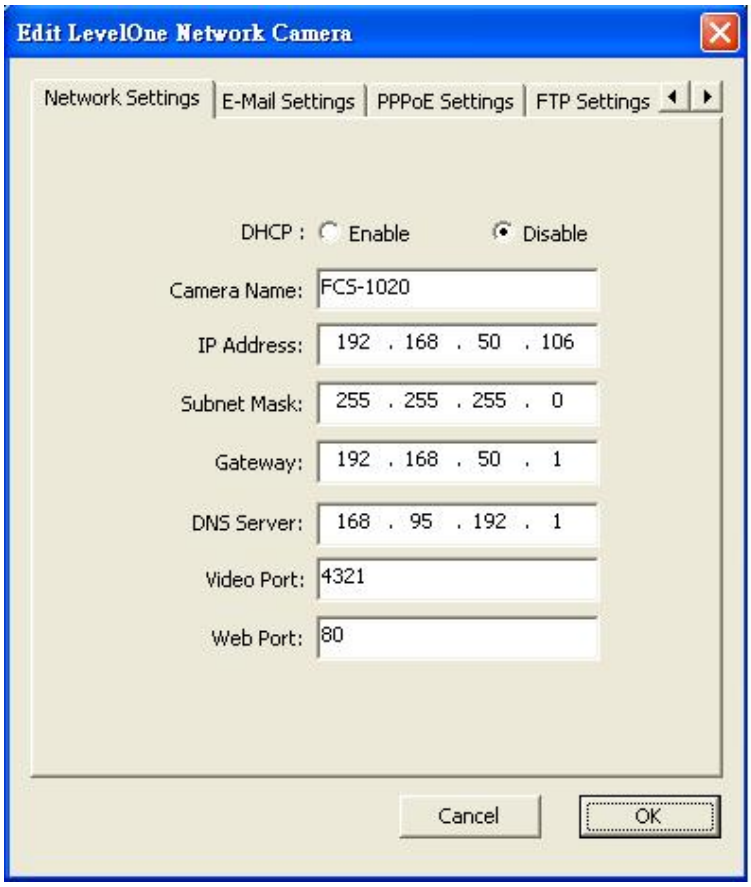
Name: “**admin**”

Password: “**1234**”



If the name and password you enter are correct, you can start to setup the camera.

6.2.1. Network Setting

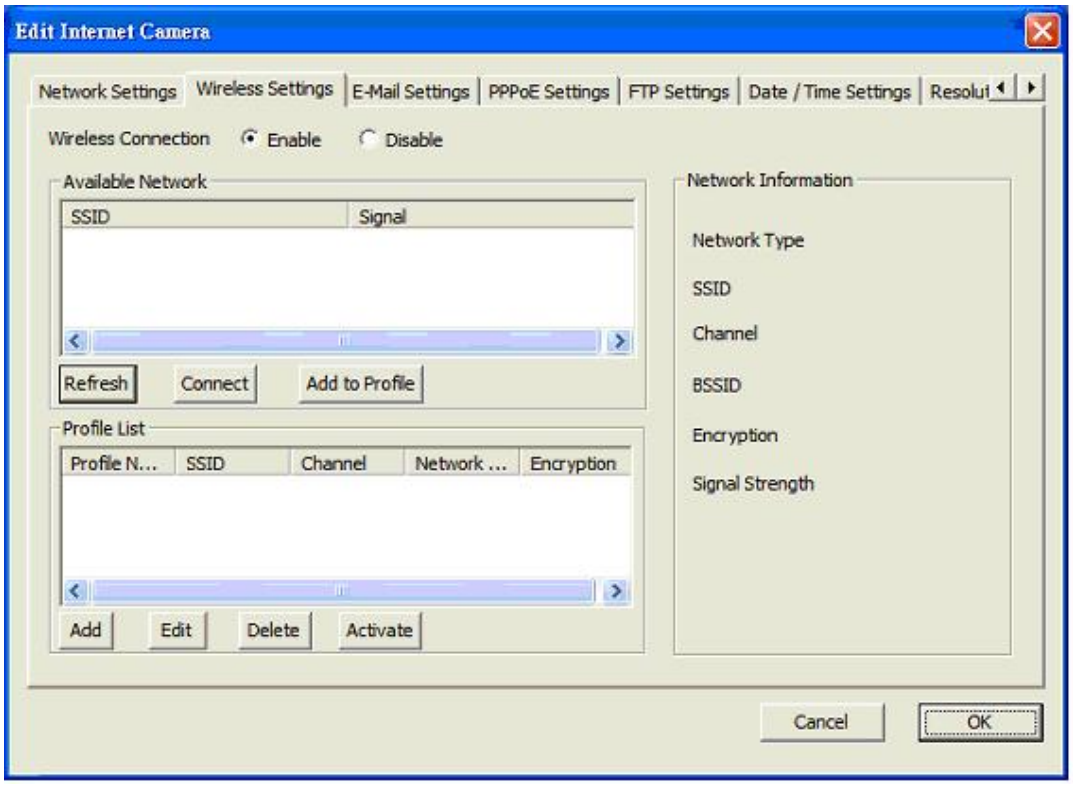


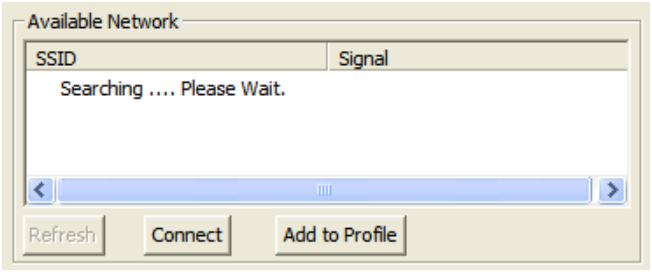
Network Setting	
IP camera Name	The default camera name is “WCS-2020”. It is recommended to name a meaningful name for the camera.
IP Address	Enter an unused IP Address within the IP address range used on your LAN. If the IP Address of your LAN is from the 192.168.2.1 to 192.168.2.254, you can set an unused IP Address from the range for the camera, for example: 192.168.2.250.
Subnet Mask	The Subnet Mask field must match the subnet setting on your LAN. For example: 255.255.255.0.
Gateway	The Gateway is used to forward frames to destinations in a different subnet on the Internet. The Gateway setting must be the same with the gateway used by the PCs on your LAN.

DNS Server	DNS Server (Domain Name Server) that translates names to IP addresses. Set the same DNS Server as the PCs on your LAN.
Video Port	The Video Port is used to transmit or receive the video streaming in the network. The default port setting is “4321”. If you want to view the video from the camera, the port setting should be correct.
Web Port	This camera support web connection, the default web port is 80. Since the web server may use port 80, you can use a different port for the camera. If you change the web port from 80 to 8080, you must type **http://192.168.2.3:8080** to connect the camera through the web browser.

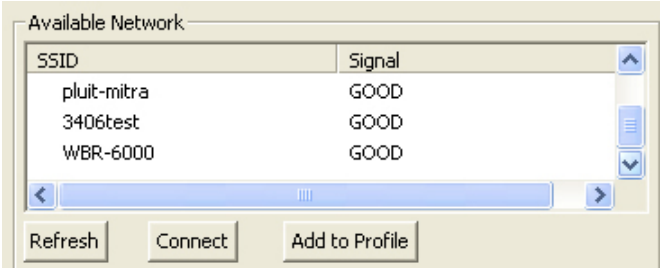
6.2.2. Wireless Settings

Utility will site survey automatically or you can press “Refresh” button to survey the AP router manually.

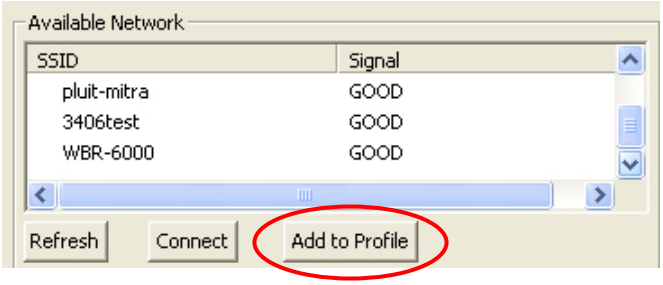




After site survey procedure, there will show existing AP SSID.

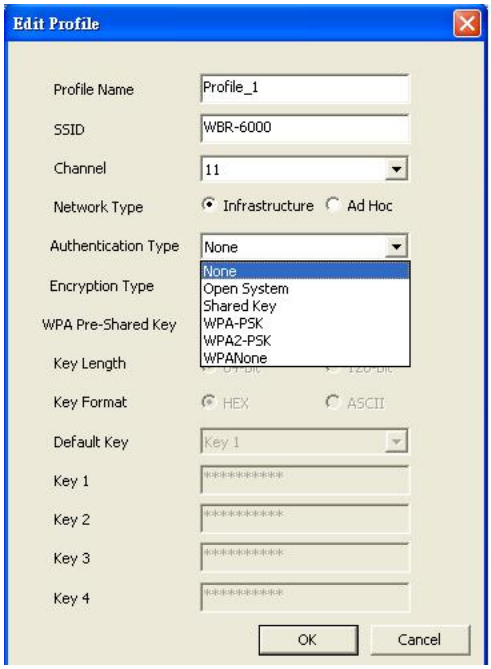


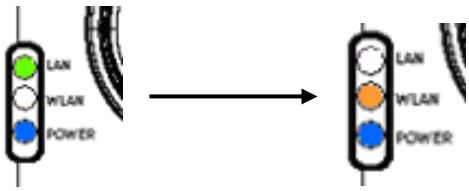
Then press “Connect” to connect AP router or press “Add to Profile” to configure the Wireless WEP and WPA encryption.



There are WEP(Open System/Shared Key) ,WPA-PSK,WPA2-PSK and WPANone encryption settings. You can choose one to match AP router wireless settings.

After set the profile, Please remove the LAN cable then IP Camera will connect to AP router automatically.

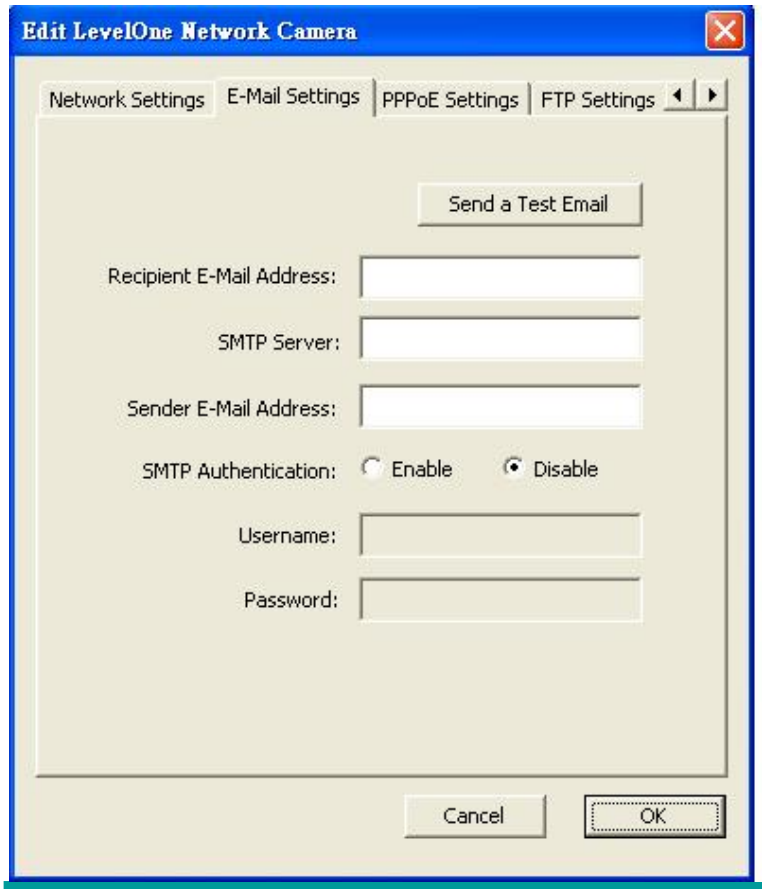




LED Status Diagram

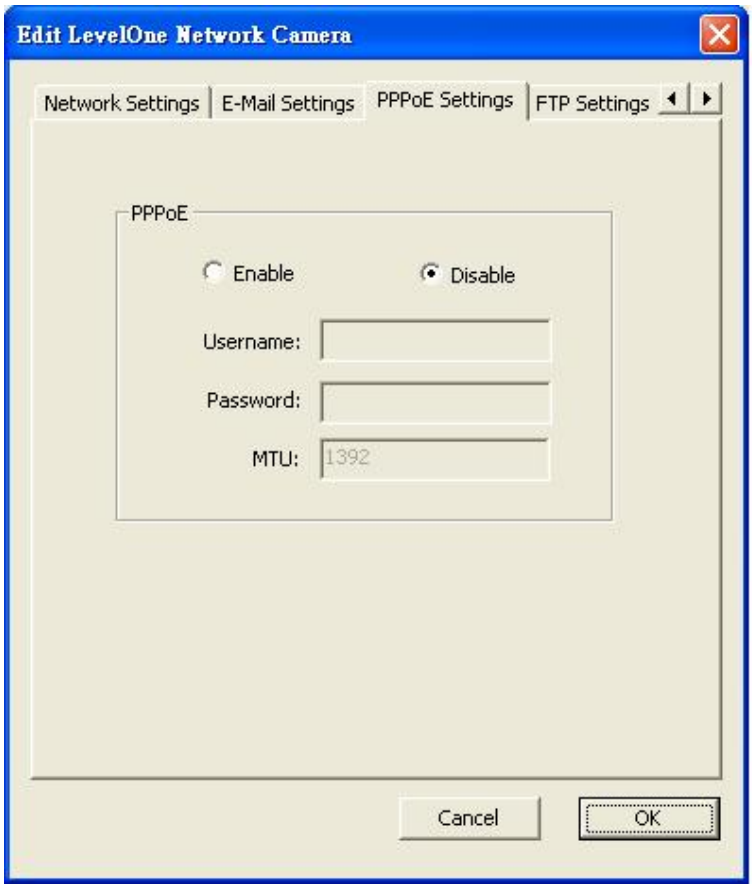
You must configure the wireless settings from wired environment. Then you can remove the wired cable and start wireless connection.

6.2.3. E-Mail Setting



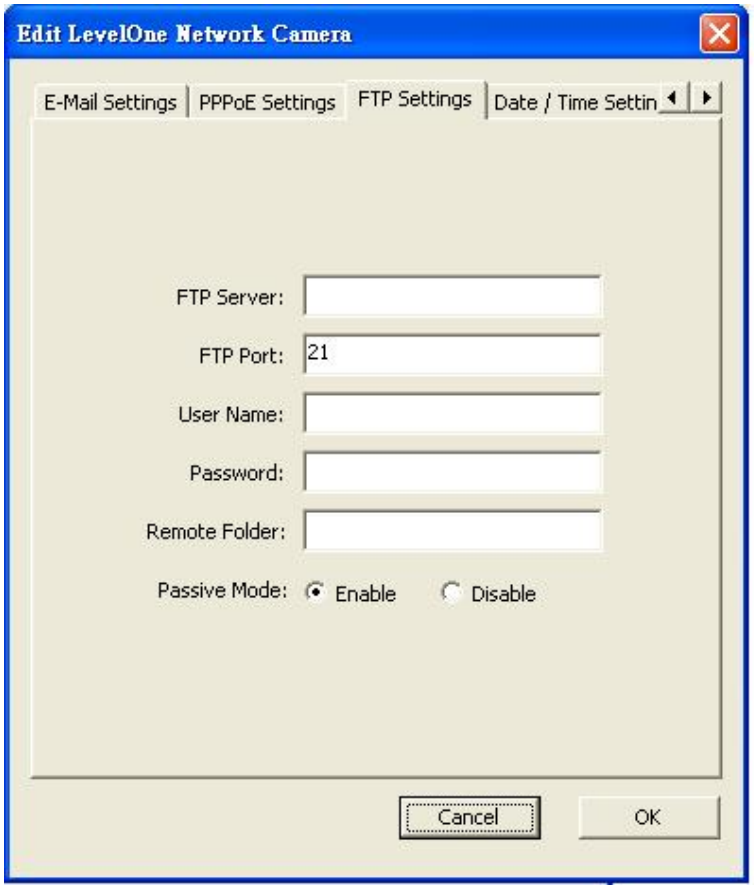
E-Mail Setting	
Recipient E-Mail Address	This camera supports “Snap Shot” and “Motion Detection” functions. You can snapshot a picture and send the picture by E-Mail. Enter the E-Mail Account for receiving the picture.
SMTP Server	Enter the SMTP Server for the E-Mail sending.
Sender E-Mail Address	Specified the e-mail address of the e-mail sender.
Authentication	Enable or Disable the SMTP Authentication function
Username	When Authentication is enabled, input the SMTP Username.
Password	When Authentication is enabled, input the password.
Send a Test Email	Press this button to send a test e-mail to your mailbox. You can use this function to test if your setting is correct.

6.2.4. PPPoE Settings



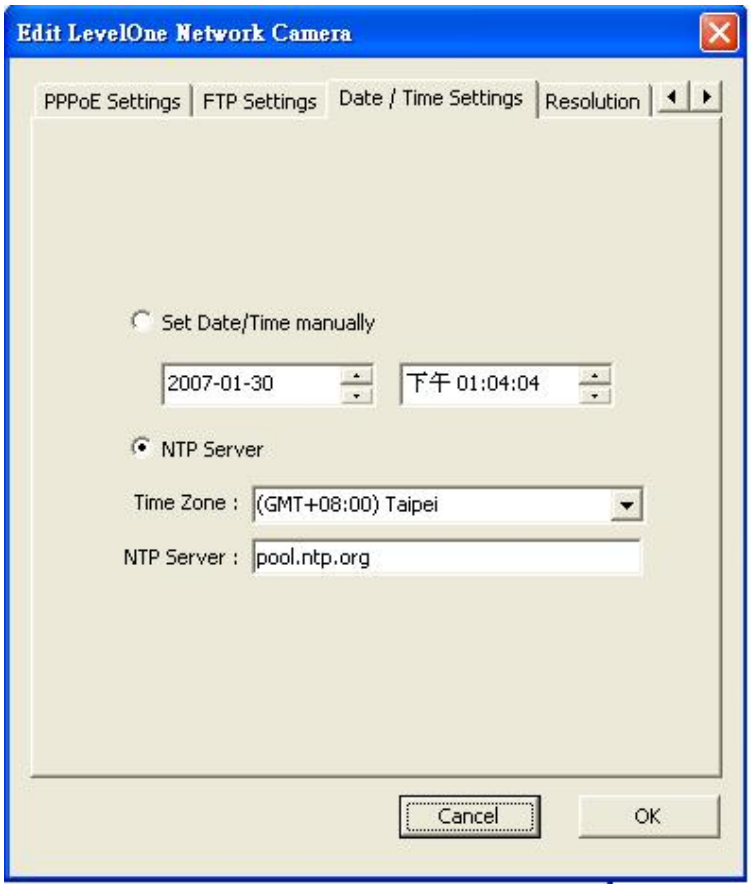
PPPoE Settings	
Enable/Disable	If enable the PPPoE function, IP Camera will use PPPoE for network connection first. The default value is “Disable”.
Username	Enter the Username of PPPoE connection.
Password	Enter the Password of PPPoE connection

6.2.5. FTP Settings



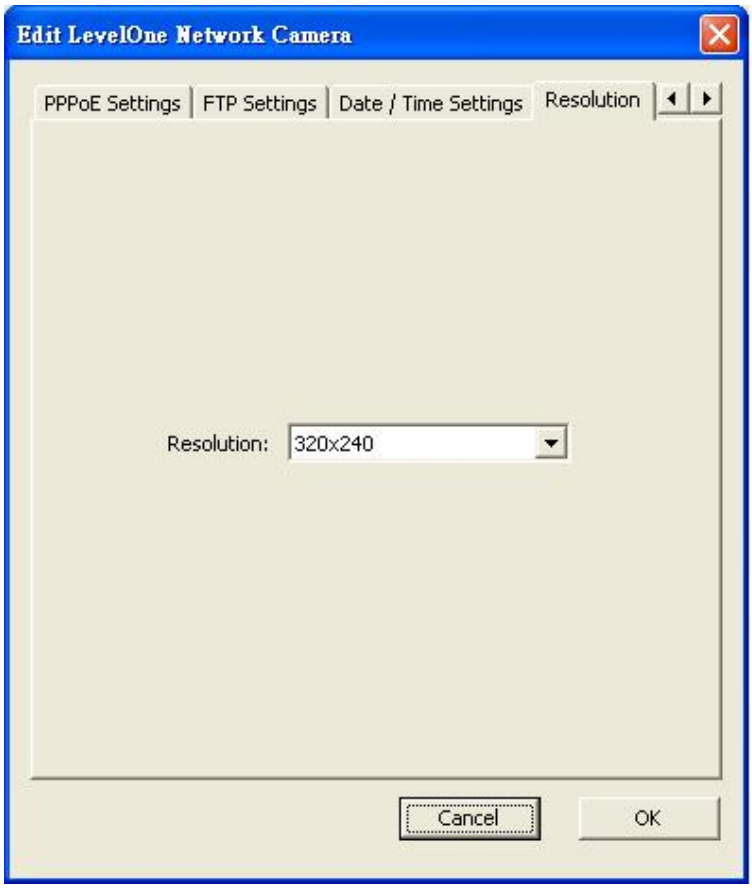
FTP Settings	
FTP Server	This camera supports “Motion Detection” functions. When Motion Detection event occurred, you can record the pictures to FTP server. Enter the FTP address for receiving the pictures.
FTP Port	Enter the port of the FTP server.
User Name	Specify the user account of ftp server.
Password	Specify the Password of your ftp account.
Remote Folder	Specify the folder of the ftp site that you want to store the video.
Passive Mode	If your Camera is under NAT, you usually need to enable this feature.

6.2.6. Date / Time Settings



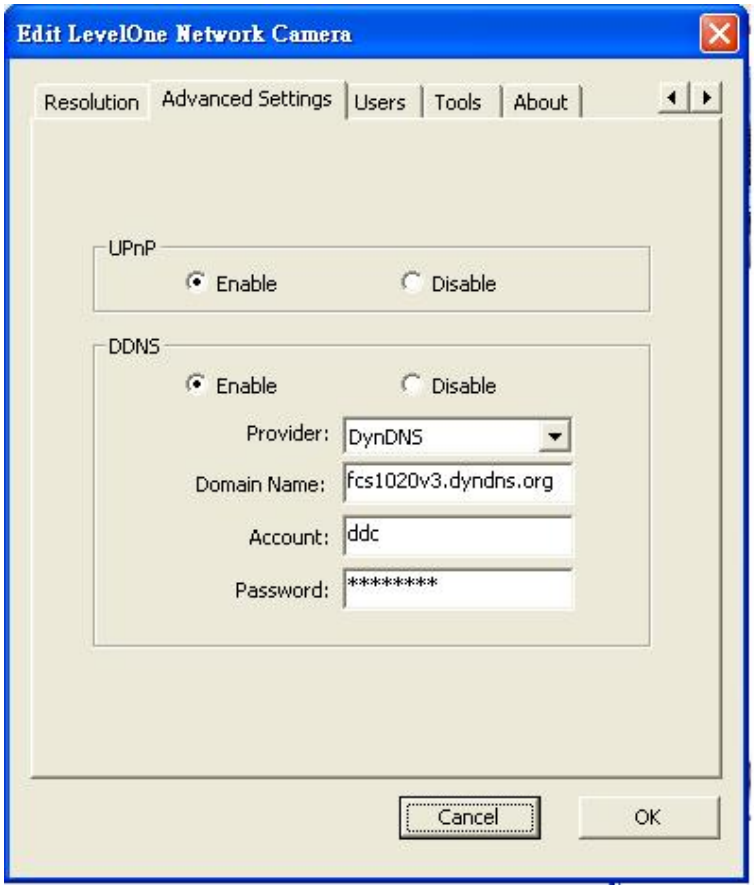
Date / Time Settings	
Set Date/Time manually	Set the current Date and Time.
NTP Server	Synchronize the Date and Time with NTP server.
Time Zone	Select the time zone that your camera put on.
NTP Server	Specify the IP Address of the NTP Server.

6.2.7. Resolution



Resolution	
Resolution	Select the desired video resolution format. Larger resolution requires more bandwidth. 640 x 480 is “VGA” format. 320 x 240 is “CIF” format. 176 x 144 is “QCIF” format.

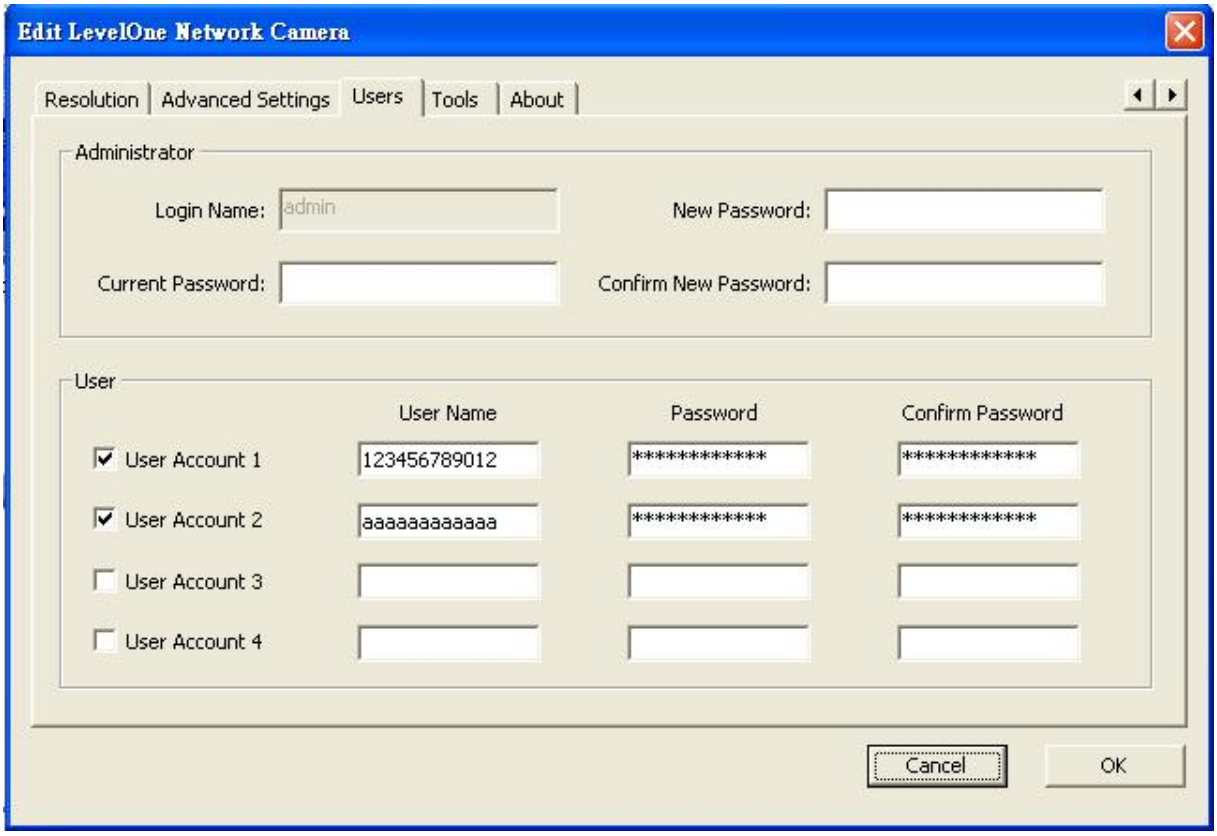
6.2.8. Advanced Setting



Advanced Setting	
UPnP	When the UPnP function is enabled, the camera can be detected by UPnP compliant system such as Windows XP. The camera will be displayed in the Neighborhood of Windows XP, so you can directly click the camera to view the video through web browser.
DDNS	Many internet connections use a "Dynamic IP address", where the Internet IP address is allocated dynamically whenever the Internet connection is established. Internet users should know the IP Address of the camera when they want to connect to the camera every time. DDNS is designed to solve this problem, by allowing users to connect to your LAN using a domain name, rather than an IP address.
Enable/Disable	Enable or disable DDNS function of the camera.

Provider	Several companies provide DDNS service. This camera supports the service from DynDNS who is one of the DDNS providers.
Domain Name	The domain name given by DynDNS is “registername.dyndns.com”. Enter the domain name that you register for the camera from DynDNS web site.
Account	Enter the login name for the DDNS service.
Password	Enter the password for the DDNS service.

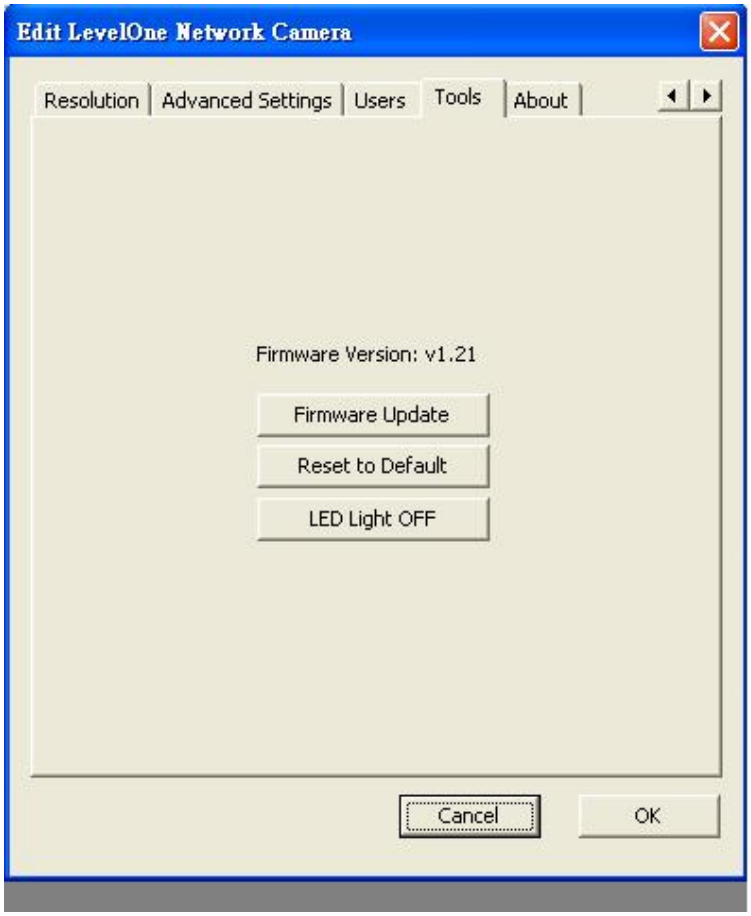
6.2.9. Users



Users	
Administrator	Setting the password of Administrator account
Current Password	Enter the current password of the camera.

New Password	Enter the new password you want to use for the camera.
Confirm New Password	Retype the new password to confirm the setting.
User	Setting the user account and password. Your camera can support 4 user account.

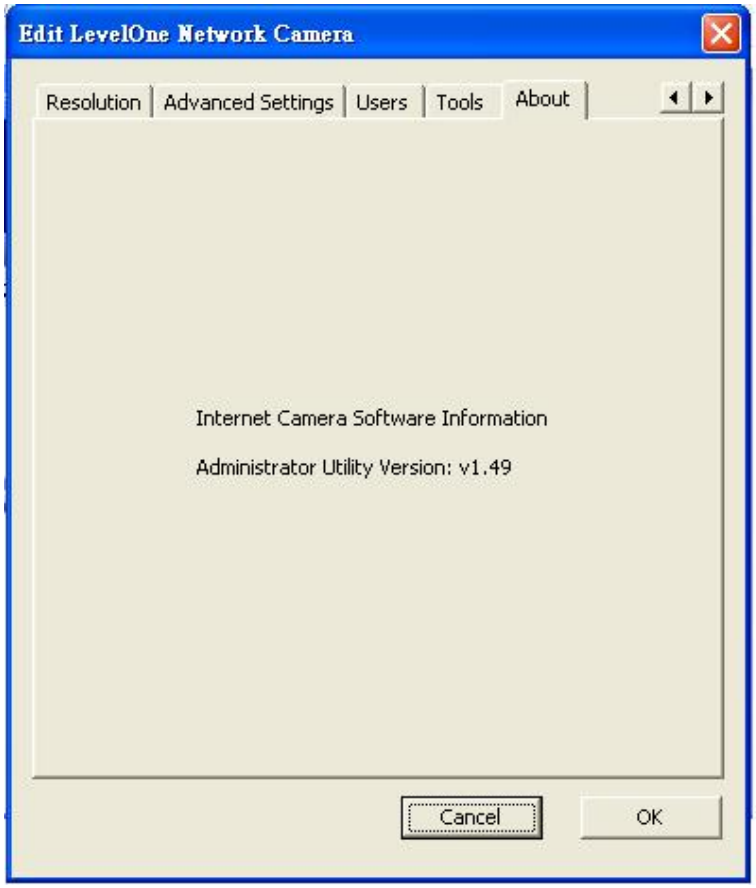
6.2.10. Tools



Tools	
Firmware Version	Display current firmware version.
Firmware Update	You can upgrade camera's firmware via this function. Press this button and select the correct firmware to upgrade.

Reset to Default	If you want to reset the camera, click this button. The default settings of the camera are as follows. Camera Name: “WCS-2020” IP Address: “192.168.2.3” Subnet Mask: 255.255.255.0 Administrator Name: “Admin” Password: “1234” Video Port: “4321” Web Port: “80”
LED Light OFF	The function can turn off LED light manually.

6.2.11. About



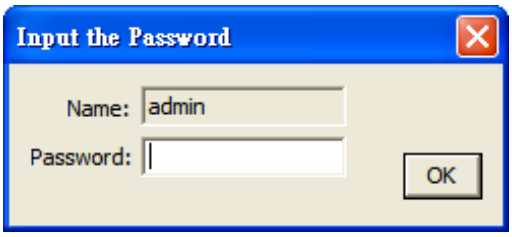
About	
Administrator Utility Version	Display current Administrator Utility Version.

6.3. Setting Wizard

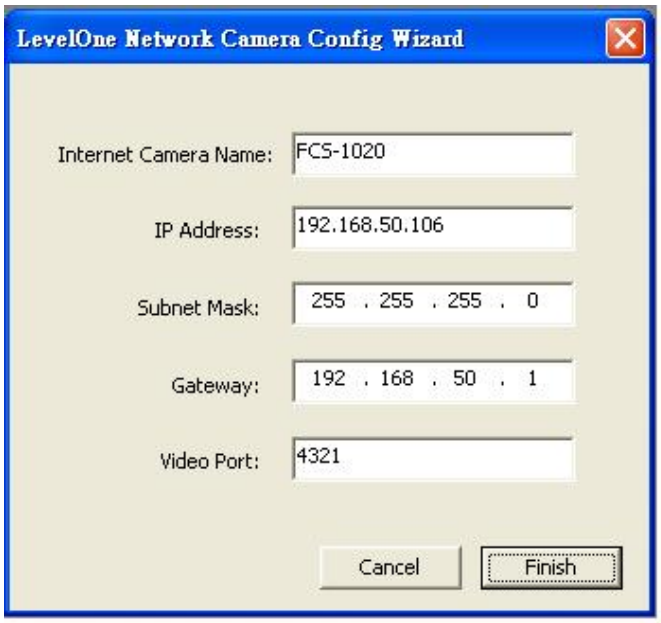
When you click the “Setting Wizard”, a screen will pop up for you to enter the “Administrator Name” and “Password”. The default value is as follows.

Name: “**admin**”

Password: “**1234**”



If the name and password you enter are correct, you can start to setup the camera.



Setting Wizard	
IP camera Name	The default camera name is “WCS-2020”. It is recommended to enter a meaningful name for the camera.
IP Address	The wizard will auto setup an available IP Address to the camera.

	For example: if the IP address of the network is 192.168.2.x, the wizard will search an unused IP Address from 192.168.2.1 to 192.168.2.250 and assign the camera an available IP Address. You are allowed to enter another IP Address to change the setting.
Subnet Mask	The wizard will auto search the Subnet Mask setting of the network and set the camera in the same Subnet Mask. You can enter another Subnet Mask to change the setting.
Gateway	The wizard will auto search the Gateway setting of the network and set the camera to use the same Gateway. You can enter another Gateway to change the setting.
Video Port	It defines the video stream port. The default value is “4321”.
Cancel	Click “Cancel” to stop wizard setting.
Finish	Click “Finish” to complete the camera setting.

When you finish the camera setting, you can click “Ok” to run the “Camera Viewer” immediately or click “Cancel” to run the “Camera Viewer” later.

7. Using the Camera Viewer

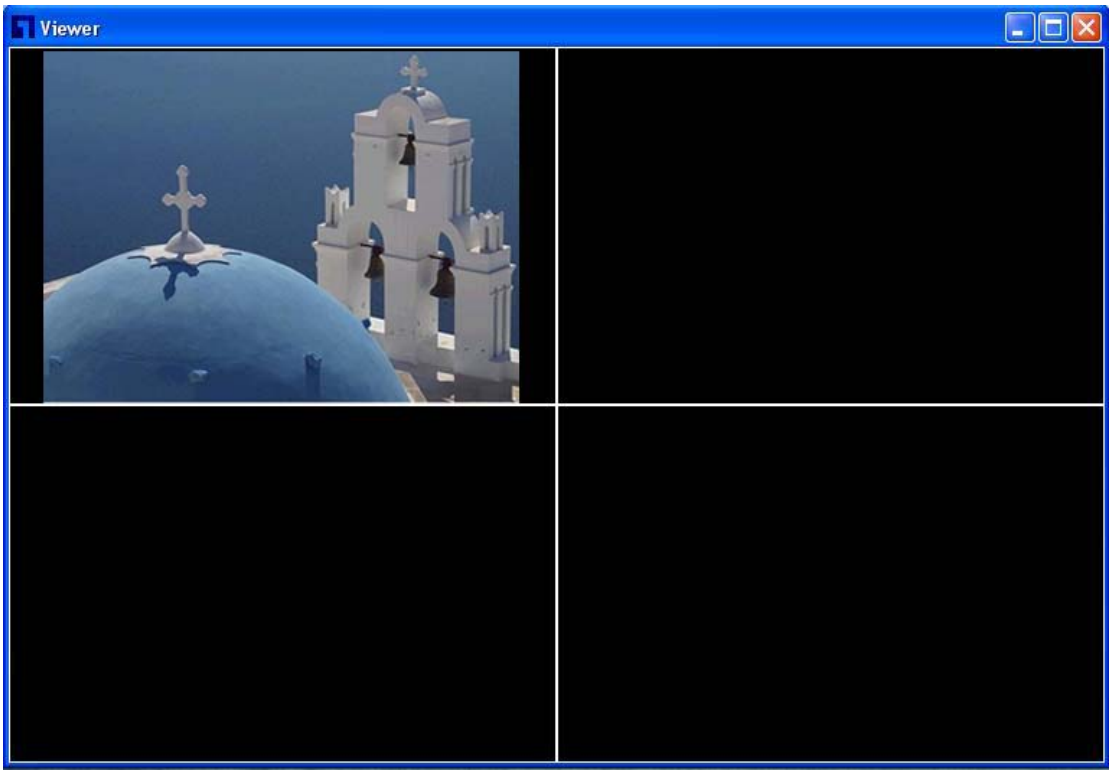
The Camera Viewer Utility allows users to view video up to four cameras. It also allows users to manual/schedule recording video and playback the video file. The status of camera viewing such as frame rate, video received, and etc. are also recorded in time.

There are three ways to run the Camera Viewer Utility as follows.

1. Click “Start”, select “\Program Files\Internet Camera\util\util.exe” to run the utility.
2. Double click the “IP Camera Viewer” icon to run the utility.
3. Click “Setting Wizard” from Administrator Utility and follow the instructions in the utility.

7.1. Panel Introduction

In the beginning when you start the Camera Viewer, you would see a Control Panel and a four division Viewer window.



7.2. Camera Buttons

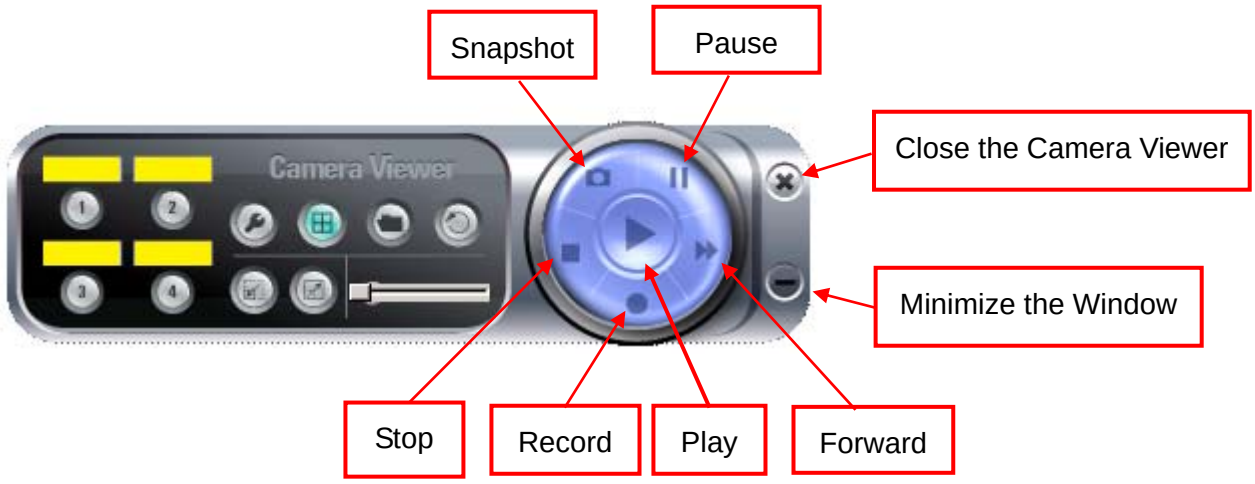
Camera Buttons	
Camera 	Click one of these four cameras will connect to the selected camera that you want to view and configure. If you want to remove the camera from the viewer, please **right click** the icon and select “Reset Camera x”. If you want to configure the camera, please **right click** the icon and select “Configure Camera x”.

7.3. Camera Status

There is a status bar shown different color to indicate the status of each IP camera.

Camera Status	
Yellow	It means that there is no camera set to connect.
Blue	It means that the camera is connected and playing the live video.
Pink	It means that the camera is not connected now.
Red	It means that the camera is recording.

7.4. Control Buttons



Control Buttons	
Play	The “Play” button is an intelligent play user-interface. In the normal display mode and WCS-2020 is disconnected, clicking on the “Play” can make the viewer connect to WCS-2020. In the

playback mode, clicking on the “Play” can play the video in the normal speed.

Stop

The “Stop” button is an intelligent play user-interface. In the normal display mode and WCS-2020 is connected, clicking on the “Stop” can make the viewer disconnect the camera. In the playback mode, clicking on the “Stop” can stop playing the video.

Pause

The “Pause” button provides you a way to pause the current video display. When the displaying video is paused, click on the “Play” again to resume the video display.

Forward

The “Forward” button to forward the speed of display when playback the recording file. Click the button at a time will increase the playing speed one time.

Snapshot

Click “Snapshot” will make the viewer to take a snapshot of the video and save the picture as a bitmap file in the hard disk. (You can set the directory for storing these bitmap files at the Section 7.8.4)

Record

By clicking “Record” you can record video immediately. (You can set the directory for storing video files at the section 7.8.4)

7.5. Video Recording

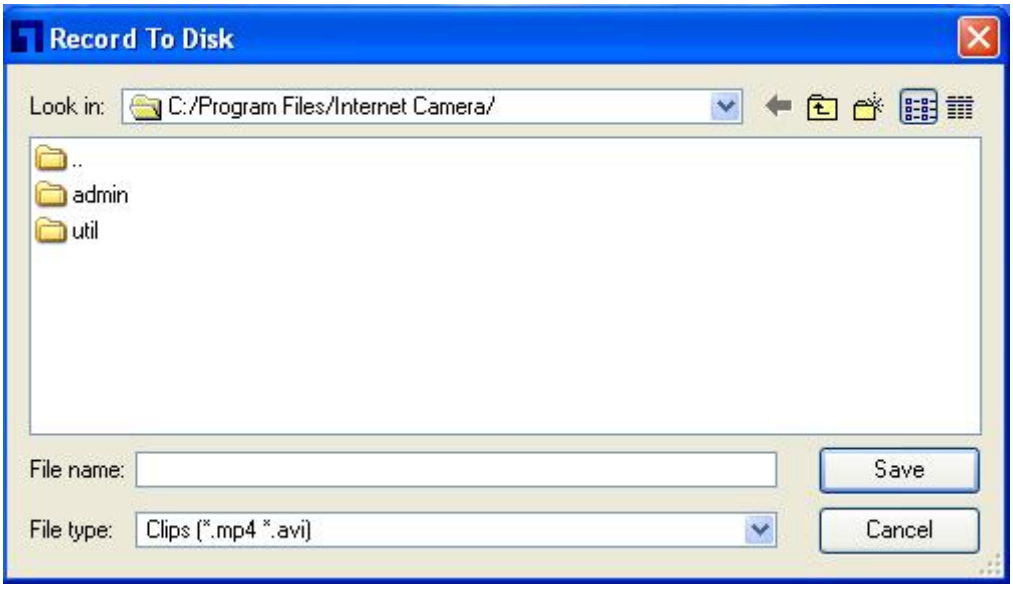
This utility allows you record the video in AVI files. There are two ways of video recording – Manual Recording and Schedule Recording.

Manual Recording

You can manually record the video stream into an assigned video file.

Click “Record” , then the viewer utility will start to record the video stream. You can assign the path in the setting dialog.(at section 7.8.4) Clicking “Stop” will stop recording.

Note: Before manual recording, you have to click the camera button to select WCS-2020 that you want to record first and make sure that the viewer is successfully connecting to WCS-2020.



Schedule Recording

You can assign a schedule and let this viewer automatically recording the video stream. Please refer to Section 7.8 to see how to setup schedule for the recording. The file name of the recorded video file is the start time of recording. For example, the file name "IPCamera_2004-10-8-23-56-40.avi" means it was recorded at 2004/10/8 23:56:40.

7.6. Change Resolution

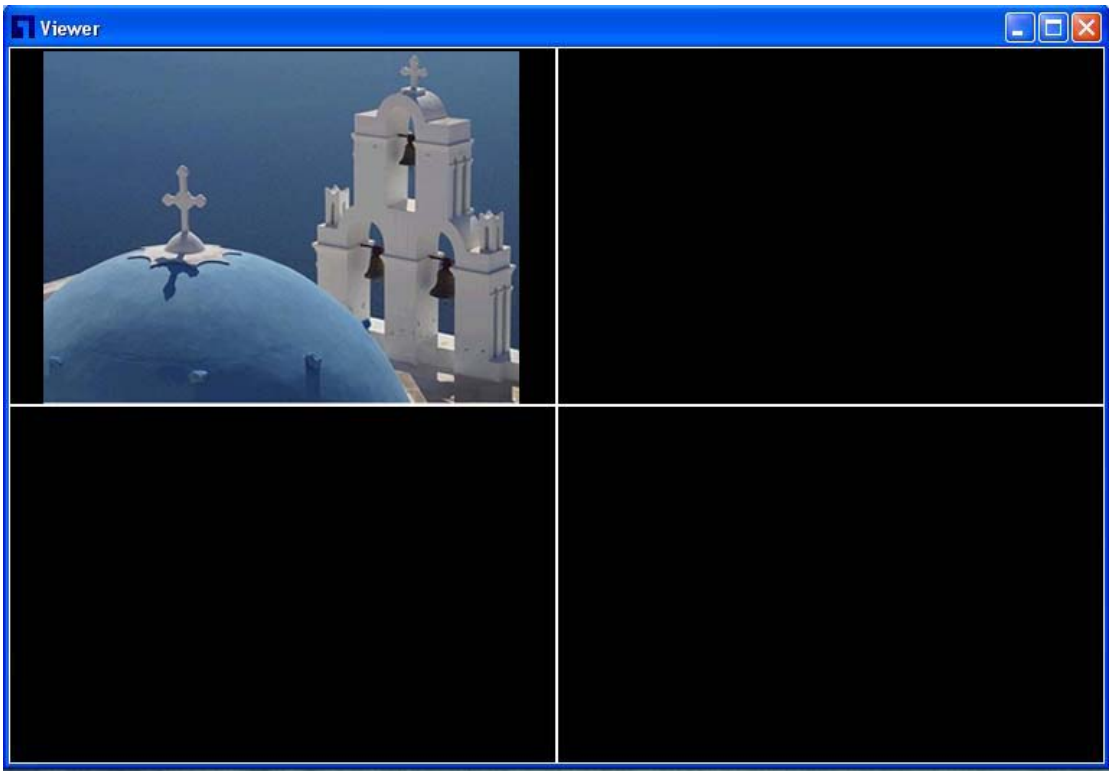
WCS-2020 supports two resolution, 640x480 (VGA) and 320x240 (CIF).You can change the resolution of each IP camera by clicking the resolution button.

Note: Before changing the resolution of WCS-2020, you have to select WCS-2020 by clicking the camera button first. If you change the resolution of an IP camera, other clients who are viewing the same IP camera simultaneously will also see the video with the changed resolution, too.

Resolution	
VGA	Change the resolution to 640x480 (VGA) mode.
QVGA	Change the resolution to 320x240 (QVGA) mode.

7.7. View Four Cameras Simultaneously

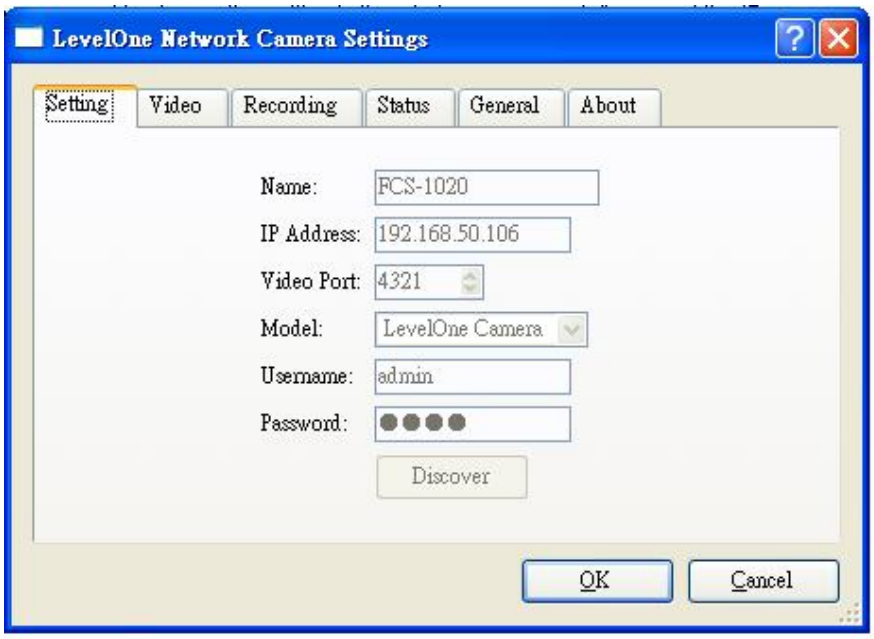
Click the four division button can view the 4 cameras simultaneously in a four-division window.



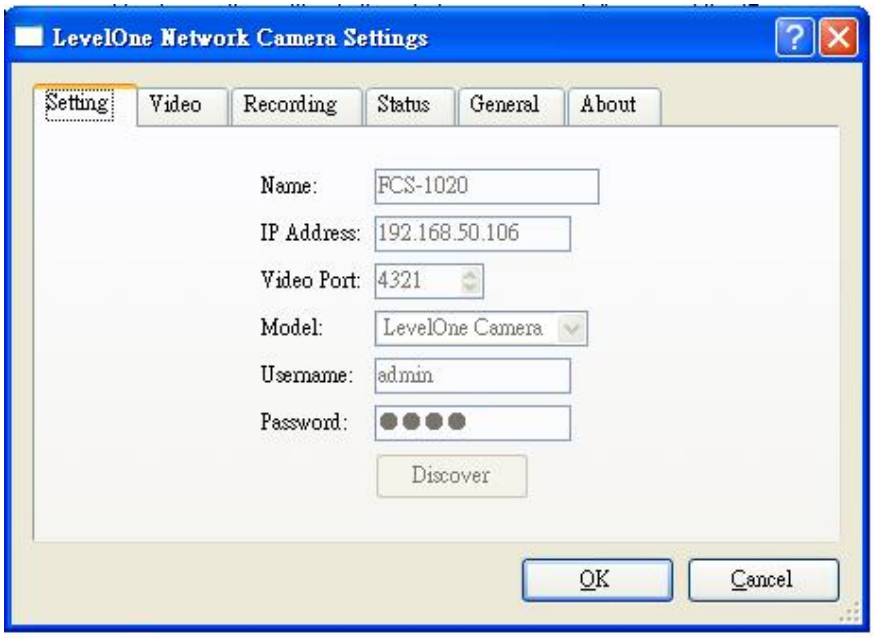
7.8. Viewer Utility Setting

Click the “Setting” button , then the setting window of WCS-2020 will pop up.

Note: When you want to change the settings such as IP Address, Video Port, etc. in the “Setting” option, you must disconnect WCS-2020 first by clicking the “Stop” ..



7.8.1. Setting

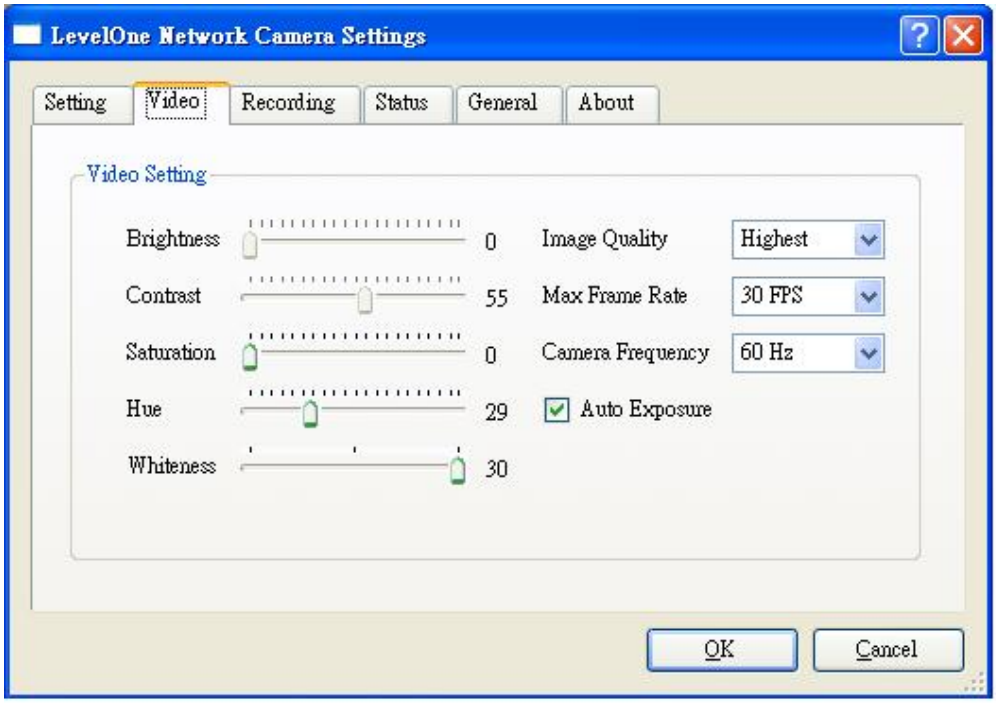


Setting	
Name	It is not required to fill the camera name for connecting camera. It is for users to identify the camera.
IP Address	IP address/Domain name of WCS-2020.
Video Port	The number of service port used by WCS-2020.
Model	Select a IP camera model which you are using.
Username	The user name for login into WCS-2020. By default, the user name is “admin”.
Password	The password for login into WCS-2020. By default, the password is “1234”.
Discover	Click “Discover”, then camera auto-discover windows will pop up.

The window will show all the discovered cameras on LAN environment for you to select.

7.8.2. Video

You can setup schedule for the recording here. This utility will record the video stream in the assigned file folder according to the schedule automatically. The recorded video files are AVI format.



Video	
Brightness	You can adjust “Brightness” value in this function. The value is from 0 to 99(Default: 50). The image will be brighter when the value is bigger and bigger.
Contrast	You can adjust “Contrast” value in this function. The value is from 0 to 99(Default: 50). The contrast will be more obvious when the value is bigger and bigger.
Saturation	You can adjust “Saturation” value in this function. The value is from 0 to 99(Default: 50). The saturation will be more obvious when the value is bigger and bigger.

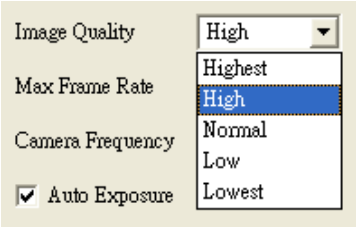
Hue

You can adjust “Hue” value in this function. The value is from 0 to 99. The hue will be changed when the value is adjusted.

Whiteness

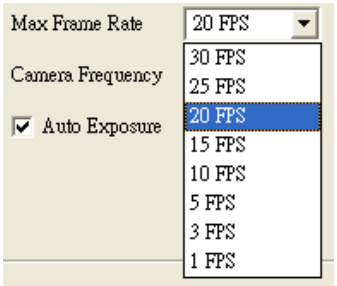
You can adjust “Whiteness” value in this function. The value is from 0 to 99. The whiteness level will be changed when the value is adjusted.

Image Quality



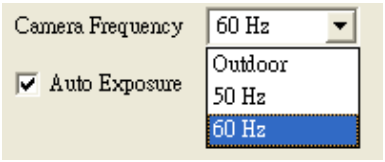
You can adjust image quality in this function. There are five levels can be selected.

Max Frame Rate



You can adjust frame rate in this function. There are 1 to 30FPS can be selected.

Camera Frequency



You can adjust camera frequency in this function. There are outdoor, 50Hz and 60Hz can be selected.

Auto Exposure

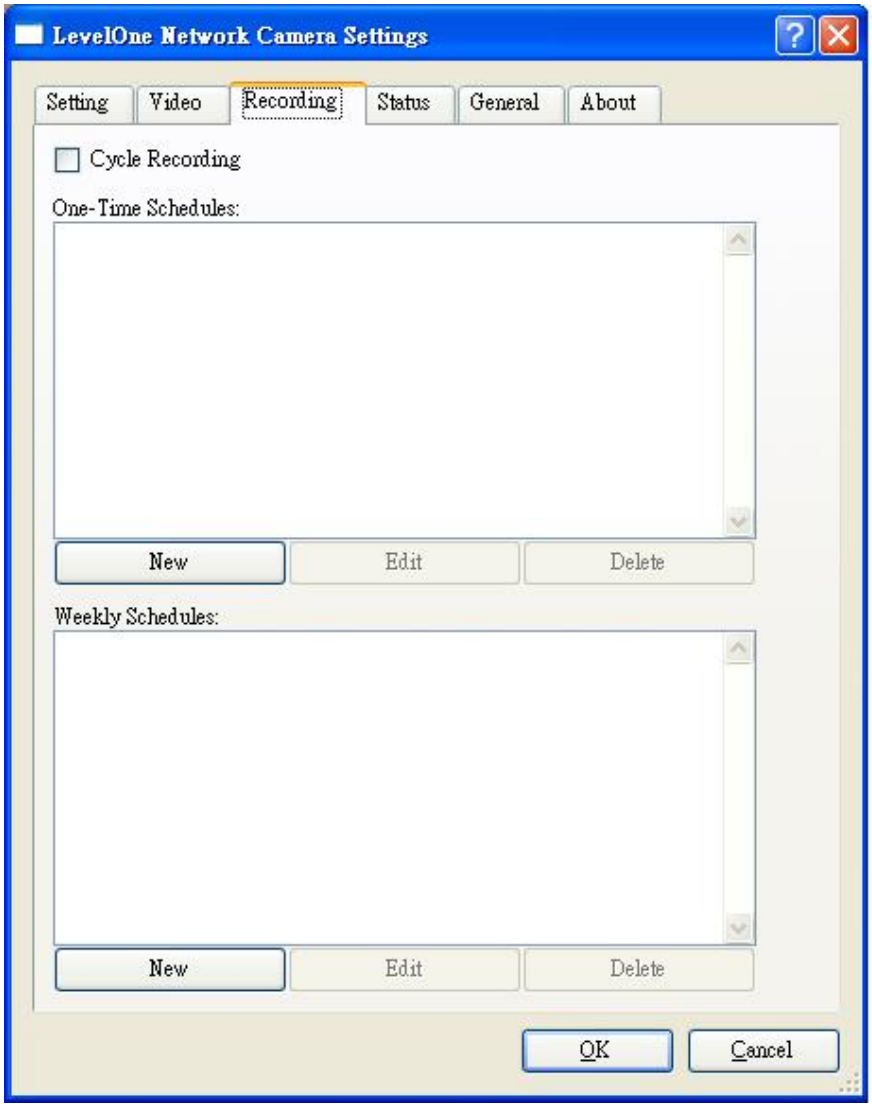
When you enable “Auto Exposure” function. The sensor will auto detect the illumination of environment and auto adjust the image brightness value.

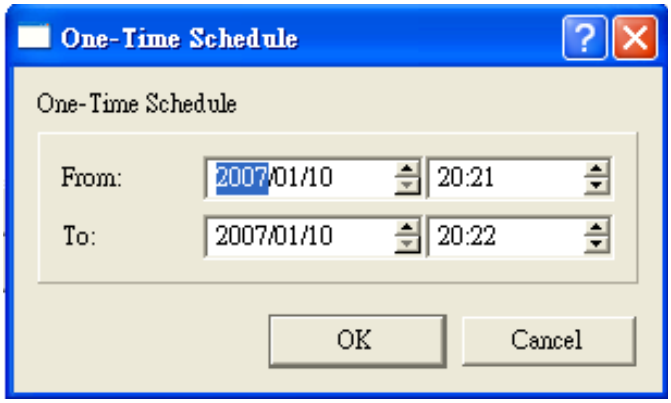
7.8.3. Recording

You can setup schedule for the recording here. This utility will record the video stream in the assigned file folder according to the schedule automatically. The recorded video files are AVI format.

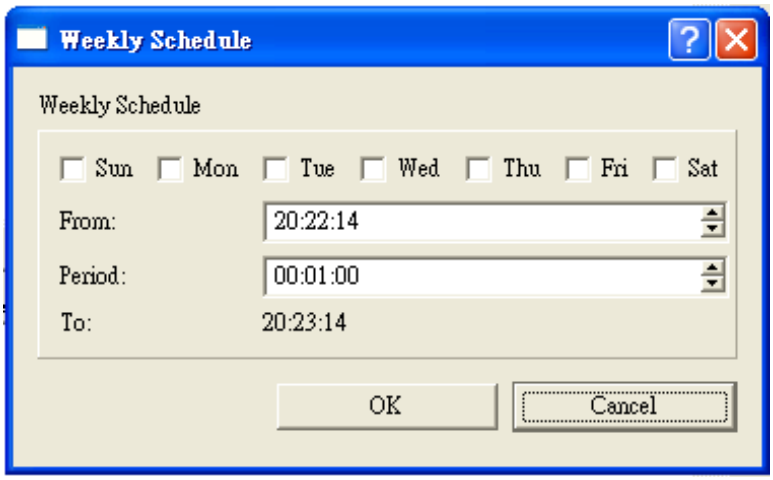
Note:

1. The utility will only start to record the video stream when this utility is running and is successfully connecting to WCS-2020 in the beginning of the schedule.
2. The schedule setting of one-time or weekly schedule should not overlap, or the recording will fail.





One-Time Schedule



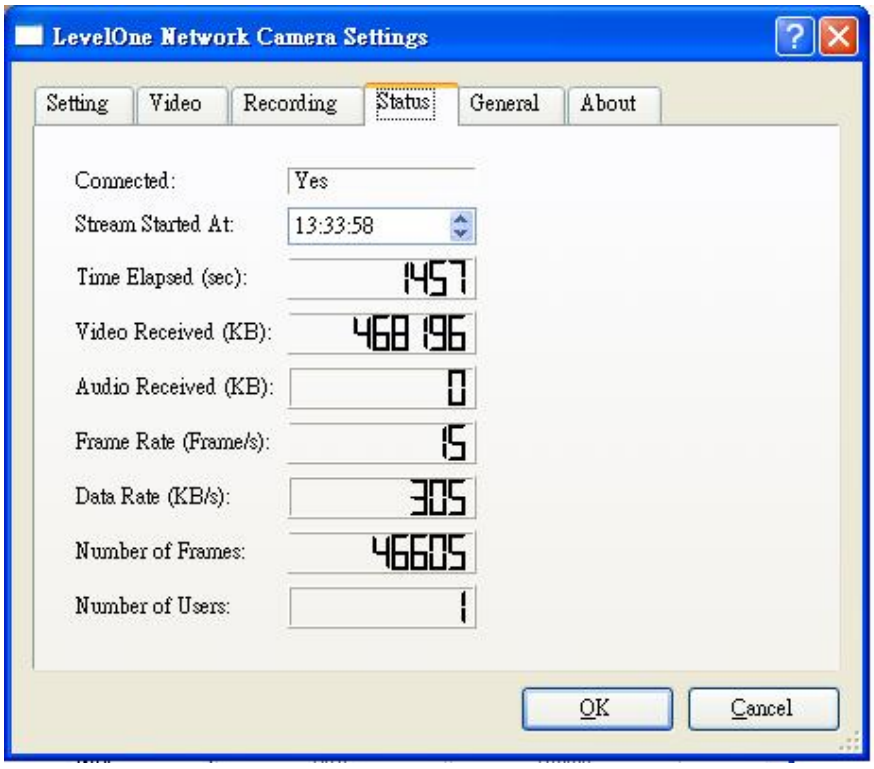
Weekly Schedule

Schedule	
Cycle Recording	Check this check box to enable cycle recording. When the Cycle Recording is checked and the storage usage has already reached the maximum reserved storage space, the utility will automatically delete the oldest recorded video file and use the space to store the newly recorded video stream.
One-Time Schedule	You can assign a range of time and the utility will automatically record the video stream only during the period of time. The default time is 2 minutes later from the current time.
Weekly Schedule	You can assign the days in a week and the period of time in a day when you want to record the video stream. The utility will automatically record the video stream during the periods of time

	every week again and again.
Schedule	
New	Click “New” to add a new recording schedule.
Edit	Select an existing schedule in the schedule list and click “Edit” to edit the schedule.
Delete	Select an existing schedule in the schedule list and click “Delete” to delete the schedule.

7.8.4. Status

You can see the current status information of the connection session between the utility and WCS-2020.

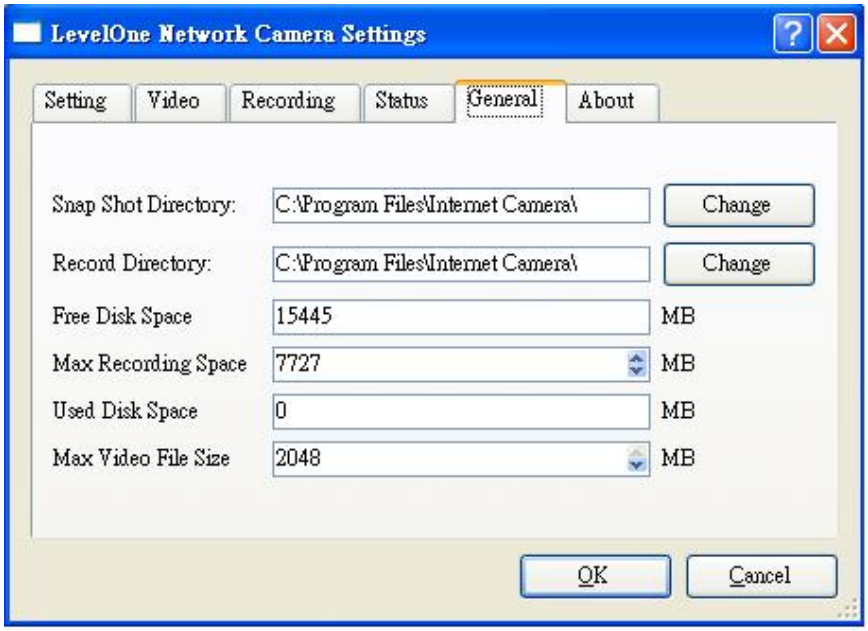


Status	
Connected	It displays “Yes” when the utility is connecting to WCS-2020 and displays “No” when the utility is not connecting to WCS-2020.
Status	

Stream Started At	The beginning time of the current connection session between the utility and WCS-2020.
Time Elapsed	The elapsed time of the current connection session between the utility and WCS-2020.
Video Received	The total size (Unit is KByte) of video stream received during the current connection session between the utility and WCS-2020.
Audio Received	The total size (Unit is KByte) of audio stream received during the current connection session between the utility and a network camera (**Reserved**)
Frame Rate	The frame rate (frame per second) of the current video download speed from WCS-2020 to the utility.
Data Rate	The data rate (KByte per second) of the current video download speed from WCS-2020 to the utility.
Number of Frames	The total number of video frames received during the current connection session between the utility and WCS-2020.
Number of Users	The total number of users that viewing this camera currently.

7.8.5. General

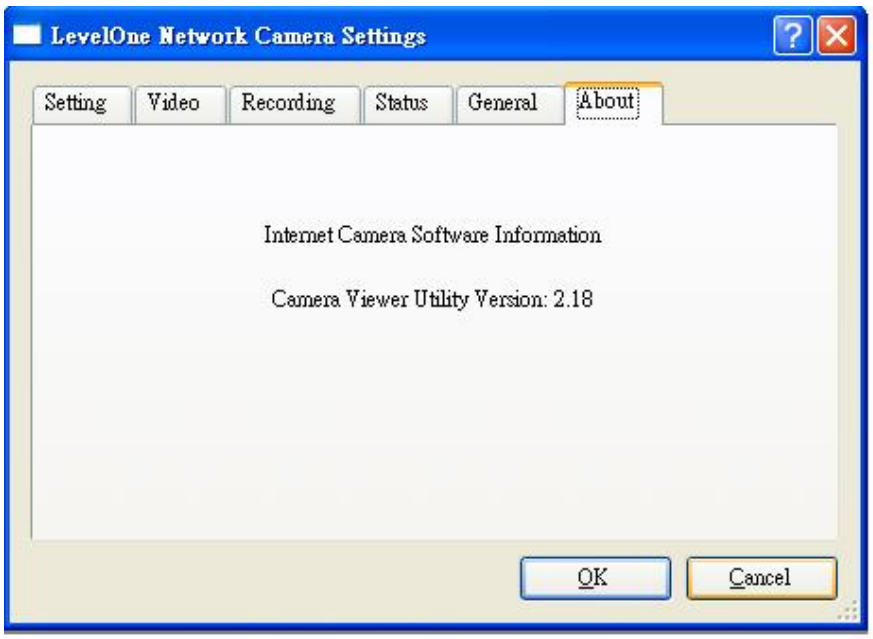
You can manage storage usage for this IP camera here.



General	
Snap Shot Directory	This lets you assign the directory where bitmap files will be stored when you click “Snapshot” to take pictures. The default folder is where the software program is installed, for example: “C:\Program Files\IP camera”.
Record Directory	This lets you assign the directory where the recorded video files will be stored. The default folder is where the software program is installed, for example: “C:\Program Files\IP camera”.
Free Disk Space	The current free disk space of the hard drive where is assigned to save recording files.
Max Recording Space	You can reserve a disk space to store the recorded video and snapshot files. If the space is run out, a message will pop up to remind you.

Used Disk Space	The current used disk space for saving the recording file.
Max Video File Size	This let you assign a maximum size of each video file. The upper bound of this value is 2 GB per file.

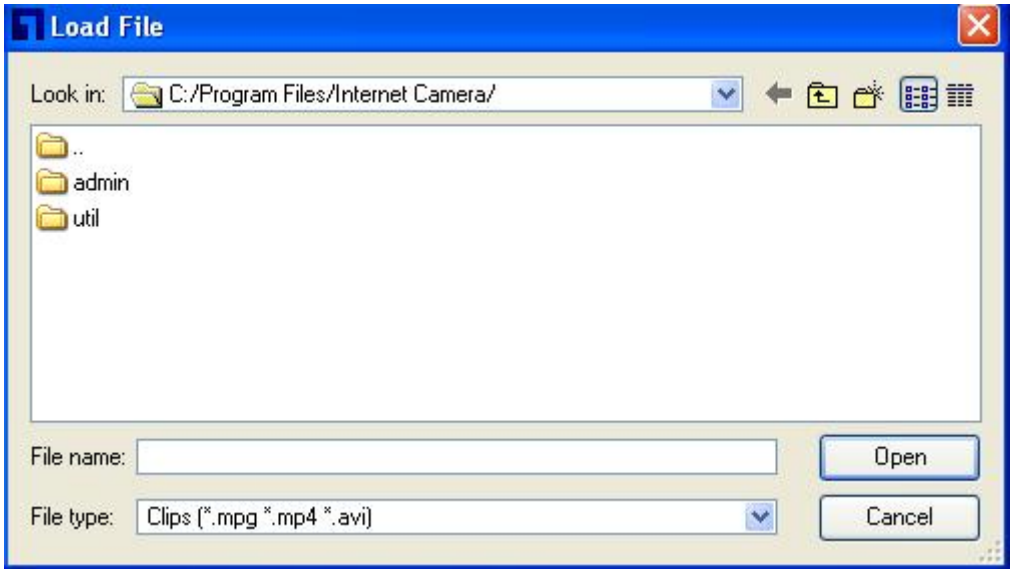
7.8.6. About



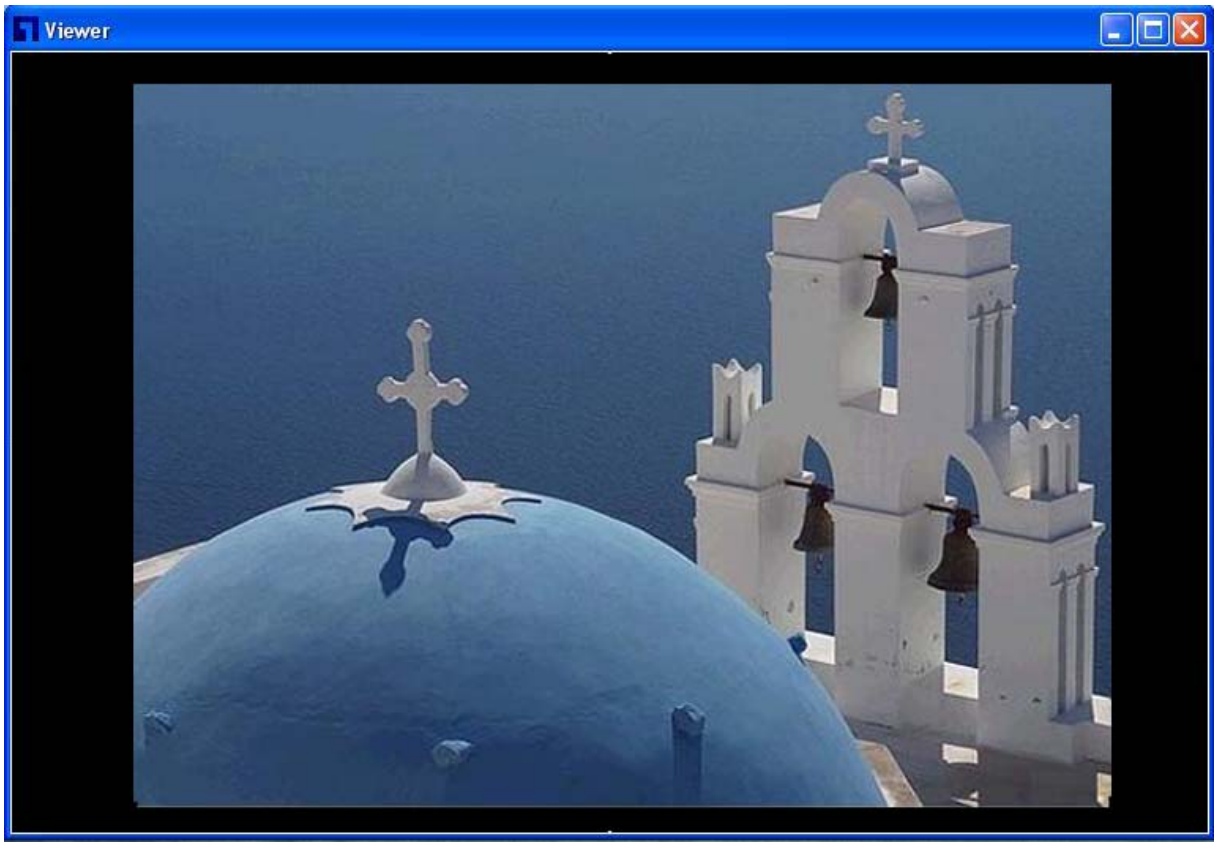
About	
Camera Viewer Utility Version	Display current Camera Viewer Utility Version.

7.9. Playback

Click the “Open File” and a “Load File” window will be popped up. Select the file that you want to play.



The viewer will start to play the selected video file.

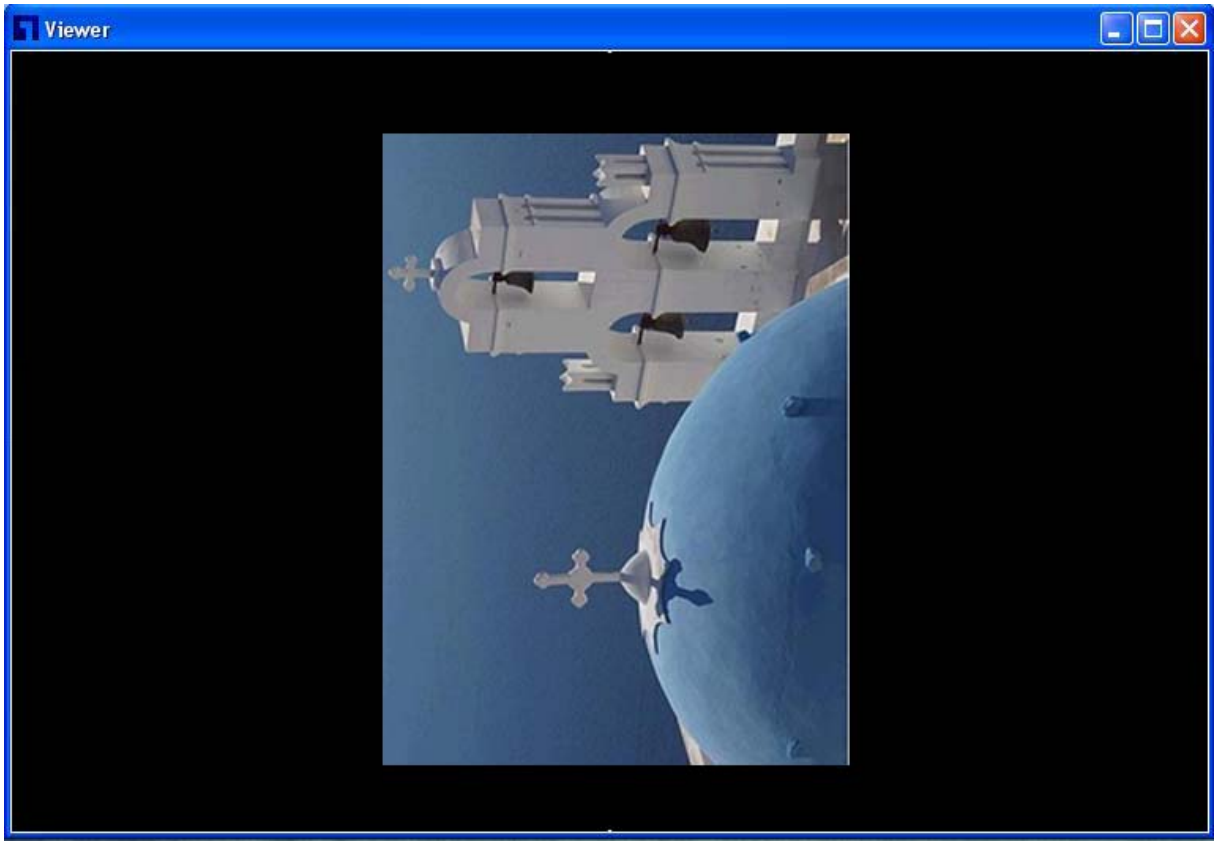


Playing Control	
Play	When the video playback is in Stop state, just click “Play” and the viewer will play the video file from the beginning point. When the video playback is in Pause state, just click “Play” and the viewer will play the video file from the current pause point. When the viewer is playing with fast speed, just click “Play” to let the viewer play with the normal speed.
Pause	When the recorded video is playing, you can click “Pause” to freeze the playback. If you want the viewer to continue playing from the current pause point, just click “Play” .
Stop	When the viewer is playing, you can click “Stop” to stop the playback. If you want the viewer to play again, just click “Play” and the viewer will play the video file from the beginning point.

Playing Control	
Forward	If you want the viewer to play the video file in a faster speed when the viewer is playing the video file, just click “Forward” and the viewer will double the playing speed. If you want the viewer play with the normal speed when the viewer is playing with fast speed, just click “Play” .

7.10. Rotate Video

Rotate function lets you rotate the video frame 180 of degree angle each time you click the “Rotate” . With this function, you can view the live video with normal, and 180 degree angles counterclockwise.



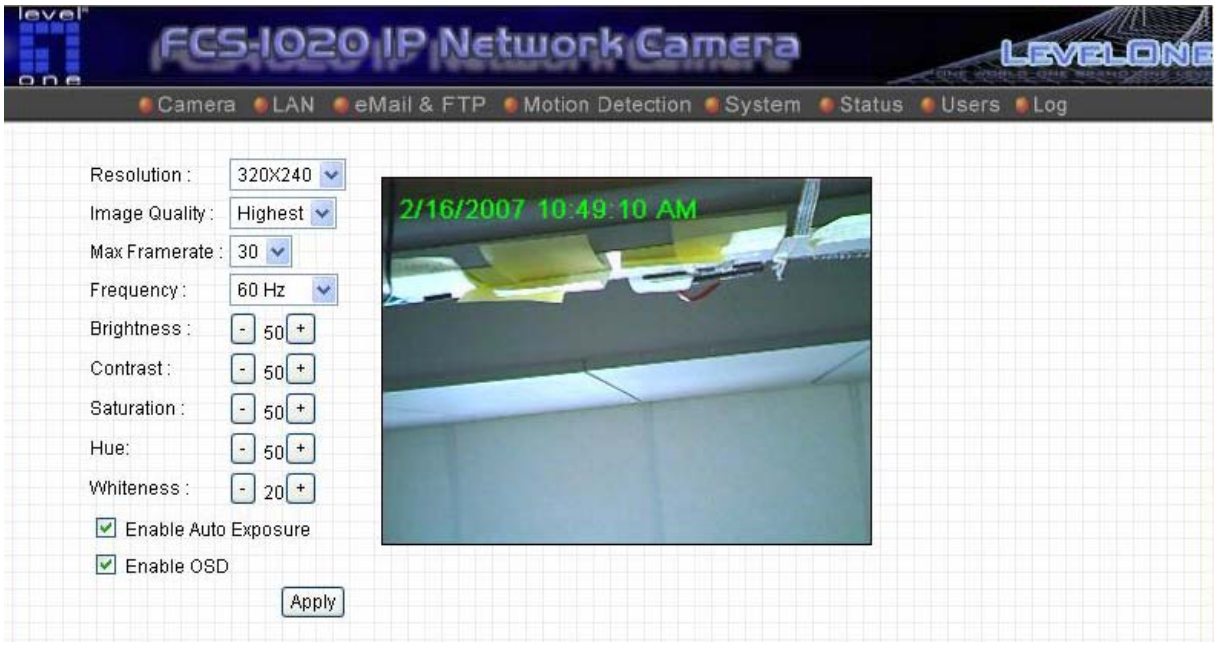
8. Web Connection and Setup

You can use the Web browser to connect the camera for viewing or setting. Open the web browser and enter the IP Address of the camera to establish a connection. The default IP Address of the camera is "**192.168.2.3**".

When the welcome screen appears, enter the "Admin Name" and "Password". The default values are:
Admin Name: "**admin**"
Password: "**1234**"

When the camera is connected, the browser will take you to the live video page. If you are viewing this camera at first time, the following dialog will appear to install the ActiveX plug in. Please check the publisher part, you should only accept it if it is published by DIGITAL DATA COMMUNICATIONS ASIA CO., LTD.

After installed the ActiveX plug-in, the video image will be shown up in the web screen directly.



The menu options for the web control screen are as follows.

Camera – View live video and adjust the video format from the menu.

LAN – Setup the camera LAN port functions in the menu.

WLAN – Setup the camera WLAN port functions in the menu.

E-Mail & FTP – Setup the E-Mail client and FTP client in the menu.

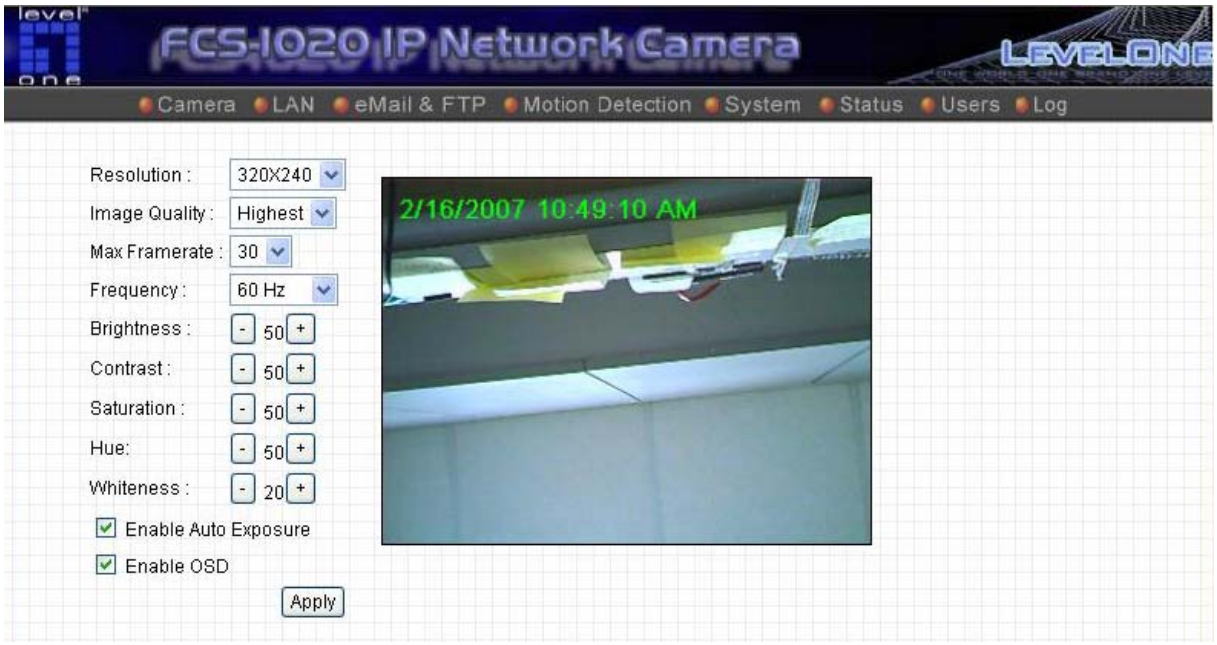
Motion Detection – Configure the Motion Detection Actions here.

System – Setup System utilities and settings in this menu.

Status – Shows the camera information and current status in this page.

Users – This camera support up to 4 user accounts. You can setup them in this menu.

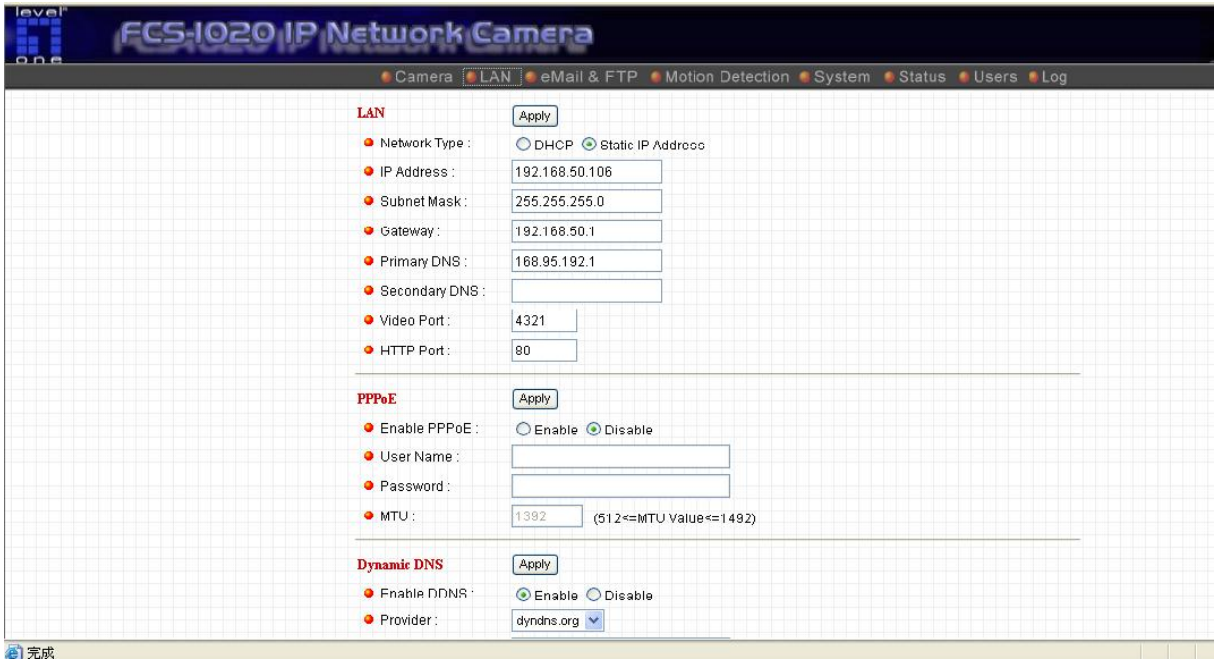
8.1. Camera Setting



Camera Setting	
Resolution	Select the desired video resolution format. Larger resolution requires more bandwidth. 640 x 480 is “VGA” format. 320 x 240 is “CIF” format. The default resolution is CIF format.
Image Quality	Adjust this property to control the video quality
Max Frame Rate	Set the video max frame rate. This camera can support at most 30 frames per second. Set the frame rate higher can get video more smooth. But will use more bandwidth.
Frequency	Adjust this property to fitting light frequency.
Brightness	You can adjust the brightness of the video. If the video is too dark, you can input the larger number in this text box. The video will be brighter. This value can be from 1 to 99.

Contrast	You can adjust the contrast by change the value. This value can be from 1 to 99.
Saturation	You can adjust the saturation by change the value. This value can be from 1 to 99.
Hue	You can adjust the hue by change the value. This value can be from 1 to 99.
Whiteness	You can adjust the white balance by change this value. This value can be from 10 to 30.
Enable Auto Exposure	You can enable Auto Exposure by check this box.
Enable OSD	You can enable or disable “Time Stamp” function in this item. When you disable “OSD” function, the “Time Stamp” will be hidden.
Apply	When you finish “AV Server” setting, click this button to validate the setting values.

8.2. LAN Setting



LAN	
Network Type	This camera can obtain IP via DHCP protocol or specified static IP Address to it..
IP Address	Enter an unused IP Address within the IP address range used on your LAN. If the IP Address of your LAN is from the 192.168.2.0 to 192.168.2.250, you can set an unused IP Address from the range for the camera, for example: 192.168.2.250.
Subnet Mask	The Subnet Mask field must match the subnet setting on your LAN. For example: 255.255.255.0.
Gateway	The Gateway is used to forward frames to destinations in a different subnet on the Internet. The Gateway setting must be the same with the gateway used by the PCs on your LAN.
DNS Server	DNS Server (Domain Name Server) that translates names to IP addresses. Set the same DNS Server as the PCs on your LAN.
Video Port	The AV Control Port is used to transmit or receive the AV

	streaming in the network. The default port setting is “4321”. If you want to view the video from the camera, the port setting should be correct.
Web Port	This camera support web connection, the default web port is 80. Since the web server may use port 80, you can use a different port for the camera. If you change the web port from 80 to 8080, you must type **http://192.168.2.3:8080** to connect the camera through the web browser.
Apply	When you finish the “LAN”, click “Apply”.

PPPoE

Enable PPPoE	Enable or disable PPPoE function of the camera.
User Name	Enter the User Name for the PPPoE Connection.
Password	Enter the Password for the PPPoE Connection.
MTU	A maximum transmission unit (MTU) is the largest size packet or frame, specified in octets (eight-bit bytes), that can be sent in a packet- or frame-based network such as the Internet.
Apply	When you finish the “PPPoE” setting, click “Apply”.

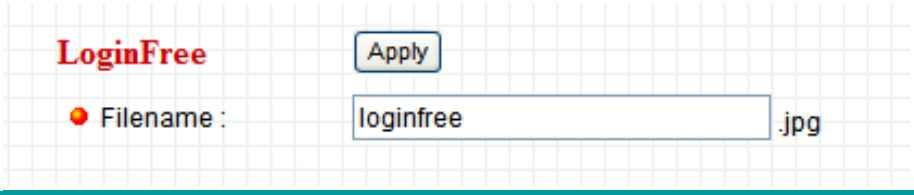
Dynamic DNS

Enable DDNS	Enable or disable DDNS function of the camera.
Provider	Several companies provide DDNS service. This camera supports the service from DynDNS company.
Domain Name	The domain name given by DynDNS is “registername.dyndns.com”. Enter the domain name that you register for the camera from DynDNS web site.
User Name	Enter the login name for the DDNS service.
Password	Enter the password for the DDNS service.

Apply	When you finish the “Dynamic DNS” setting, click “Apply”.

UPnP

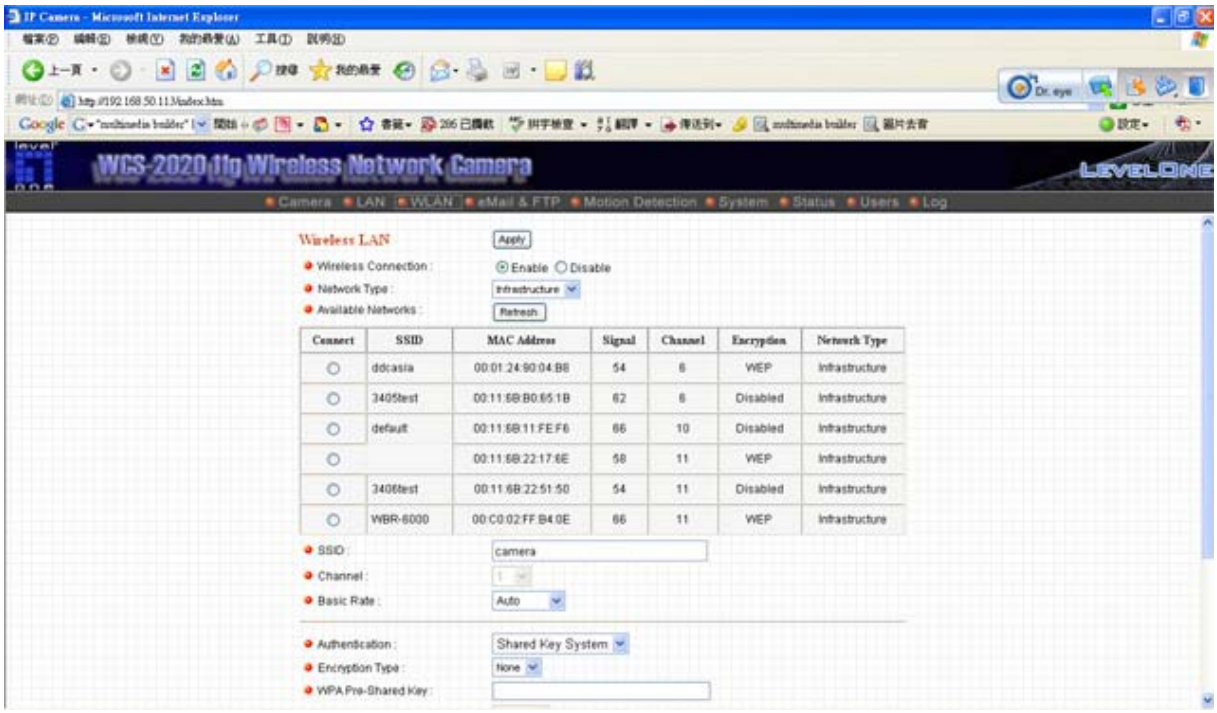
Enable UPNP	Enable or disable UPnP function of the camera.
Apply	When you finish the “UPnP” setting, click “Apply”.



LoginFree

Filename	The default value is “loginfree”. That’s mean user can get a snapshot image from Internet Explorer. The format is like: IP Camera will send a snapshot image to Internet Explorer. If user changed file name (Ex: “1234”), the URL must be changed to “http://192.168.2.3/1234.jpg”
Apply	When you finish the “UPnP” setting, click “Apply”.

8.3. WLAN



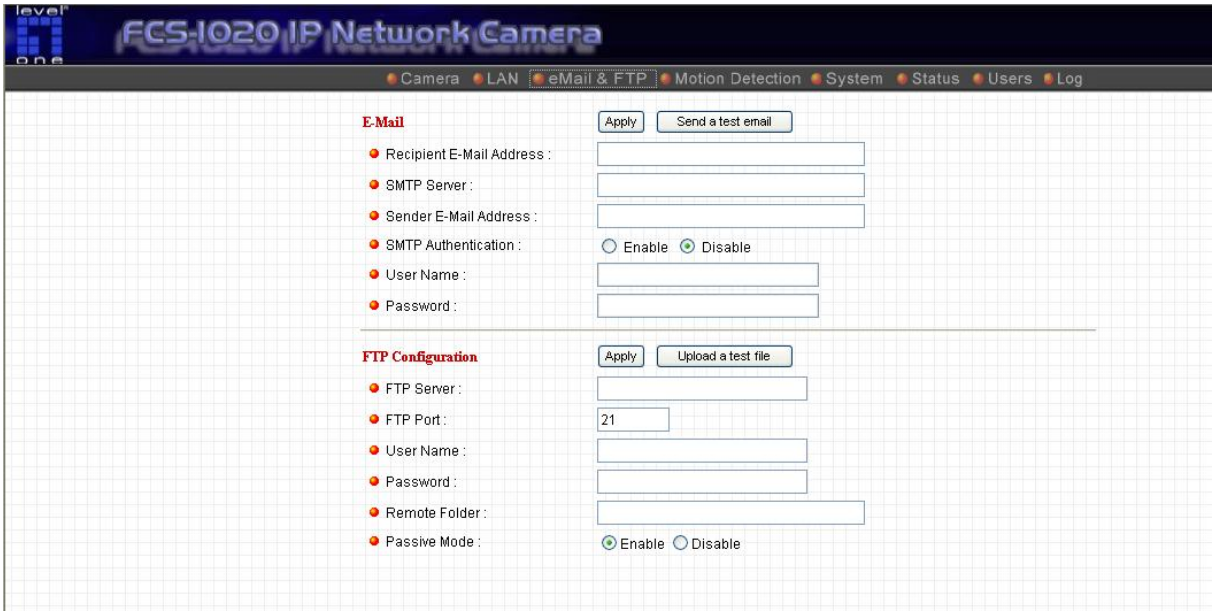
Wireless Setting	
Wireless connection	Enable or disable the wireless function of the WCS-2020. By default, the function is disabled.
Network Type	Infrastructure – This operation mode requires the presence of a Wireless LAN Access Point or Router. All communication is done via the Access Point or Router. Ad-Hoc – Select this mode if you want to connect to another wireless stations in the Wireless LAN network without through an Access Point or Router.
Available Networks	Select the networks listed below and click apply to connect to the specified network.
SSID	The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs.

	You may specify a SSID for the card and then only the device with the same SSID can interconnect to the card. If you want to add one of the networks nearby to the profile list, pull down the menu, all the networks nearby will be listed and you can add one of them to the profile list.
Channel	This setting is only available for Ad Hoc mode. Select the number of the radio channel used for the networking. The channel setting should be the same with the network you are connecting to.
Basic Rate	The camera will force to the data rate that you selected to transmit data.
Authentication and Encryption Type	Choose the authentication type you want to use. “None” means that you don’t want any encryption for wireless. “Open System” means that you can use WEP for encryption or not to encryption. When you select “Shared Key”, you must use WEP for encryption. The last option is “WPA-PSK”. When you select this authentication type, you can encryption your wireless with WPA-TKIP or WPA-AES.
WPA Pre-Shared Key	The WPA-PSK key can be from 8 to 64 characters and can be letters or numbers. This same key must be used on all of the wireless stations in the network.
WEP Key Length	You may select 64-bit or 128-bit to encrypt transmitted data. Larger key length will provide higher level of security, but the throughput will be lower.
WEP Key Format	Hexdecimal – Only “A-F“, “a-f“ and “0-9“ are allowed to be set as WEP key. ASCII – Numerical values, characters or signs are allowed to be WEP key. It is more recognizable for user.
Default Key	Select one of the keys (1~4) as the encryption key.
Key1 ~ Key4	The WEP keys are used to encrypt data transmitted in the wireless network.

	Fill the text box by following rules below. 64-bit – Input 10-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or 5-digit ASCII characters (including “a-z” and “0-9”) as the encryption keys. For example: “0123456aef“ or “test1”. 128-bit – Input 26-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or 13-digit ASCII characters (including “a-z” and “0-9”) as the encryption keys. For example: “0123456789012345678 9abcdef“ or “administrator”.
Apply	When you finish “WLAN” setting, click this button to validate the setting values.

8.4. E-Mail and FTP

The “E-Mail & FTP” lets you setup E-Mail client and FTP client that camera can sent live video to your e-mail account or FTP server when Motion has been detected.

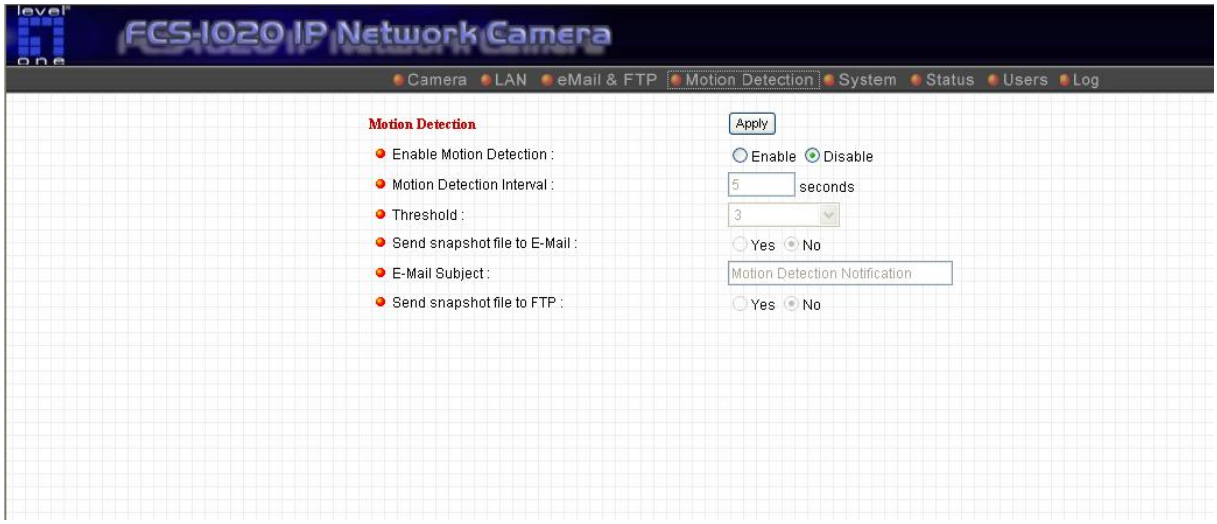


eMAIL & FTP	
Recipient E-Mail Address	This camera supports “Motion Detection” function. Enter the E-Mail Account for receiving the pictures.

SMTP Server	Enter the SMTP Server for the E-Mail sending.
Sender E-Mail Address	Specified the e-mail address of the e-mail sender.
SMTP Authentication	Enable or Disable the SMTP Authentication function
Username	When Authentication is enabled, input the SMTP Username.
Password	When Authentication is enabled, input the password.
Send a Test Email	Press this button to send a test e-mail to your mailbox. You can use this function to test if your setting is correct.
FTP Server	This camera supports “Motion Detection” functions. When Motion Detection event occurred, you can record the pictures to FTP server. Enter the FTP address for receiving the pictures.
FTP Port	Enter the port of the FTP server.
User Name	Specify the user account of ftp server.
Password	Specify the Password of your ftp account.
Remote Folder	Specify the folder of the ftp site that you want to store the video.
Password	When Authentication is enabled, input the password.
Passive Mode	If your Camera is under NAT, you usually need to enable this feature.

8.5. Motion Detection

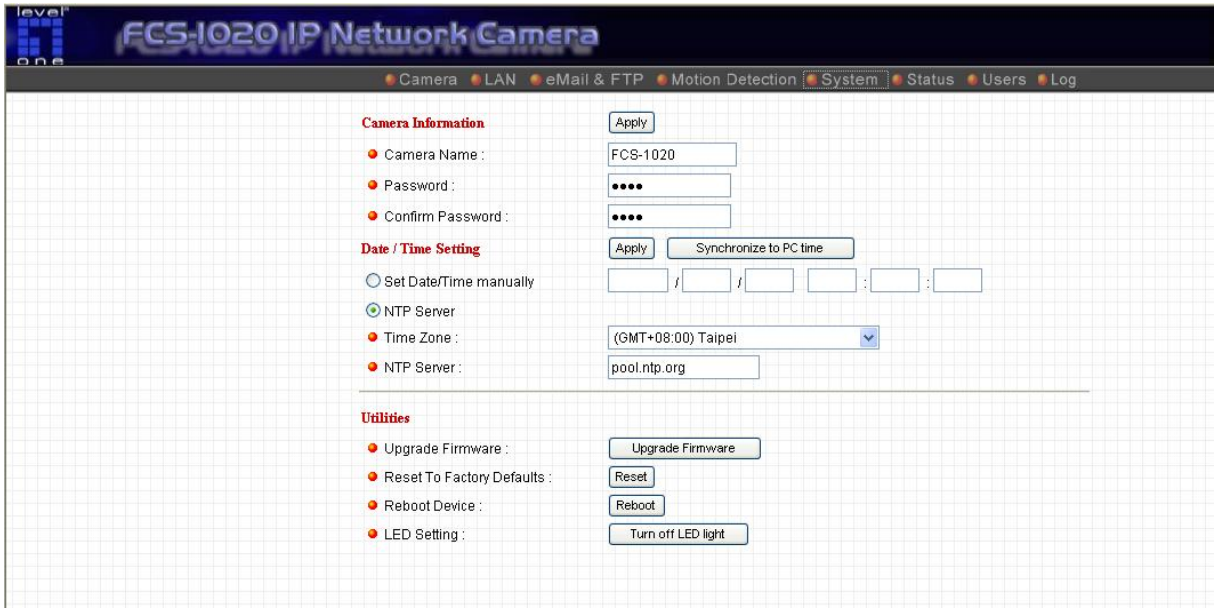
The “Motion Detection” allows users to setup the behavior of motion detection feature.



Motion Detection	
Motion Detection Enable	Enable or Disable the Motion Detection Function.
Next Event Detected Interval	Setup the interval between two events. For example, if you setup the interval to 5 seconds, the next event will start after this event finished + 5 seconds.
Threshold	Setup the sensitivity of motion detection.
Send Recording File to E-Mail	Select Yes to send the recorded video file to your e-mail account that you had specified at “E-Mail & FTP” menu.
E-Mail Subject	Specify the subject of motion detection notify e-mail.
Send Recording File to FTP	Select Yes to send the recorded video file to your FTP server that you had specified at “E-Mail & FTP” menu.

8.6. System

The “System” allows users to setup the camera’s parameters, like camera name, data/time setting. And also provide firmware upgrade and reset tools at this page.

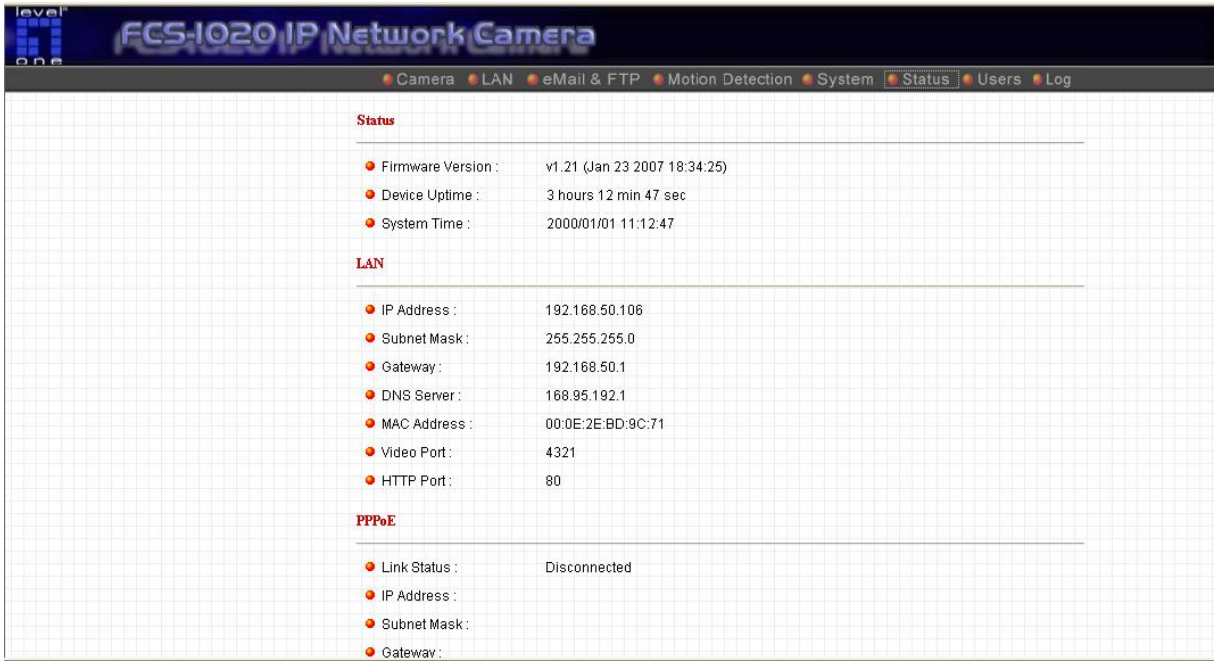


System	
Camera Name	The default camera name is “WCS-2020”. It is recommended to name a meaningful name for the camera.
Login Name	Setup your administrator account’s login name. Default name is “admin”
Password	Enter up to 4 digits password for the new user account.
Confirm Password	Enter the password again to confirm the setting.
Set Date/Time manually	Display the current Date and Time.
NTP Server	Synchronize the Date and Time with this NTP server.
Time Zone	Select the time zone that your camera put on.

NTP Server	Specify the IP Address of the NTP Server.
Upgrade Firmware	You can upgrade camera's firmware via this function. Press the browse button, find the correct firmware and press upgrade.
Reset to Factory Defaults	If you want to reset all the camera settings to default, click this button.
Reboot Device	To reboot WCS-2020, click "Reboot".
LED Setting	There are four LEDs to indicate the status of IP camera. If you wan to secure the camera from noticing, you can turn off the LED light by clicking "LED Light OFF". To turn on the LED light, click "LED Light ON".

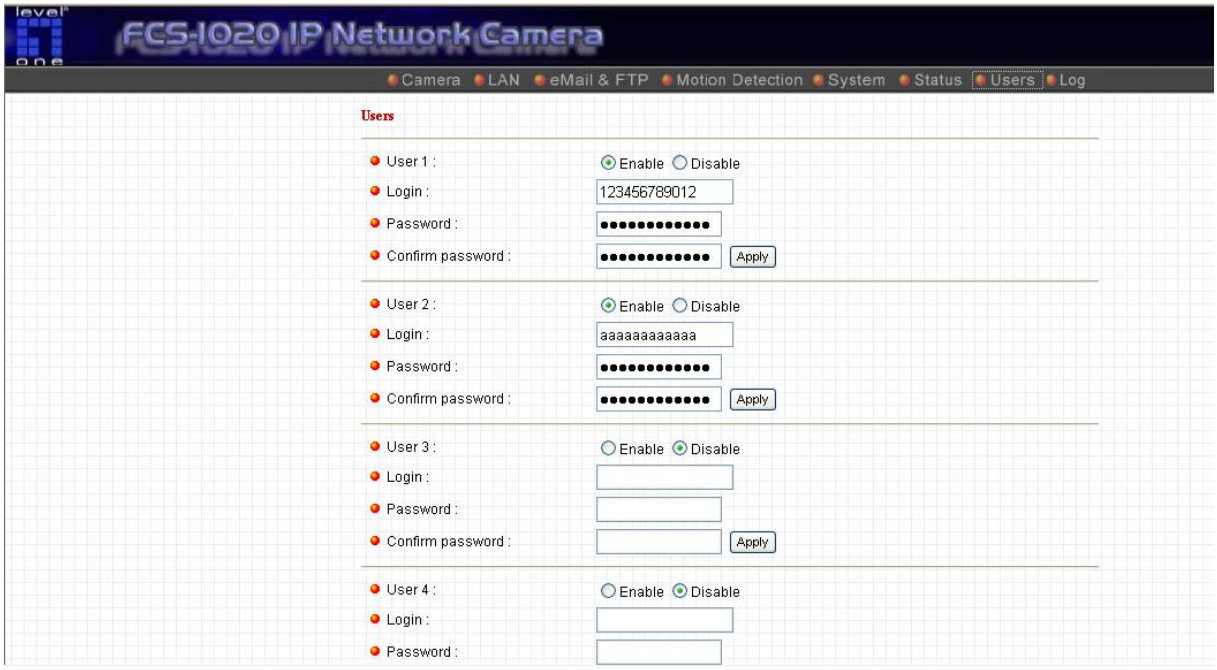
8.7. Status

The "Status" shows the current firmware version, uptime, system time and IP information of this camera.



8.8. Users

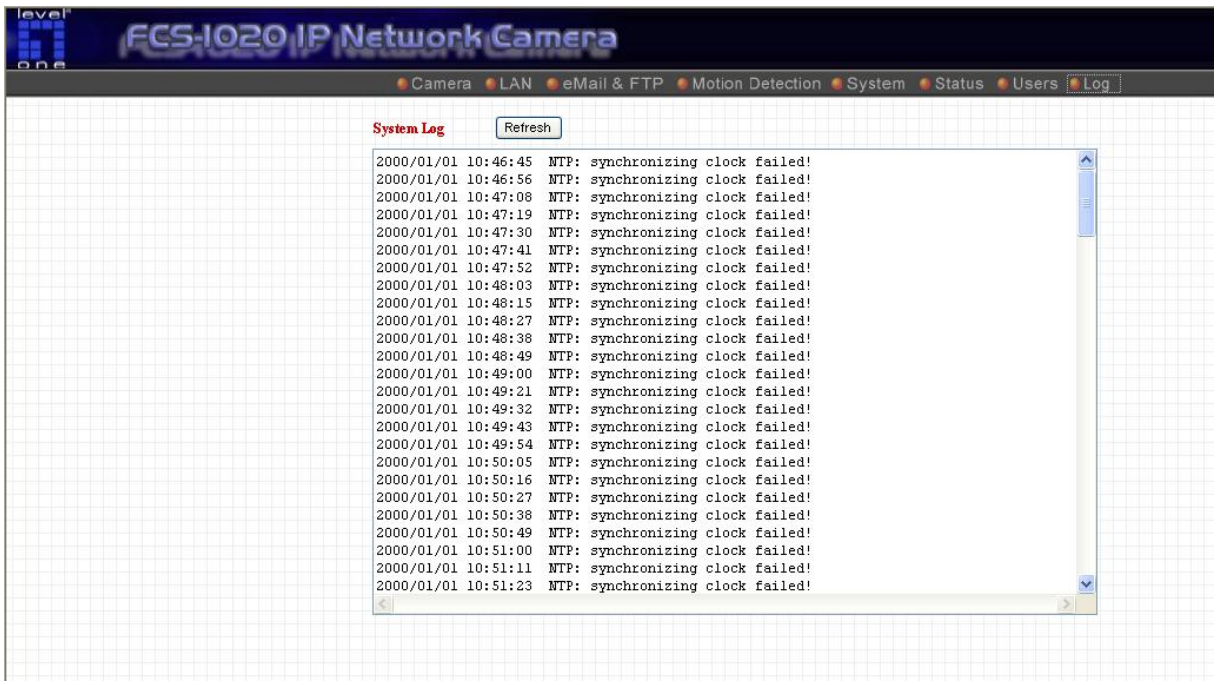
The “Users” allows users to add four user accounts which are able to view video from Camera Viewer and Web Management. These users, unlike Administrator, are not allowed to configure the camera.



User 1 / 2 / 3 / 4	
User #	Enable or Disable the user number #.
Login	Enter the the login name to the camera.
Password	Enter up to 4 digits password for the new user account.
Confirm Password	Enter the password again to confirm the setting.
Apply	Click “Apply” to save the user account setting.

8.9. Log

The “Log” allows users to monitor the device event and time. If you have trouble to use this device, the log file will help administrator to know the status of device.



Log	
Log screen	The screen will show event and event time of device.
Refresh	You can press “Refresh” button to refresh the log screen.

9. Frequently Asked Questions

Q1: What is an IP camera?

A: WCS-2020 is a standalone system connecting directly to an Ethernet or Fast Ethernet network. It is different from the conventional PC Camera; WCS-2020 is an all-in-one system with built-in CPU and web-based solutions providing a low cost solution that can transmit high quality video images for monitoring. WCS-2020 can be managed remotely, accessed and controlled from any PC/Notebook over the Intranet via a web browser or camera viewer.

Q2: What algorithm is used to compress the digital image?

A: WCS-2020 utilizes MJPEG video compression technology to provide high quality images. MJPEG is a standard for video compression and can be applied to various application software.

Q3: Can I capture or record still images from WCS-2020?

A: Yes, you are able to capture or record still images with the snapshot function from the Camera Viewer application supplied with WCS-2020 CD-ROM.

Q4: What network cabling is required for WCS-2020?

A: WCS-2020 uses Category 5 UTP Twisted-pair cable allowing 10 Base-T and 100 Base-T networking.

Q5: Can WCS-2020 be setup as a PC-cam on the computer?

A: No, WCS-2020 is used only on Ethernet and Fast Ethernet network.

Q6: Can WCS-2020 be connected on the network if it consists of only private IP Addresses?

A: Yes, WCS-2020 can be connected to a LAN with private IP Addresses.

Q7: The focus on WCS-2020 is bad, how can I correct it?

A: Adjust WCS-2020 focus manually.

10. Technical Specifications

- **Video specification**

Max Resolution: 640 x 480 pixels
Sensor: 1/4" color CMOS sensor
Gain control: Automatic
Exposure: Automatic
White Balance: Automatic
Focal Length: 4.8 mm
Aperture: F=1.8

- **Image (Video Setting)**

Image compression: MJPEG Image Video
Digital 24-bit Color
Frame rate: 30fps@QVGA, 20fps@VGA
Video resolution: 160x120, 320x240, 640x480

- **System Hardware**

LAN Connector: One RJ-45 port to connect to 10/100Mbps Ethernet
Wireless: IEEE 802.11b/g
LED Indicator: LAN LED (Green), WLAN LED (Amber), Power LED (Blue)
Power Supply: 12VDC, 1A

- **HTTP/Utility**

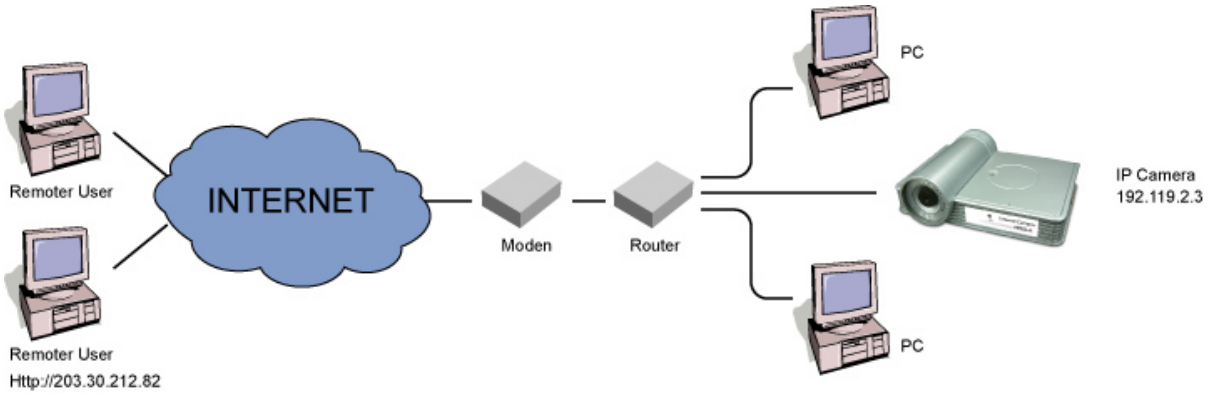
Includes easy-to-use Viewer & Recorder utility
Provides Admin utility & WEB browser Management
View multiple cameras simultaneously - Up to 4 cameras at a time
Manual/Schedule Record, Video Playback/Stop/Forward/Pause
Supports four additional user accounts for viewing camera
Auto sending Snap Shot by E-mail or FTP
Support DDNS and UPnP functions
Supports Windows 2000/XP/2003
Firmware Upgradeable

- **EMI & Safety**

FCC, CE

11. Appendix A Router/Gateway Setup for Internet Viewing

To view IP camera across the Internet, you have to make sure Router/Gateway has configured to pass incoming TCP/UDP connections from remote PC to WCS-2020. The Router/Gateway should set port forwarding or virtual server for the connections. Please see the illustration as below.



Router/Gateway Port Forwarding/Virtual Server Setup

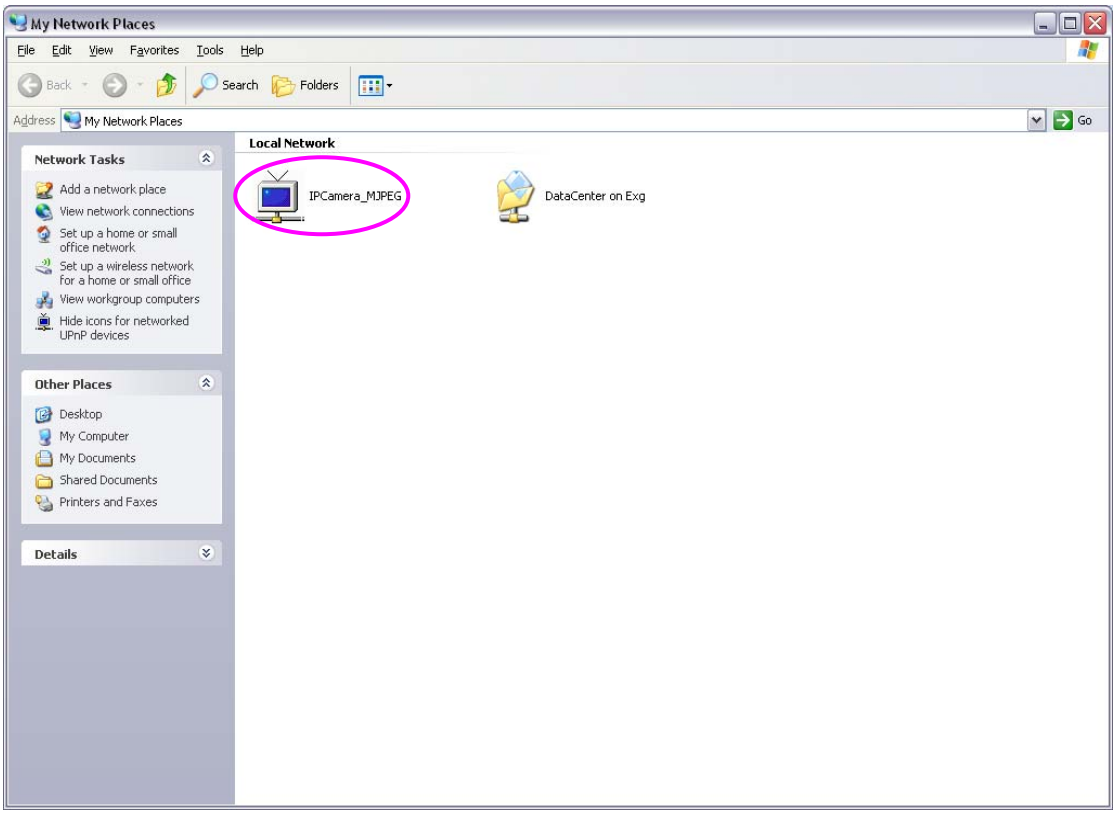
Name	Protocol	Port	LAN IP
Setup 1	TCP	80	192.168.2.3
Setup 2	TCP	4321	192.168.2.3
Setup 3	UDP	13364	192.168.2.3

Port Definition	
Setup 1	It is the port of Web port. You have to configure the protocol to “TCP”.
Setup 2	It is the port of Video port. You have to configure the protocol to “TCP”.
Setup 3	It is the port for IP camera and Administrator Utility communication. The protocol setting should be “UDP”.
Viewing IP camera via Web Browser	
Setup 1/Setup 2	If you want to view the video via Web Browser, you have to ensure the Router/Gateway has configured setup1 and setup 2. If

	the web port is not default port “80”, but changed to 8080. The remote user has to enter http://203.30.212.82:8080.
Viewing IP camera via Camera Viewer Utility	
Setup 2	If you want to use Camera Viewer Utility to view the camera, please make sure the Router/Gateway has configured setup2.
Setup IP camera via Administrator Utility	
Setup 3	If you want to use Administrator Utility to configure WCS-2020 via Internet, the Router/Gateway should configure setup 3.

12. Appendix B Viewing via UPnP in Windows XP

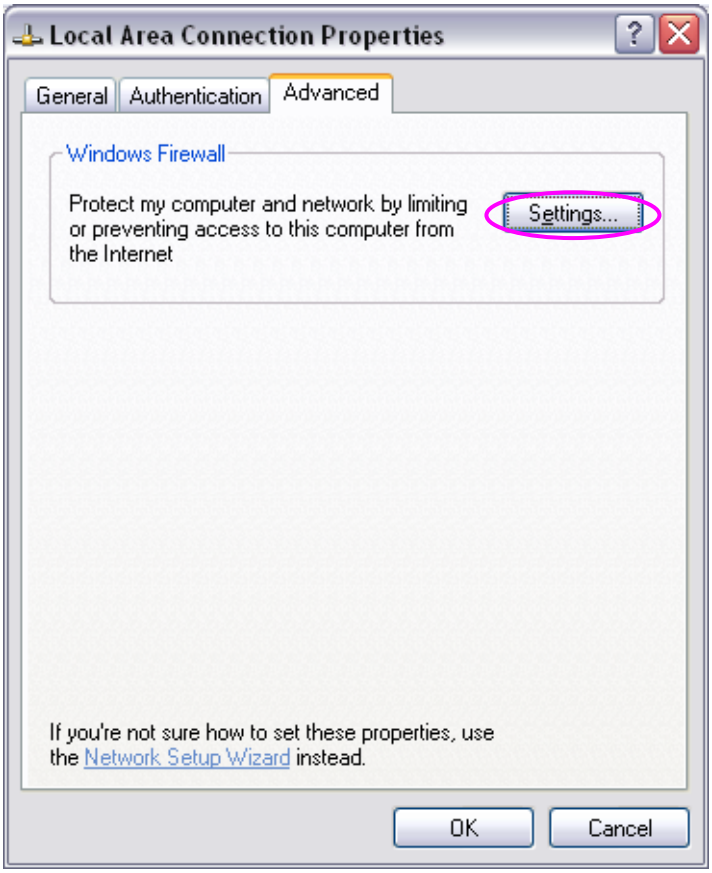
When the UPnP function is enabled, the camera can be detected by UPnP compliant system such as Windows XP. The camera will be displayed in the Neighborhood of Windows XP, so you can directly double click the camera or right click the camera and select “Invoke” to view the video through web browser.



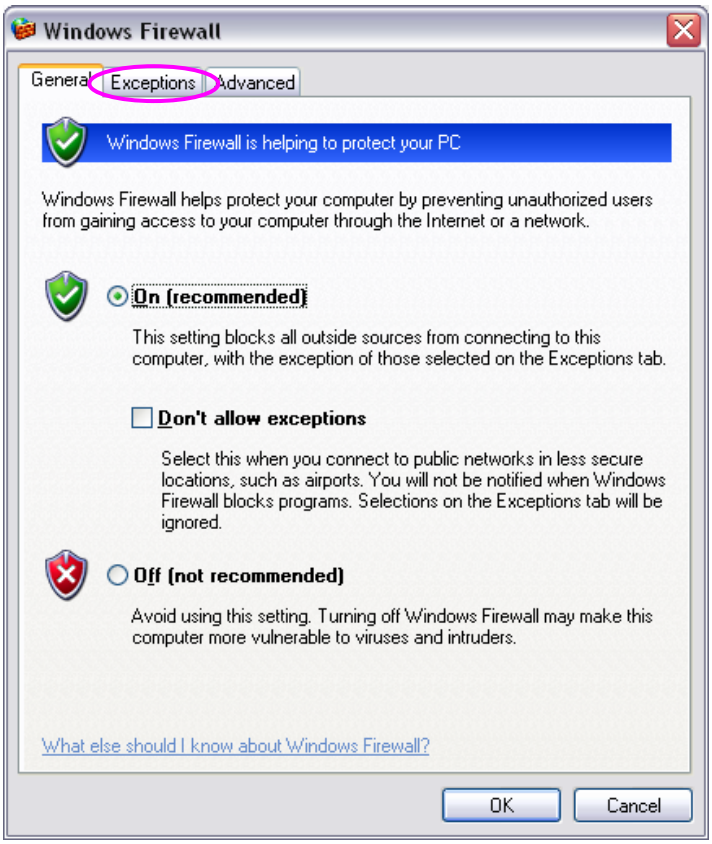
Enable UPnP in Windows XP SP2

If you can't find the camera in the Neighborhood of Windows XP SP2 or you have seen the following message when you double click the camera. You have to check if UPnP function is blocked by the firewall. Please follow the steps below to enable it.

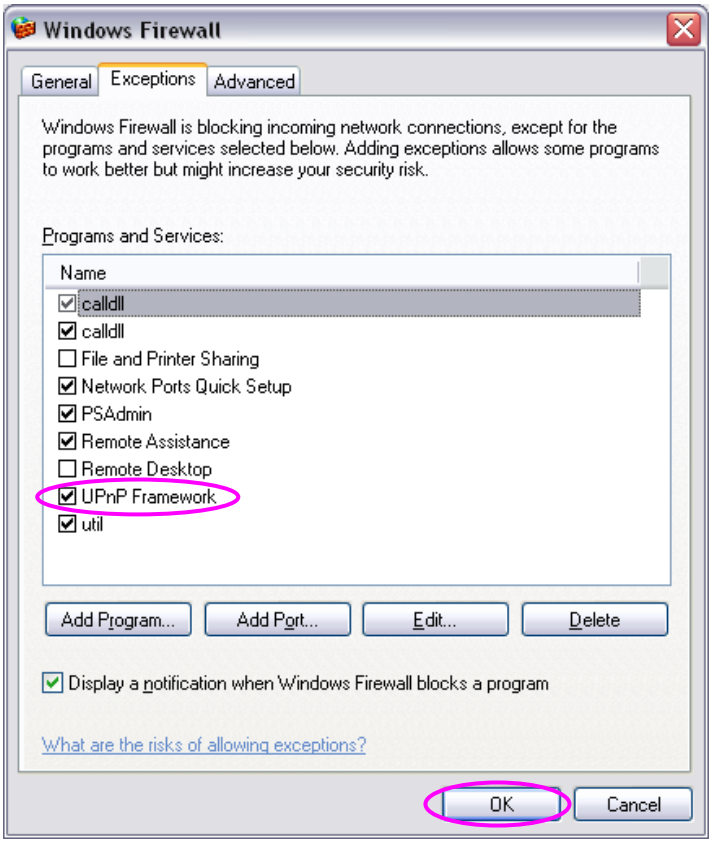
1. Go to "Start\Settings\Network Connections".
2. Right click the "Local Area Connection" and select "Properties".
3. In the "Local Area Connection Properties", select "Advanced" option menu and click "Settings".



4. The "Windows Firewall" screen will be popped up, select "Exceptions" option menu.



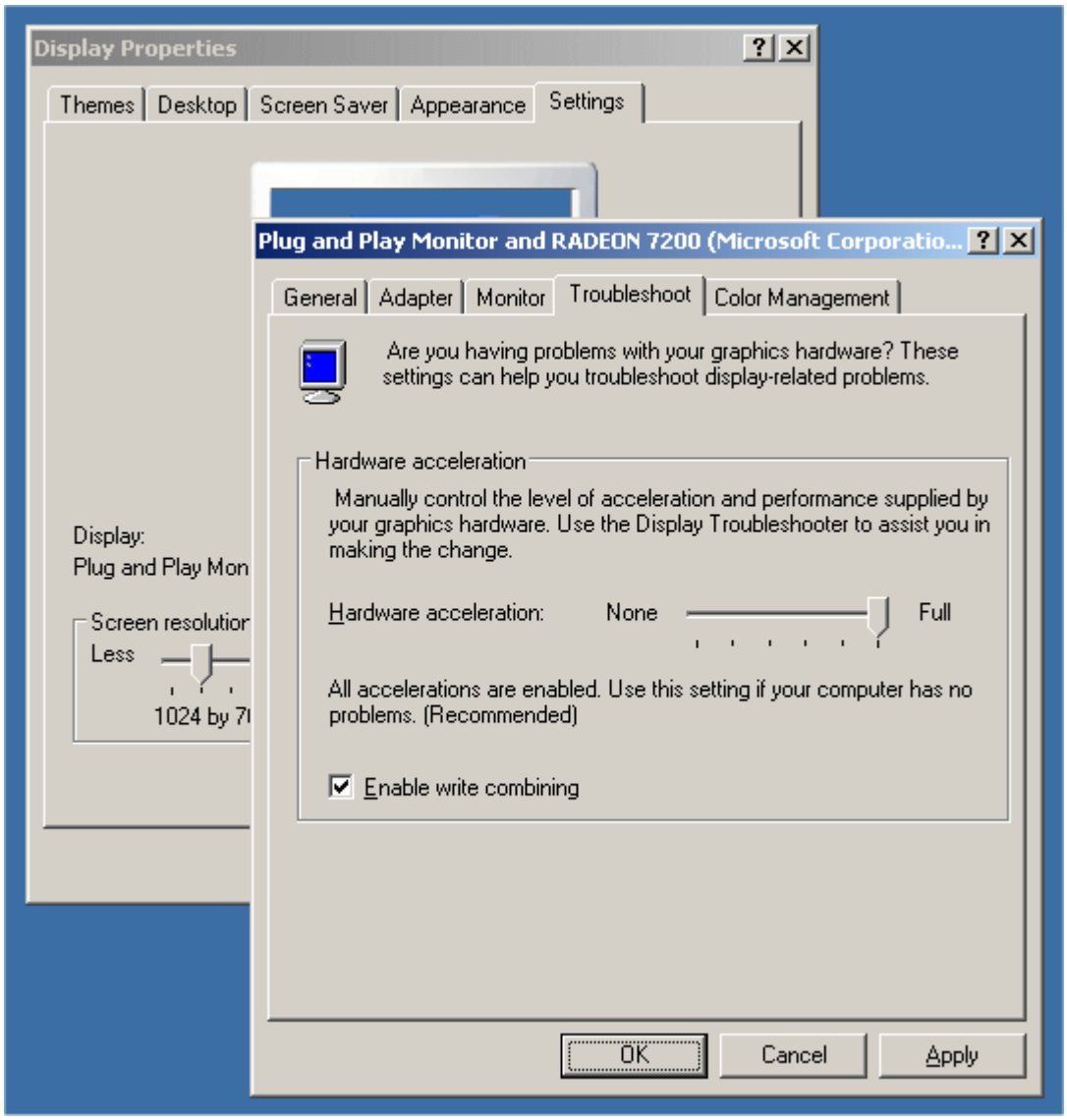
5. Enable “UPnP Framework” from the “Programs and Services list” and click “Ok”.



13. Appendix C Configure Windows 2003 Server

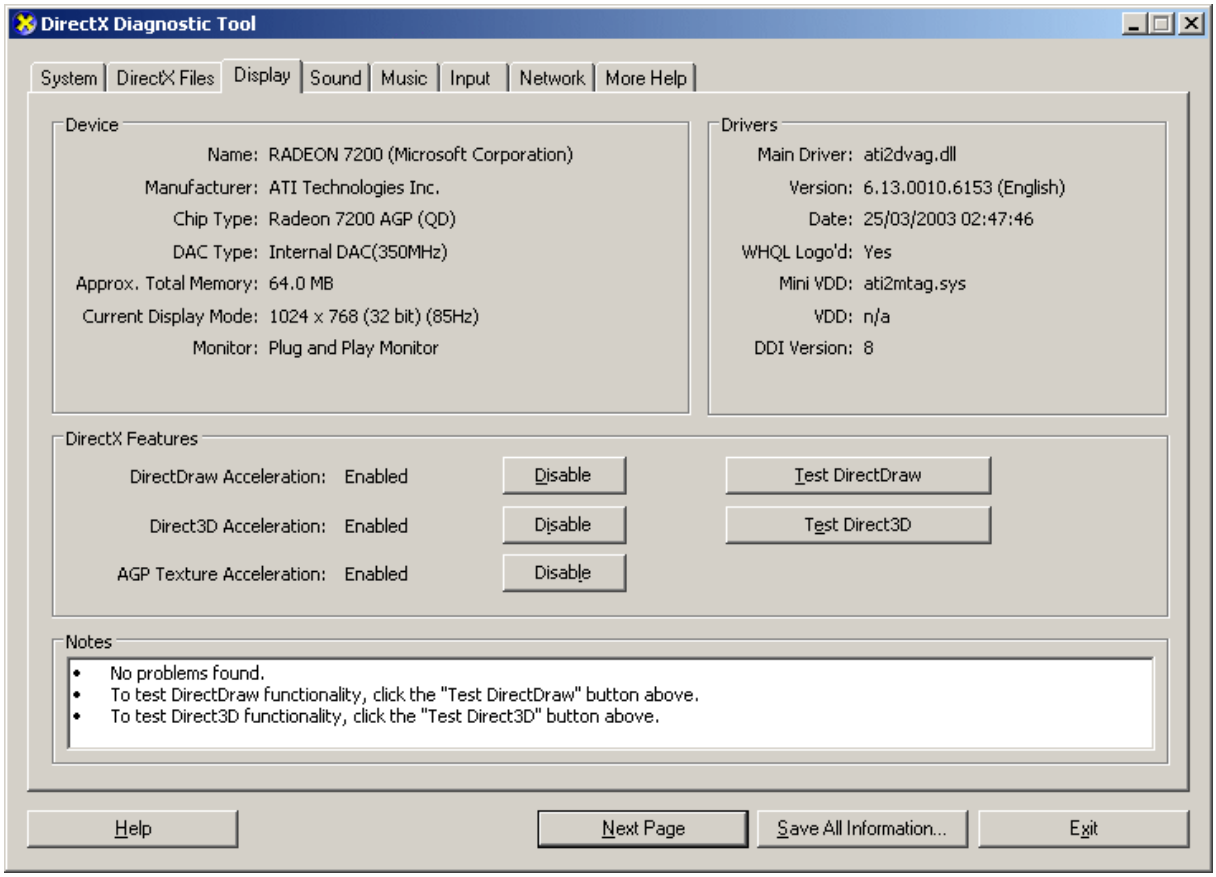
Graphics Hardware Acceleration and DirectX are disabled by default on a Server configuration to ensure maximum stability and uptime. But for any reason you need to enable them to use DirectX enabled applications this section will guide you through on how you can do it.

Enabling Graphics Hardware Acceleration



1. Simply right click anywhere on your desktop and select Properties -> Settings tab -> Advanced -> and finally, the Troubleshoot tab.
2. Now move the Hardware acceleration slider across to Full
3. Click OK
4. You may experience a monitor black out for a few seconds, this is normal.

Enabling DirectX



5. go to Start -> Run -> and type dxdiag followed by enter. You will get a dialog box asking if you want to allow dxdiag to access the internet to check for valid WHQL certificates - click on Yes.

6. Let's click on the Display tab, now click on all three boxes to enable DirectDraw, Direct3D and AGP Texture Acceleration.

14. Appendix D GNU GENERAL PUBLIC LICENSE

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linux-2.4.26
bridge-utils-0.96
busybox-1.00-pre7
ppp-2.4.1
rp-pppoe-3.5
Wireless_tools.26
gcc-3.3.5
binutils-2.14
uClibc-0.9.26

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