Communicate via **Micro network**

Micronet®
Making Communication Easier

User's Manual

1080p Full HD Mini Bullet IP Camera

Model No.: SP5591K

www.micronet.com.tw

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1. Introduction

Micronet SP5591K, Full HD 1080p WDR Day & Night Outdoor mini Bullet IP camera provides superior image quality with 2 megapixel 1080p Real-Time resolution. The excellent color and image presentation with Sony CMOS sensor and advanced WDR technology under challenge lighting condition deliver exceptional recording quality for surveillance monitoring. In addition, SP5591K supports high quality video compression in H.264, MPEG-4,and MJPEG; and also multiple streaming, which allows the first stream for recording in 1080p and the second stream for Live view in 720p.

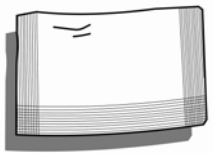
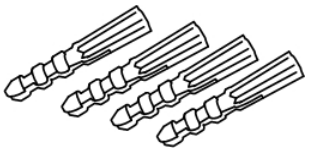
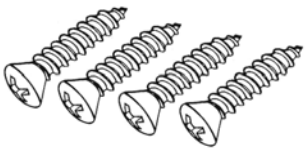
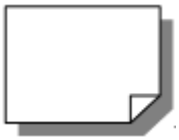
Mechanically, SP5591K is designed in small size with PoE compliant, which makes it so easy and convenient for SMB(small-mid size business) and home installations. With its compact size and affordable price, yet it's not missing any important features that might be needed while performing the monitoring tasks. Along with SP5736P, the standalone NVR, it becomes a perfect package for anyone's security solution where accurate identification is necessary.

1.1 Features

- **Progressive Scan** CMOS Sensor
- **Full HD 1080p** with 2 Megapixel high resolution live view and recording to see a particular spot in larger and clearer image.
- **Sony CMOS sensor** for very high quality presence in color and contrast.
- **Multiple Stream** such as H.264 and MJPEG provides efficient bandwidth and save storage space.
- **Motion Detection** alerts when there is intruder.
- **Privacy Mask** keeps the personal spot that does not want to be seen.
- **WDR(Wide Dynamic Range)** gives clear image even when there is strong light in the background.
- **3D Noise Reduction** reduces the image noise to enhance picture quality.
- **Tampering Alarm** sends picture alert when anyone tries to remove the IP camera.
- **ICR + IR LED** allows monitoring at day time and night time.
- **IP66 Weather** Proof designed for use in rugged environments and adverse weather conditions.
- **PoE 802.3af** saves the trouble of a power source.
- **Compact Size** Design offers convenience to carry and install.

1.2 Package Contents

Please check the package contains the following items listed below.

 Mini Bullet IP Camera	 Desiccant
 Plastic Screw Anchors (x5)	 M4 Self Tapping Screws (x5)
 CD (bundled software and documentation)	 Quick Guide

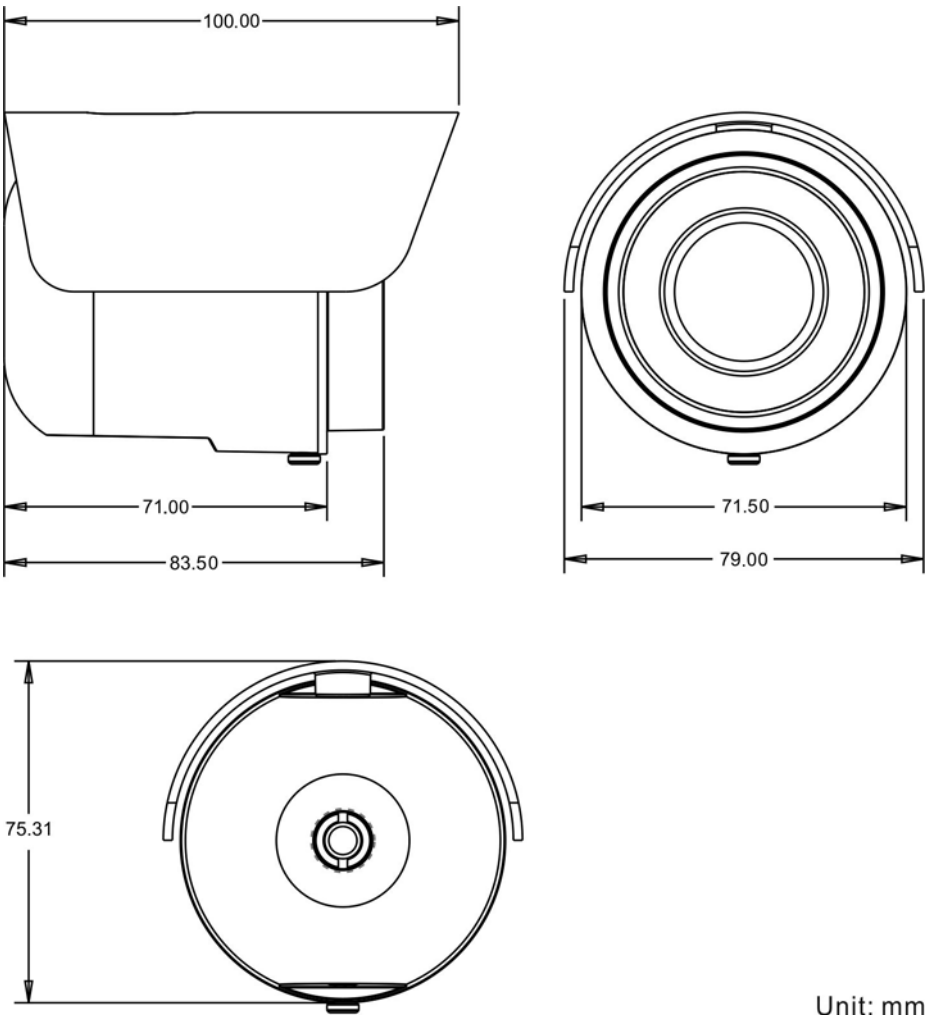
2. Introduction of the Bullet IP Camera

This chapter will provide the camera dimensions and overview of the supplied all-in-one cable for reference before installation.

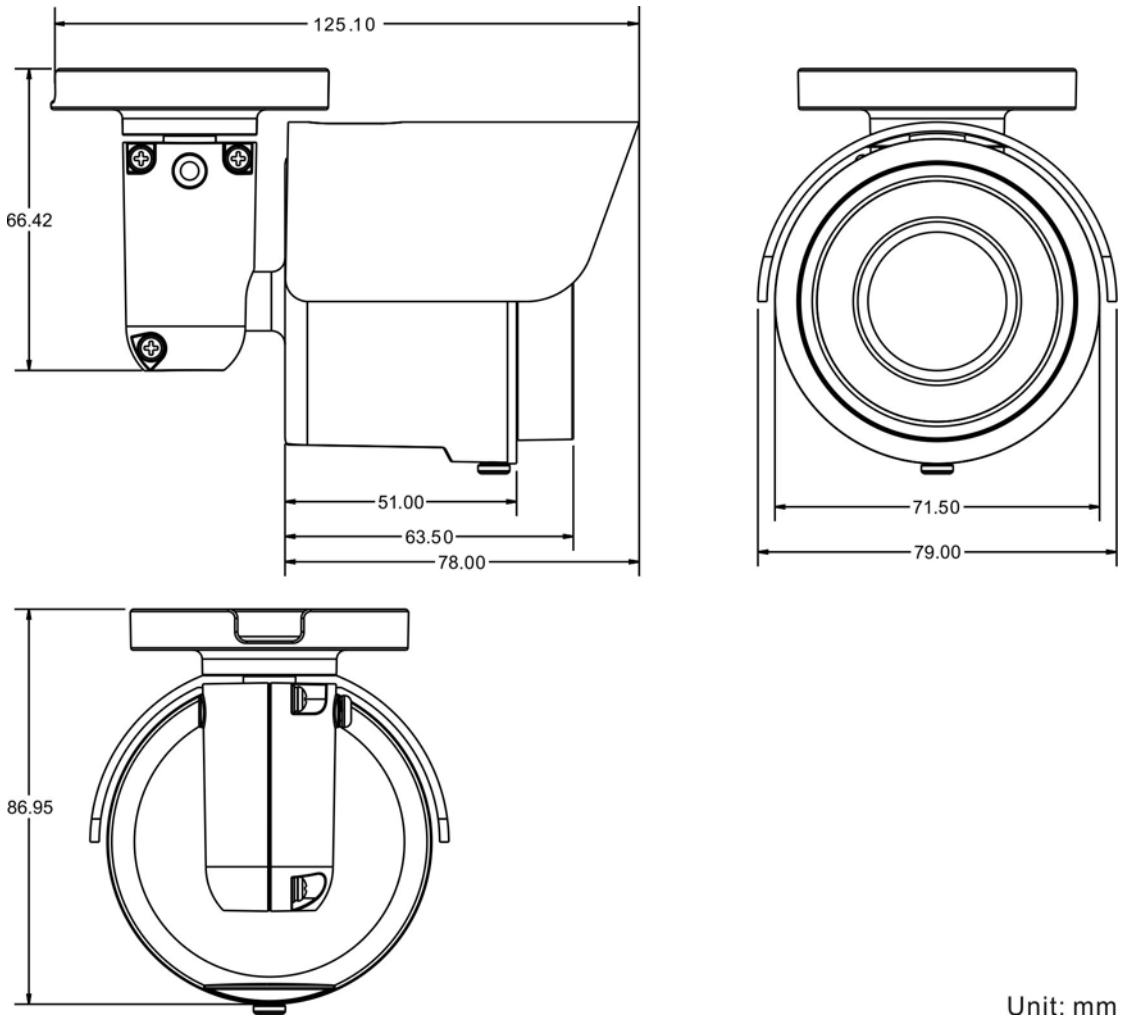
2.1 Camera Dimensions

The Bullet IP Camera's dimensions are shown below.

Outdoor (without Cable Management)



Outdoor (with Cable Management)



Unit: mm

2.2 Camera's Interface

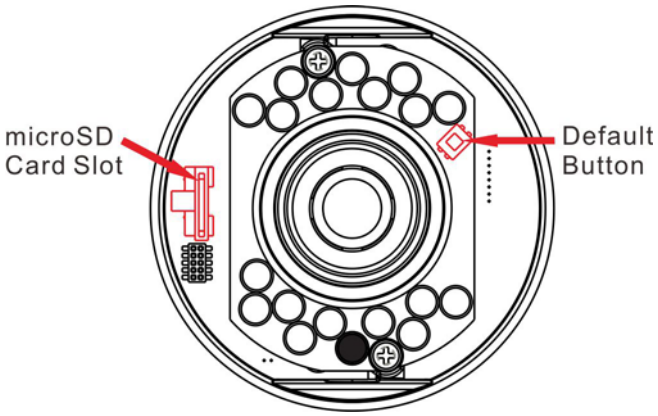
The Bullet IP Camera is equipped with an all-in-one cable for quick wiring. Definition for each connector will be given as follows.

No.	Connector	Definition
1	Power	DC 12V connectors / Power connection
2	RJ-45	10/100 Mbps Ethernet / PoE
3	MicroSD Card Slot	For video recording storage
4	Default Button	Press the button for at least 20 seconds with one finger to restore the system.

SD Card Slot/ Reset Button

Follow the steps below to reach the SD Card Slot, Reboot Button and Factory Default Button on IP Camera:

The positions of the microSD Card Slot and the Default Button are shown as below.



microSD Card Slot

Insert the SD Card in the microSD Card Slot to store videos and snapshots.

Default Button

Press the button with a proper tool to restore the system to default setting.

NOTE: Before installing, please refer to Desiccant User Guide in the package to place the Desiccant in the Camera to prevent moisture from condensing on IP Camera's Glass Cover.

3. Installation

Please read the instructions provided in this chapter thoroughly before installing the Bullet IP Camera.

3.1 Power and Ethernet Cable Connection

Power Connection

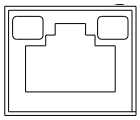
Make sure the camera's power cable is correctly and firmly connected; refer to the pin definition table in section 2.2 Camera's Connectors. If using Power over Ethernet (PoE), make sure Power Sourcing Equipment (PSE) is in use in the network.

Ethernet Cable Connection

Use of Category 5 Ethernet cable is recommended for network connection; to have best transmission quality, cable length shall not exceed 100 meters. Connect one end of the Ethernet cable to the RJ-45 connector of the IP Camera, and the other end of the cable to the network switch or PC.

NOTE: In some cases, you may need use an Ethernet crossover cable when connecting the IP Camera directly to the PC.

Check the status of the link indicator and activity indicator LEDs; if the LEDs are unlit, please check LAN connection.

	Green Link Light indicates good network connection. Orange Activity Light flashes for network activity indication.

3.2 Ceiling/Wall Mount Installation

The Bullet IP Camera can be installed directly on a wall or ceiling with the integrated 2-axis adjustable Bracket Mount. Please note that the wall or ceiling must have enough strength to support the IP Camera.

Follow the steps below to install the IP Camera:

Step 1:

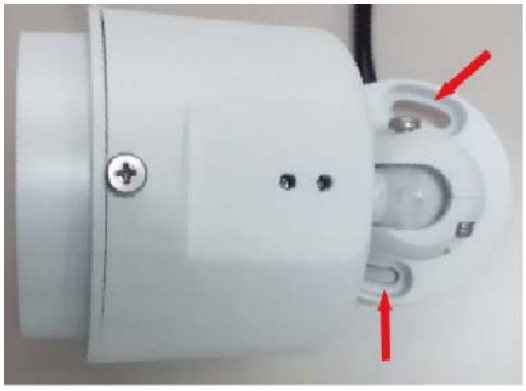
Unpack the Bullet IP Camera package and take out the IP Camera.

Step 2:

Connect the power/Ethernet wires from ceiling or wall to the corresponding connectors of the camera's All-in-one Cable.

Step 3:

Fix the IP Camera's Bracket on the ceiling/wall with three supplied self tapping screws



Step 4:

Use the supplied Inner Hex Wrench and cross screwdriver to loosen the hex bolt/screw on the side of the Bracket Mount and the Camera Housing to adjust the position of the IP Camera.

4. System Requirements

To perform the IP Camera via web browser, please ensure your PC is in good network connection, and meet system requirements as described below.

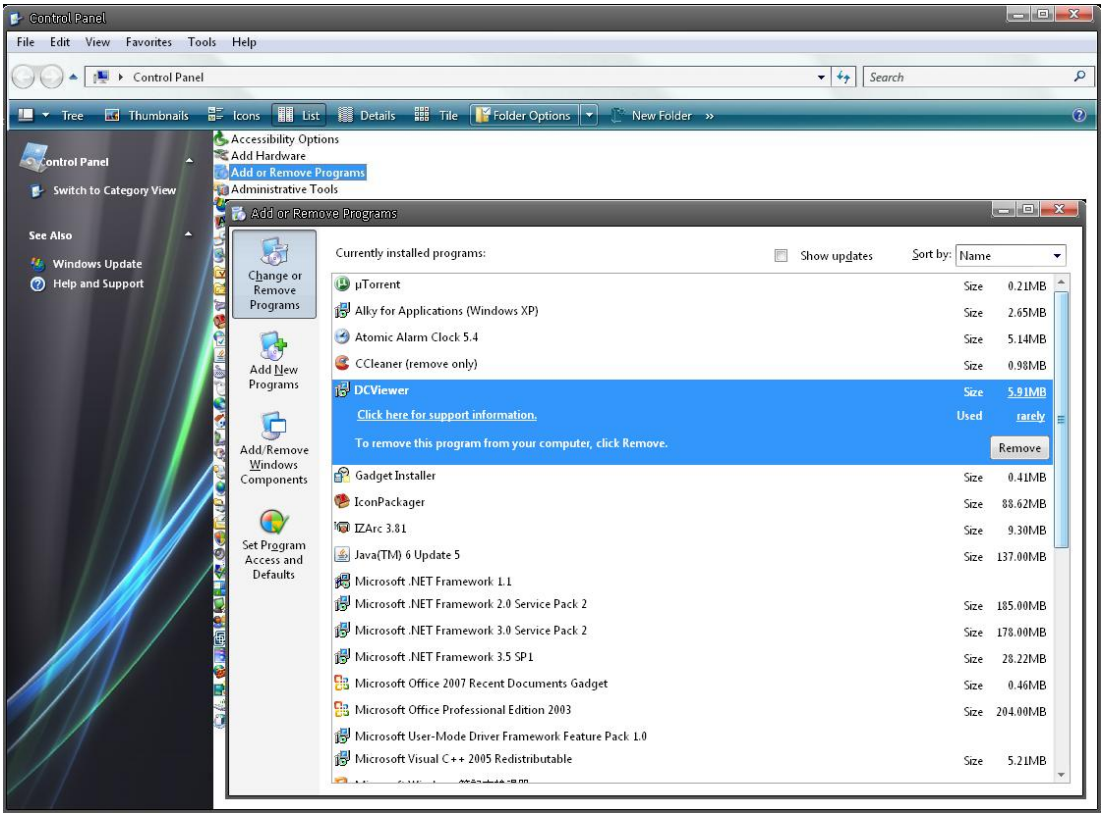
Items	System Requirement
Personal Computer	1. Intel® Pentium® M, 2.16 GHz or Intel® Core™2 Duo, 2.0 GHz 2. 2 GB RAM or more
Operating System	Windows VISTA/ Windows XP / Windows 7
Web Browser	Microsoft Internet Explorer 6.0 or later Firefox Chrome Safari
Network Card	10Base-T (10 Mbps) or 100Base-TX (100 Mbps) operation
Viewer	ActiveX control plug-in for Microsoft IE

5. Deleting the Existing DC Viewer

For users who have installed the DC Viewer in the PC previously, please first delete the existing DC Viewer from the PC before accessing to the IP Camera.

Deleting the DC Viewer

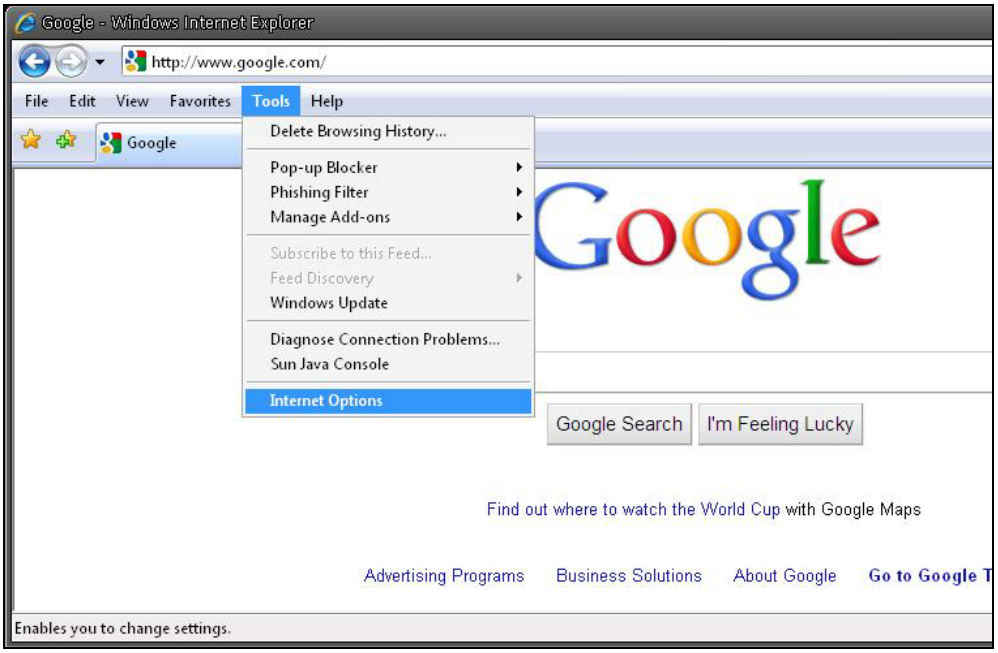
Click “Control Panel”, and then double click “Add or Remove Programs.” In the “Currently installed programs” list, select “DCViewer” and click the button “Remove” to uninstall the existing DC Viewer as shown in the figure below.



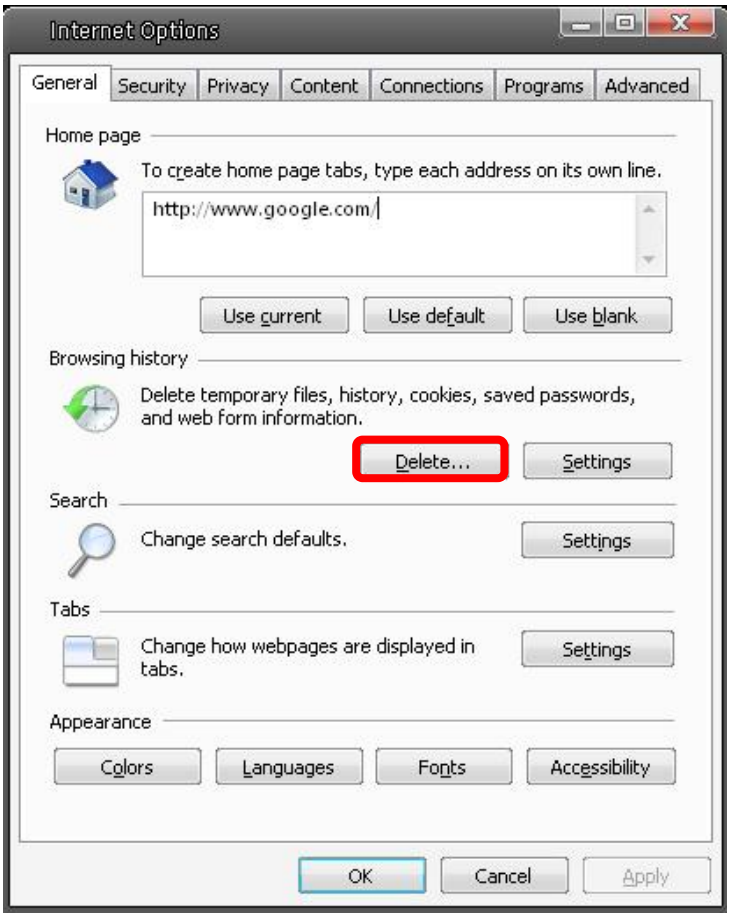
Deleting Temporary Internet Files

To improve browser performance, it is suggested to clean up the all the files in the Temporary Internet Files. The procedure is as follows:

STEP 1: Click the “Tools” tab and select the option “Internet Options.”



STEP 2: Click on “Delete”, then tap the “Delete Files” in the “Temporary Internet files” section.



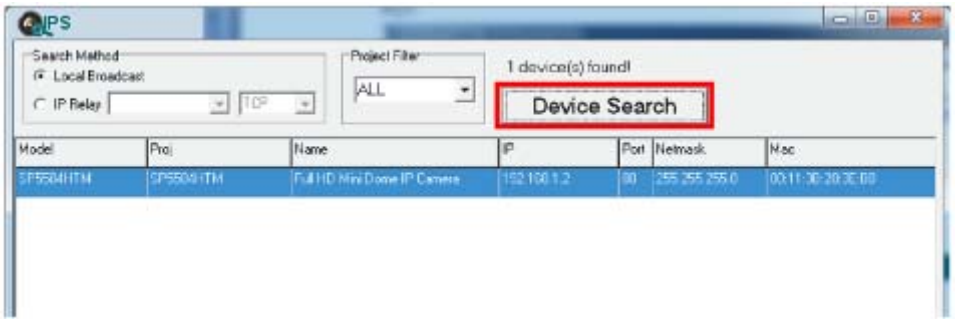
The popup window for confirmation will come out as shown below. Click “Yes” to start deleting the files.

6. Accessing Camera

For initial access to the IP Camera, users can search the camera through the installer program: IPScanUtility.exe, which can be found in “Utility” folder in the supplied CD.

IPScanUtility Software Setup

Step 1: Double click on the program IPScanUtility.exe (see the icon below); its window will appear as shown below. Then click the “Device Search” button.

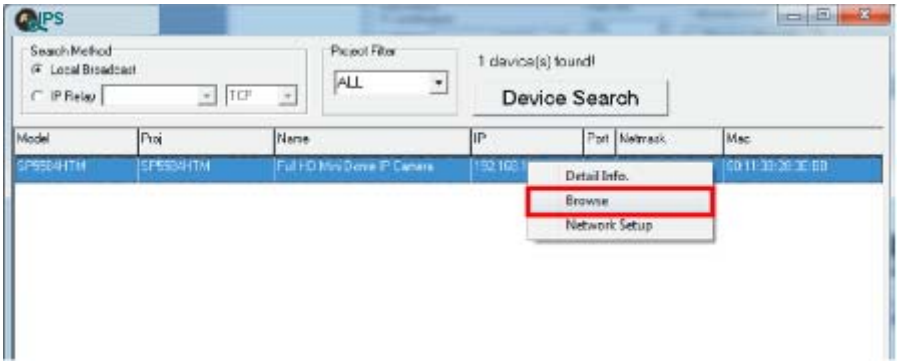


Step 2: The security alert window will pop up. Click “Unblock” to continue.

Device Search

Step 3: Click “Device Search” again, and all the finding IP devices will be listed in the page, as shown in the figure below. The IP Camera’s default IP address is: **192.168.1.2**.

Step 4: Double click or right click and select “Browse” to access the camera directly via web browser.



Step 5: Then the prompt window of request for entering default username and password (as shown below) will appear for logging in to the IP Camera.

The default login ID and password for the Administrator are:

Login ID	Password
root	pass

NOTE: ID and password are case sensitive.

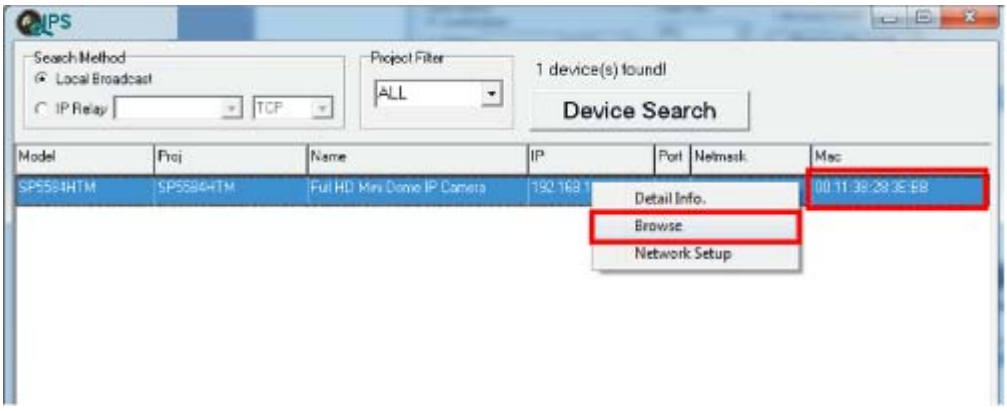
NOTE: It is strongly advised that administrator's password be altered for the security concerns. Refer to 7.3.2 Security for further details.

Additionally, users can change the IP Camera's network property, either DHCP or Static IP, directly in the device finding list. Refer to the following section for changing the IP Camera's network property.

Example of Changing IP Camera's Network Property

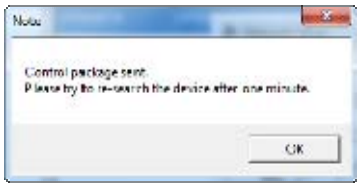
Users can directly change an IP Camera's network property, ex. from static IP to DHCP, in the finding device list. The way to change the IP Camera's network property is specified below:

Step 1: In the finding device list, click on the IP Camera that you would like to change its network property. On the selected item, right click and select "Network Setup." Meanwhile, record the IP Camera's MAC address, for future identification.

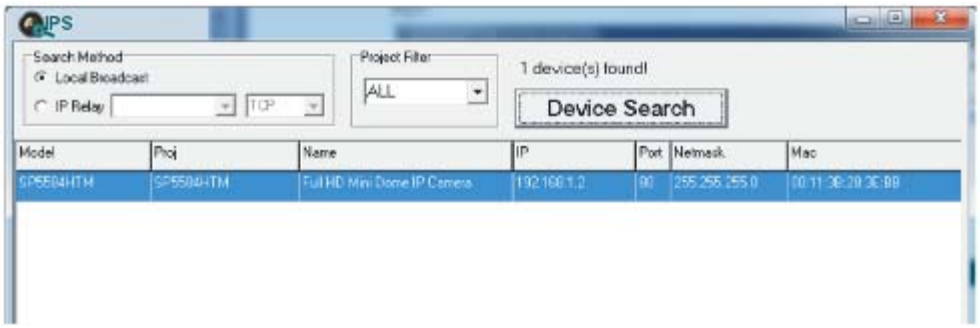


Step 2: The “Network Setup” page will come out. Select “DHCP,” and press “Apply” button down the page.

Step 3: Click “OK” on the Note of setting change. Wait for one minute to re-search the IP Camera.



Step 4: Click the “Device Search” button to search all the devices. Then select the IP Camera with the correct MAC address. Double click on the IP Camera, and the login window will come out.



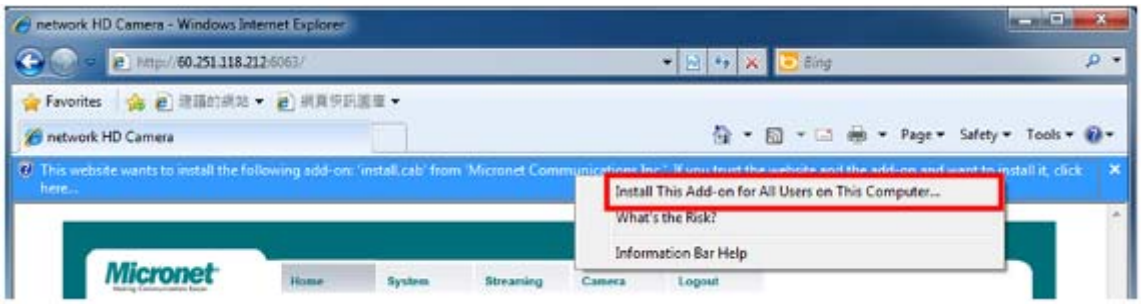
Step 5: Enter User name and Password to access the IP Camera.

Installing DC Viewer Software Online

For the initial access to the IP Camera, a client program, DC Viewer, will be automatically installed to your PC when connecting to the IP Camera.

If the Web browser doesn't allow DC Viewer installation, please check the Internet security settings or ActiveX controls and plug-ins settings (refer to Appendix B: Internet Security Settings) to continue the process.

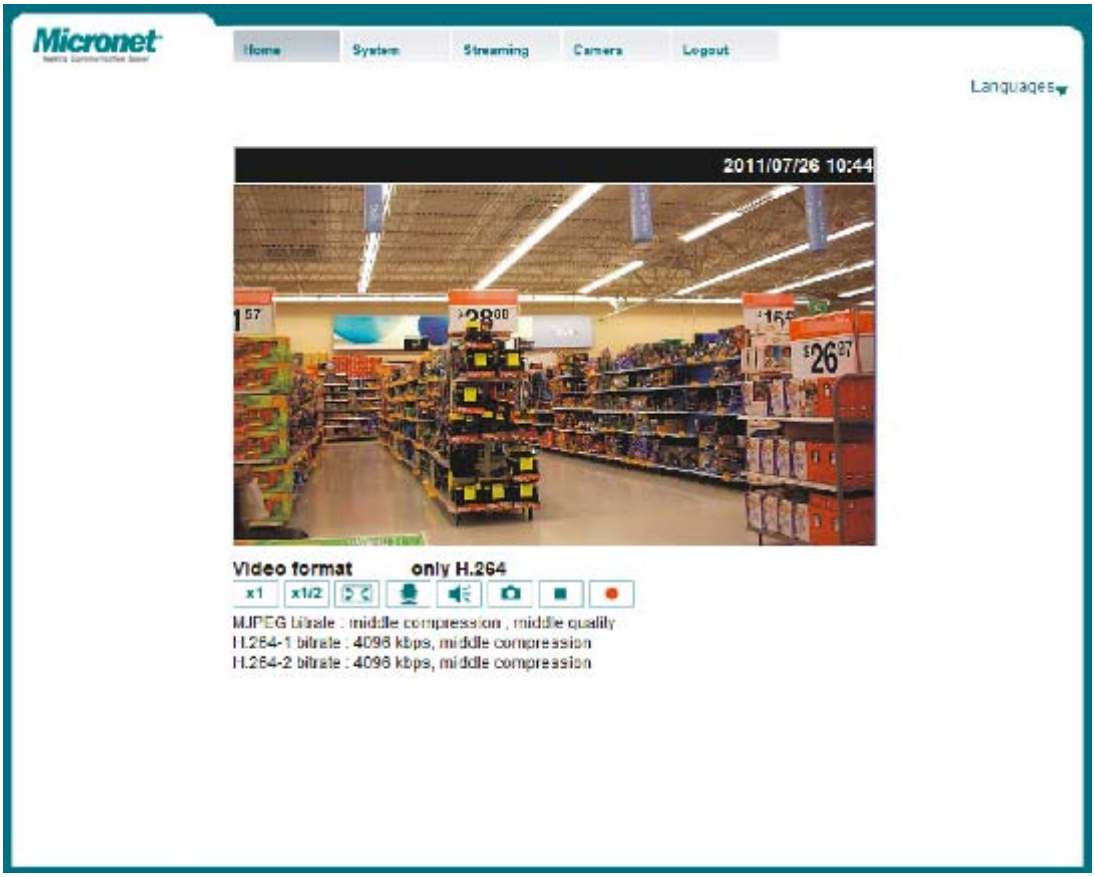
The Information Bar (just below the URL bar) may come out and ask for permission to install the ActiveX Control for displaying video in browser (see the figure below). Right click on the Information Bar and select "Install ActiveX Control…" to allow the installation.



Then the security warning window will pop up. Click "Install" to carry on software installation.

Click "Finish" to close the DC Viewer window when download is finished. For the detailed software download procedure, please refer to Appendix C: DC Viewer Download Procedure.

Once login to the IP Camera, users will see the Home page as shown below:



Administrator/User Privileges

"Administrator" represents the person who can configure the IP Camera and authorize users access to the camera; "User" refers to whoever has access to the camera with limited authority, i.e. entering Home and Camera setting pages.

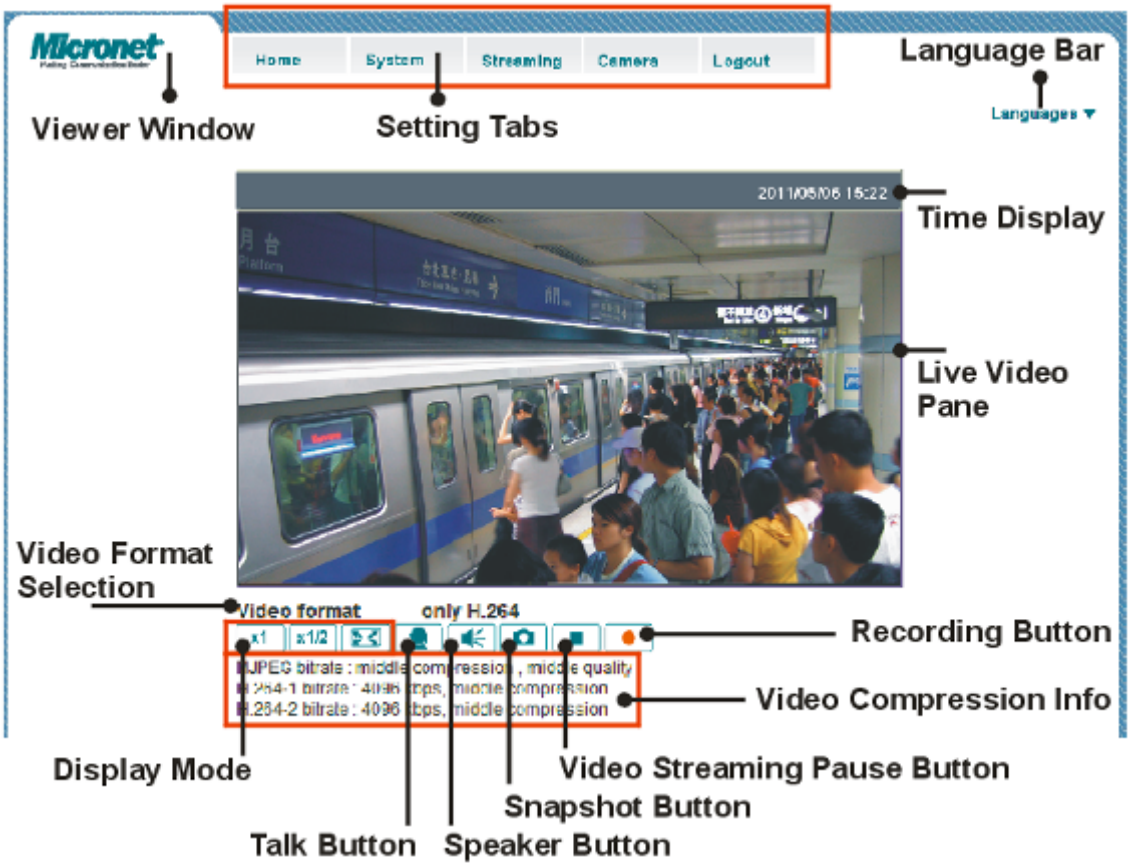
7. Configuration & Operation

The IP Camera is provided with a user-friendly browser-based configuration interface, and a free bundled Micronet CMS (Micronet CMS) for video playback and Micronet VSS(Micronet VSS) recording.

For further information about CMS/VSS software, please refer to CMS and VSS user's manual.

7.1 Browser-based Viewer Introduction

The figure below shows the main page of the IP Camera user interface.



There are five tabs: Home, System, Streaming, Camera and Logout on the top panel.

Home

Users can monitor live video of the targeted area.

System setting

The administrator can set host name, system time, root password, network related settings, etc. Further details will be interpreted in 7.3 System Related Settings.

Streaming setting

The administrator can modify video resolution and rotate type and select audio compression mode in this page.

Camera setting

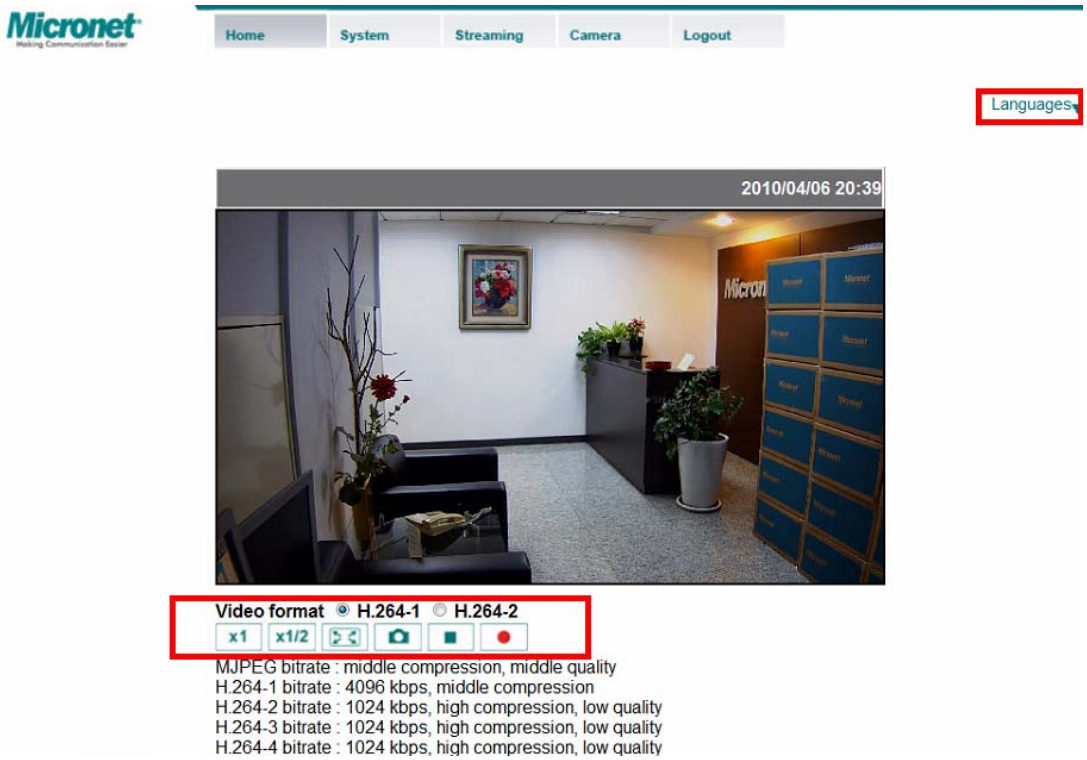
Users can adjust various camera parameters, including <Exposure>, <White Balance>, <Brightness>, <Sharpness>, <Contrast>, <Saturation>, <Hue> and < TV System>.

Logout

Click on the tab to re-login the IP Camera with another username and password.

7.2 Home Page

In the Home page, there are several function buttons right down the displayed image.



Multiple Languages Support

Multiple languages are supported, including English, French, German, Italian, Korean, Simplified Chinese, Russian, etc. for the viewer window interface.

Screen Size Adjustment

Image display size can be adjusted to x1/2 and full screen.

Snapshot button

Press the button, and the JPEG snapshots will automatically be saved in the appointed place. The default place of saving snapshots is: C:\. To change the storage location, please refer to 7.3.13 File Location for further details.

NOTE: For users with Windows 7 operating system, it is required to log on as an Administrator to implement the Snapshot function.

Video Streaming Pause /Restart button (pause/restart)

Press the stop button to disable video streaming, the live video will be displayed as black. Press the restart button to show the live video again.

Web Recording button (on/off)

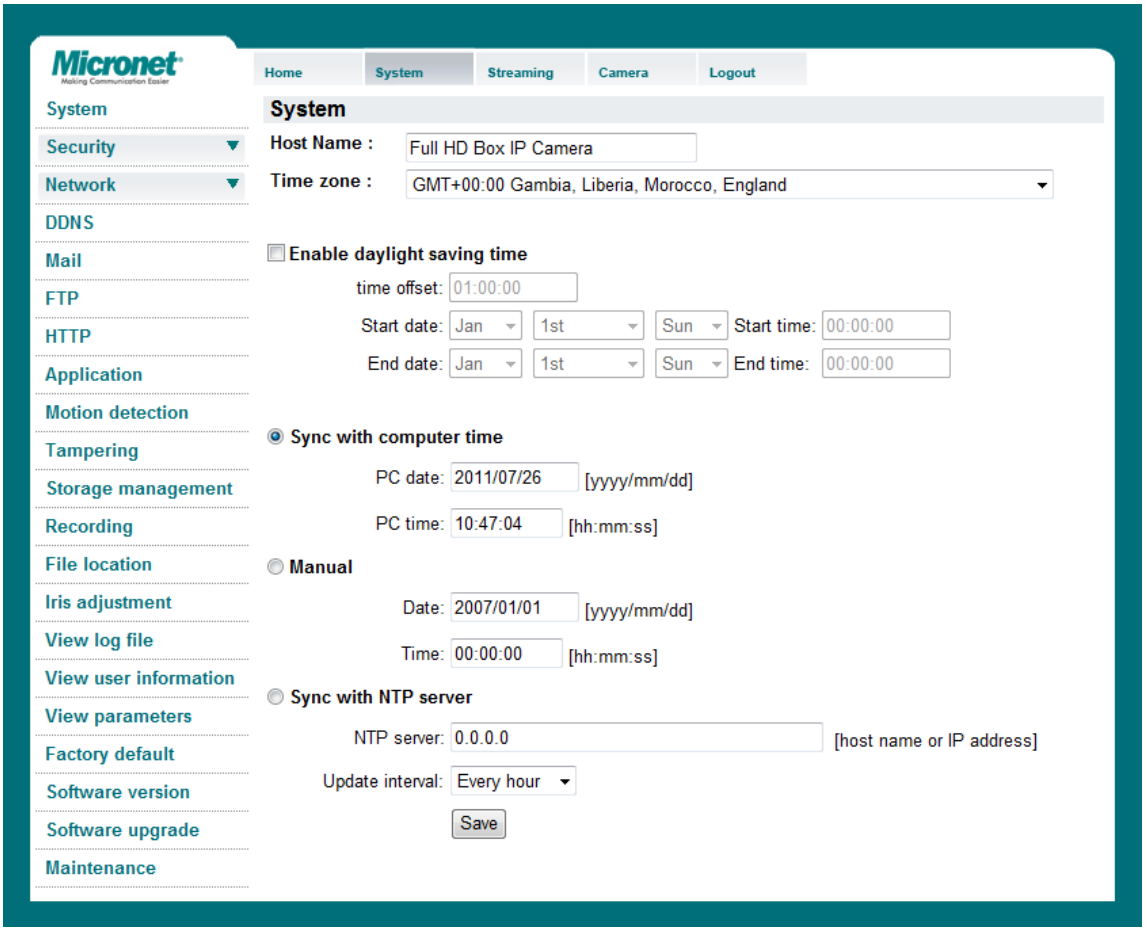
Press the <Recording> button, and the recordings from the Live View will be saved directly to the specified location on the local hard drive, which could be configured in the “File Location” (snapshot) page. The default storage location for the web recording is: C:\. Please refer to 7.3.13 File Location for further details

NOTE: For users with Windows 7 operating system, it is required to log on as an Administrator to implement the Web Recording function.

7.3 System Related Settings

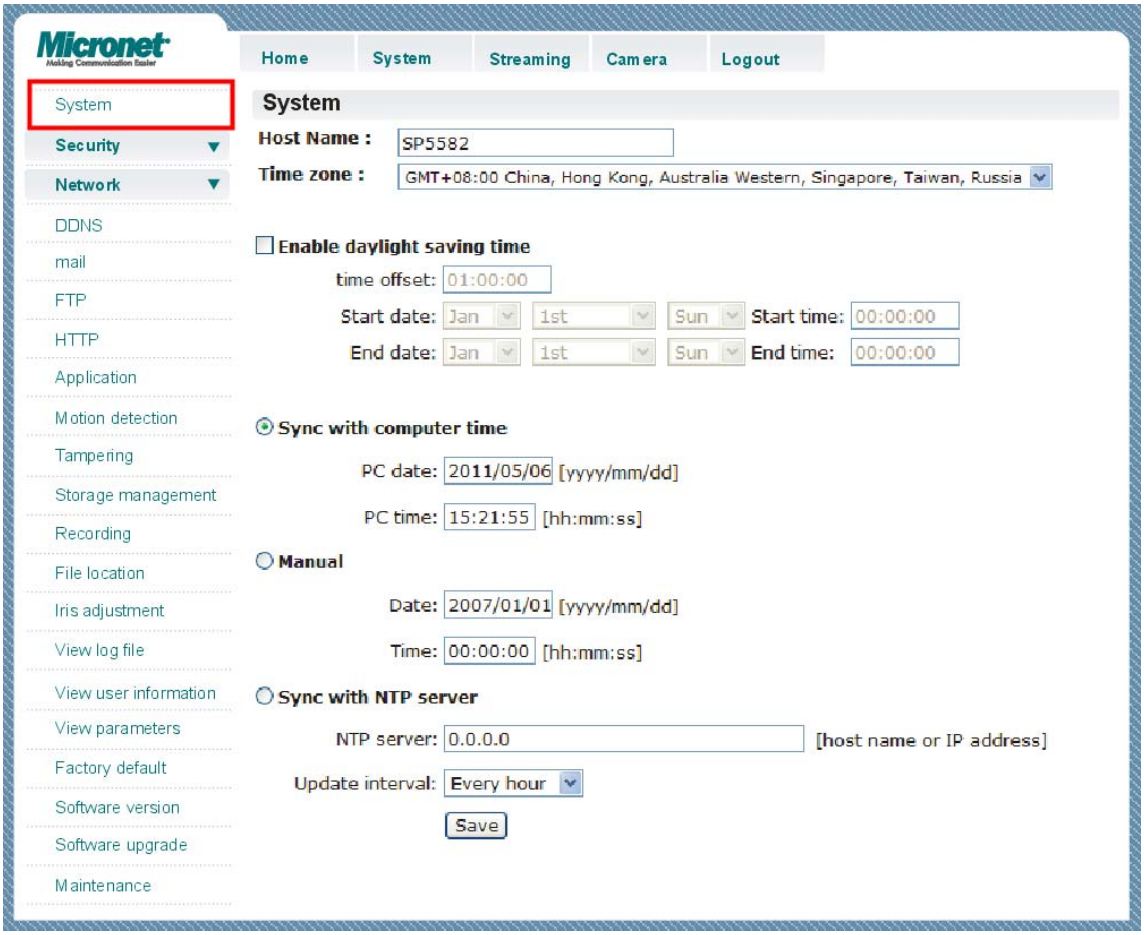
The figure below shows all categories under the "**System**" tab. Each category in the left column will be explained in the following sections.

NOTE: The "System" configuration page is only accessible by the Administrator.



7.3.1 Host Name and System Time Setting

Press the first category: <System> in the left column; the page is shown as below.



Host Name

The name is for camera identification. If alarm function (refer to 7.3.8 Application) is enabled and is set to send alarm message by Mail/ FTP, the host name entered here will display in the alarm message. The maximum length of the Host Name is 30 characters.

Time Zone

Select the time zone you are in from the drop-down menu.

Enable Daylight Saving Time

To enable DST, please check the item and then specify time offset and DST duration. The format for time offset is [hh:mm:ss]; for instance, if the amount of time offset is one hour, please enter “01:00:00” into the field.

Sync With Computer Time

Select the item, and video date and time display will synchronize with the PC's.

Manual

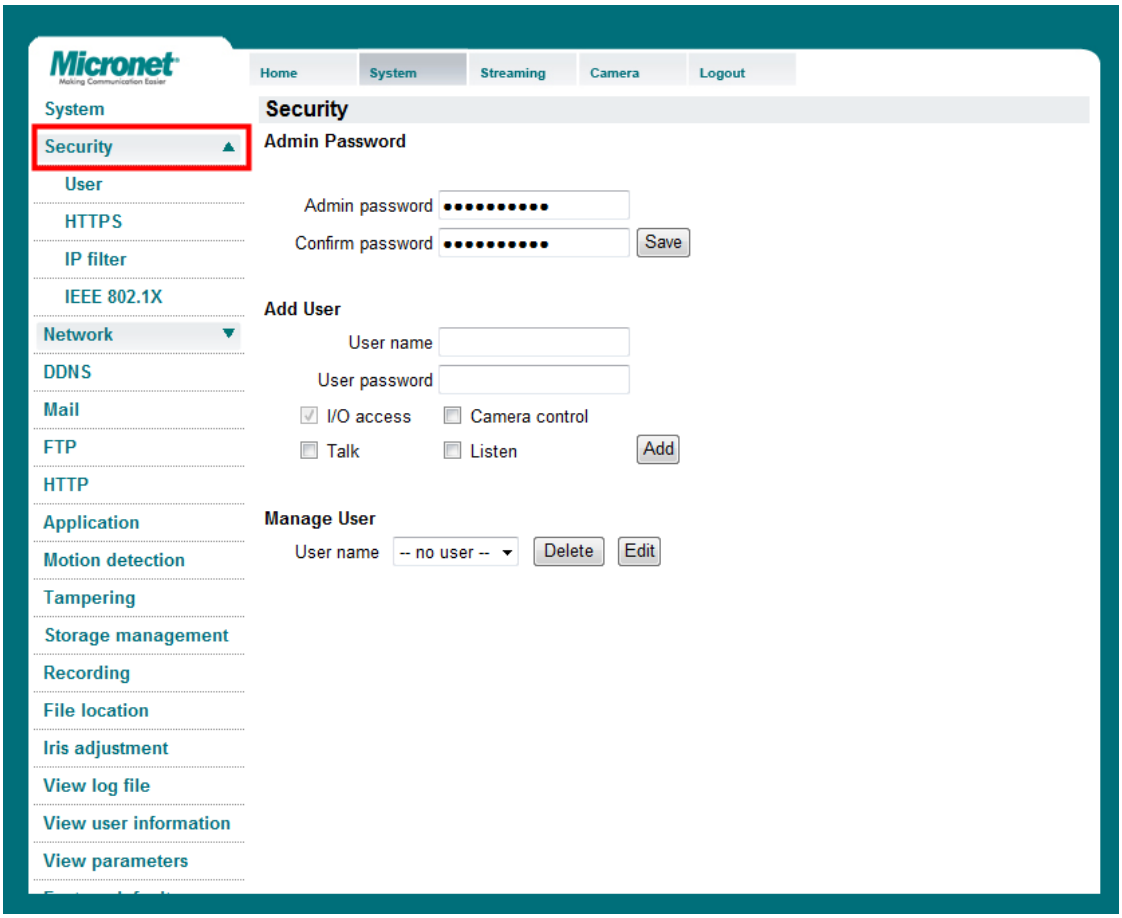
The Administrator can set video date, time and day manually. Entry format should be identical with that shown next to the enter fields.

Sync with NTP server

Network Time Protocol (NTP) is an alternate way to synchronize your camera's clock with a NTP server. Please specify the server you wish to synchronize in the enter field. Then select an update interval from the drop-down menu. For further information about NTP, please see the web site: www.ntp.org.

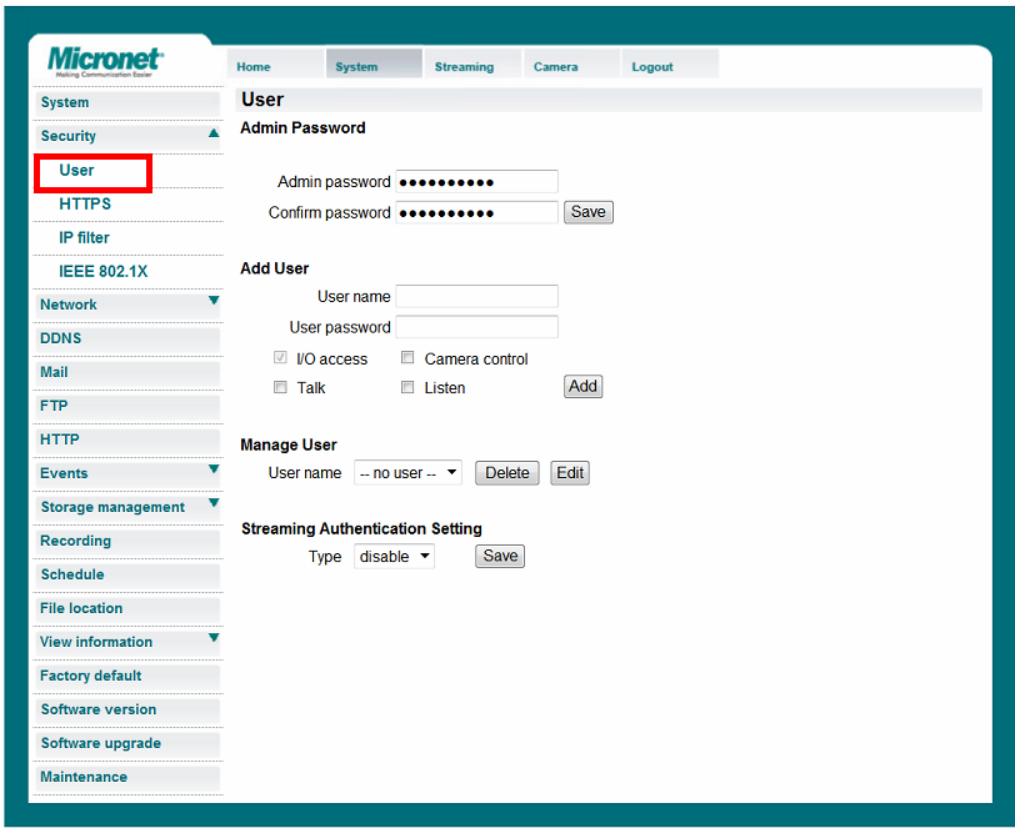
7.3.2 Security

Click the category: <Security>, there will be a drop-down menu with tabs including <User>, <HTTPS>, <IP Filter>, and <IEEE 802.1X>.



7.3.2.1 User

Click the <User> tab under the category <Security> and the page is shown as the figure below.



Root password

Change the administrator's password by inputting the new password in both text boxes. The input characters/numbers will be displayed as dots for security purposes. After clicking <Save>, the web browser will ask the Administrator for the new password for access. The maximum length of the password is 14 characters.

NOTE: The following characters are valid: A-Z, a-z, 0-9, !#$%&'-.@^_~.

Add user

Type the new user's name and password and click <Add> to add the new user. User name can be up to 16 characters, and the maximum length of the password is 14 characters. The new user will be displayed in the user name list. There is a maximum of twenty user accounts. Each user can be assigned the privileges of **"Camera control"**, **"Talk"** and **"Listen"**.

- **I/O access**

This item supports fundamental functions that enable users to view video when accessing to the camera.

- **Camera control**
  This item allows the specified User to change camera parameters on the Camera Setting page.

- **Talk/Listen**
  Talk and Listen functions allow the appointed user in the local site (PC site) communicating with, for instance, the administrator in the remote site.

Manage User

- **Delete user**
  To delete a user, pull down the user list, and select the user name you wish to delete. Then click <Delete> to remove it.

- **Edit user**
  Pull down the user list and select a user name. Click <Edit> to edit the user's password and privilege.

NOTE: It is required to enter the User password as well as select the function open to the user. When finished, click <Save> to modify the account authority.

Streaming Authentication Setting

This setting provides security against unauthorized users from getting streaming via Real Time Streaming Protocol (RTSP). If the setting is enabled, users will be requested to enter user name and password before viewing the live streams. There are three security modes available: Disable, Basic and Digest. Refer to the descriptions below for more details.

- **Disable**
  If disable mode is selected, there will be no security provided to against unauthorized access. Users will not be asked to input user name and password for authentication.

- **Basic**
  This mode can only provide basic protection for the live streams. There will still be risks for the password being intercepted.

- **Digest**
  Digest mode is a safer option for protection. The password is sent in an encrypted format to prevent it from being stolen.

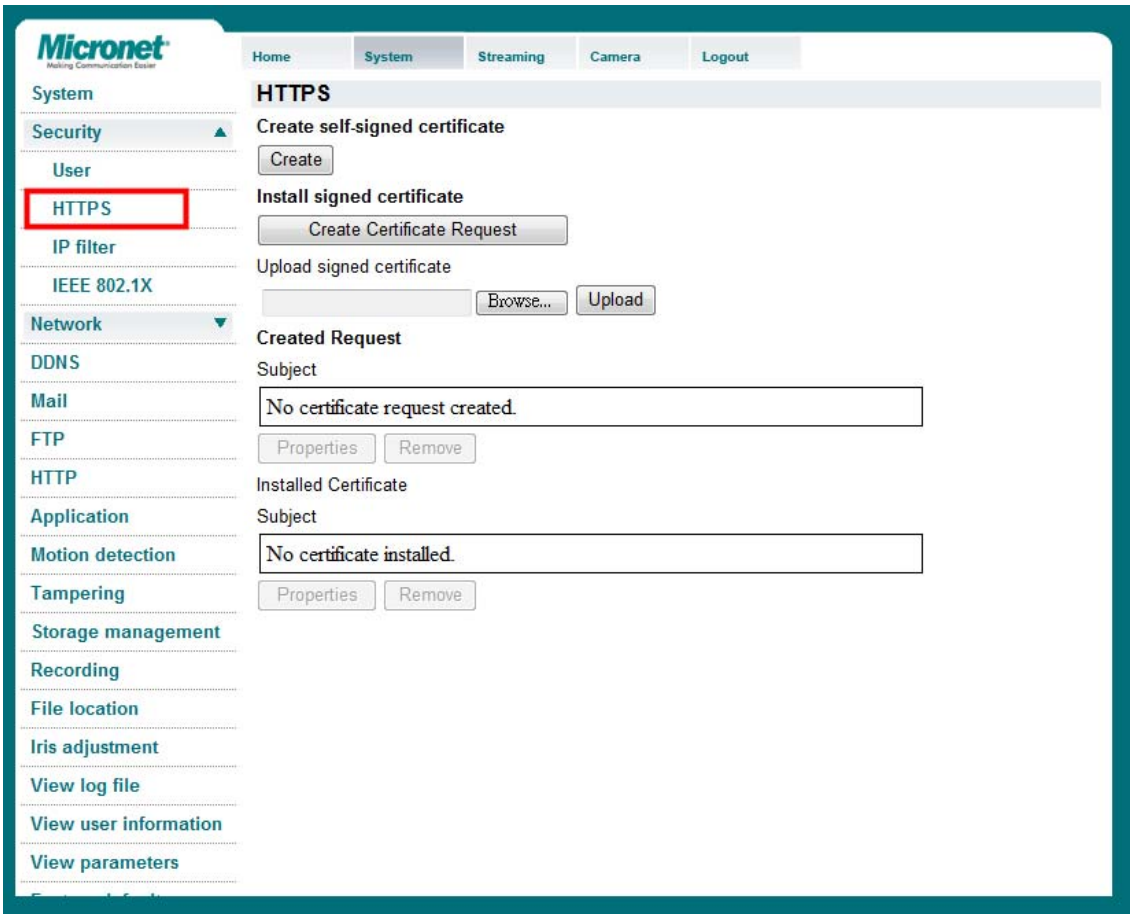
http://192.168.7.123/lang1/server_editaccount...
http://192.168.7.123/lang1/server_editaccount.html
User name [user]
User password
I/O access
Camera control
Talk
Listen
Save
Close
Don
Internet
100%

http://192.168.7.123/lang1/server_editaccount...
http://192.168.7.123/lang1/server_editaccount.html
User name [user]
User password
I/O access
Camera control
Talk
Listen
Save
Close
Don
Internet
100%

7.3.2.2 HTTPS

<HTTPS> allows secure connections between the IP Camera and web browser using <Secure Socket Layer (SSL)> or <Transport Layer Security (TLS)>, which ensure camera settings or Username/ Password info from snooping. It is required to install a self-signed certificate or a CA-signed certificate for implementing <HTTPS>.

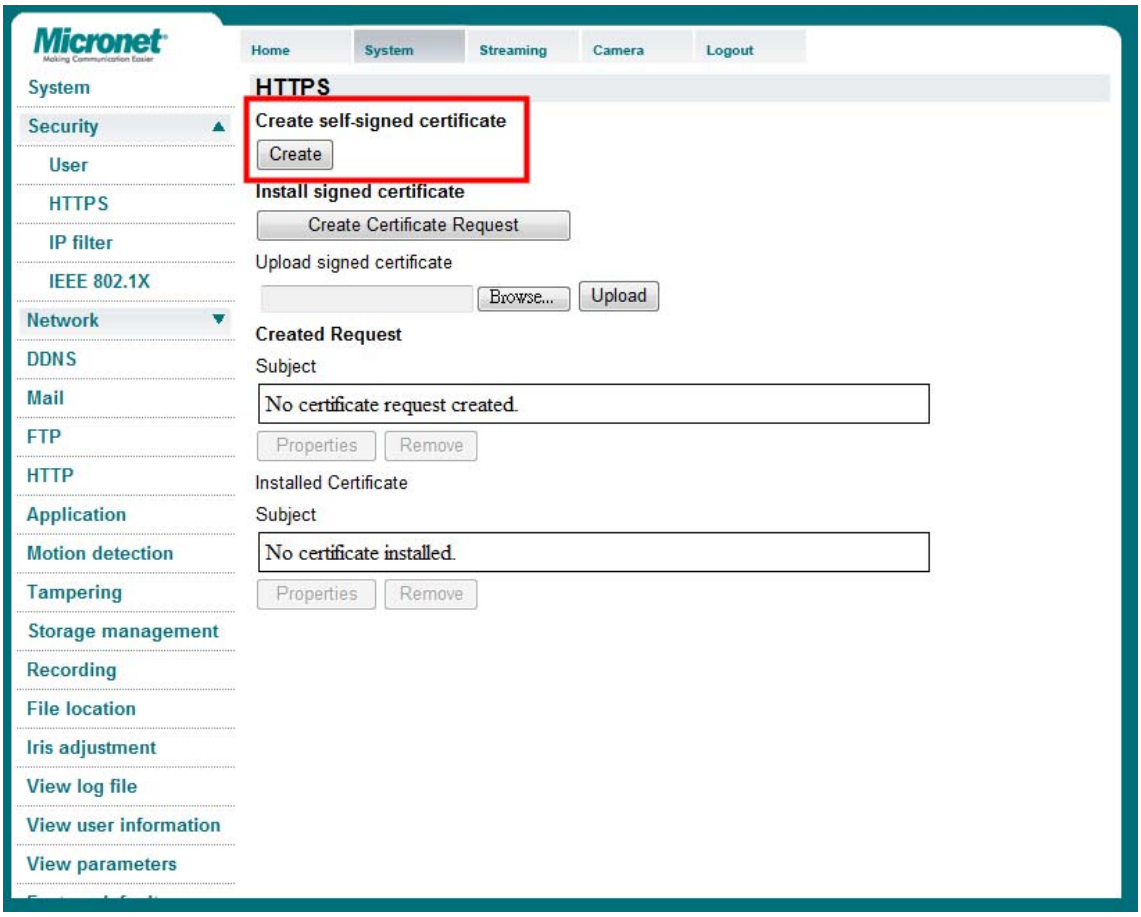
Click the <HTTPS> tab, and the HTTPS setting page is shown as the figure below.



To use HTTPS on the IP Camera, a HTTPS certificate must be installed. The HTTPS certificate can be obtained by either creating and sending a certificate request to a Certificate Authority (CA) or creating a self-signed HTTPS certificate, as described below.

Create Self-signed Certificate

Before a CA-issued certificate is obtained, users can create and install a self-signed certificate first.

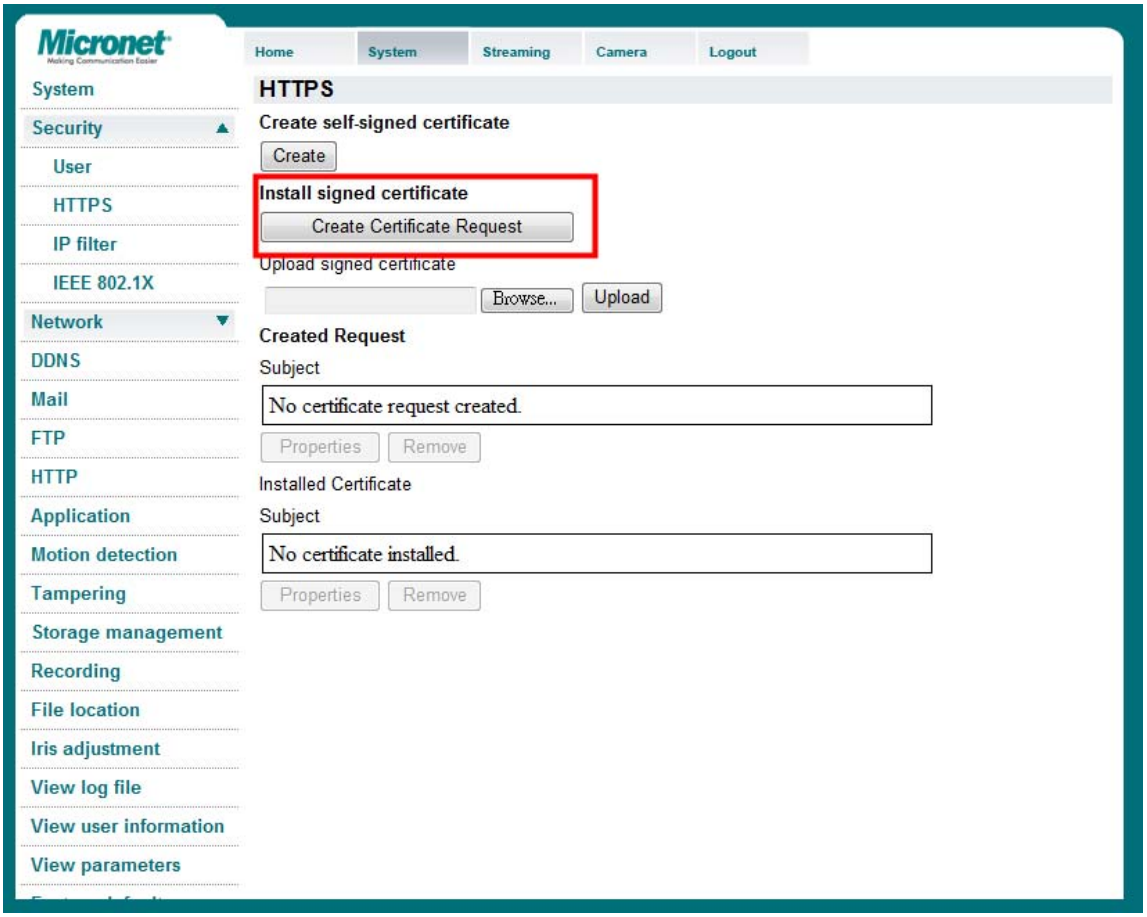


Click <Create> button under “Create self-signed certificate” and provide the requested information to install a self-signed certificate for the IP Camera. Please refer to the last part of this section: Provide the Certificate Information for more details.

NOTE: The self-signed certificate does not provide the same high level of security as when using a CA-issued certificate.

Create Certificate Request

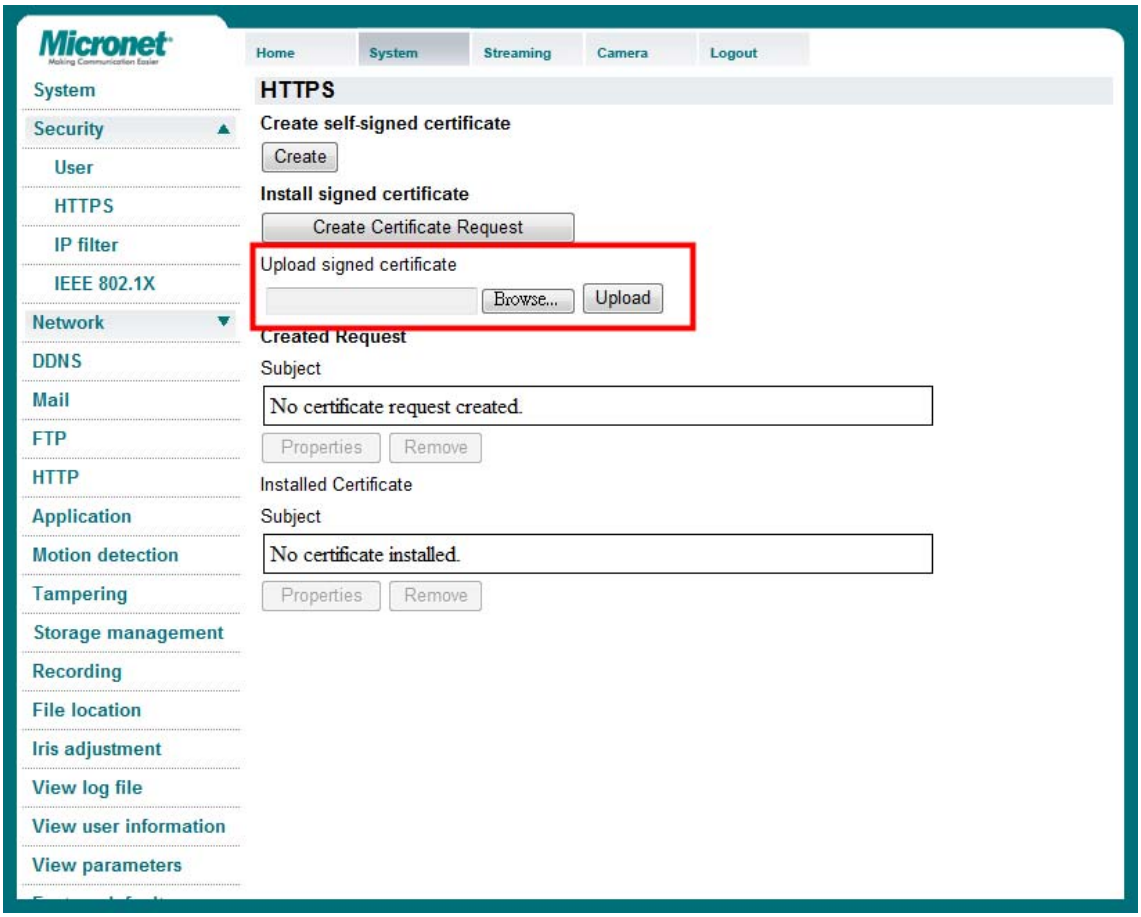
Click the “Create Certificate Request” button to create and submit a certificate request in order to obtain a signed certificate from CA.



Provide the request information in the create dialog. Please refer to the following Provide the Certificate Information for more details.

When the request is complete, the subject of the Created Request will be shown in the field. Click “Properties” below the Subject field, copy the PEM-formatted request and send it to your selected CA.

When the signed certificate is returned, install it by uploading the signed certificate.



Provide the Certificate Information

To create a Self-signed HTTPS Certificate or a Certificate Request to CA, please enter the information as requested:

- **Country**
  Enter a 2-letter combination code to indicate the country the certificate will be used in. For instance, type in “US” to indicate United States.

- **State or province**
  Enter the local administrative region.

- **Locality**
  Enter other geographical information.

- **Organization**
  Enter the name of the organization to which the entity identified in “Common Name” belongs.

- **Organization Unit**
  Enter the name of the organizational unit to which the entity identified in “Common Name” belongs.

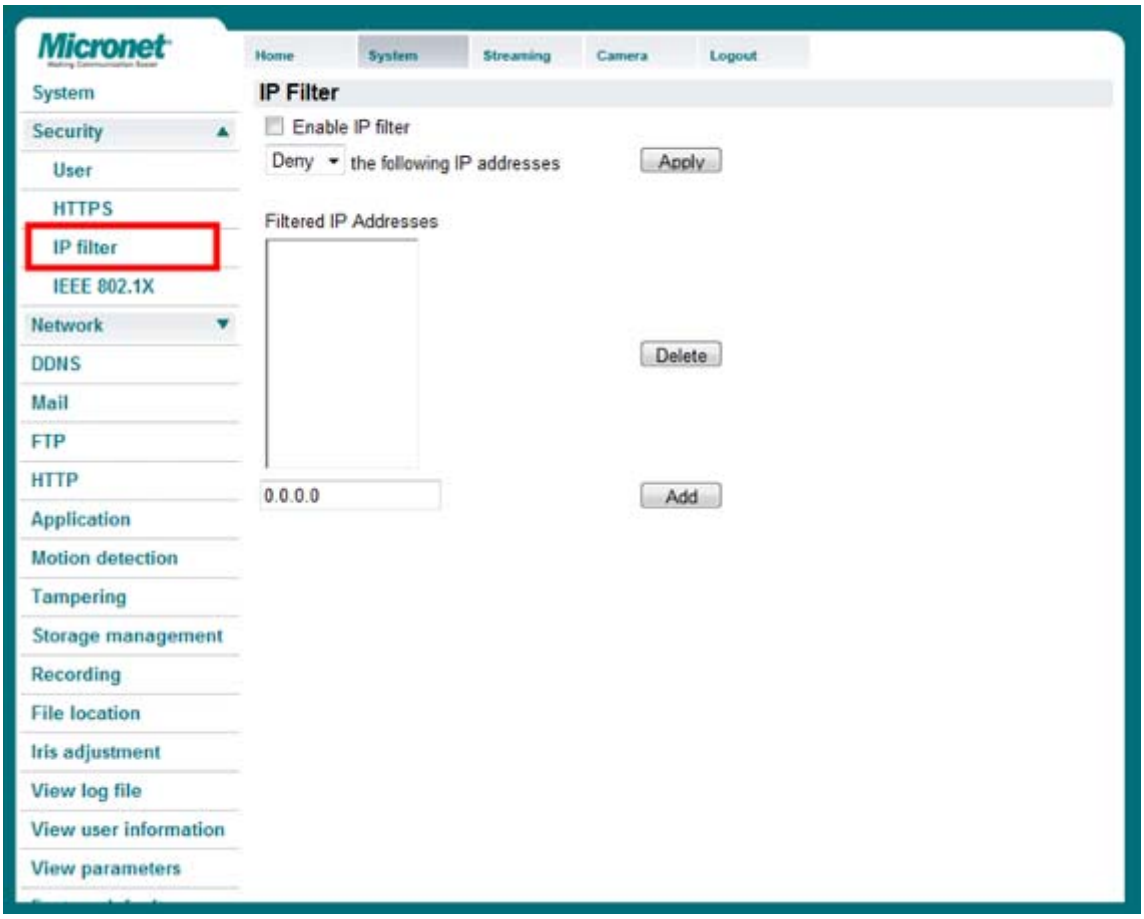
- **Common Name**
  Indicate the name of the person or other entity that the certificate identifies (often used to identify the website).

- **Valid days (Self-signed Certificate Only)**
  Enter the period in days (1~9999) to indicate the valid period of certificate.

Click “OK” to save the Certificate Information after complete.

7.3.2.3 IP Filter

Using the IP filter, access to the IP Camera can be restricted by denying/allowing specific IP addresses.



General

- **Enable IP Filter**
  Check the box to enable the IP Filter function. Once enabled, the listed IP addresses (IPv4) will be allowed/ denied access to the IP Camera.

  Select “Allow” or “Deny” from the drop-down list and click the <Apply> button to determine the IP Filter behavior.

- **Add/ Delete IP Address**
  Input the IP address and click the <Add> button to add a new filtered address.

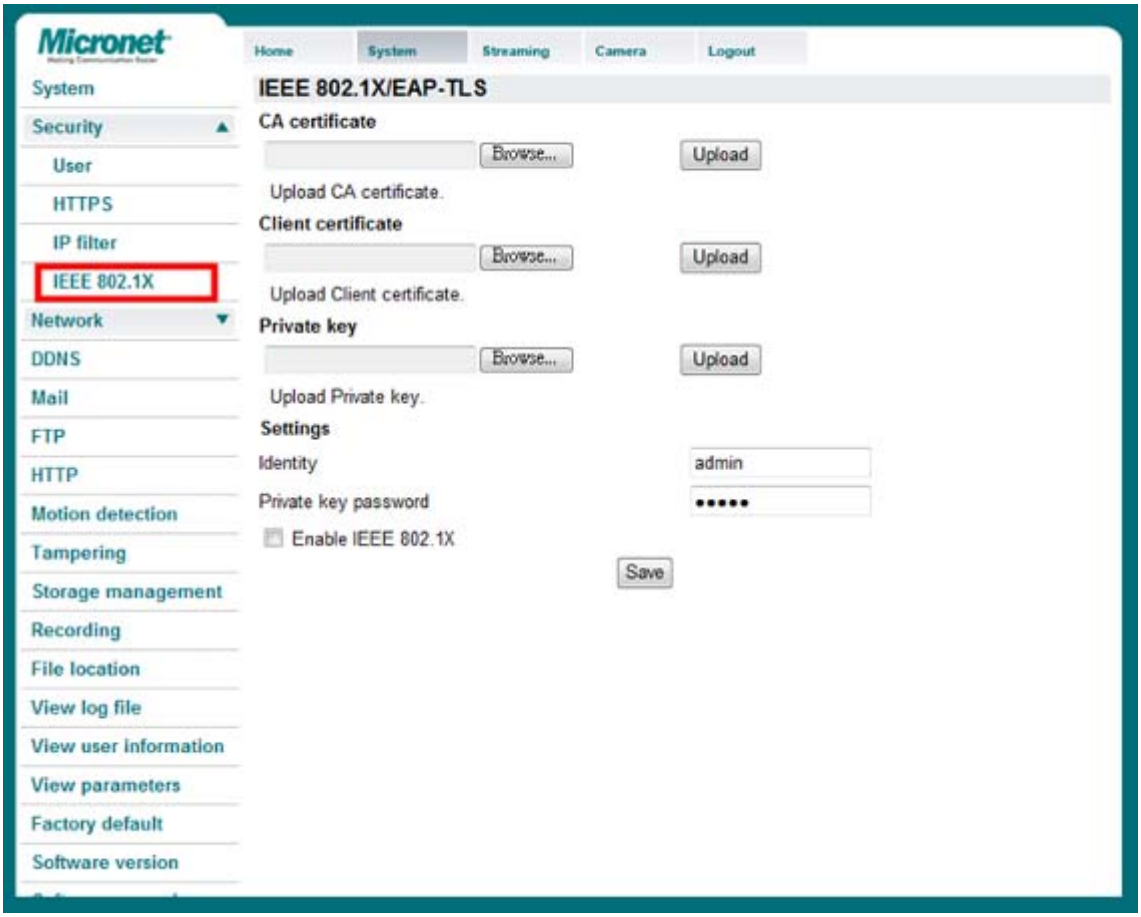
  The Filtered IP Addresses list box shows the currently configured IP addresses. Up to 256 IP address entries may be specified.

  To remove an IP address from the list, please select the IP and then click the <Delete> button.

7.3.2.4 IEEE 802.1X

The IP Camera is allowed to access a network protected by 802.1X/EAPOL (Extensible Authentication Protocol over LAN).

Users need to contact with the network administrator for gaining certificates, user IDs and passwords.



CA Certificate

The CA certificate is created by the Certification Authority for the purpose of validating itself. Upload the certificate for checking the server's identity.

Client Certificate/ Private Key

Upload the Client Certificate and Private Key for authenticating the IP Camera itself.

Settings

- **Identity**
  Enter the user identity associated with the certificate. Up to 16 characters can be used.

- **Private Key Password**
  Enter the password (maximum 16 characters) for your user identity.

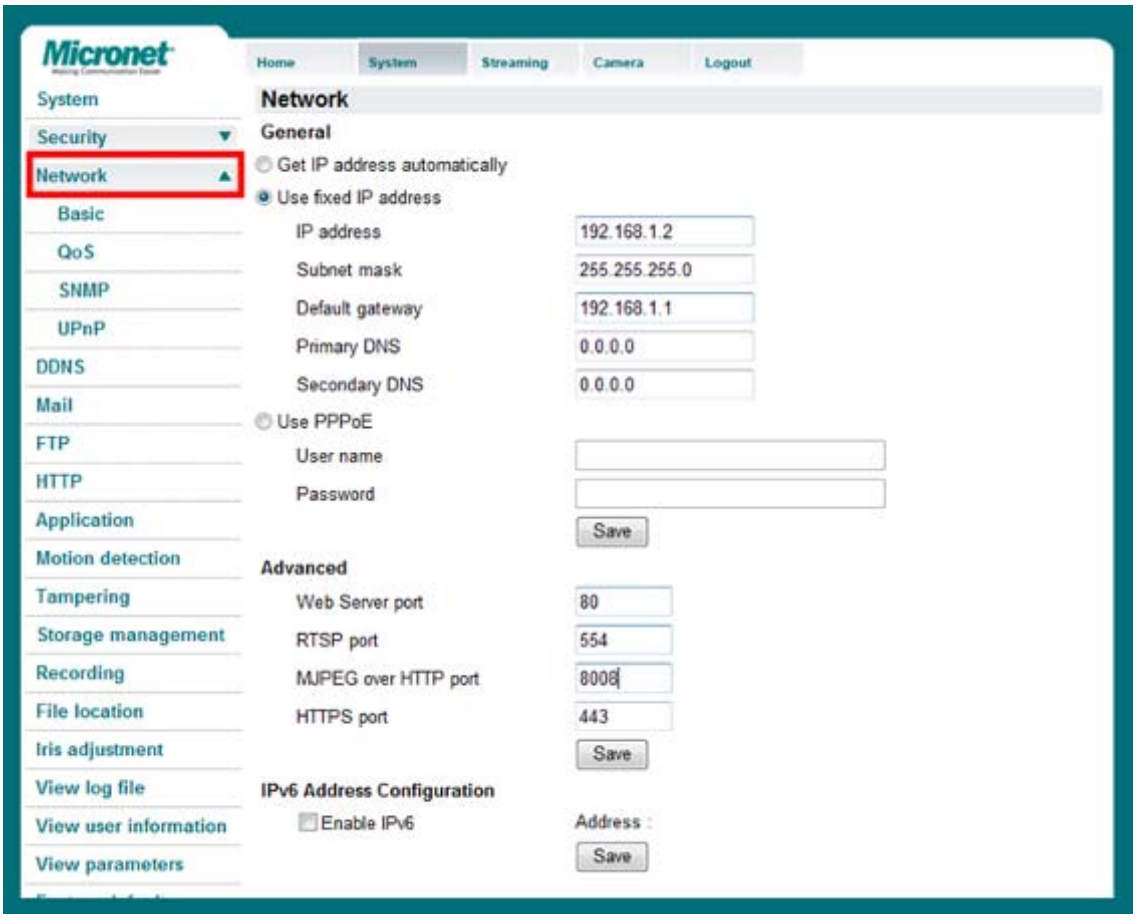
Enable IEEE 802.1X

Check the box to enable IEEE 802.1X.

Click "Save" to save the IEEE 802.1X/ EAP—TLS setting.

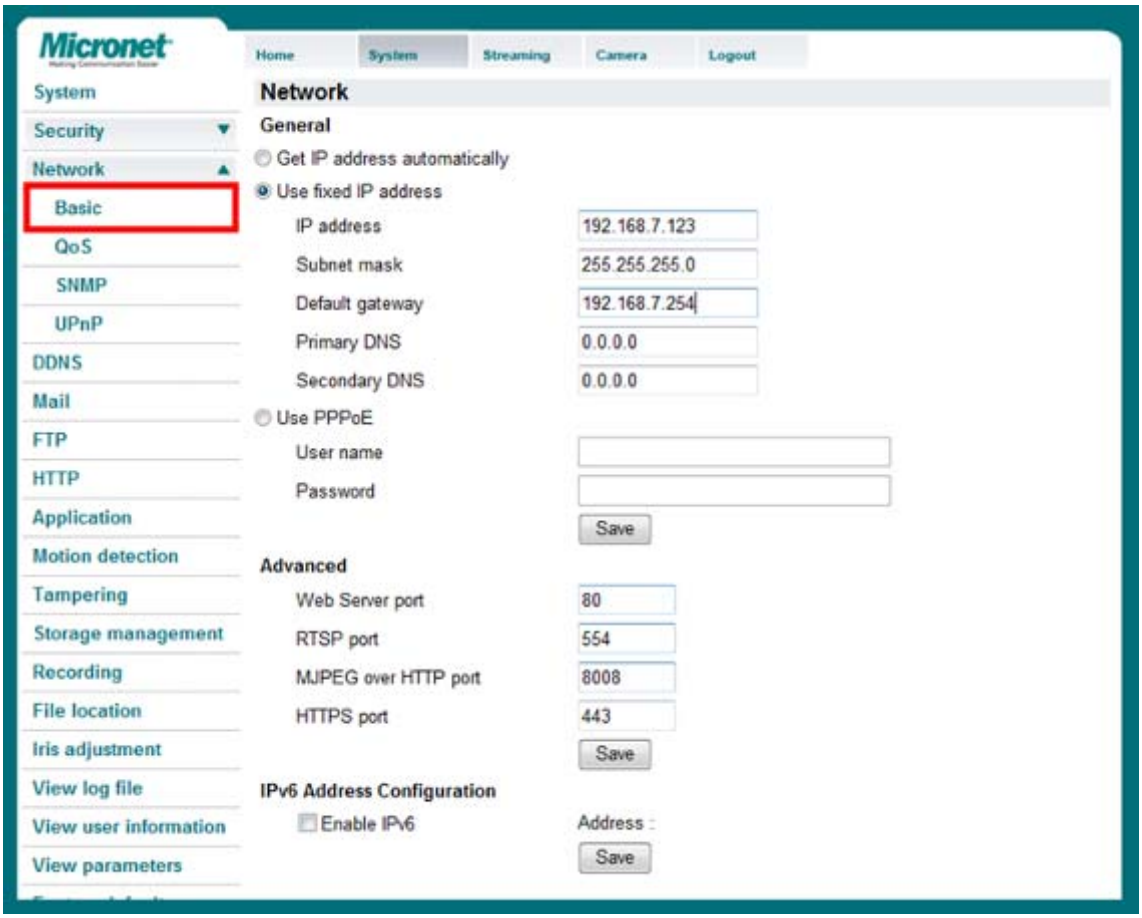
7.3.3 Network

Click the category: < Network>, there will be a drop-down menu with tabs including <Basic>, <QoS>, <SNMP>, and <UPnP>.



7.3.3.1 Basic

Users can choose to connect to the IP Camera with fixed or dynamic (DHCP) IP address. The IP Camera also provides PPPoE (Point-to-Point Protocol over Ethernet) support for users who connect to the network via PPPoE.



Get IP address automatically (DHCP)

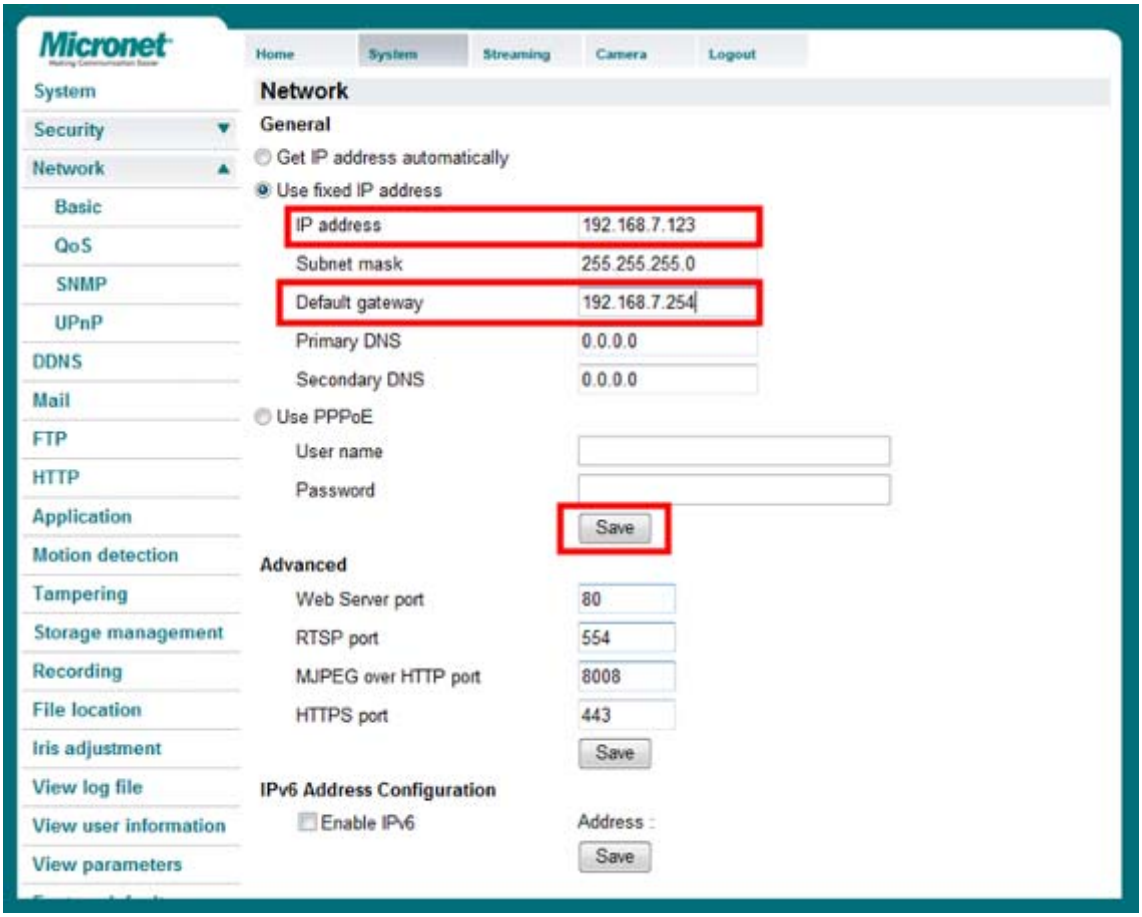
The camera's default setting is "**Use fixed IP address**". Please refer to the previous section 6. Accessing Camera for login with the default IP address.

If select "**Get IP address automatically**", after the IP Camera restarts, users can search it through the installer program: DeviceSearch.exe, which can be found in "DeviceSearch" folder in the supplied CD.

NOTE: Please make the record of the IP Camera's MAC address, which can be found in the label of the camera, for identification in the future.

Use fixed IP address

To setup static IP address, select "**Use fixed IP address**" and move the cursor to the IP address blank (as indicated below) and insert the new IP address, ex. 192.168.7.123; then go to the Default gateway (explained latter) blank and change the setting, ex. 192.168.7.254. Press "Save" to confirm the new setting.



When using static IP address to login to the IP Camera, users can access it either through "IPScanUtility" software (refer to 6. Accessing Camera) or input the IP address in the URL bar and press "Enter".

- **IP address**
  This is necessary for network identification.

- **Subnet mask**
  It is used to determine if the destination is in the same subnet. The default value is "255.255.255.0".

- **Default gateway**
  This is the gateway used to forward frames to destinations in different subnet. Invalid gateway setting will fail the transmission to destinations in different subnet.

- **Primary DNS**
  Primary DNS is the primary domain name server that translates hostnames into IP addresses.

- **Secondary DNS**
  Secondary DNS is a secondary domain name server that backups the primary DNS.

Use PPPoE

For the PPPoE users, enter the PPPoE Username and Password into the fields, and click on the “Save” button to complete the setting.

Advanced

- **Web Server port**
  The default web server port is 80. Once the port is changed, the user must be notified the change for the connection to be successful. For instance, when the Administrator changes the HTTP port of the IP Camera whose IP address is 192.168.1.2 from 80 to 8080, the user must type in the web browser “http://192.168.1.2:8080” instead of “http://192.168.1.2”.

- **RTSP port**
  The default setting of RTSP Port is 554; the setting range is from 1024 to 65535.

- **MJPEG over HTTP port**
  The default setting of MJPEG over HTTP Port is 8008; the setting range is from 1024 to 65535.

- **HTTPS port**
  The default setting of HTTPS Port is 443; the setting range is from 1024 to 65535.

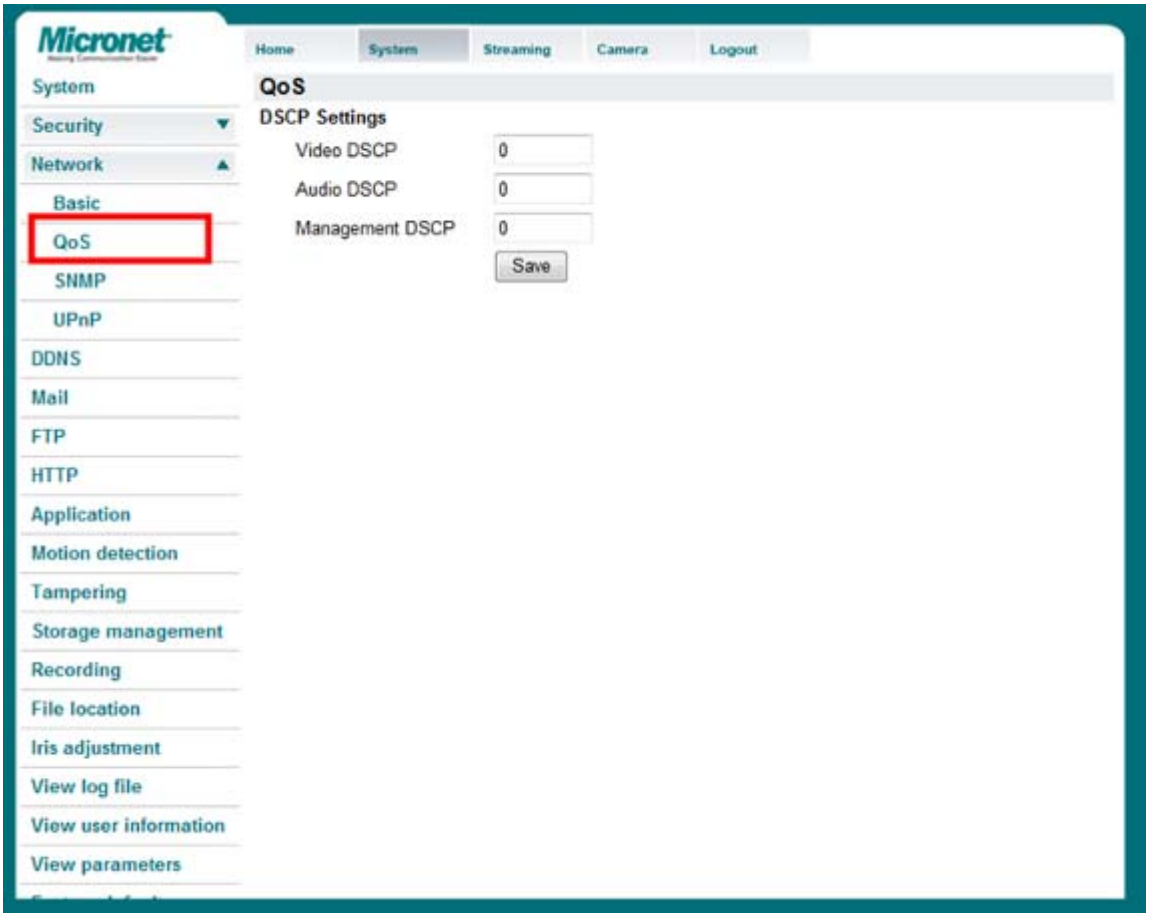
NOTE: Be aware to assign a different port number for each separate service mentioned above.

IPv6 Address Configuration

With IPv6 support, users can use the corresponding IPv6 address for browsing. Enable IPv6 by checking the box and click “Save” to complete the setting.

7.3.3.2 QoS (Quality of Service)

QoS allows providing differentiated service levels for different types of traffic packets, which guarantees delivery of priority services especially when network congestion occurs. Adapting the Differentiated Services (DiffServ) model, traffic flows are classified and marked with DSCP (DiffServ Codepoint) values, and thus receive the corresponding forwarding treatment from DiffServ capable routers.



DSCP Settings

The DSCP value range is from 0 to 63. The default DSCP value is 0, which means DSCP disabled.

The IP Camera uses the following QoS Classes: Video, Audio and Management.

- **Video**
  The class consists of applications such as MJPEG over HTTP, RTP/RTSP and RTSP/HTTP.

- **Audio**
  This setting is only available for the IP Cameras that support audio.

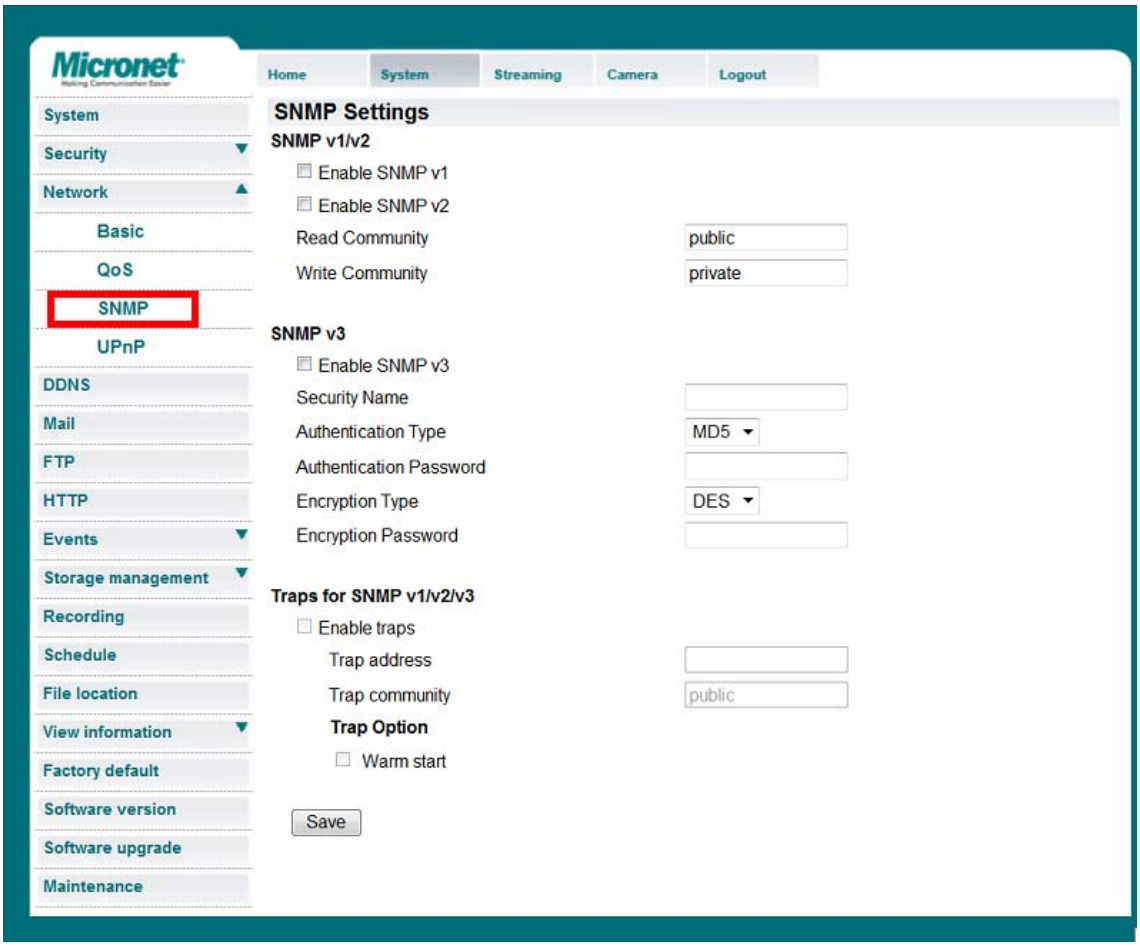
- **Management**
  The class consists of HTTP traffic: Web browsing.

Click the “Save” button when complete.

NOTE: To enable this function, please make sure the switches/routers in the network support QoS.

7.3.3.3 SNMP (Simple Network Management Protocol)

With Simple Network Management Protocol (SNMP) support, the IP Camera can be monitored and managed remotely by the network management system.



SNMP v1/ v2

- **Enable SNMP**
  Select the version of SNMP to use by checking the box.

- **Read Community**
  Specify the community name that has read-only access to all supported SNMP objects. The default value is “public”.

- **Write Community**
  Specify the community name that has read/write access to all supported SNMP objects (except read-only objects). The default value is “write”.

Traps for SNMP v1/ v2

Traps are used by the IP Camera to send massages to a management system for important events or status changes.

- **Enable Traps**
  Check the box to activate trap reporting.

- **Trap address**
  Enter the IP address of the management server.

- **Trap community**
  Enter the community to use when sending a trap message to the management system.

SNMP v3

SNMP v3 supports an enhanced security system that provides protection against unauthorized users and ensures the privacy of the messages. Users will be requested to enter security name, authentication password and encryption password while setting the camera connections in the network management system. With SNMP v3, the messages sent between the cameras and the network management system will be encrypted to ensure privacy.

- **Enable SNMP v3**
  Enable SNMP v3 by checking the box.

- **Security Name**
  The maximum length of the security name is 32 characters.

  NOTE: The valid characters are A-Z, a-z, 0-9, !#$%&'-.@^_~.

- **Authentication Type**
  There are two authentication types available: MD5 and SHA. Select SHA for a higher security level.

- **Authentication Password**
  The authentication password must be 8 characters or more. The input characters / numbers will be displayed as dots for security purposes.

  NOTE: The valid characters are A-Z, a-z, 0-9, !#$%&'-.@^_~.

- **Encryption Type**
  There are two encryption types available: DES and AES. Select AES for a higher security level.

- **Encryption Password**
  The minimum length of the encryption password is 8 characters and the maximum length is 512 characters. The input characters / numbers will be displayed as dots for security purposes. The encryption password can also be left blank. However, the messages will not be encrypted to protect privacy.

  NOTE: The valid characters are A-Z, a-z, 0-9, !#$%&'-.@^_~.

Traps for SNMP v1 / v2 / v3

Traps are used by the IP Camera to send massages to a management system for important events or status changes.

- **Enable Traps**
  Check the box to activate trap reporting.

- **Trap address**
  Enter the IP address of the management server.

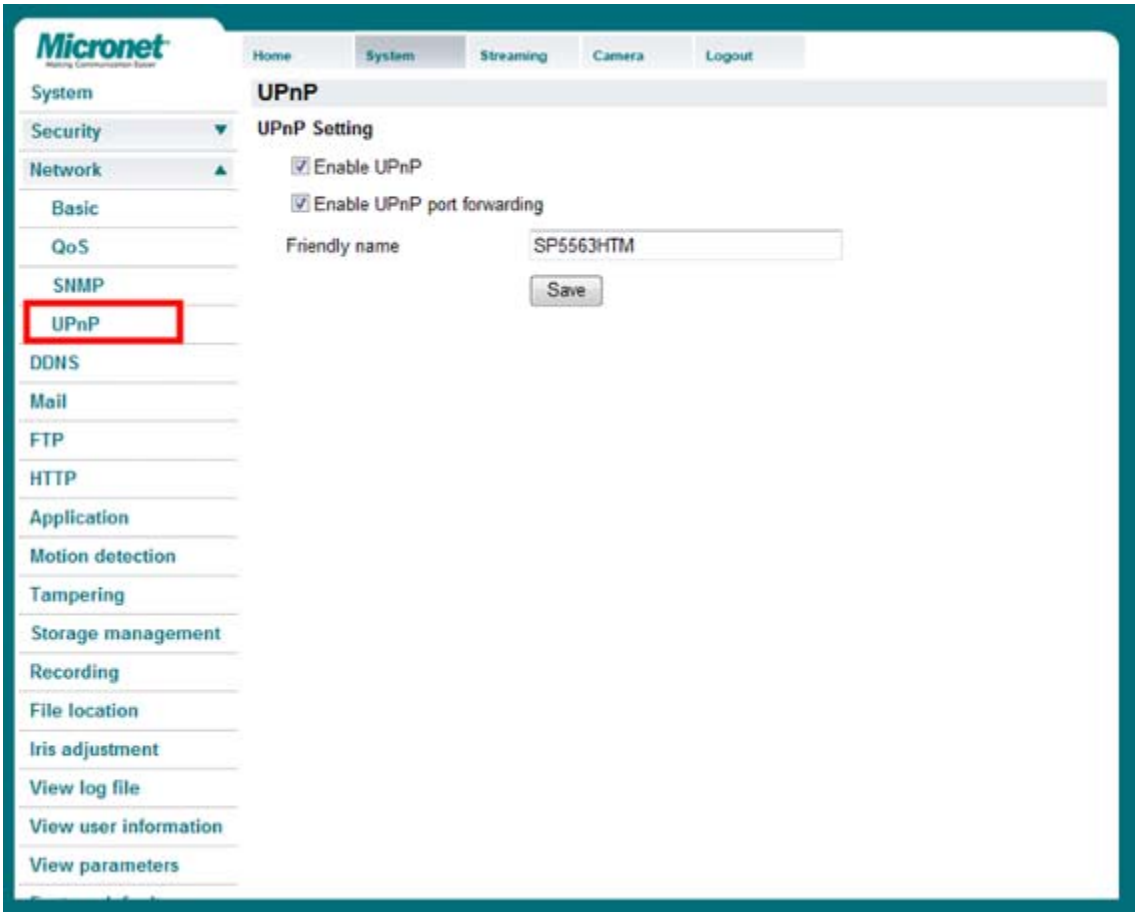
- **Trap community**
  Enter the community to use when sending a trap message to the management system.

Trap Option

- **Warm Start**
  A Warm Start SNMP trap signifies that the SNMP device, i.e. IP Camera, performs software reload.

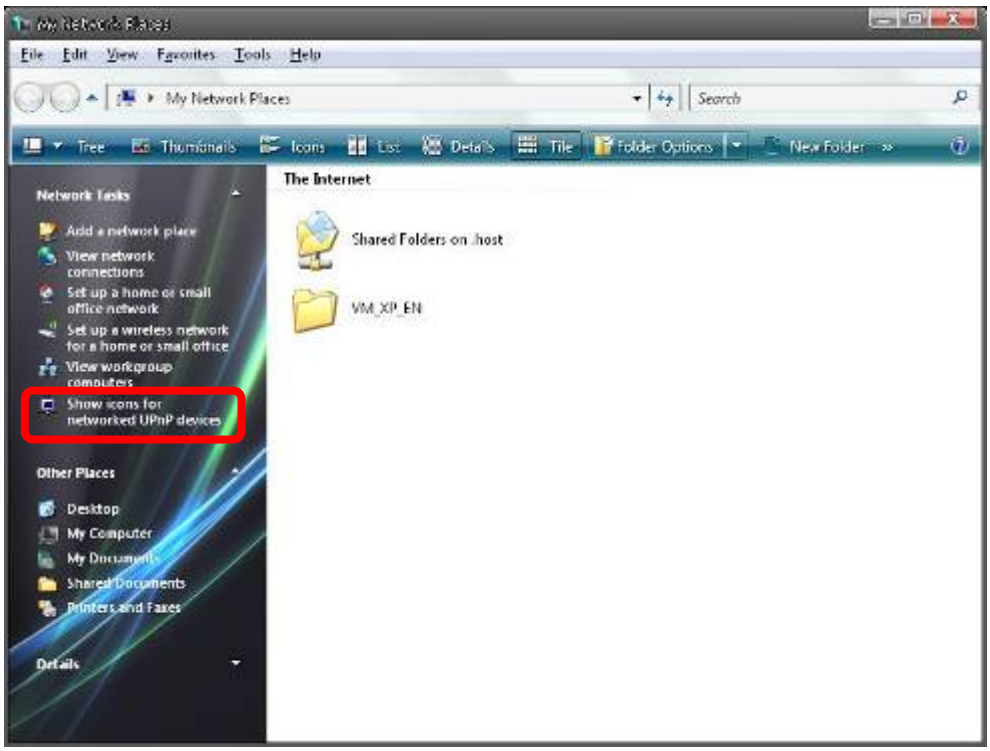
Click on <Save> when finished.

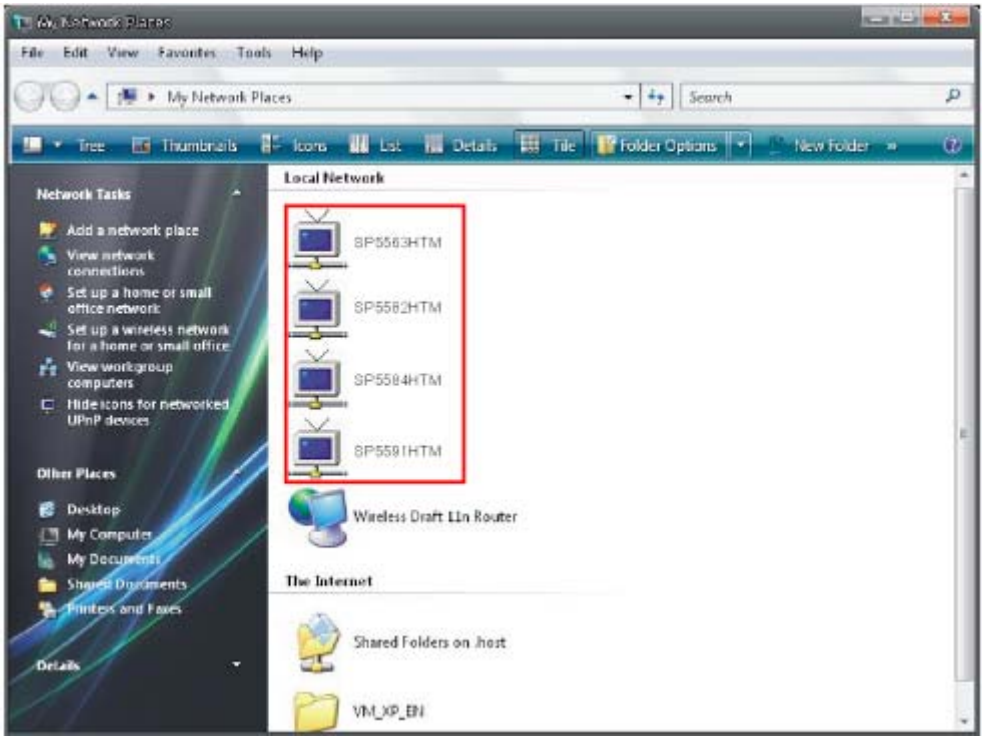
7.3.3.4 UPnP



UPnP Setting

- **Enable UPnP**
  When the UPnP is enabled, whenever the IP Camera is presented to the LAN, the icon of the connected IP Cameras will appear in My Network Places to allow for direct access as shown below.





NOTE: To enable this function, please make sure the UPnP component is installed on your computer. Please refer to Appendix E: Install UPnP components for UPnP component installation procedure.

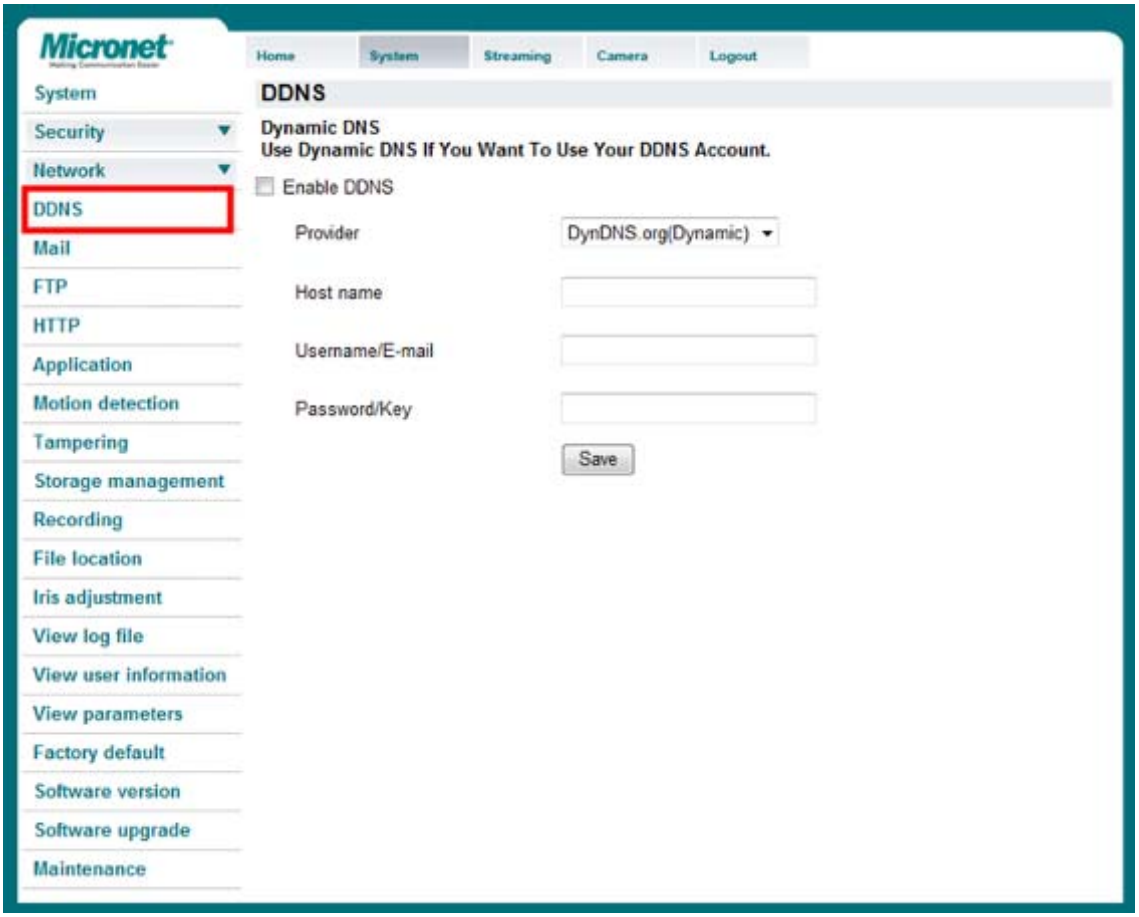
- **Enable UPnP port forwarding**
  When the UPnP port forwarding is enabled, the IP Camera is allowed to open the web server port on the router automatically.

  NOTE: To enable this function, please make sure that your router supports UPnP and it is activated

- **Friendly name**
  Set the name for the IP Camera for identity.

7.3.4 DDNS

Dynamic Domain Name System (DDNS) allows a host name to be constantly synchronized with a dynamic IP address. In other words, it allows those using a dynamic IP address to be associated to a static domain name so others can connect to it by name.



Enable DDNS

Check the item to enable DDNS.

Provider

Select one DDNS host from the provider list.

Host name

Enter the registered domain name in the field.

Username/E-mail

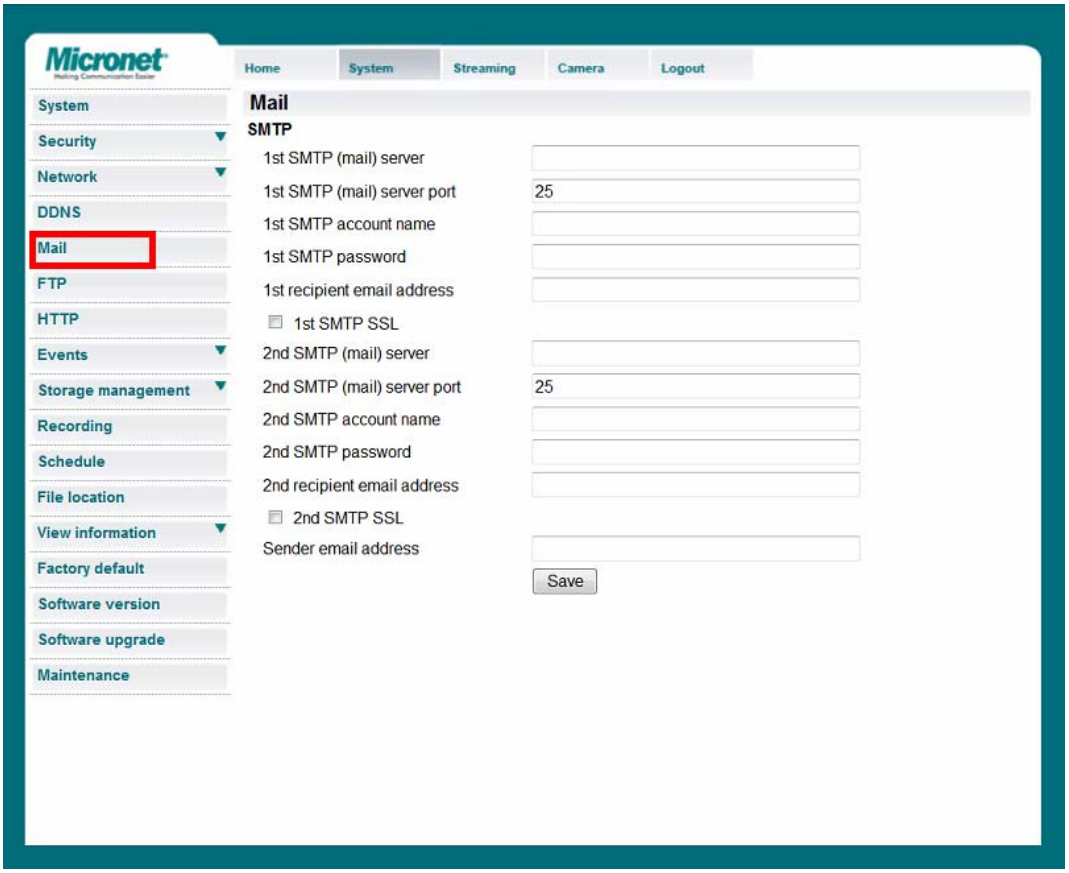
Enter the username or e-mail required by the DDNS provider for authentication.

Password/Key

Enter the password or key required by the DDNS provider for authentication.

7.3.5 Mail

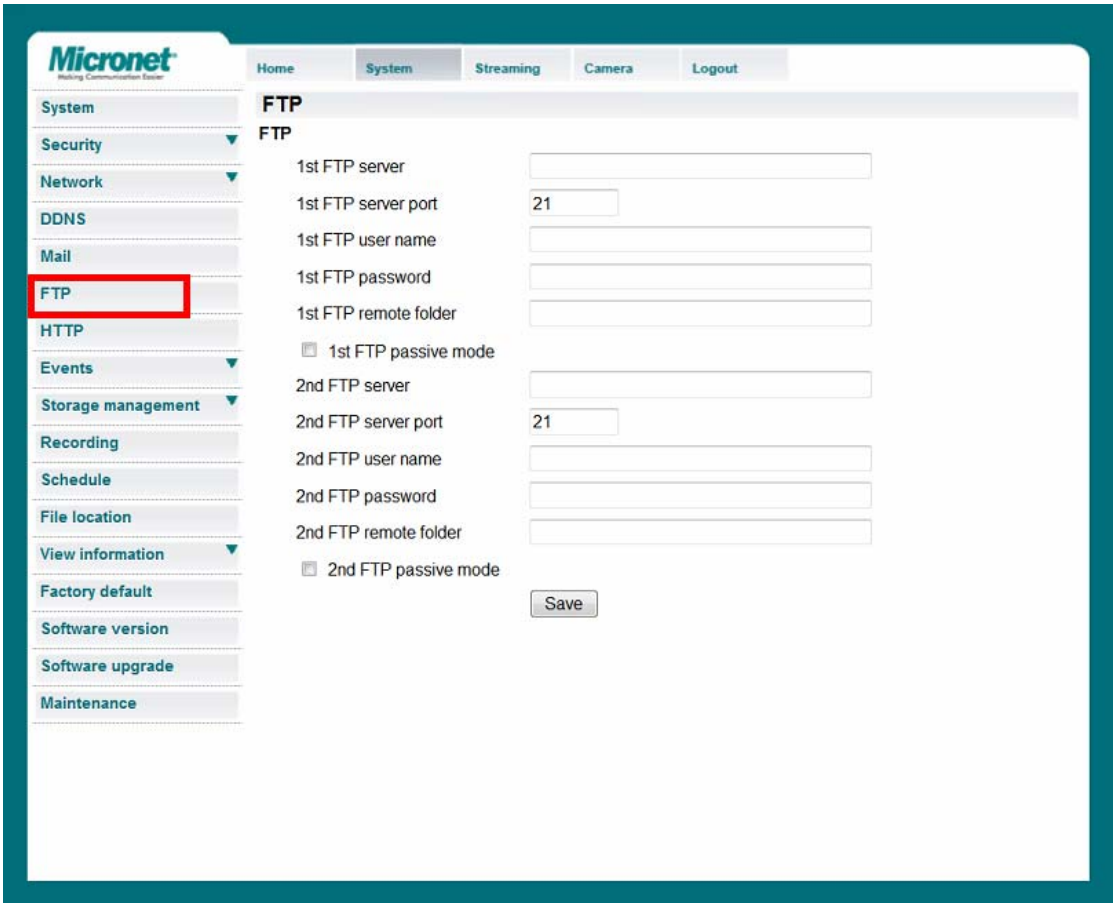
The Administrator can send an e-mail via Simple Mail Transfer Protocol (SMTP) when motion is detected. SMTP is a protocol for sending e-mail messages between servers. SMTP is a relatively simple, text-based protocol, where one or more recipients of a message are specified and the message text is transferred. The configuration page is shown as follows:



Two sets of SMTP can be configured. Each set includes SMTP Server, Account Name, Password and E-mail Address settings. For SMTP server, contact your network service provider for more specific information.

7.3.6 FTP

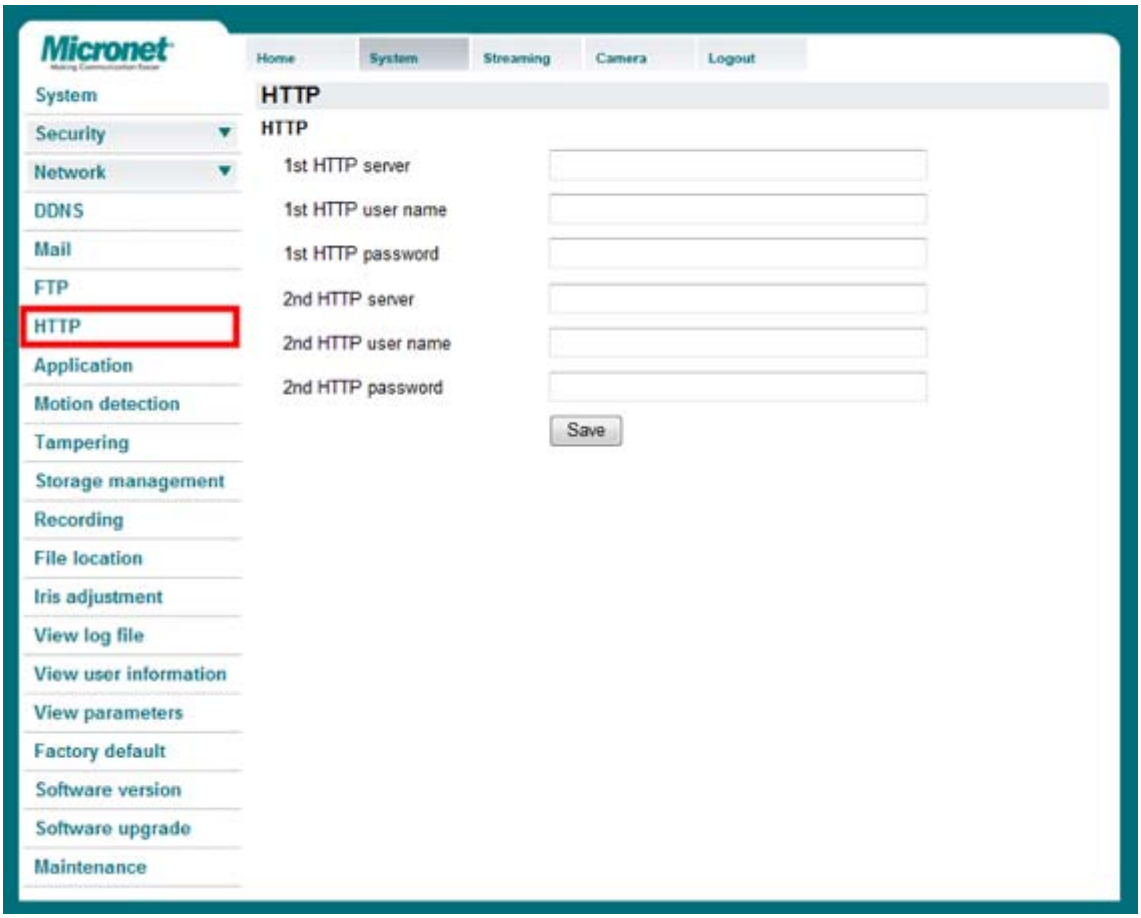
The Administrator can set as sending alarm message to a specific File Transfer Protocol (FTP) site when motion is detected. Users can assign alarm message to up to two FTP sites. The FTP setting page is shown below. Enter the FTP details, which include server, server port, user name, password and remote folder, in the fields. Press “Save” when finished.



7.3.7 HTTP

A HTTP Notification server can listen for notification messages from IP Cameras by triggered events. The HTTP setting page is shown below. Enter the HTTP details, which include server name (for instance, http://192.168.1.2/admin.php), user name, and password in the fields. <Alarm> triggered and <Motion Detection> notifications can be sent to the specified <HTTP> server.

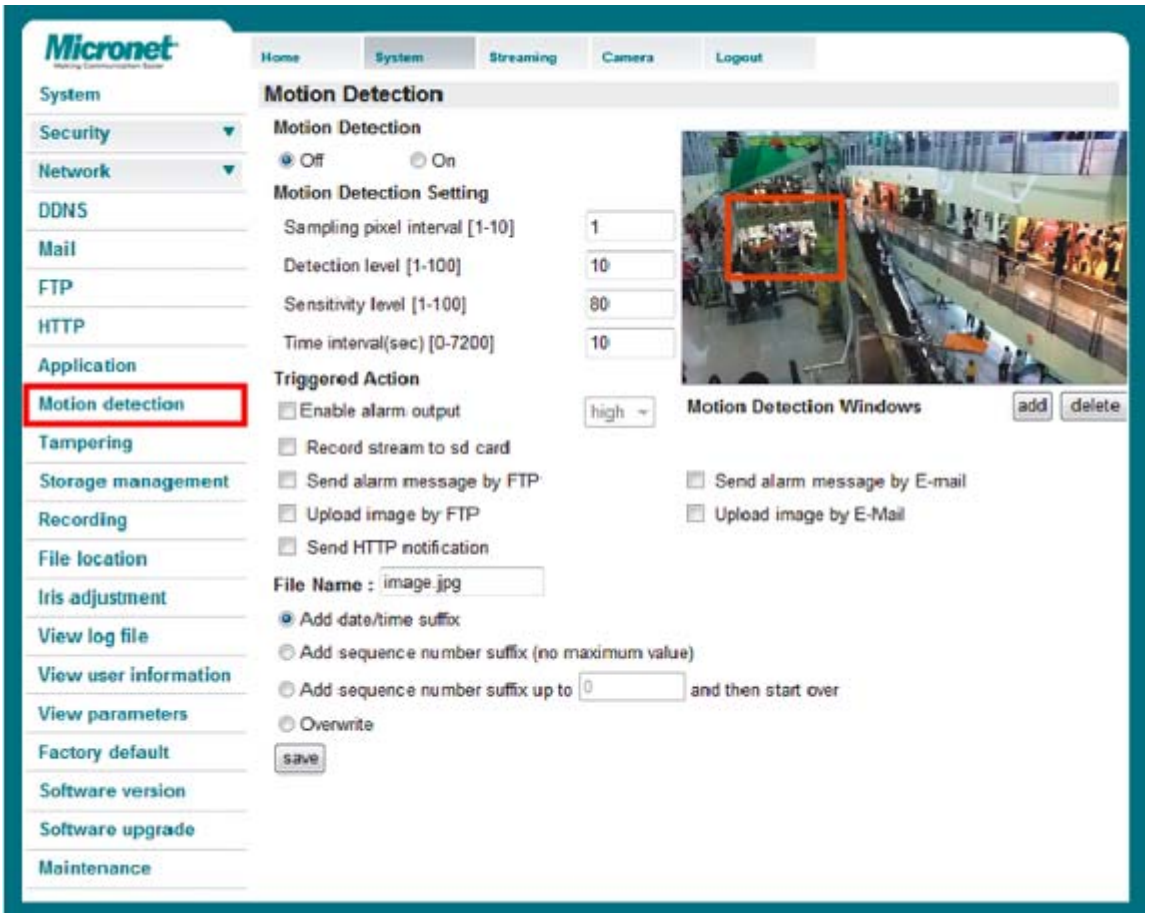
Click “Save” when finished.



Please refer to: 7.3.8 Application: Send HTTP notification/ 7.3.9 Motion Detection for HTTP Notification settings.

7.3.8 Motion Detection

Motion Detection function allows detecting suspicious motion and triggering alarms when motion volume in the detected area reaches/exceeds the determined sensitivity threshold value.

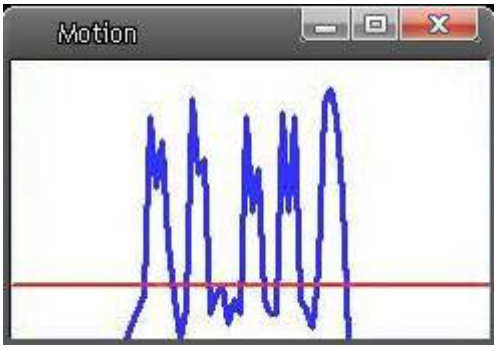


In the Motion Detection setting page, there is a frame (**Motion Detection Window**) displayed on the Live View Pane. The Motion Detection Window is for defining the motion detection area. To change the size of the Motion Detection Window, move the mouse cursor to the edge of the frame and draw it outward/inward. Moving the mouse to the center of the frame can shift the frame to the intended location.

Up 10 Motion Detection Windows can be set. Press the “add” button under the Live View Pane to add a Motion Detection Window. To cancel a Motion Detection Window, move the mouse cursor to the selected Window, and click on the “delete” button.

If Motion Detection function is activated, the pop-off window (Motion) with indication of motion will be shown.

When motion is detected, the signals will be displayed on the Motion window as shown below.



Detailed settings of Motion Detection are described as follows:

Motion Detection

You will be able to turn on/off Motion Detection in System section. Default setting is Off.

Motion Detection Setting

Users could adjust various parameters of Motion Detection in this section.

- **Sampling pixel interval [1-100]:**
  The default value is 10, which means system will take one sampling pixel for every 10 pixel.

- **Detection level [1-100]:**
  The default level is 10. The item is to set detection level for each sampling pixel; the smaller the value, the more sensitive it is.

- **Sensitivity level [1-100]:**
  The default level is 80, which means if 20% or more sampling pixels are detected differently, system will detect motion. The bigger the value, the more sensitive it is. Meanwhile, when the value is bigger, the red horizontal line in the motion indication window will be lower accordingly.

- **Time interval (sec) [0-7200]:**
  The default interval is 10. The value is the interval between each detected motion.

Triggered Action (Multi-option)

The Administrator can specify alarm actions that will take when motion is detected. All options are listed as follows:

- **Enable Alarm Output**
  Check the item and select the predefined type of alarm output to enable alarm relay output when motion is detected.

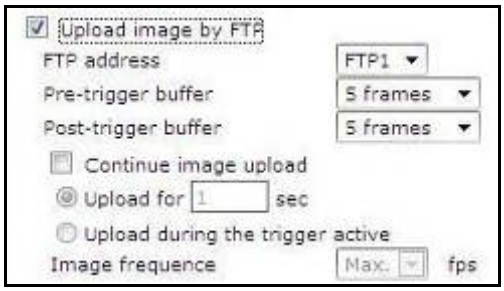
- **Record stream to SD Card**
  Select this item, and the Motion Detection recording will be stored in Micro SD/ SDHC card when motion is detected.

  NOTE: Please make sure the local recording (with Micro SD/SDHC card) is activated so that this function can be implemented. Refer to 7.3.12 Recording for further details.

- **Send Alarm Message by FTP/E-Mail**
  The Administrator can select whether to send an alarm message by FTP and/or E-Mail when motion is detected.

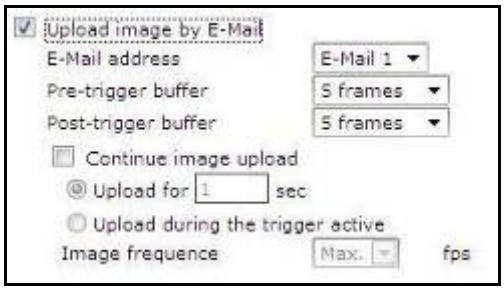
- **Upload Image by FTP**

  Select this item and the Administrator can assign a FTP site and configure various parameters as shown in the figure below. When motion is detected, event images will be uploaded to the appointed FTP site.



- **Upload Image by E-Mail**

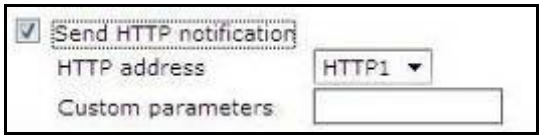
  Select this item, and the Administrator can assign an e-mail address and configure various parameters as shown in the figure below. When motion is detected, event images will be sent to the appointed e-mail address.



NOTE: Make sure SMTP or FTP configuration has been completed. Refer to 7.3.5 Mail and 7.3.6 FTP for further details.

- **Send HTTP notification**
  Check this item, select the destination HTTP address, and specify the parameters for event notifications by <Motion Detection> triggered. When an alarm is triggered, the notification can be sent to the specified HTTP server.

  For instance, if the custom parameter is set as" action=1&group=2", and the HTTP server name is" http://192.168.1.2/admin.php", the notification will be sent to HTTP server as" http://192.168.1.2/admin.php?action=1&group=2" when alarm is triggered.



File Name

The uploaded image's filename format can be set in this section. Please select the one that meets your requirements.

Save

Click the Save button to save all the Motion Detection settings mentioned above.

7.3.9 Network Failure Detection

Network Failure Detection allows the IP Camera to ping another IP device (e.g. NVR, VSS, Video Server, etc.) within the network periodically and generates some actions in case of network failure occurs, for instance, a Video Server is somehow disconnected.

Being capable of implementing local recording (through Micro SD card) when network failure happens, the IP Camera could be a backup recording device for the surveillance system.

Detection Switch
You will be able to turn on/off Network Failure Detection in System section. Default setting is Off.

Detection Type
Input the IP device address and the period of ping time to ping. The ping time setting range is from 1 to 99 minutes.

Triggered Action (Multi-option)
The Administrator can specify alarm actions that will take when network failure is detected. All options are listed as follows:

Enable Alarm Output
Select the item to enable alarm relay output.

Record Stream to SD Card
Select the item and the alarm-triggered recording will be saved into your Micro SD card.

Pre-trigger buffer recording function allows users to check what happened to cause the trigger. The pre-trigger buffer time range is from 1 to 3 seconds. Select <Upload for __ sec> to set the recording duration after alarm is triggered. The setting range is from 1 to 99999 seconds. Select <Upload during the trigger active> to record the triggered video until the trigger is off.

NOTE: Please make sure the local recording (with Micro SD/ SDHC card) is activated so that this function can be implemented. Refer to Recording for further details.

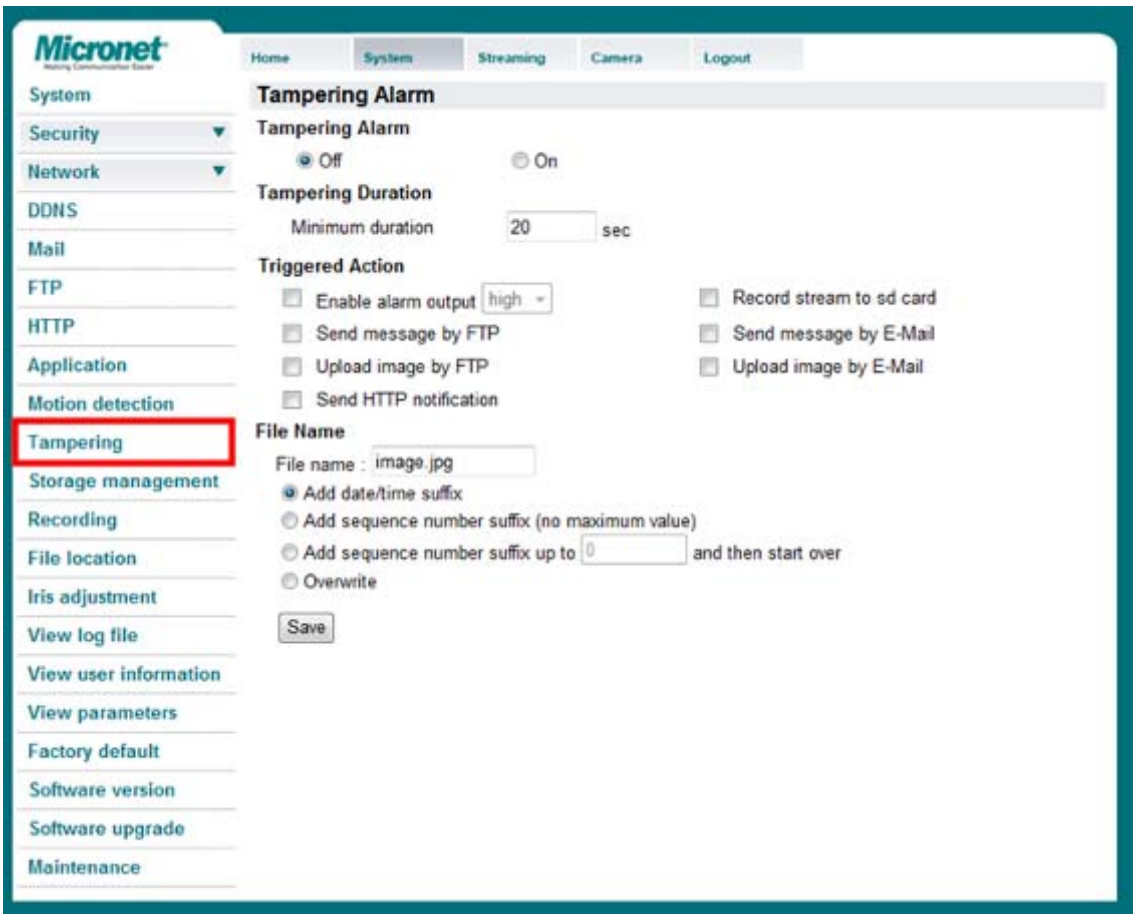
Send Alarm Message by FTP/E-Mail
The Administrator can select whether to send an alarm message by FTP and/or E-Mail when an alarm is triggered.

Save
Click on the <Save> button to save all the settings mentioned above.

7.3.10 Tampering

Tempering Alarm function helps the IP Camera against tampering such as deliberate redirection, blocking, paint spray, and lens cover, etc through video

analysis and reaction to such events by sending out notifications or uploading snapshots to the specified destination(s).



Detection of camera tampering is achieved by measuring the differences between the older frames of video (which are stored in buffers) and more recent frames.

Tampering Alarm

You will be able to turn on/off Tampering Alarm function in Tampering Alarm setting page. The default setting is Off.

Tampering Duration

Minimum Tampering Duration is the time for video analysis to determine whether camera tampering has occurred. Minimum Duration could also be interpreted as defining the Tampering threshold; longer duration represents higher threshold. Settable Tampering Duration time range is from 10 to 3600 seconds.

Triggered Action (Multi-option)

The Administrator can specify alarm actions that will take when tampering is detected. All options are listed as follows:

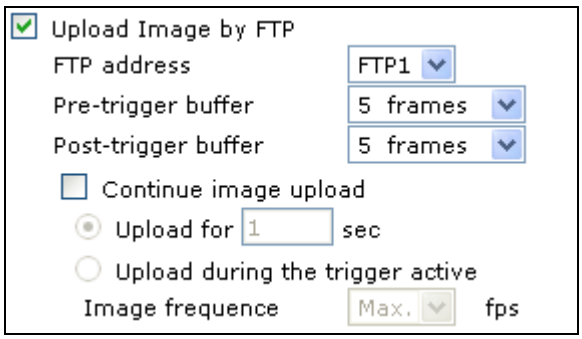
- **Enable Alarm Output**
  Check the item and select the predefined type of alarm output to enable alarm relay output when tampering is detected.

- **Record stream to SD Card**
  Select this item and the Tampering Alarm recording will be stored in Micro SD/ SDHC card when tampering is detected.

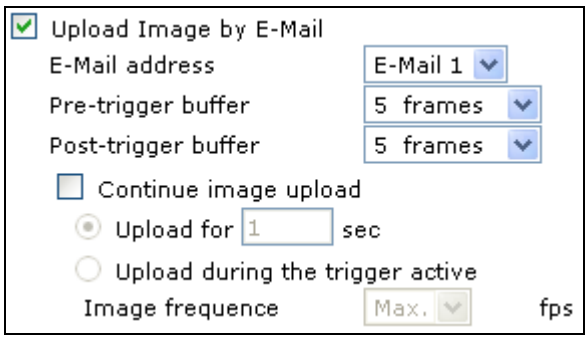
  NOTE: Please make sure the local recording (with Micro SD/ SDHC card) is activated so that this function can be implemented. Refer to 7.3.12 Recording for further details.

- **Send Alarm Message by FTP/E-Mail**
  The Administrator can select whether to send an alarm message by FTP and/or E-Mail when tampering is detected.

- **Upload Image by FTP**
  Select this item and the Administrator can assign a FTP site and configure various parameters as shown in the figure below. When tampering is detected, event images will be uploaded to the appointed FTP site.



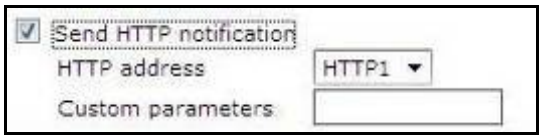
- **Upload Image by E-Mail**
  Select this item and the Administrator can assign an e-mail address and configure various parameters as shown in the figure below. When tampering is detected, event images will be sent to the appointed e-mail address.



NOTE: Make sure SMTP or FTP configuration has been completed. Refer to 7.3.5 Mail and 7.3.6 FTP for further details.

- **Send HTTP notification**
  Check this item, select the destination HTTP address, and specify the parameters for HTTP notifications. When the Tampering Alarm is triggered, the HTTP notifications can be sent to the specified HTTP server.

  For instance, if the custom parameter is set as" action=1&group=2", and the HTTP server name is" http://192.168.0.1/admin.php", the notification will be sent to HTTP server as" http://192.168.0.1/admin.php?action=1&group=2" when alarm is triggered.



File Name

The uploaded image's filename format can be set in this section. Please select the one that meets your requirements.

Save

Click the Save button to save all the Tampering Alarm settings mentioned above.

7.3.11 Periodical Event

The Periodical Event setting can be found under this path: System> Periodical Event.

With Periodical Event setting, users can set the camera to upload images periodically to a FTP site or an E-mail address. For example, if the time interval is set to 60 seconds, the camera will upload images to the assigned FTP site or E-mail address every 60 seconds. The images to be uploaded are the images before and after the triggered moment. Users can define how many images to be uploaded in the <Triggered Action> section of this setting page.

Periodical Event
The default setting for the Periodical Event function is <Off>. Enable the function by selecting <On>.

Time Interval
The default value of the time interval is 60 seconds. The setting range of the time interval is from 60 to 3600 seconds

Triggered Action
Upload Image by FTP
Select this item and the administrator can assign a FTP site and configure various parameters.
The <Pre-trigger buffer> function can define how many images to be uploaded before the triggered moment. The <Post-trigger buffer> function can define how many images to be uploaded after the triggered moment.

NOTE: Normally the setting range of the <Pre-trigger buffer> is 1 to 20. However, the setting range will change accordingly if the frame rate of MJPEG on the <Video Frame Rate> setting page is 6 or smaller.

NOTE: Make sure FTP configuration has been completed. Refer to the FTP section of this chapter for further details.

Upload Image by E-Mail
Select this item and the administrator can assign an e-mail address and configure various parameters. Images will be uploaded to the appointed e-mail address periodically.

The <Pre-trigger buffer> function can define how many images to be uploaded before the triggered moment. The <Post-trigger buffer> function can define how many images to be uploaded after the triggered moment.

NOTE: Normally the setting range of the <Pre-trigger buffer> is 1 to 20. However, the setting range will change accordingly if the frame rate of MJPEG on the <Video Frame Rate> setting page is 6 or smaller.

NOTE: Make sure SMTP configuration has been completed. Refer to the Mail section of this chapter for further details.

File Name
Enter a file name in the blank, ex. image.jpg. The uploaded image's file name format can be set in this section. Please select the one that meets the requirements.

Add date/time suffix
File name: imageYYMMDD_HHNNSS_XX.jpg
Y: Year, M: Month, D: Day
H: Hour, N: Minute, S: Second
X: Sequence Number

Add sequence number suffix (no maximum value)
File name: imageXXXXXXX.jpg
X: Sequence Number

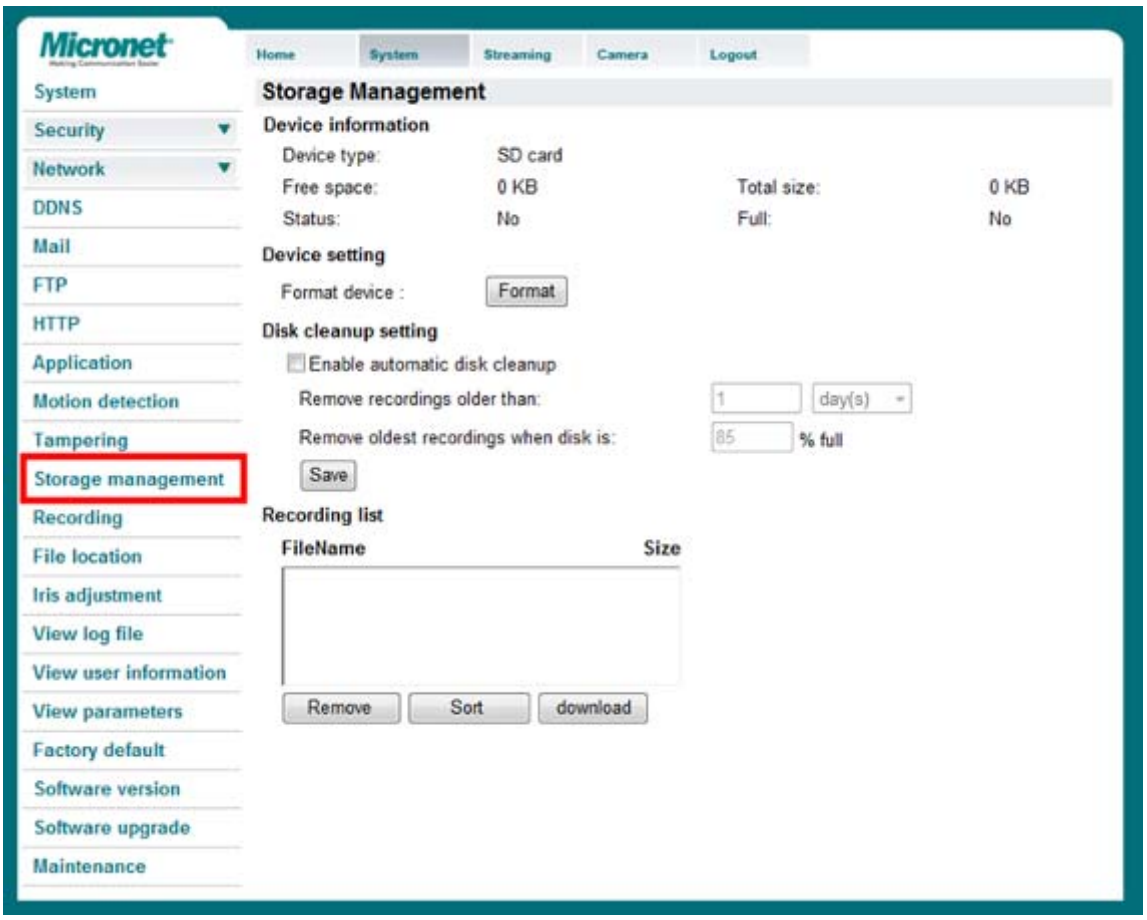
7.3.12 Storage Management

Users can implement local recording to the Micro SD/SDHC card up to 32GB. This page shows the capacity information of the Micro SD card and a recording list with all the recording files saved on the memory card. Users can also format the SD card and implement automatic recording cleanup through the setting page.

To implement Micro SD card recording, please go to the “Recording” page (refer to 7.3.12 Recording) for activation.

NOTE: Please format the Micro SD/SDHC card when using for the first time. Formatting will also be required when a memory card already

being used on one camera and later transferred to another camera with different software platform.



Device information

When users insert the Micro SD/SDHC card, the card information such as the memory capacity and status will be shown at Device Information section.

For the memory card being successfully installed, its status shall be shown at “Device information” section in the Storage Management page.

Device setting

Press the “Format” button to format the memory card.

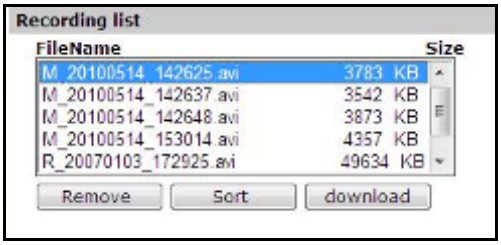
Disk cleanup setting

Users can enable automatic recordings cleanup by specifying the time and storage limits.

Recording List

Each video file on the Micro SD/SDHC card will be listed in the Recording list as shown below. The maximum file size is 60 MB (60 MB per file).

When the recording mode is set as “Always” (consecutive recording) and the Micro SD/ SDHC card recording is also allowed to be enabled by events triggered, once events occur, the system will immediately implement events recording to the memory card. Then the IP Camera will return to the regular recording mode after events recording.



- **Remove**
  To remove a file, select the file first, and then press the “Remove” button.

- **Sort**
  Press the “Sort” button, and the files in the Recording list will be listed in name and date order.

NOTE: The capital letter A/M/R appears in the very beginning of name denotes the sort of the recording: A stands for Alarm; M stands for Motion; R stands for regular recording.

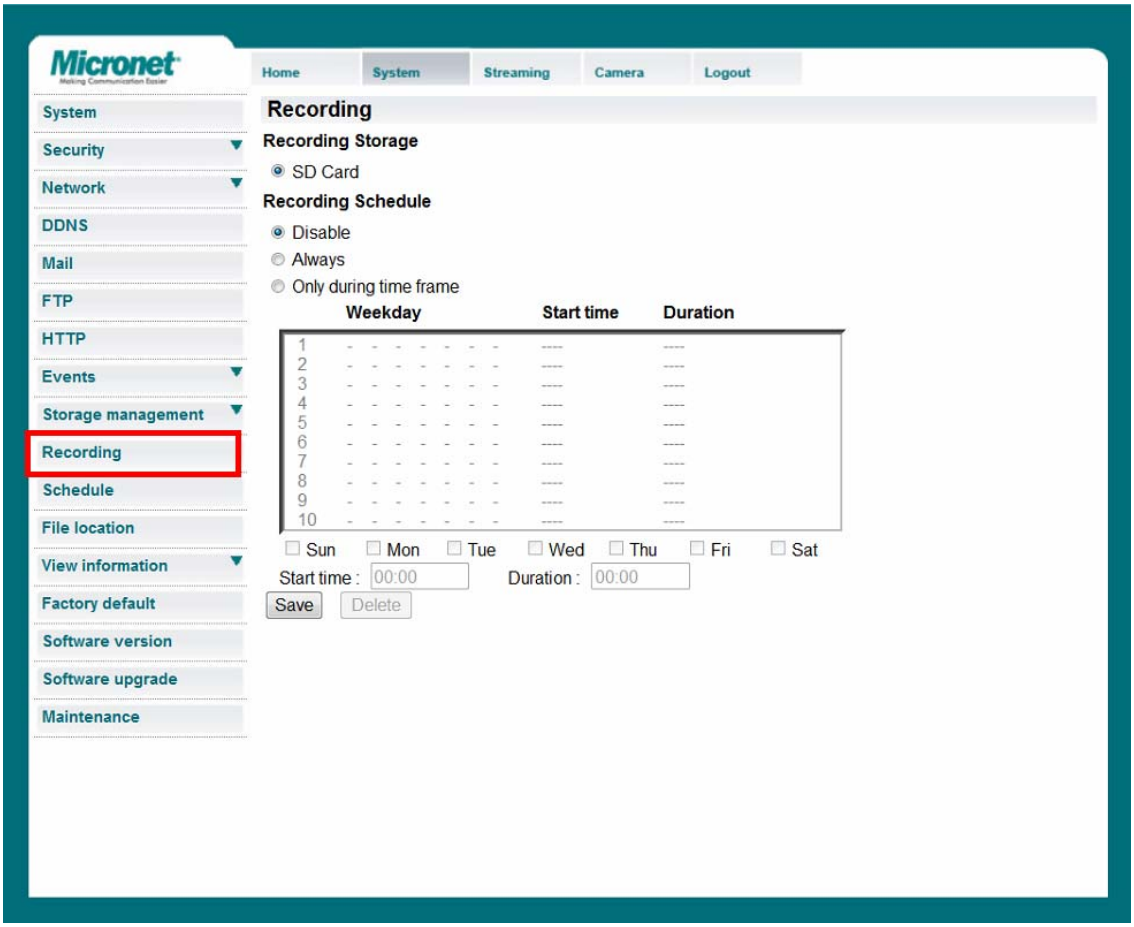
Download

To open/download a video clip, select the file first, and then press the “download” button below the Recording list field. The selected file window will pop up as shown below. Click on the AVI file to directly play the video in the player or download it to a specified location.

http://192.168.7.123/cgi-bin/sddownload.cgi?do...
http://192.168.7.123/cgi-bin/sddownload.cgi?downloadfilename=M_201(
Download recording file
Select file list
File name:
M_20100514_142625.avi
Don
Internet
100%

7.3.13 Recording

In the Recording setting page, users can specify the recording schedule that fits the present surveillance requirement.



Activating Micro SD/SDHC Card Recording

Two types of schedule mode are offered: Always and Time Frame setting. Users can setup the time frame to fit the recording schedule or choose “Always” to activate Micro SD/SDHC Card Recording all the time.

Please click on the “Save” button for confirming the schedule mode.

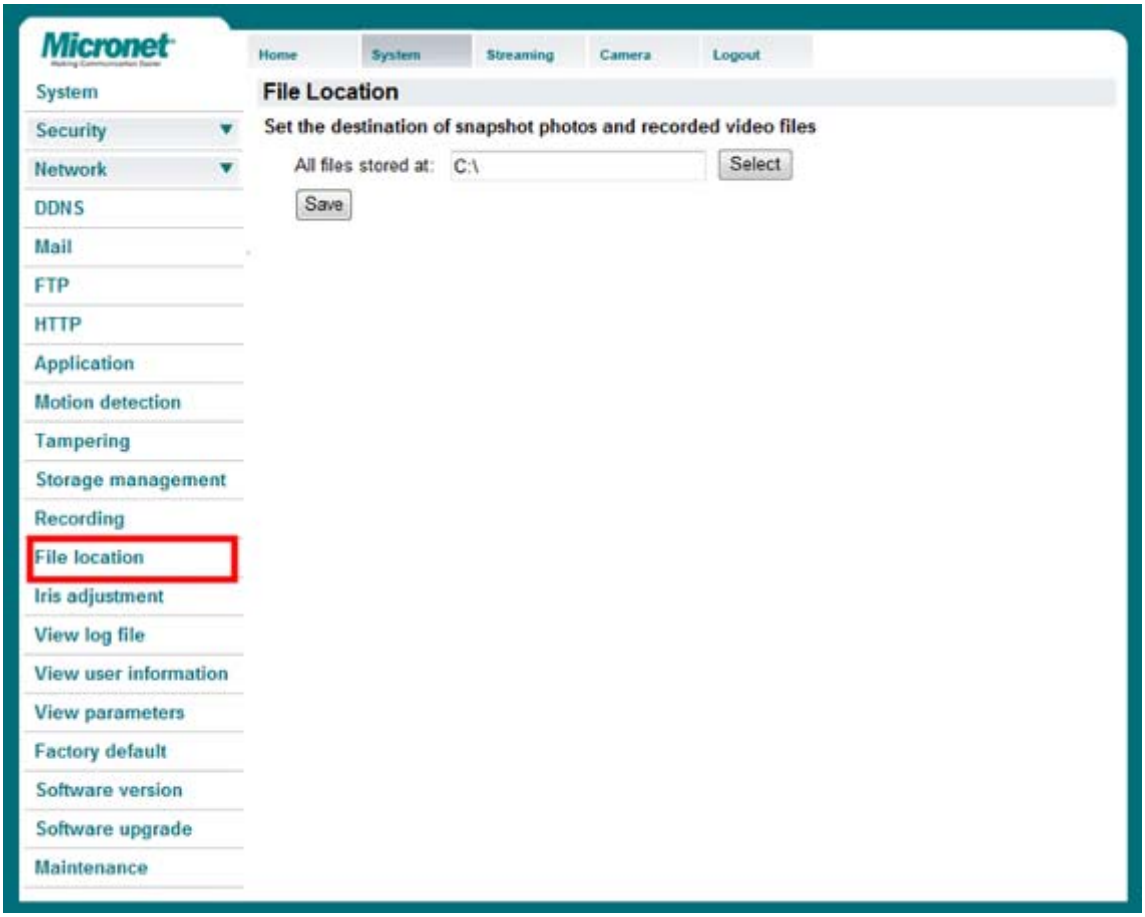
Terminating Micro SD/SDHC Card Recording

Select “Disable” to terminate the recording function.

7.3.14 File Location

Users can specify a storage location for the snapshots and Web recording. The default setting is: C:\. Once confirm the setting, press “Save,” and all the snapshots and recording will be saved in the designate location.

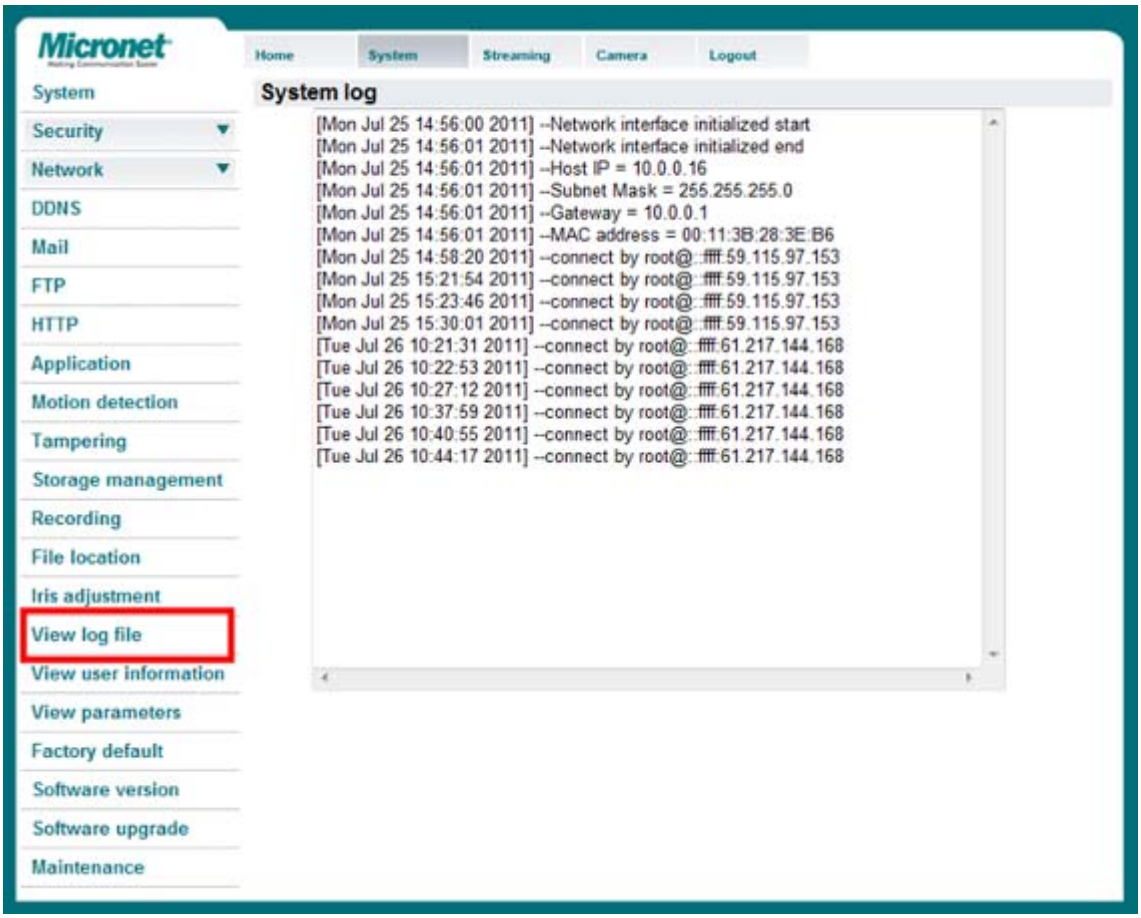
NOTE: Please make sure the selected file path contains valid characters such as letters and numbers.



NOTE: For users with Windows 7 operating system, it is required to log on as an Administrator to implement the Snapshot and Web Recording function.

7.3.15 View Log File

Click on the link to view the system log file. The content of the file provides useful information about configuration and connections after system boot-up.



7.3.16 View User Information

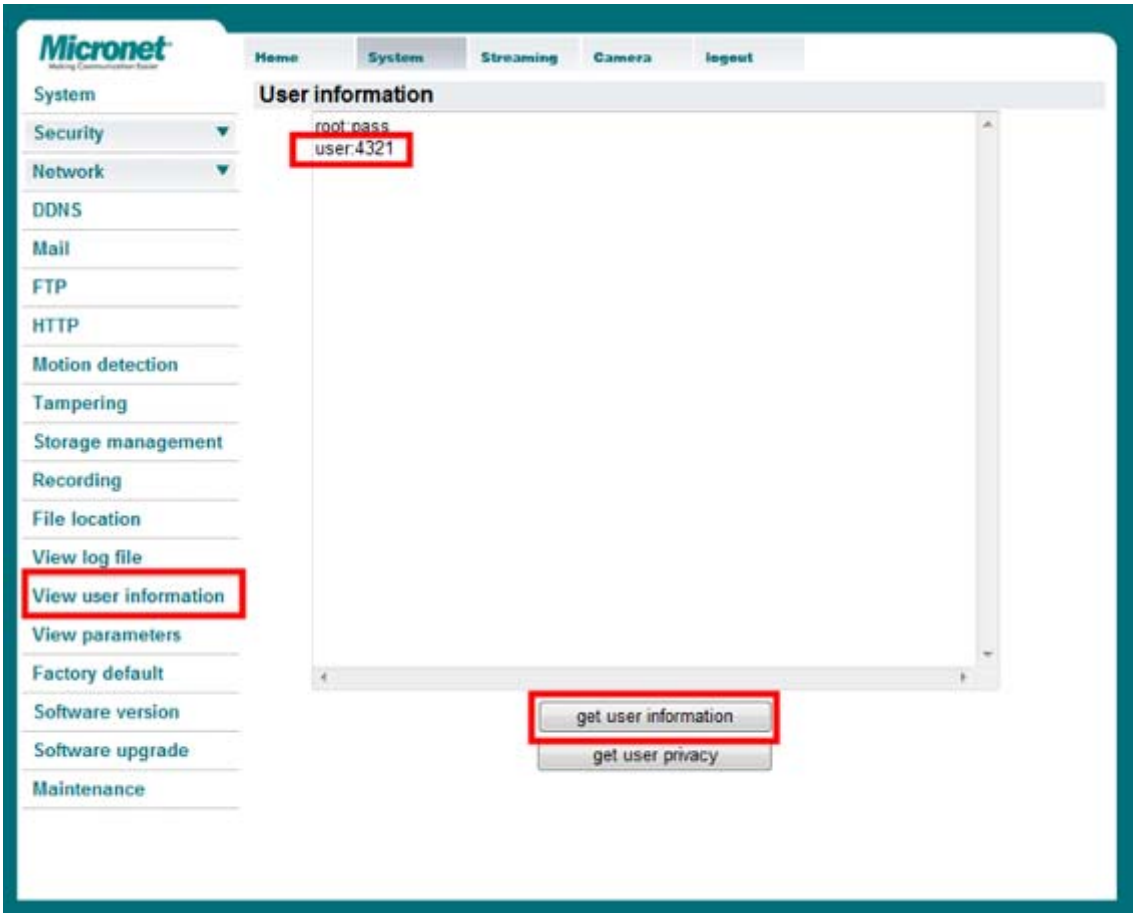
The Administrator can view each added user's login information and privileges (refer to 7.3.2 Security).

View User Login Information

All the users in the network will be listed in the "User information" zone, as shown below. As the figure below shows:

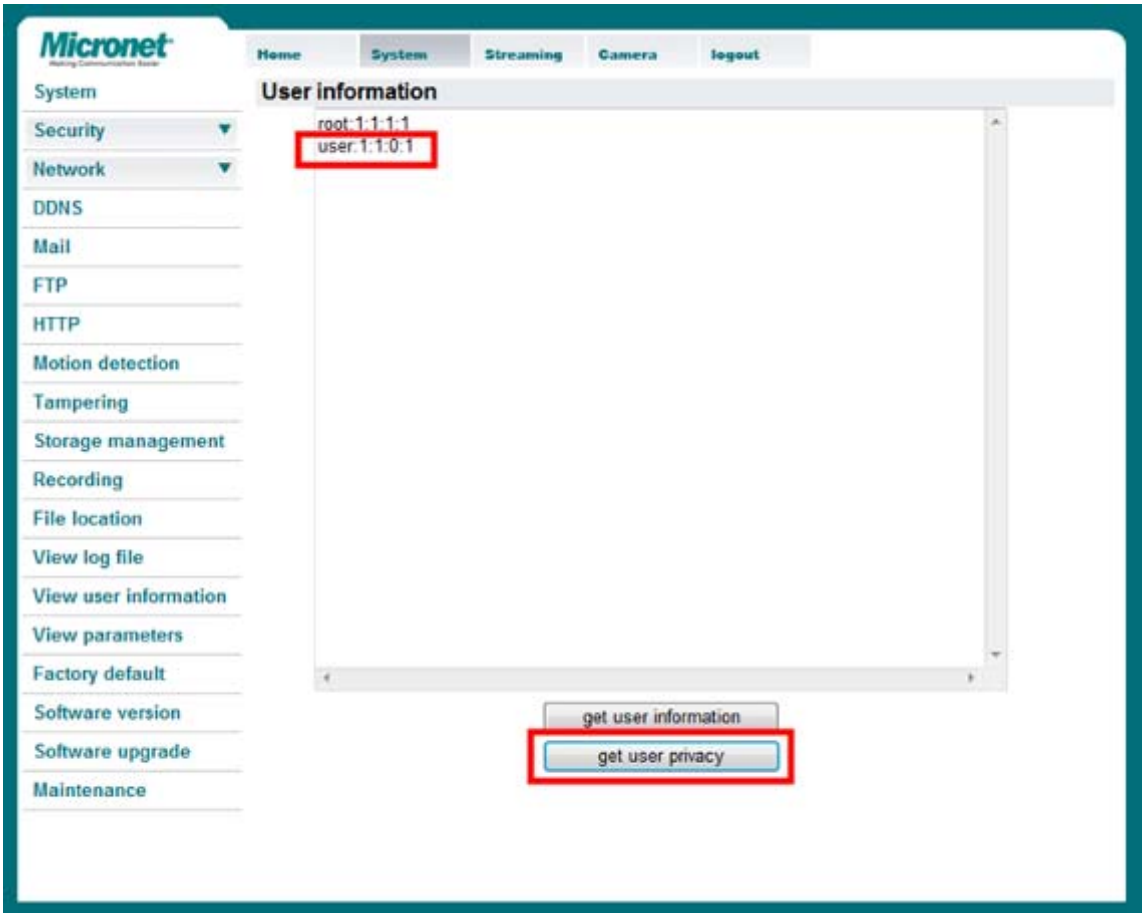
User: 4321

It indicates that one user's login username is "User", and the password is "4321".



View User Privilege

Press “get user privacy” down the page, and the Administrator can view each user’s privileges.



As the figure above shows:

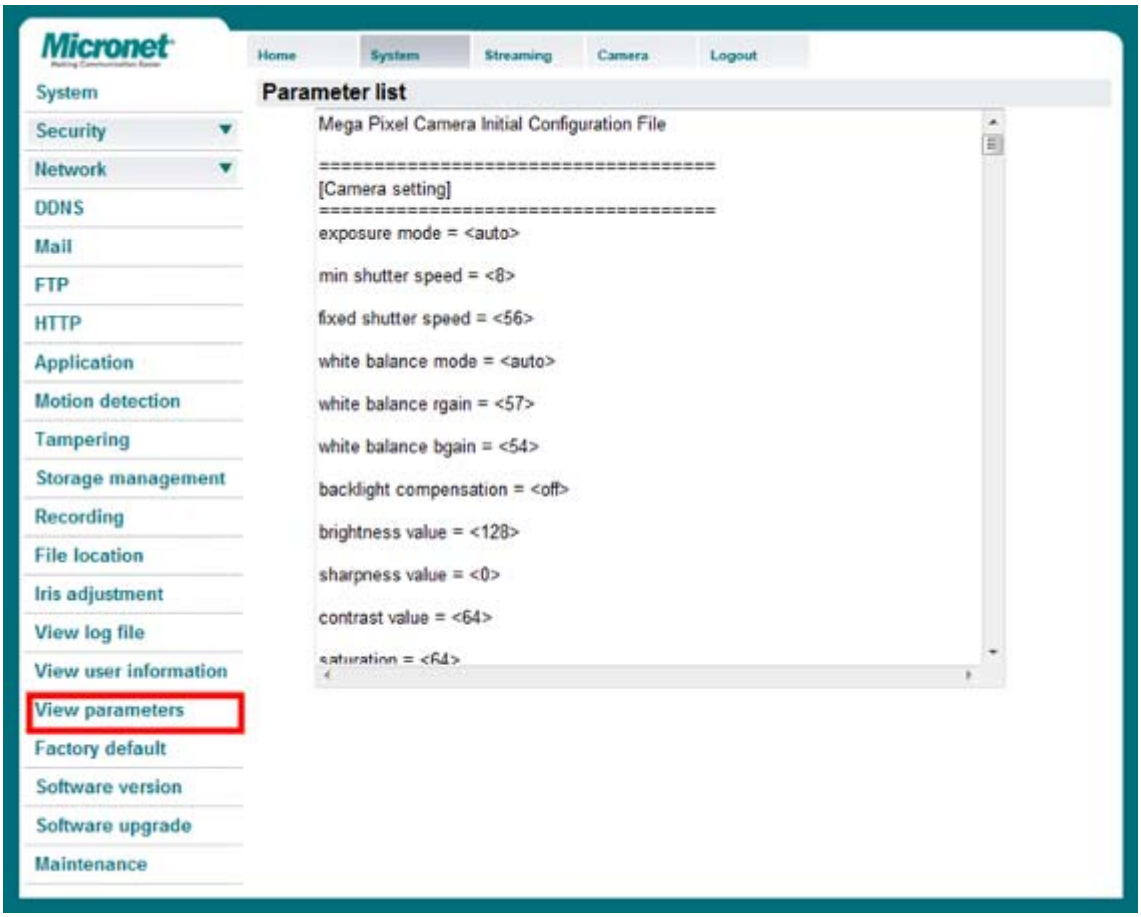
User: 1:1:0:1

1:1:0:1= I/O access: Camera control: Talk: Listen (refer to 7.3.2 Security)

Therefore, it denotes the user is granted privileges of I/O access, Camera control and Listen.

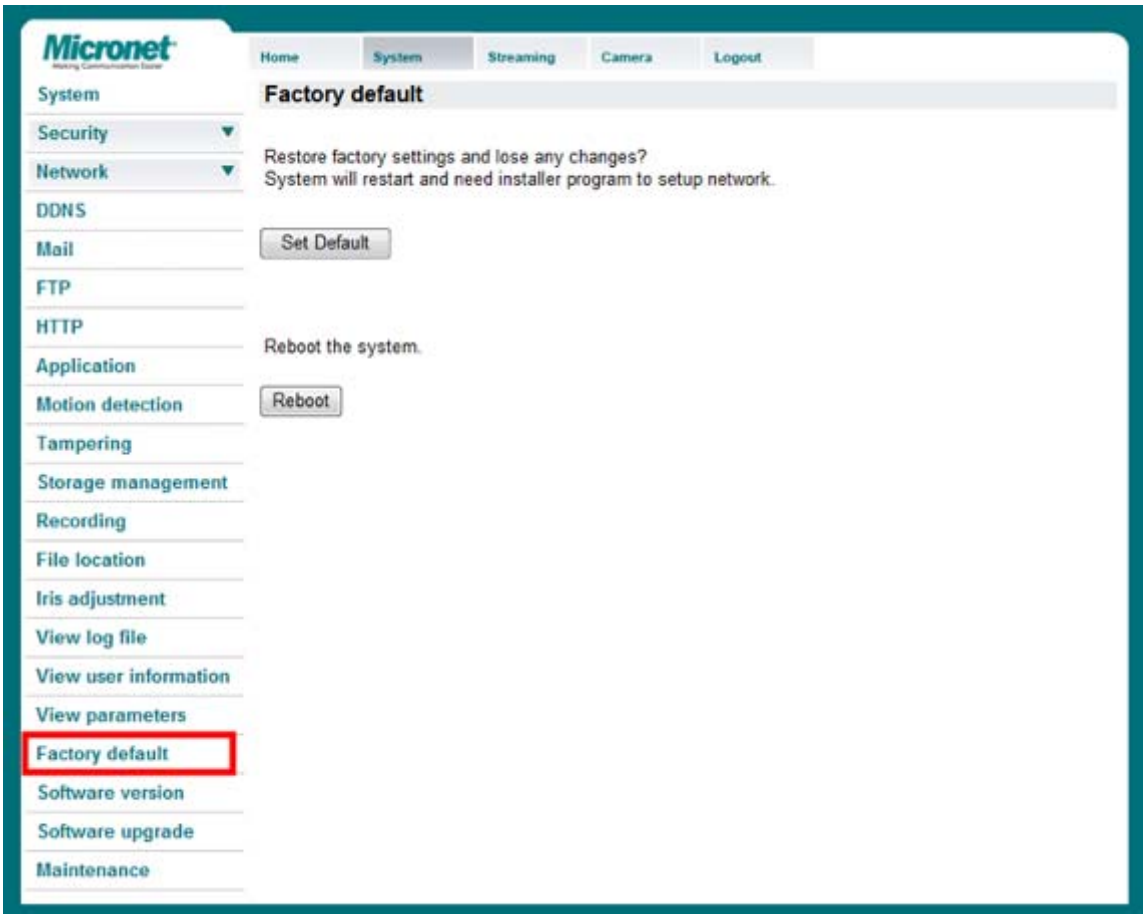
7.3.17 View Parameters

Click on this item to view the entire system's parameter setting.



7.3.18 Factory Default

The factory default setting page is shown as below. Follow the instructions to reset the IP Camera to factory default setting if needed.



Set Default

Click on the “Set Default” button to recall the factory default settings. Then the system will restart in 30 seconds.

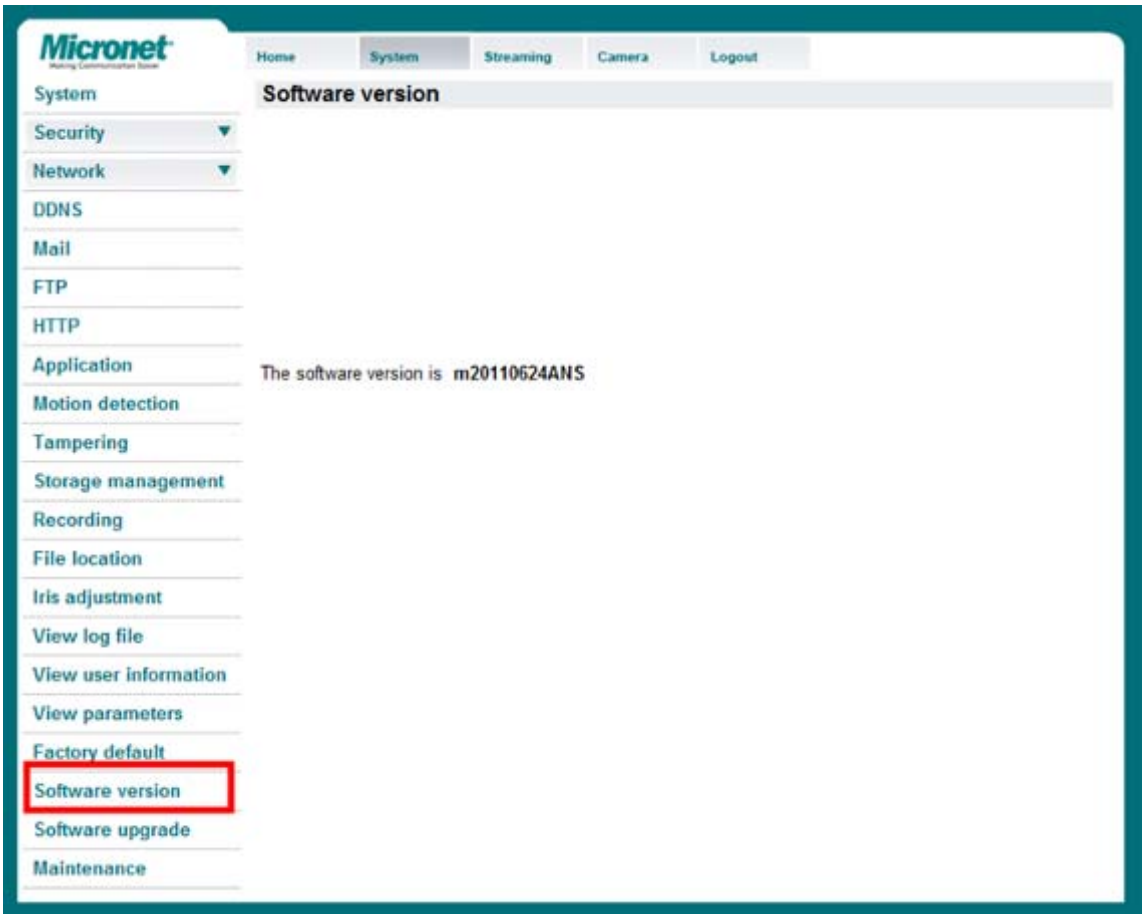
NOTE: The IP address will be restored to default.

Reboot

Click on the “Reboot” button, and the system will restart without changing current settings.

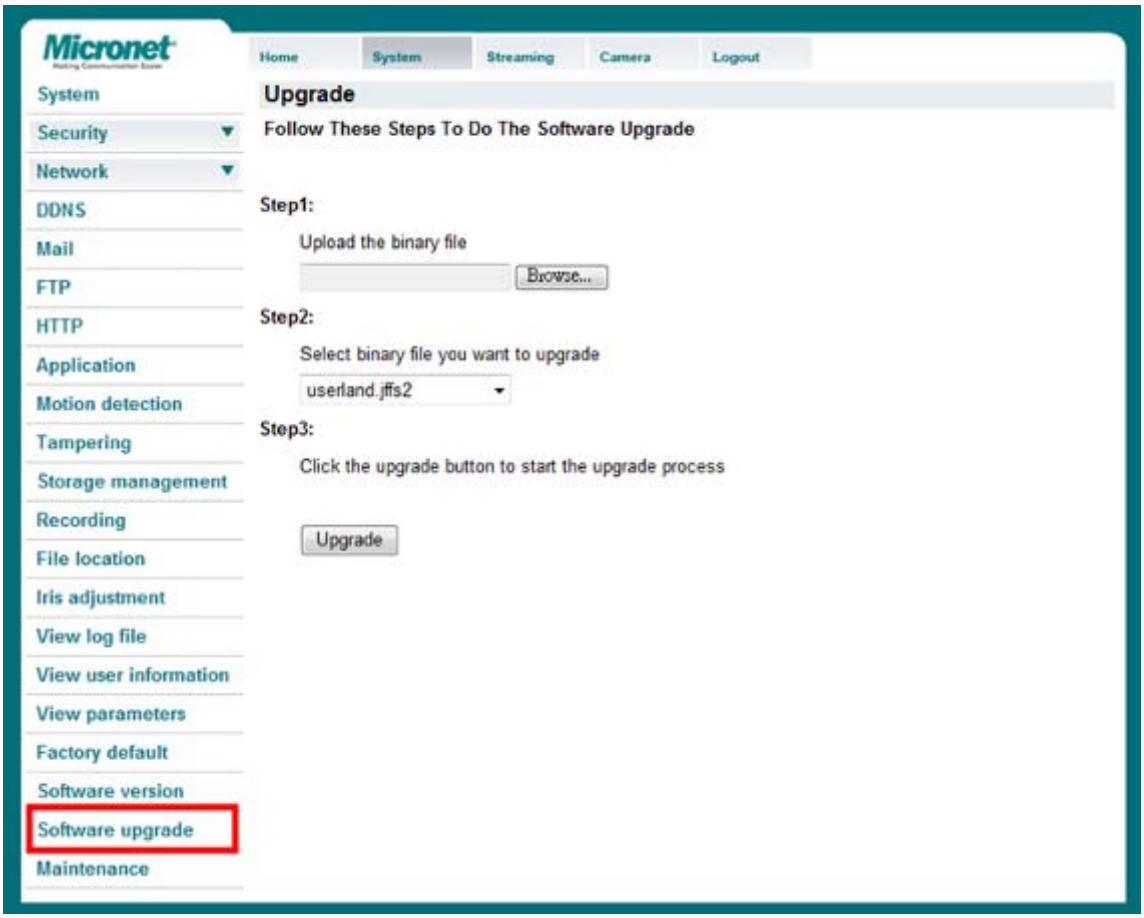
7.3.19 Software Version

The current software version is displayed in the software version page, which is shown as the figure below.



7.3.20 Software Upgrade

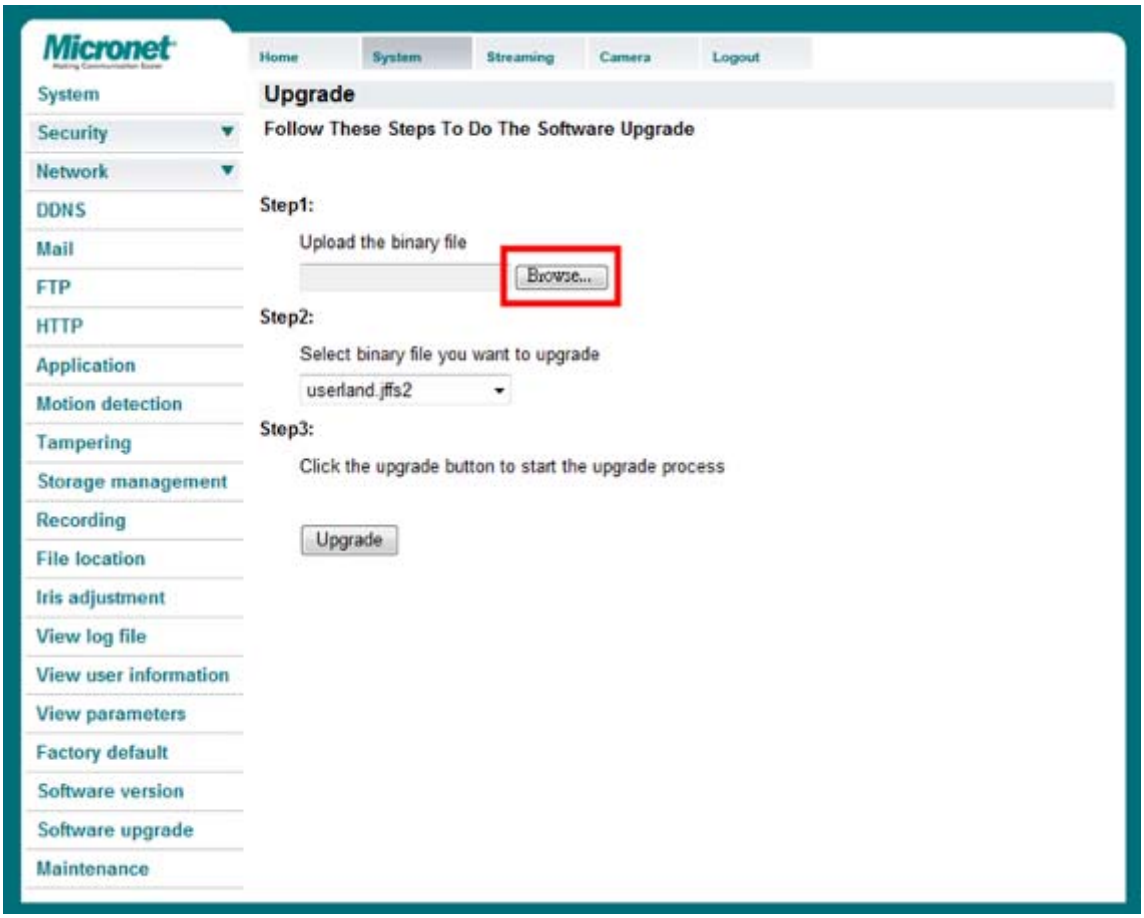
Software upgrade can be carried out in the “Software Upgrade” page, as shown below.



NOTE: Make sure the upgrade software file is available before carrying out software upgrade.

The procedure of software upgrade is like the following:

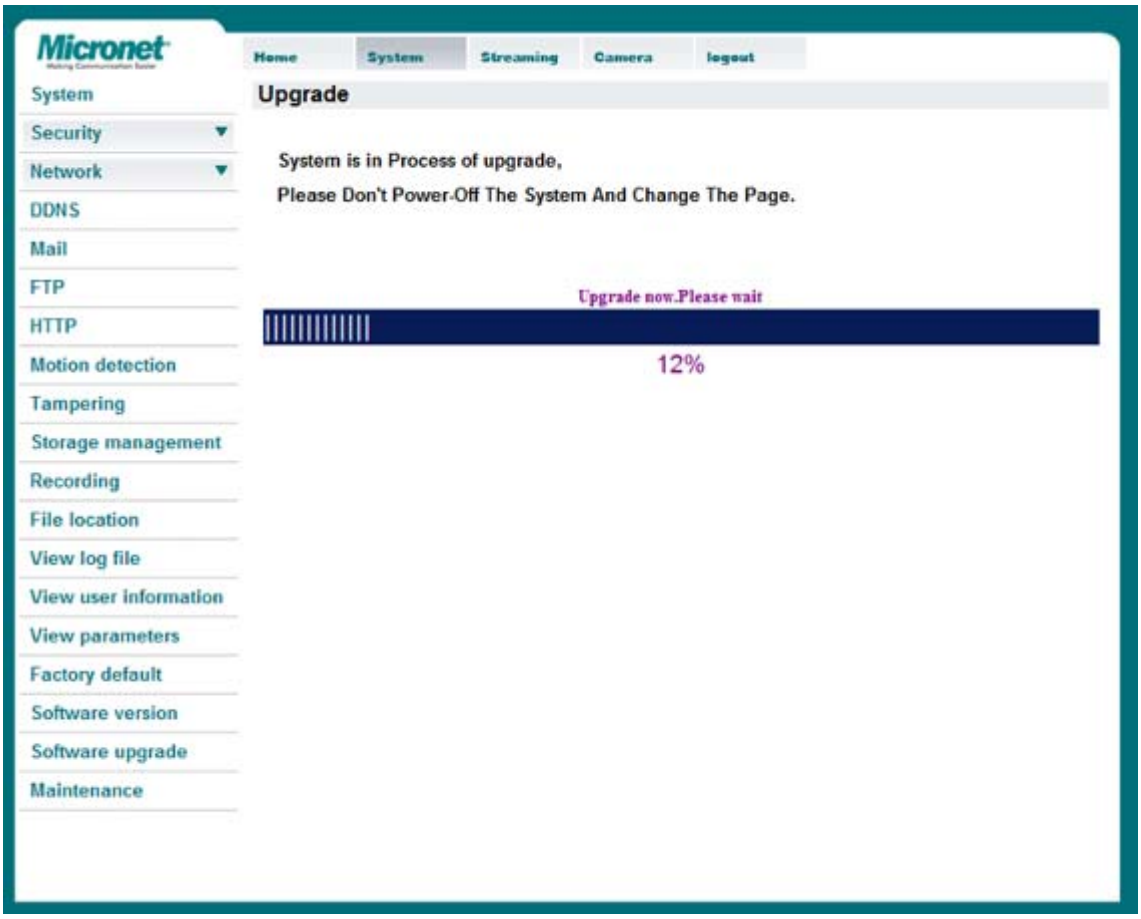
Step 1: Click “Browse” and select the binary file to be uploaded, ex. Userland.jffs2.



NOTE: Do not change the upgrade file name, or the system will fail to find the file.

Step 2: Pull down the upgrade binary file list and select the file you want to upgrade; in this case, select “userland.jffs2.”

Step 3: Press “Upgrade”. The system will first check whether the upgrade file exists or not, and then begin to upload the upgrade file. Subsequently, the upgrade status bar will display on the page. When it runs to 100%, the upgrade process is finished.



After the upgrade process is finished, the viewer will return to Home page.

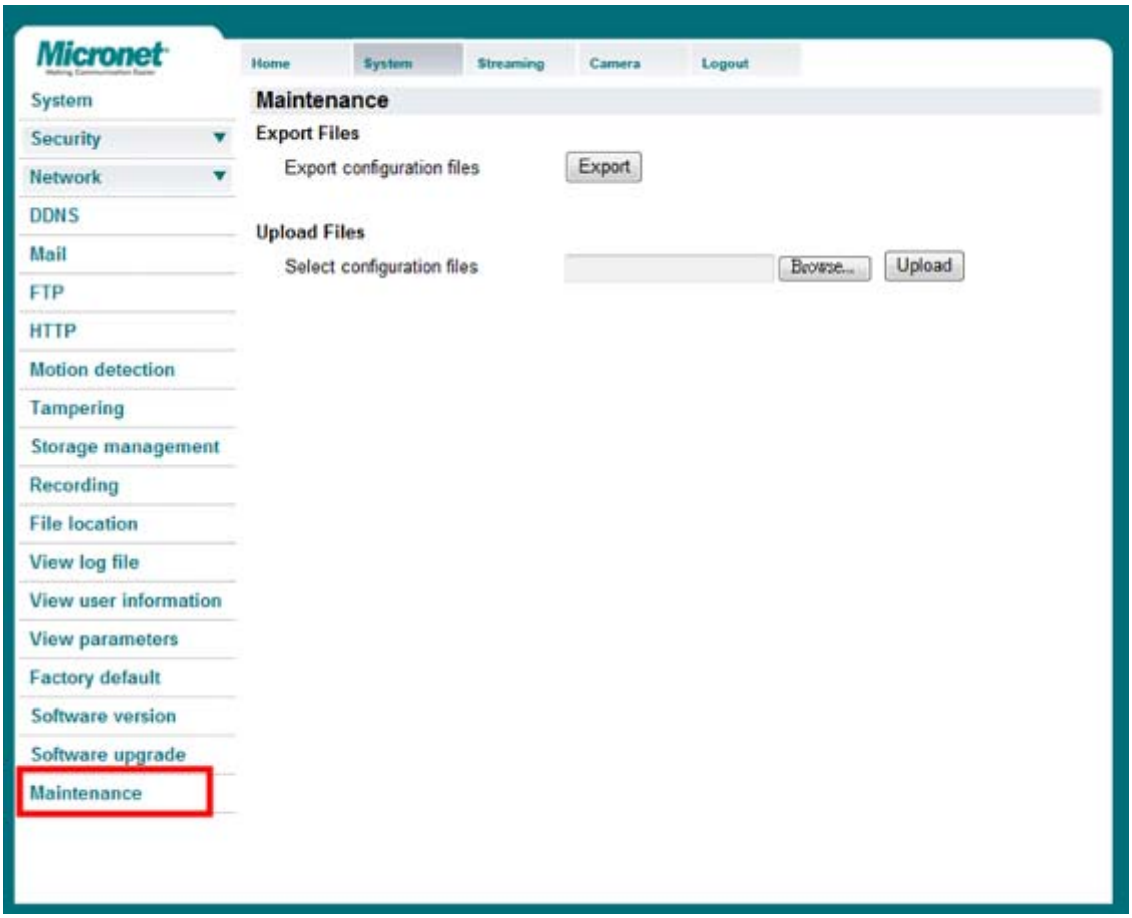
Step 4: Close the video browser.

Step 5: Click “Control Panel”, and then double click “Add or Remove Programs.” In the “Currently install programs” list, select “DCViewer” and click the button “Remove” to uninstall the existing DC Viewer.

Step 6: Open a new web browser, re-login the IP Camera, and then allow the automatic download of DC Viewer.

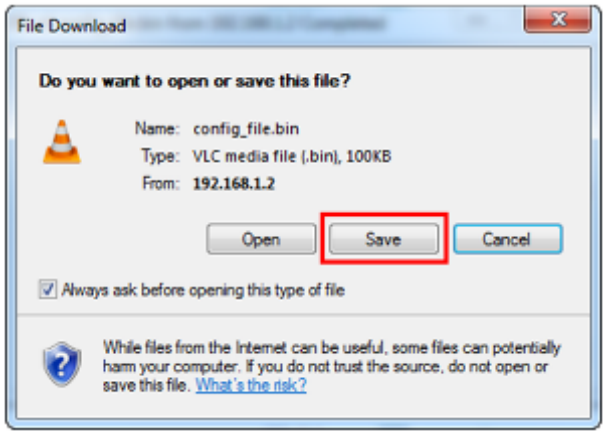
7.3.21 Maintenance

Users can export configuration files to a specified location and retrieve data by uploading an existing configuration file to the IP Camera.



Export

Users can save the system settings by exporting the configuration file (.bin) to a specified location for future use. Press the “Export” button, and the popup File Download window will come out as shown below. Click “Save” and specify a desired location for saving the configuration file.



Upload

To copy an existing configuration file to the IP Camera, please first click on “Browse” to select the configuration file, and then press the “Upload” button for uploading.

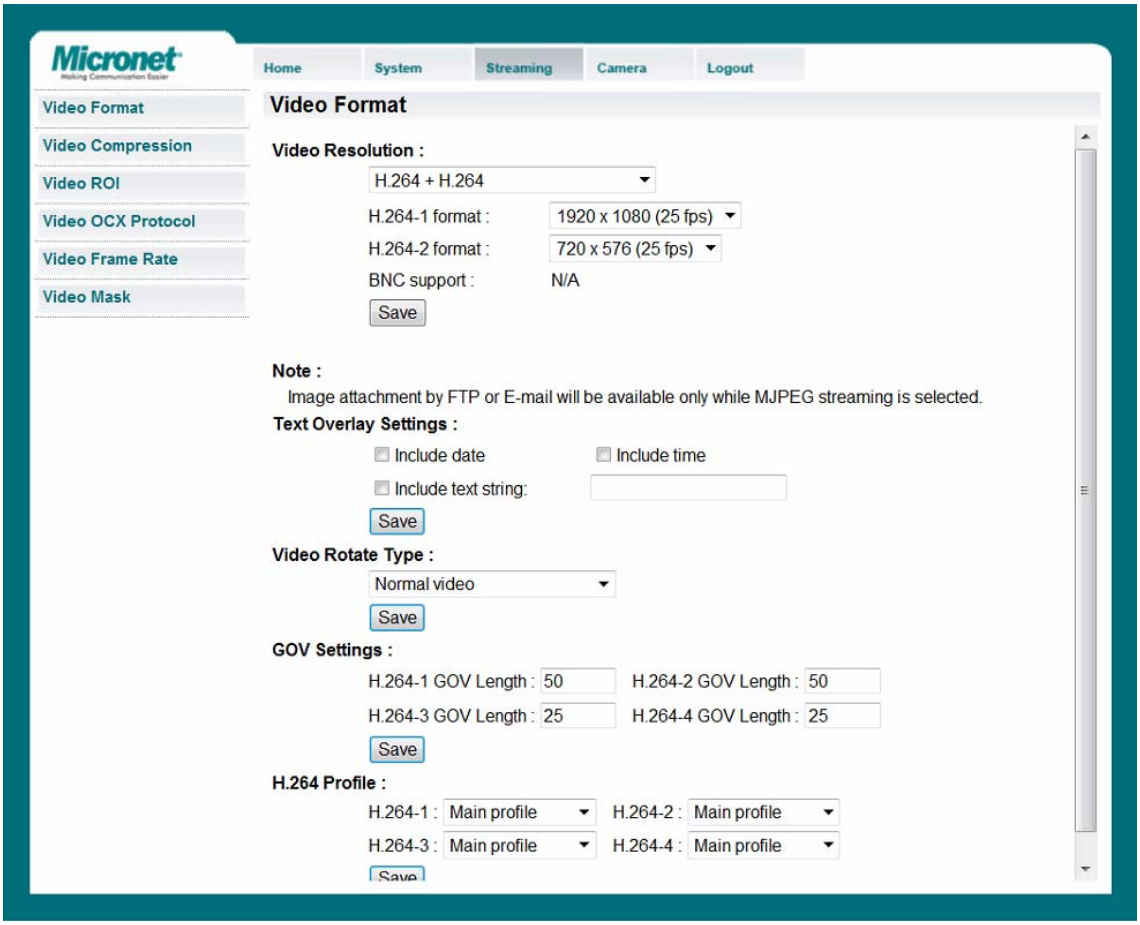
7.4 Video and Audio Streaming Settings

Press the tab “Streaming” in the top of the page, and the configurable video and audio items will display in the left column. In Streaming, the Administrator can configure specific video resolution, video compression mode, video protocol, audio transmission mode, etc. Further details of these settings will be specified in the following sections.

7.4.1 Video Resolution and Rotate Type

Users can setup Video Resolution on Video Format page of the user-friendly browser-based configuration interface.

Video Format can be found under this path: **Streaming> Video Format**.



Text Overlay Settings

Users can select the items to display data including date/time/text on the live video pane. The maximum length of the string is 18 alphanumeric characters.

Click “Save” to confirm the Text Overlay setting.

Video Rotate Type

Users can change video display type if necessary. Selectable video rotate types include Normal, Flip, Mirror and 180 degree. Differences among these types are illustrated as below.

Suppose the displayed image of IP Camera is shown as the figure below.

To rotate the image, users can select “Flip”, for instance. Then the displayed image will be reversed as shown below.

The following is descriptions for different video rotate type.

- **Flip**
  If select <Flip>, the image will be rotated vertically.

- **Mirror**
  If select <Mirror>, the image will be rotated horizontally.

- **180 Degree**
  Selecting <180 Degree> will make the image 180° counter-/clockwise inversed.

Click “Save” to confirm the setting.

GOV Settings

Users can set the GOV length to determine the frame structure (I-frames and P-frames) in a video stream for saving bandwidth. Longer GOV means decreasing the frequency of I-frames. Click “Save” to confirm the GOV setting.

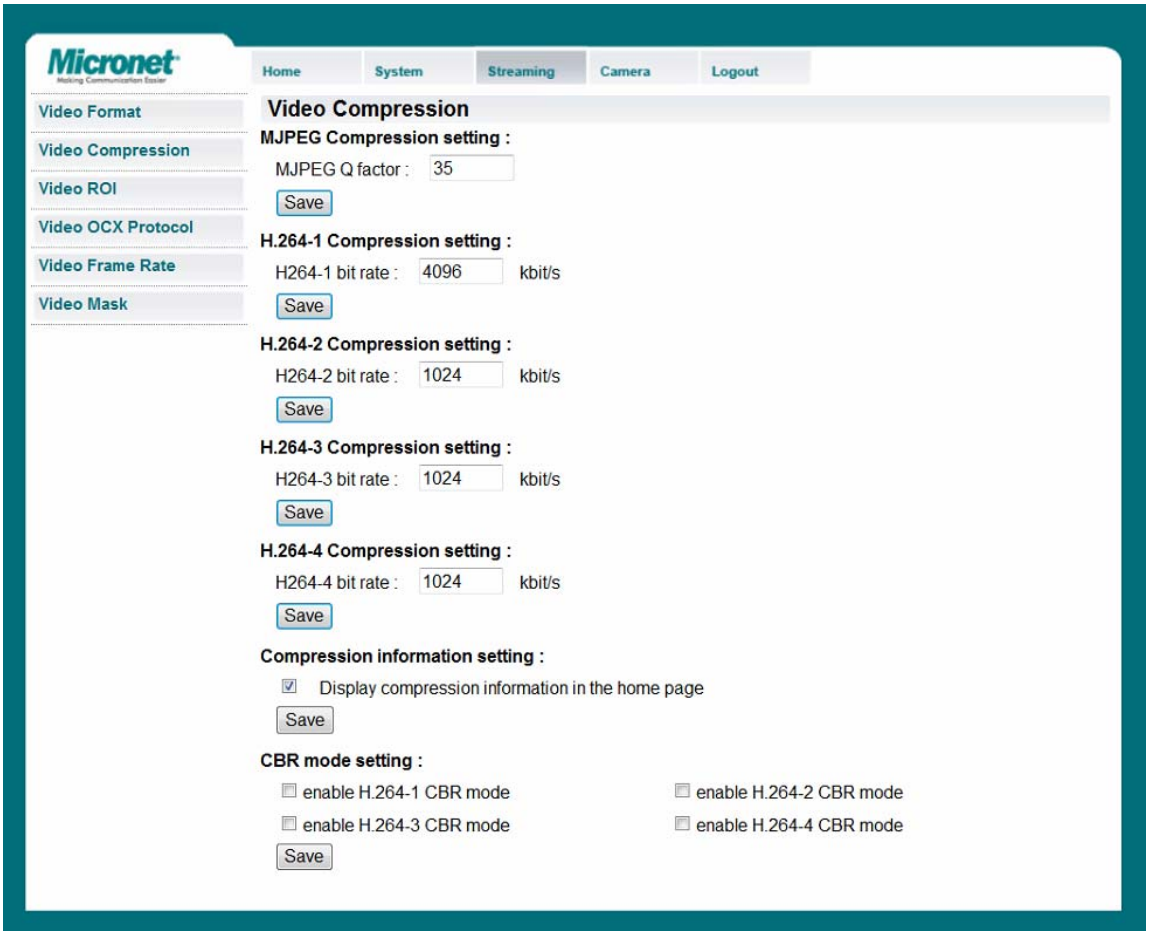
H.264 Profile

Users can set each H.264 Profile to <Baseline Profile>, <Main Profile> or <High Profile> according to its compression needs. With the same bit rate, the higher the compression ratio, the better the image quality is. The default setting is <Main Profile>.

NOTE: Please make sure the higher compression ratio is supported by system before setup.

7.4.2 Video Compression

Users can specify the values for MJPEG/ H.264 compression in the video Compression page (see the figure below), depending on the application.



MJPEG Q (Quality) factor

Higher value implies higher bit rates and higher visual quality. The default setting of MJPEG Q factor is 35; the setting range is from 1 to 70.

H.264-1/ H.264-2/ H.264-3/ H.264-4 bit rate

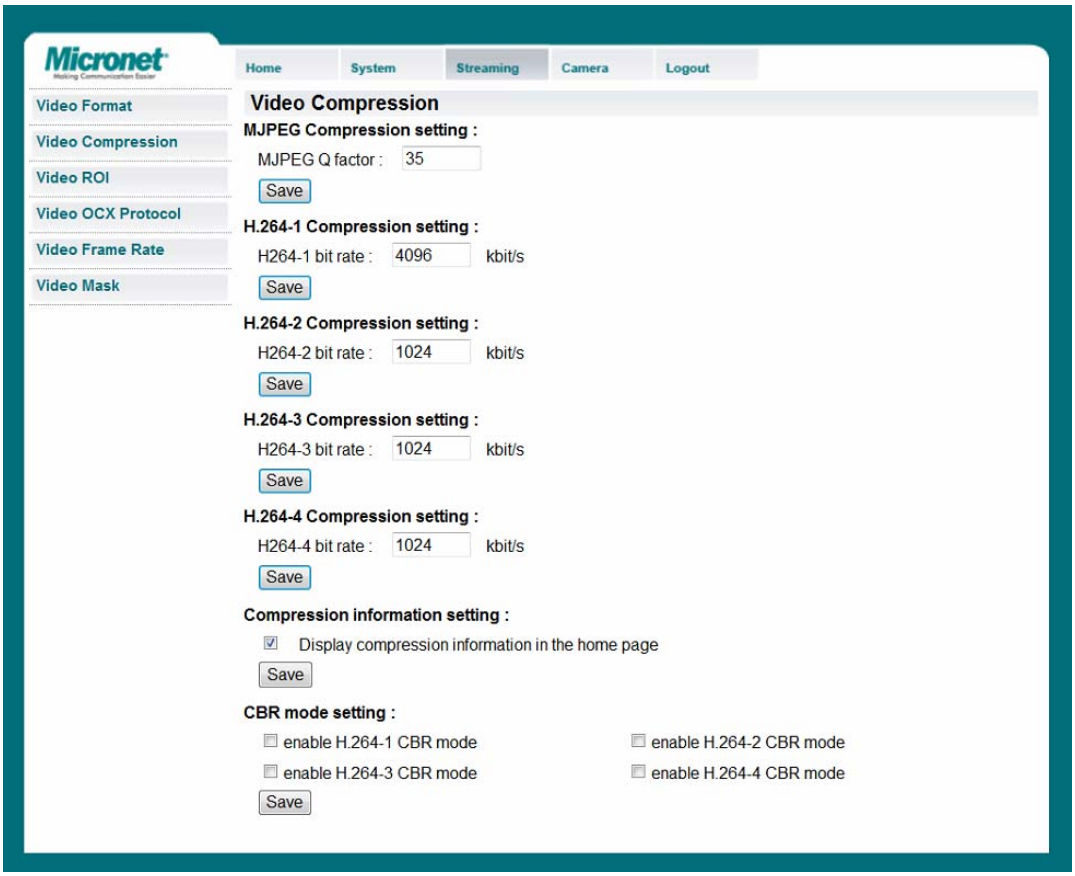
The default setting of H.264-1 is 4096 kbit/s and for H.264-2/ H.264-3/ H.264-4 is 1024 kbit/s; the setting range for H.264-1 is from 64 to 8192 kbps and for H.264-2/ H.264-3/ /H.264-4 is from 64 to 2048 kbit/s

Display Compression Information

Users can also decide whether to display compression information on the Home page.

Click “Save” to confirm the setting.

CBR Mode Setting



The CBR (Constant Bit Rate) mode could be the preferred bit rage mode if the bandwidth available is limited. It is important to take account of image quality while choosing to use CBR mode.

7.4.3 Video ROI

The Video ROI setting can be found under this path: Streaming> Video ROI.

ROI stands for Region of Interest. This function allows users to select specific monitoring region for 2nd, 3rd and 4th streams, instead of showing the full image.

NOTE: This function is only available when triple streams or above is selected under Video Resolution in Video Format Setting.

Video ROI Setting

Enable Stream 2 ROI Setting

Check the box and Stream 2 ROI Window will be displayed. To change the size of Stream 2 ROI Window, move the mouse cursor to the edge of the frame and draw it outward/inward. Moving the mouse to the center of the frame can shift the frame to the intended location.

Enable Stream 3 ROI Setting

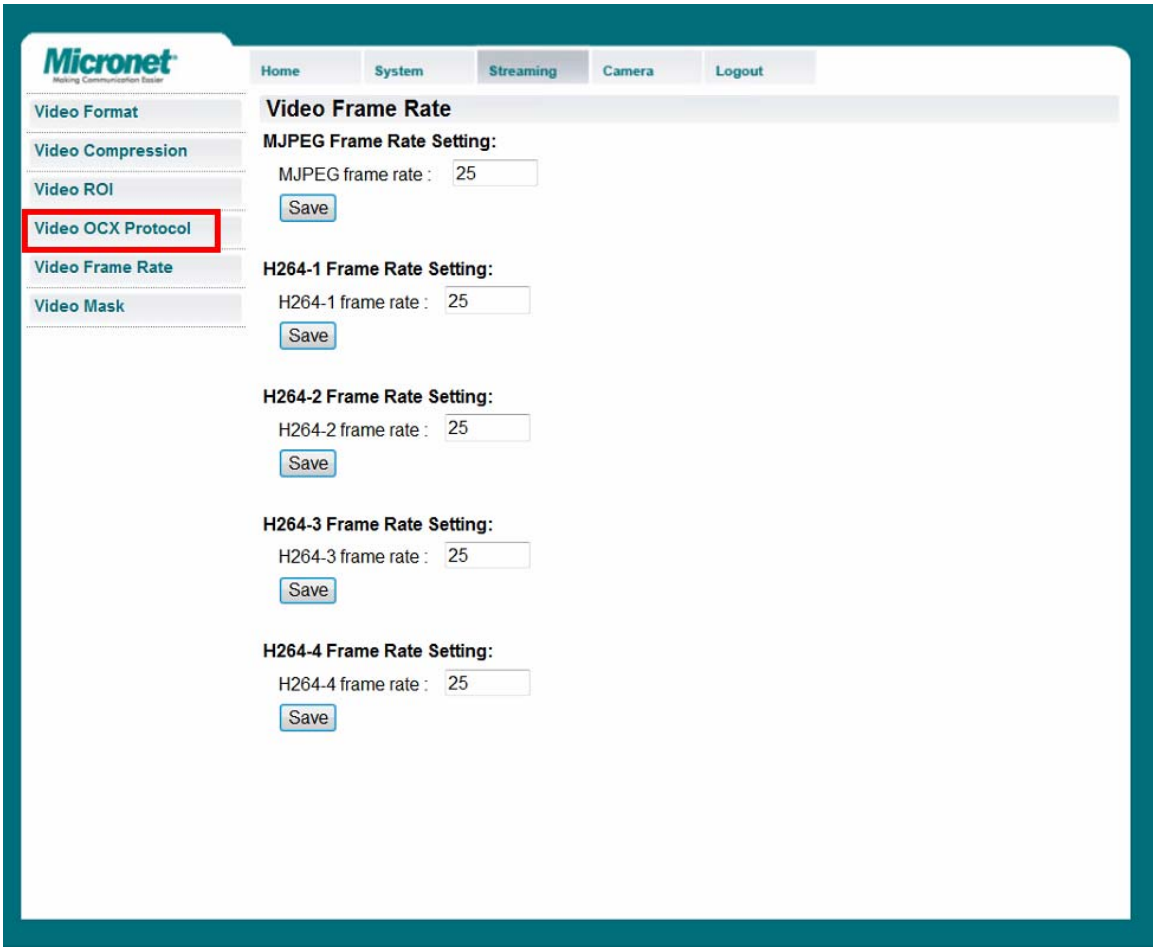
Check the box and Stream 3 ROI Window will be displayed. To change the size of Stream 3 ROI Window, move the mouse cursor to the edge of the frame and draw it outward/inward. Moving the mouse to the center of the frame can shift the frame to the intended location.

Enable Stream 4 ROI Setting

Check the box and Stream 4 ROI Window will be displayed. To change the size of Stream 4 ROI Window, move the mouse cursor to the edge of the frame and draw it outward/inward. Moving the mouse to the center of the frame can shift the frame to the intended location.

7.4.4 Video OCX Protocol

In the Video OCX protocol setting page, users can select RTP over UDP, RTP over TCP, RTSP over HTTP or MJPEG over HTTP, for streaming media over the network. In the case of multicast networking, users can select the Multicast mode. The page is shown as follows.



Video OCX protocol setting options include:

RTP over UDP / RTP over RTSP(TCP) / RTSP over HTTP / MJPEG over HTTP

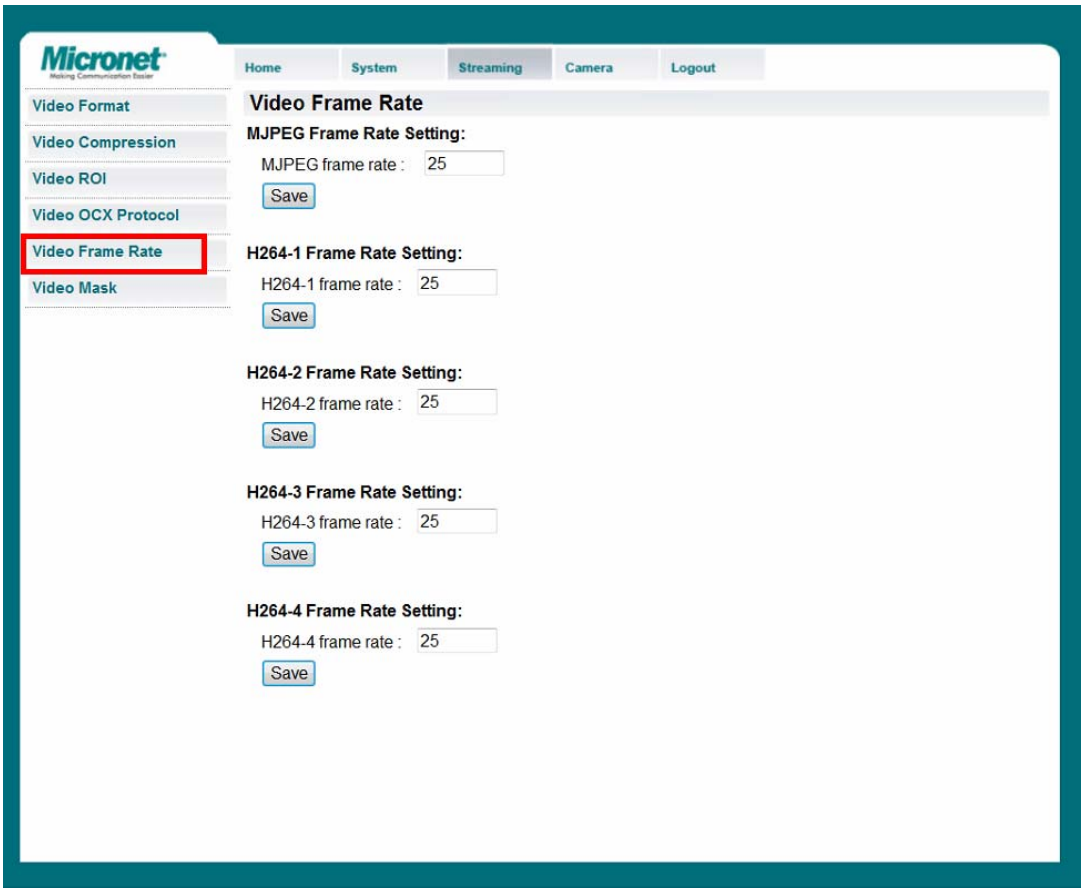
Multicast Mode

Enter all required data, including multicast IP address, H.264 video port, MJPEG video port, audio port and TTL into each blank.

Click "Save" to confirm the setting.

7.4.5 Video Frame Rate

The Video Frame Rate setting can be found under this path: Streaming> Video Frame Rate.



Video frame rate is for setting the frames per second (fps) if necessary.

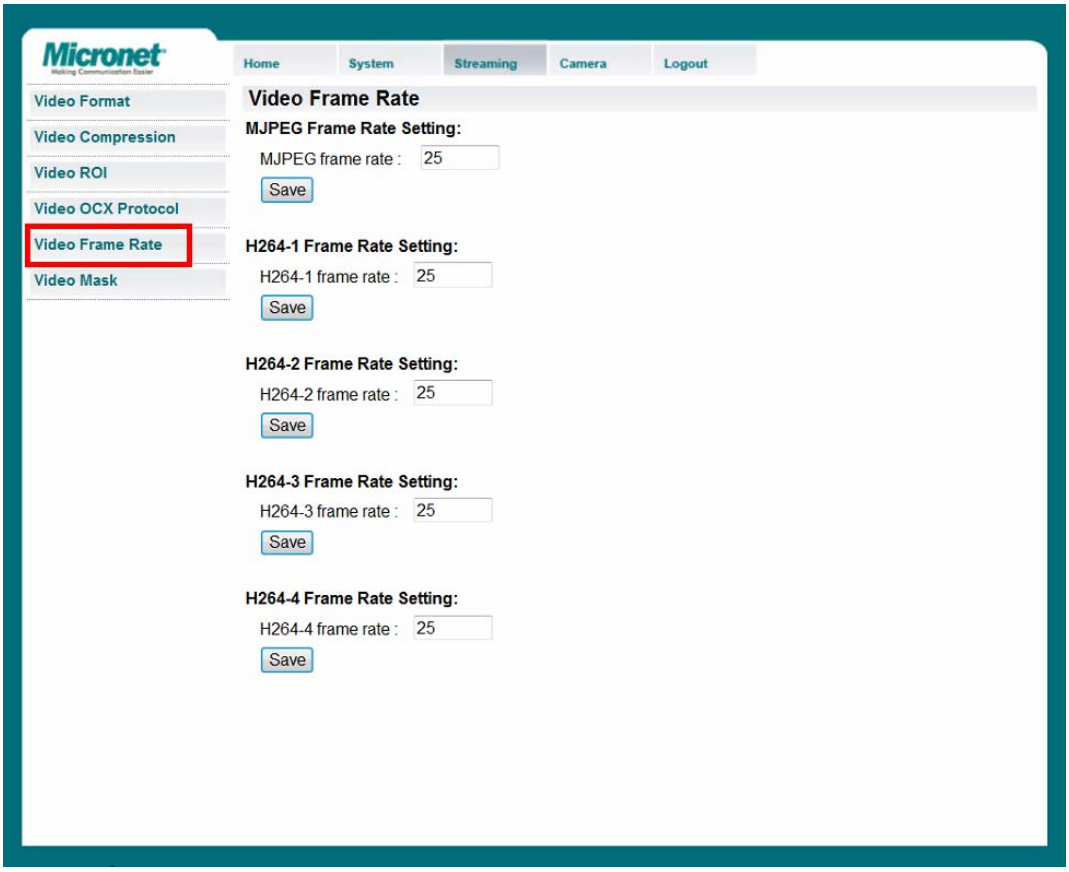
MJPEG/ H.264-1/ H.264-2/ H.264-3/ H.264-4 Frame Rate
The default setting of MJPEG/H.264-1/H.264-2/ H.264-3/ H.264-4 Frame Rate is 30 fps; the setting range is from 1 to 30.

Click on <Save> to confirm the setting.

NOTE: Lower frame rate will decrease video smoothness.

7.4.6 Video Frame Skip

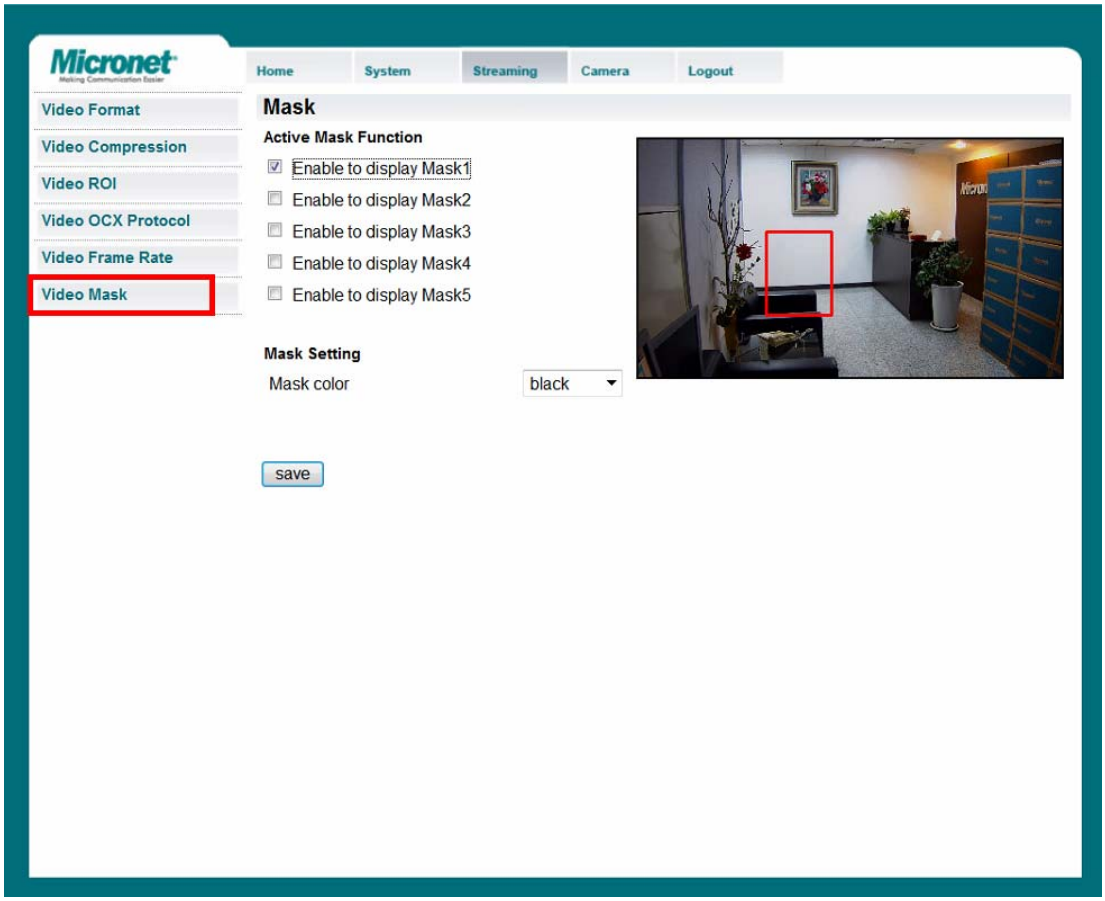
Video frame skipping is for saving bandwidth if necessary. The setting page is shown as below.



Click “Save” to confirm the setting.

NOTE: Higher frame skipping rate will decrease video smoothness.

7.4.7 Video Mask



Active Mask Function

- **Add a Mask**
  Check a Video Mask checkbox, and a red frame will come out in the Live Video pane at the right side. Use the mouse to drag and drop to adjust the mask's size and place it on the target zone.

  NOTE: It is suggested to set the Video Mask twice bigger than the object.

- **Cancel a Mask**
  Uncheck the checkbox of the Video Mask meant to be deleted, and the selected mask will disappear from the Live Video pane instantly.

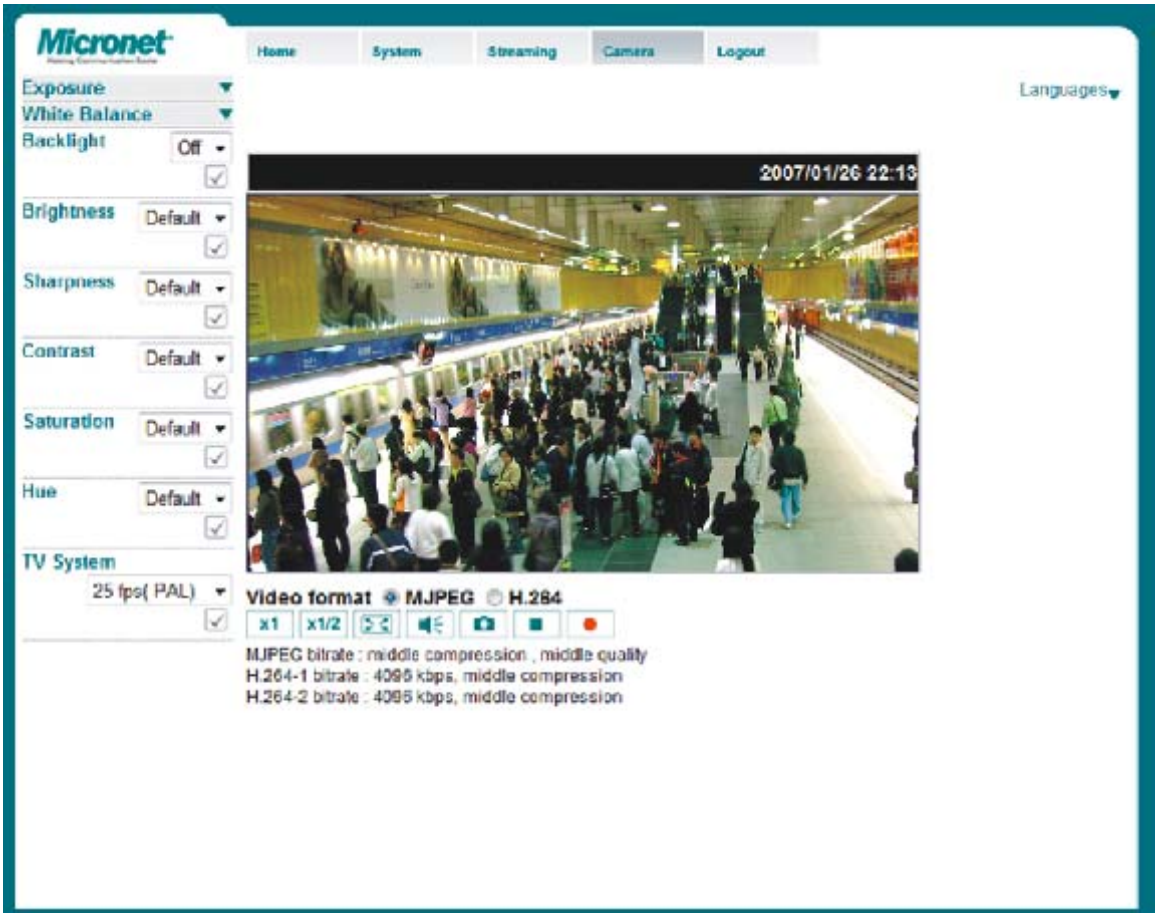
Mask Setting

- **Mask color**
  The selections of Mask color include red, black, white, yellow, green, blue, cyan, and magenta.

Click “Save” to confirm the setting.

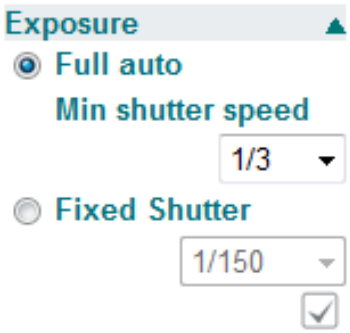
7.5 Camera Settings

The figure below is the camera configuration page. Details of each parameter setting are described in the following subsections.



7.5.1 Exposure Setting

The Exposure pull-down menu is shown as follows:



The exposure is the amount of light received by the image sensor and is determined by the width of lens diaphragm opening, the amount of exposure by the sensor (shutter speed) and other exposure parameters. With this item, users can define how the Auto Exposure function works.

Each exposure mode is specified as follows:

Full Auto Mode

In this mode, the camera's Shutter Speed, IRIS and AGC (Auto Gain Control) control circuits work together automatically to get consistent video output level. The shutter speed range is from 1 (1/1.5) to 1/30 (1/25) sec. with 6 (5) options. Users could select suitable shutter speed according to the environmental illuminance.

NOTE: The minimum shutter speed set in the Full Auto Mode will be applied to **Auto Iris Mode**.

Auto Iris

In this mode, the exposure gives priority to the auto iris. Shutter speed and AGC circuit will function automatically in cooperating with IRIS to get consistent exposure output.

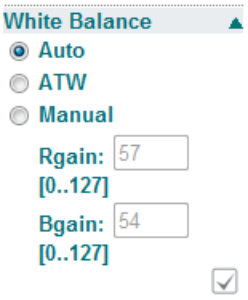
NOTE: The minimum shutter speed will vary depending on the setting in **Full Auto Mode**.

Fixed Shutter Mode

In this mode, fixed shutter speed could be selected from the dropdown menu. The shutter speed range is from 1/10000 to 1 (1/1.5) sec. with 19 (18) options. Users could select suitable shutter speed according to the environmental illumination.

7.5.2 White Balance Setting

The White Balance pull-down menu is shown as follows:



A camera needs to find reference color temperature, which is a way of measuring the quality of a light source, for calculating all the other colors. The unit for measuring this ratio is in degree Kelvin (K). Users can select one of the White Balance Control modes according to the operating environment. The following table shows the color temperature of some light sources for reference.

Light Sources	Color Temperature in K
Cloudy Sky	6,000 to 8,000
Noon Sun and Clear Sky	6,500
Household Lighting	2,500 to 3,000
75-watt Bulb	2,820
Candle Flame	1,200 to 1,500

Auto Mode

The Auto Balance White mode is suitable for environment with light source having color temperature in the range roughly from 2700 ~ 8000K.

ATW Mode (Auto Tracking White Balance)

With Auto Tracking White Balance function, the white balance in a scene will be automatically adjusted while temperature color is changing. The ATW Mode is

suitable for environment with light source having color temperature in the range roughly from 2450 ~ 10500K.

Manual Mode

In this mode, users can change the White Balance value manually. Users can select a number between 0 ~127 of “Rgain/ Bgain” item to gain the red/ blue illuminant on the Live Video Pane. Press < √ > to confirm the new setting.

7.5.3 Backlight Setting

The Backlight Compensation function prevents the center object from being too dark in surroundings where excessive light is behind the center object. Press < √ > to confirm the new setting.

7.5.4 Brightness Setting

Users can adjust the image’s brightness by adjusting the item. To increase video brightness, select a bigger number. Press < √ > to confirm the new setting.

7.5.5 Sharpness Setting

Increasing the sharpness level can make the image looked sharper; especially enhance the object’s edge. Press < √ > to confirm the new setting.

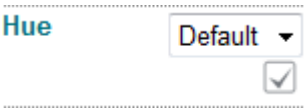
7.5.6 Contrast Setting

Camera image contrast level is adjustable; please select ranging from -6 to +19. Press < √ > to confirm the new setting.

7.5.7 Saturation Setting

Camera image saturation level is adjustable; please select ranging from -6 to +19. Press < √ > to confirm the new setting.

7.5.8 Hue Setting



Camera image hue level is adjustable; please select ranging from -12 to +13. Press < √ > to confirm the new setting.

7.5.9 Backlight

The Backlight Setting can be found under this path: Camera> Backlight.

The Backlight Compensation function prevents the center object from being too dark in surroundings where excessive light is behind the center object. Click on < √ > to confirm the new setting.

7.5.10 Digital Zoom

The Digital Zoom Setting can be found under this path: Camera> Digital Zoom.

The camera's digital zoom is adjustable from x2 to x8. Click on < √ > to confirm the new setting.

7.5.11 IR Function (Compact Fixed Dome Excluded)

The IR Function Setting can be found under this path: Camera> IR Function.

Auto/On/Off Mode
With the IR cut filter, the Camera can still catch clear image at night time or in low light conditions.

For the camera with the built-in IR LED module, there will be three additional IR function modes (Light Sensor/ Light On/ Light Off) as follows:

Light Sensor Mode
IR LED lights will be turned on/off depending on the light sensor.

Light On Mode
In this mode, IR LED lights will be always on.

Light Off Mode
In this mode, IR LED lights will be always off.

Smart Mode
The Smart Mode enhances the monochrome/night mode stability in the scenario that IR illumination is dominant. In this mode, when the external IR illuminator is turned on, the IR cut filter of the IP Camera will keep open (i.e. monochrome/night mode), preventing the camera from returning to the color/day mode when IR illumination is dominant.

Additionally, for the models with built-in IR LED module, the day/night IR switching mechanism will depends on the ambient light level instead of the light sensor (Light sensor mode) on the IR LED module.

Click on <√> to confirm the new setting.

7.5.12 WDR Function

The WDR Function Setting can be found under this path: Camera> WDR Function.

The Wide Dynamic Range (WDR) function is for solving high contrast or changing light issues so that enhances better video display. The WDR is adjustable from Low, Mid to Hi. Higher level of WDR represents wider dynamic range, so that he IP Camera can catch a greater scale of brightness. Click on < √ > to confirm the new setting.

7.5.13 Noise Reduction

The Noise Reduction Setting can be found under this path: Camera> Noise Reduction. .

The IP Camera provides multiple <Noise Reduction> options for delivering optimized image quality especially in extra low-light conditions.

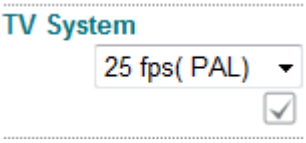
Different level options for 3D Noise Reduction (3DNR) include Low, Mid and High. Higher level of 3DNR generates relatively enhanced noise reduction.

The proprietary Smart Picture Quality (SPQ) video processing method could drastically minimum motion blur and reduce noise especially in low-light environment. The combination of SPQ and 3DNR at different level further yields exceptional video performance in various conditions.

The Noise Reduction function is configurable with the following options: 3DNR Low, 3DNR Mid, 3DNR Hi, SPQ, SPQ + 3DNR Low, SPQ + 3DNR Mid, to SPQ + 3DNR Hi.

Click on < √ > to confirm the new setting.

7.5.14 TV System Setup

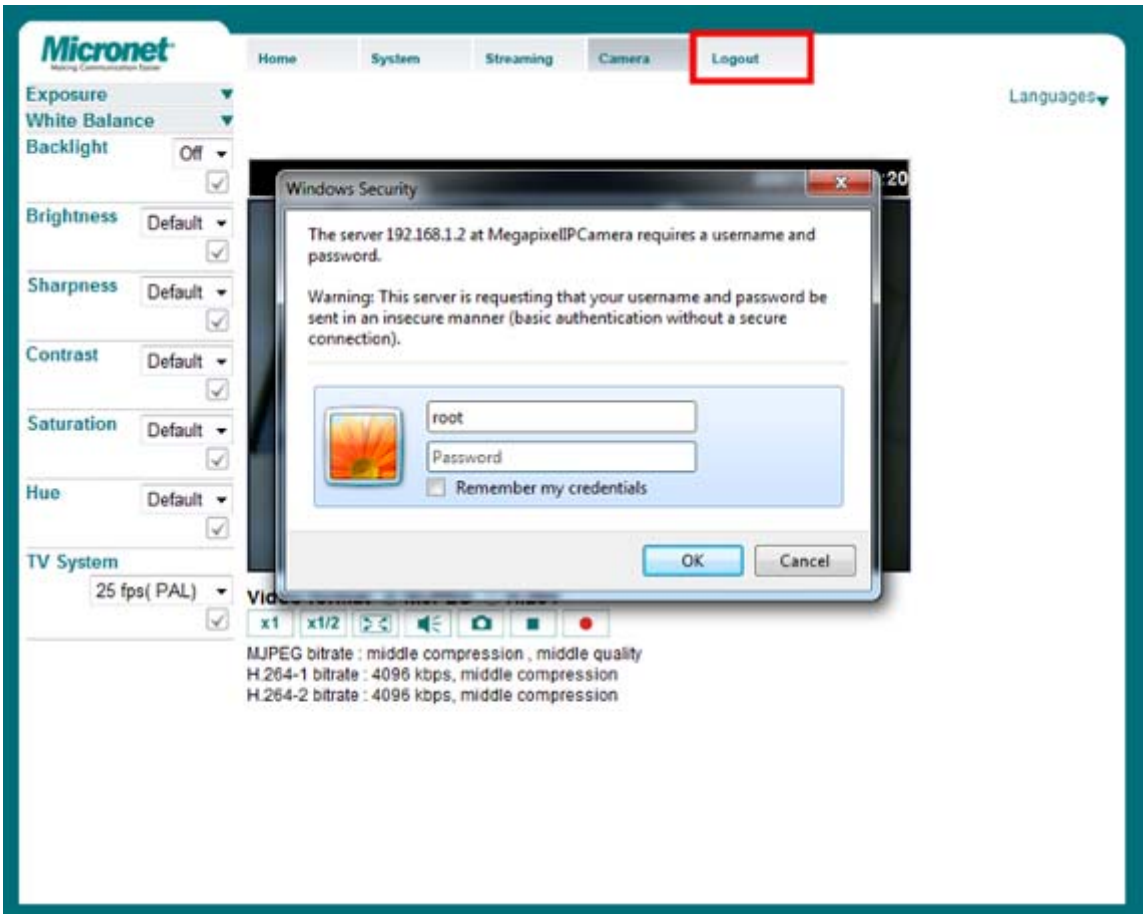


Select the video format that matches the present TV system. Press < √ > to confirm the new setting.

7.6 Logout

Press the tab “Logout” in the top of the page, and the login window will pop up. This enables login with another user name.

Admin → root



Appendix A: Technical Specifications

Camera		SP5591K
Image Sensor		1/2.8” Progressive CMOS
Effective Pixels		1920(H) x 1080(V)
Minimum Illumination	Color	0.2 lux
	B/W	0.02 lux
Shutter Speed		1~ 1/10000 sec.
White Balance		Manual / AWB / ATW
Lens		
Lens Type	Fix	F1.8/ f =3.6 mm
FOV	Fix	71.8°
Operation		
Video Compression		H.264/ MJPEG
Video Streaming		Simultaneous H.264 1080p (25/30 fps) + MJPEG 720p (25/30 fps)
		Simultaneous H.264 1080p (25/30 fps) + H.264 720p (25/30 fps)
Resolution	H.264	Full HD 1080p/ SXGA/ HD 720p/ XGA/ SVGA/ D1/ VGA/ CIF
	MJPEG	
Image Setting	Brightness	Manual
	Exposure	Auto/Manual
	Sharpness	Manual
	Contrast	Manual
	White Balance	Auto/Manual
	Saturation	Manual
	Backlight Compensation	On/Off
	Hue	Manual
	Digital Zoom	Support
	WDR	On/Off
	3D Noise Reduction	On/Off
	Motion detection	On/Off
	Privacy Mask	On/Off
	Privacy Mask Type	Color
	ICR *	Auto/On/Off
	Tampering Alarm	On/Off
Event Notification		HTTP, FTP, SMTP
Multiple Languages		English, French, German, Italian, Korean, Simplified Chinese, Traditional Chinese, Russian
Network		
Interface		10/100Mbps Ethernet (RJ-45)
Protocol		IPv4/ v6, TCP/IP, UDP, RTP, RTSP, HTTP, HTTPS, ICMP,FTP, SMTP, DHCP, PPPoE, UPnP, IGMP, SNMP, QoS, ONVIF
Password Levels		User and Administrator
Security		HTTPS, IP Filter, IEEE 802.1X
Internet Browser		Internet Explorer (6.0+), Chrome, Firefox, Safari
User Account		20
Mechanical		
Built-in IR Illuminator*	Working distance	up to 15m
	Wavelength	850nm
	Number of LEDs	18
Connectors	Power	connector
	Ethernet	RJ-45
	Micro SD	Micro SDHC 32GB support

LED Indicator	Power, Link, ACT
General	
Operating Temperature	-10˚C ~ 50˚C (14˚F ~ 122˚F)
	Humidity: 10% to 90%, no condensation
Power Source	DC12V/ AC24V*/ PoE
Power Consumption	System: 2.5W Built-in IR Illuminator: +1.3W,
Weatherproof Standard	IP66
Regulatory	CE, FCC, RoHS Compliant
Dimension	Ø 71.5 x 100 mm (Ø 2.8 x 3.94 in.)
Weight	330g

(*) Optional

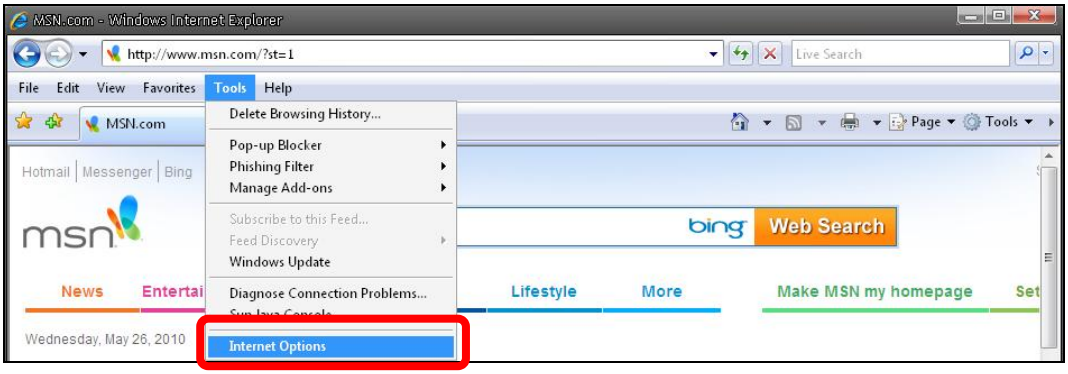
Appendix B: Internet Security Settings

If ActiveX control installation is blocked, please either set Internet security level to default or change ActiveX controls and plug-ins settings.

Internet Security Level: Default

Step 1: Start the Internet Explorer (IE).

Step 2: Select <Tools> from the main menu of the browser. Then Click <Internet Options>.



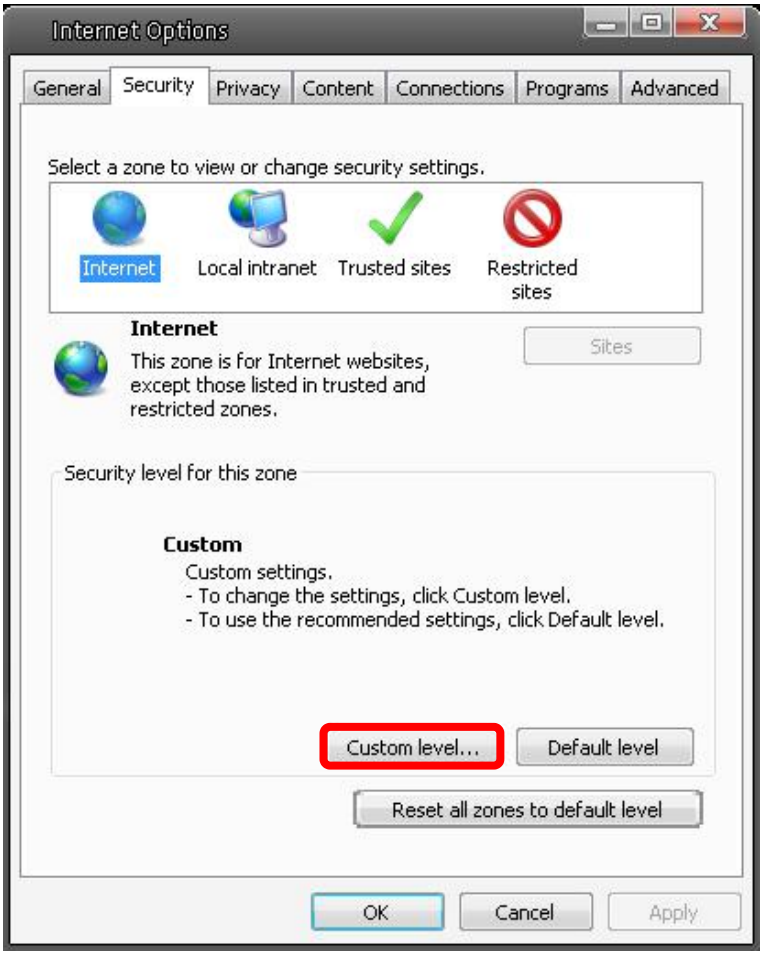
Step 3: Click the <Security> tab, and select <Internet>.

Step 4: Down the page, press “Default Level” (see the figure above) and click “OK” to confirm the setting. Close the browser window, and open a new one later when accessing the IP Camera.

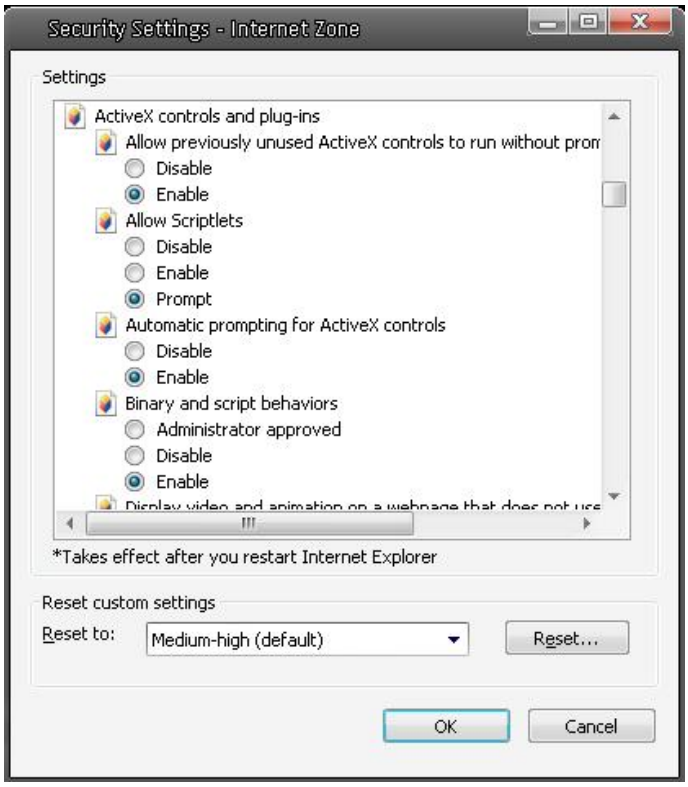
ActiveX Controls and Plug-ins Settings

Step 1~3: Refer to the previous section above.

Step 4: Down the page, press “Custom Level” (see the figure below) to change ActiveX controls and plug-ins settings.



The Security Settings screen is displayed as below:



Step 5: Under “ActiveX controls and plug-ins”, set ALL items (as listed below) to <Enable> or <Prompt>. Please note that the items vary by IE version.

ActiveX controls and plug-ins settings:

1. Allow previously unused ActiveX controls to run without prompt.
2. Allow Scriptlets.
3. Automatic prompting for ActiveX controls.
4. Binary and script behaviors.
5. Display video and animation on a webpage that does not use external media player
6. Download signed ActiveX controls
7. Download unsigned ActiveX controls
8. Initialize and script ActiveX controls not marked as safe for scripting
9. Run ActiveX controls and plug-ins
10. Script ActiveX controls marked safe for scripting

Step 6: Click <OK> to accept the settings and close the <Security> screen.

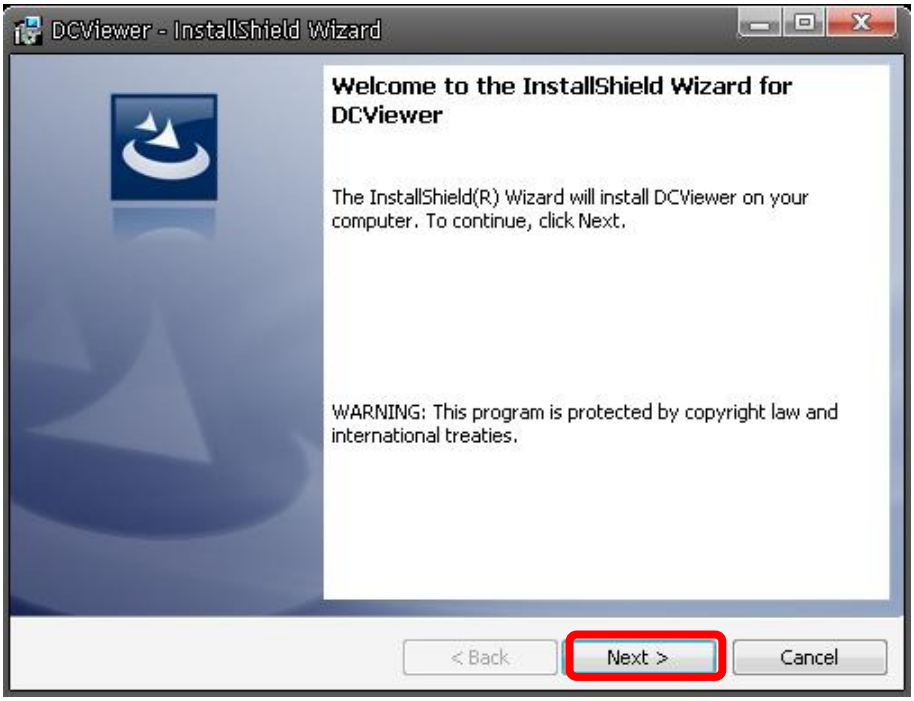
Step 7: Click <OK> to close the Internet Options screen.

Step 8: Close the browser window, and restart a new one later for accessing the IP Camera.

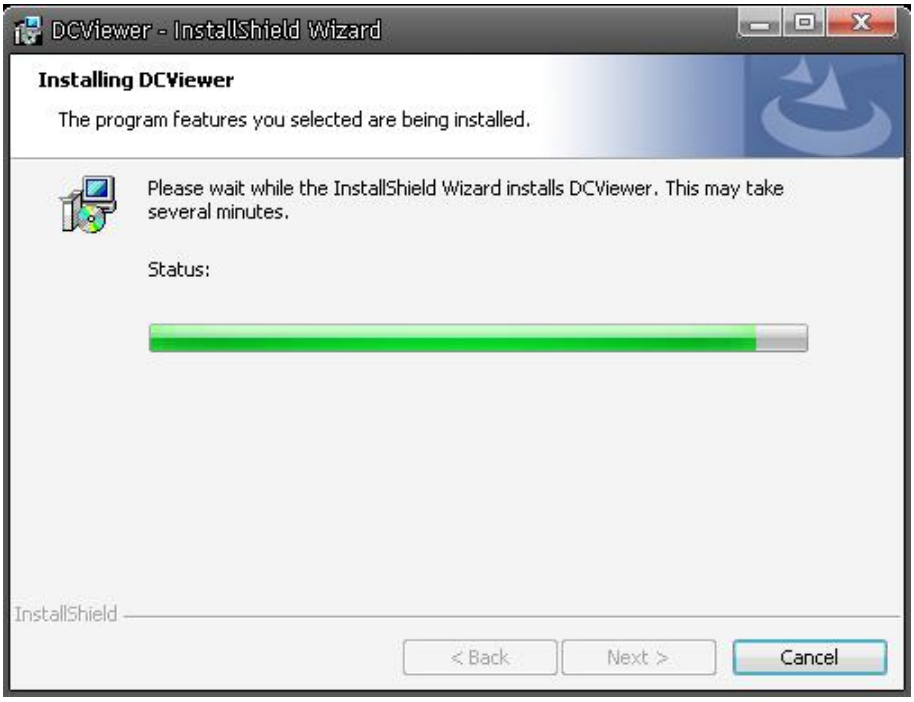
Appendix C: DC Viewer Download Procedure

The procedure of DC Viewer software download is specified as follows.

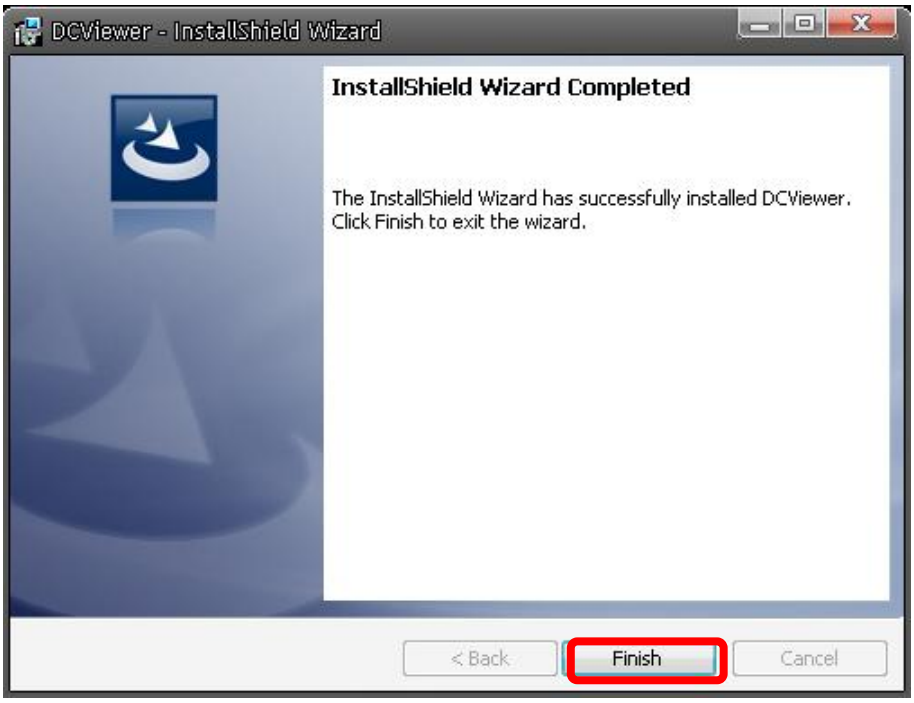
Step 1: In the DC Viewer installation page, click “Next” for starting installing.



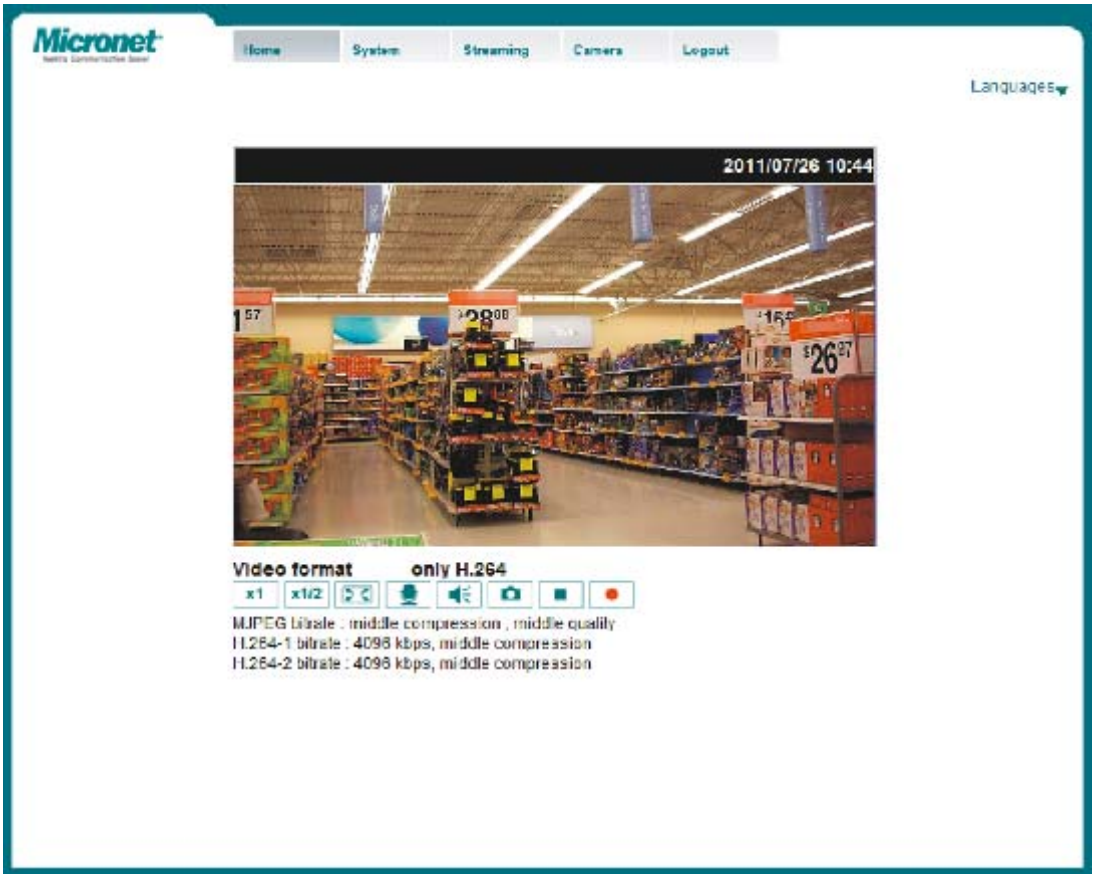
Step 2: Setup starts. Please wait for a while until the loading bar runs out.



Step 3: Click “Finish” to close the DC Viewer installation page.



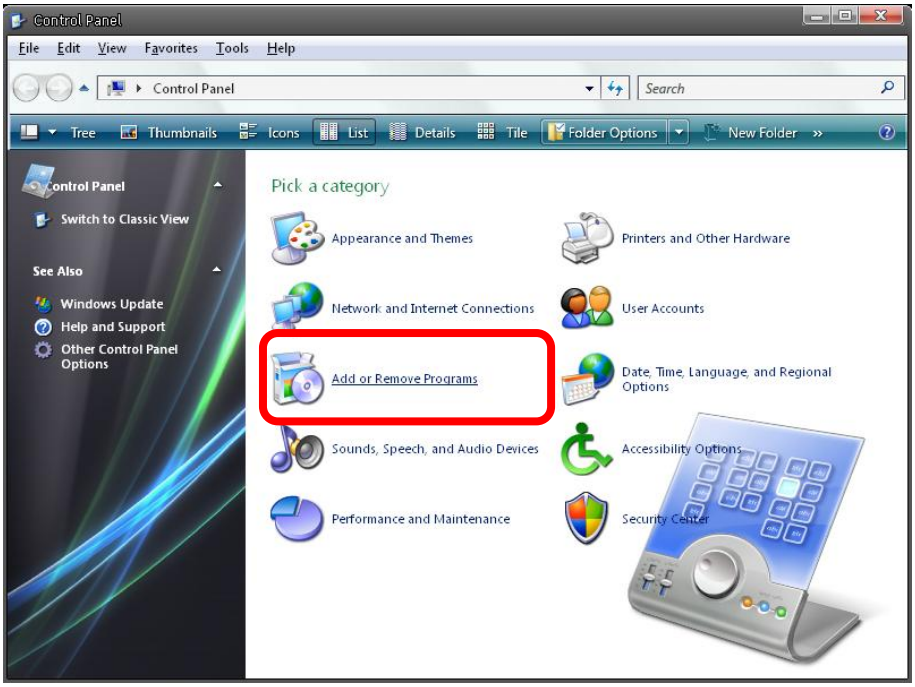
Then, the IP Camera’s Home page will display as follows:



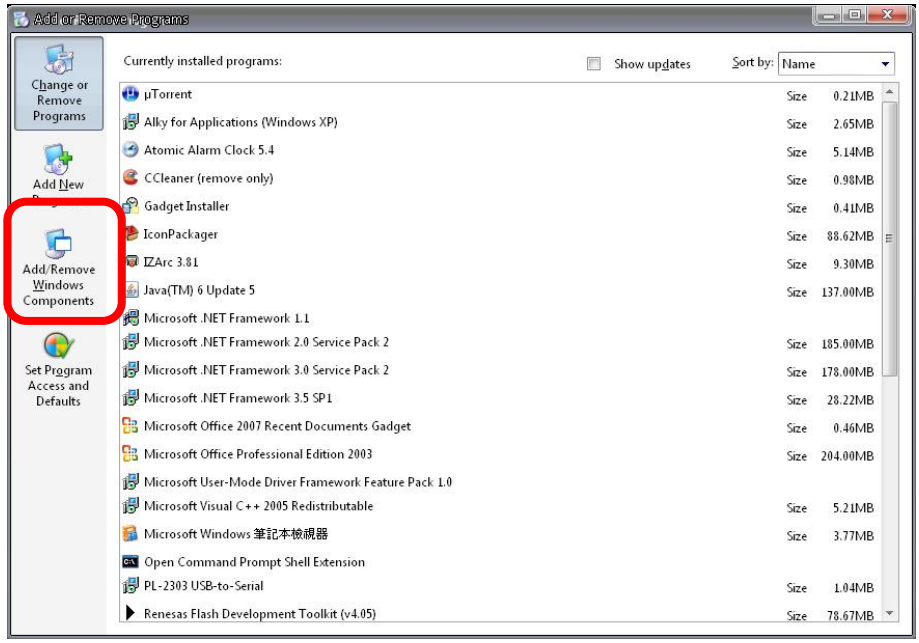
Appendix D: Install UPnP Components

Please follow the instructions below to install UPnP components.

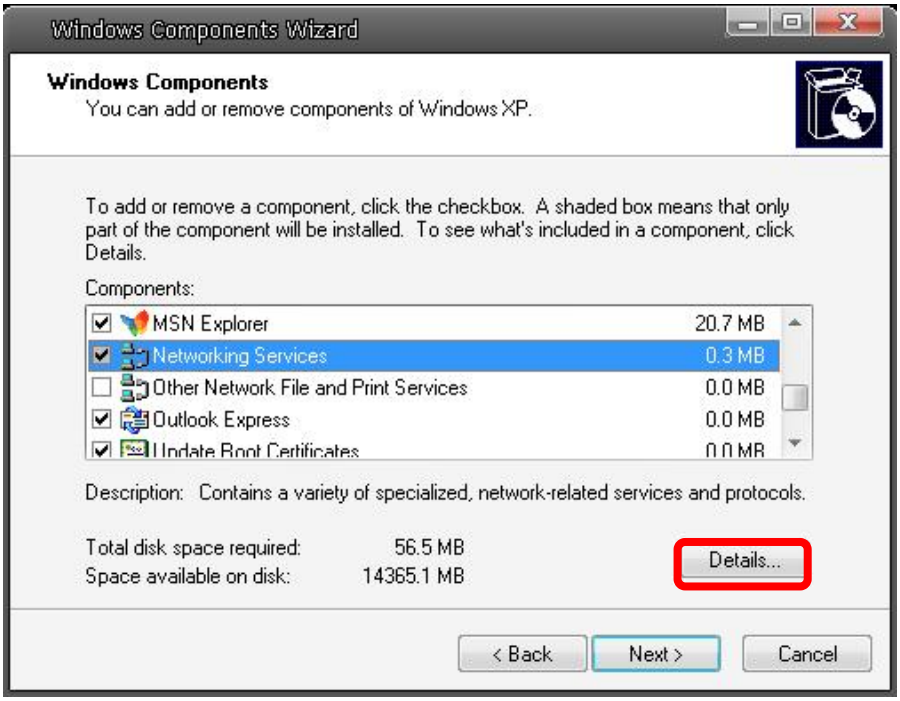
Step 1: Go to “Start”, click on “Control Panel”, and then double click “Add or Remove Programs”.



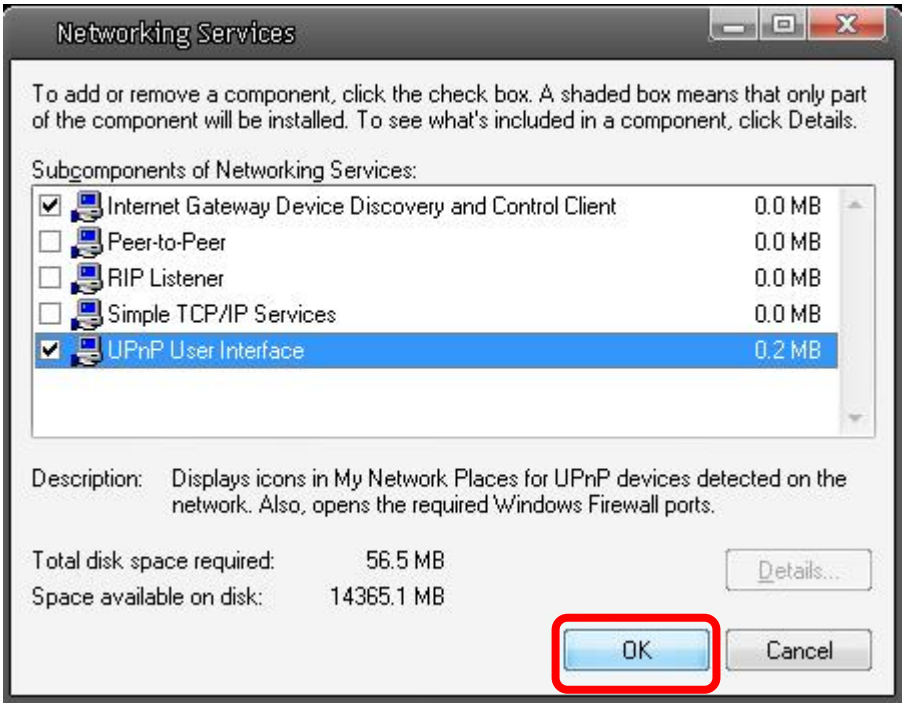
Step 2: Click on “Add/Remove Windows Components” in the Add or Remove Programs page.



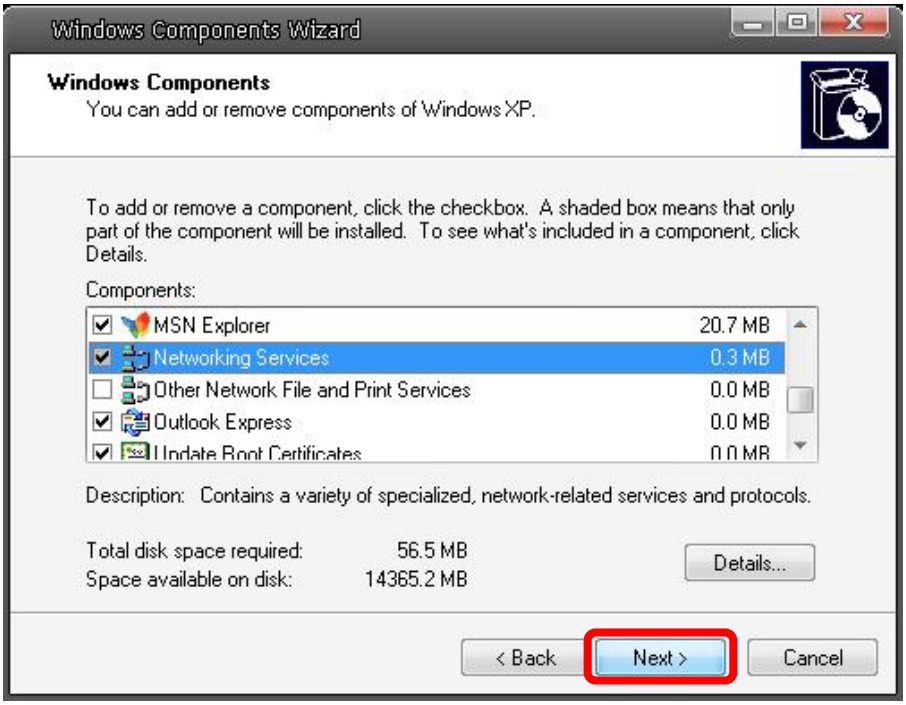
Step 3: Select “Networking Services” from the Components list in the Windows Components Wizard window, and then click “Details”.



Step 4: Select “UPnP User Interface” in the Networking Services’ subcomponents list and then click “OK”.



Step 5: Click “Next” in the Windows Components Wizard page.



Step 6: Click “Finish” to complete installation.

Appendix E: Video Resolution

2M- Quad Streams

H.264 + H.264 + H.264 + H.264 / MJPEG			
H.264-1	**H.264-2**	**H.264-3**	**H.264-4 / MJPEG**
1920 x 1080 (15 fps)	1280 x 1024 (15 fps)	720 x 480 (15 fps)	352 x 240 (30 fps)
		640 x 480 (15 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	1280 x 720 (15 fps)	800 x 600 (15 fps)	720 x 480 (15 fps)
			640 x 480 (15 fps)
			352 x 240 (30 fps)
		720 x 480 (15 fps)	720 x 480 (15 fps)
			640 x 480 (15 fps)
		720 x 480 (30 fps)	352 x 240 (30 fps)
		640 x 480 (15 fps)	640 x 480 (30 fps)
		640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	1024 x 768 (15 fps)	800 x 600 (15 fps)	720 x 480 (15 fps)
			640 x 480 (15 fps)
			352 x 240 (30 fps)
		720 x 480 (15 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		720 x 480 (30 fps)	352 x 240 (30 fps)
		640 x 480 (15 fps)	640 x 480 (30 fps)
		640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	800 x 600 (15 fps)	800 x 600 (15 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		800 x 600 (30 fps)	352 x 240 (30 fps)
		720 x 480 (15 fps)	720 x 480 (30 fps)
		720 x 480 (30 fps)	640 x 480 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
	800 x 600 (30 fps)	720 x 480 (30 fps)	352 x 240 (30 fps)
		640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	720 x 480 (15 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)	352 x 240 (30 fps)
		640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)

H.264 + H.264 + H.264 + H.264 / MJPEG			
H.264-1	**H.264-2**	**H.264-3**	**H.264-4 / MJPEG**
1280 x 1024 (15 fps)	1280 x 1024 (15 fps)	1280 x 720 (15 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		800 x 600 (15 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		800 x 600 (30 fps)	352 x 240 (30 fps)
		720 x 480 (15 fps)	720 x 480 (30 fps)
		720 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	1280 x 720 (15 fps)	1280 x 720 (15 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		800 x 600 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
	1280 x 720 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
	1024 x 768 (15 fps)	800 x 600 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
	1024 x 768 (30 fps)	720 x 480 (30 fps)	352 x 240 (30 fps)
		640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	800 x 600 (15 fps)	800 x 600 (30 fps)	720 x 480 (30 fps)
	800 x 600 (30 fps)	800 x 600 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
1280 x 1024 (30 fps)	800 x 600 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
	720 x 480 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
	640 x 480 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)

H.264 + H.264 + H.264 + H.264 / MJPEG			
H.264-1	**H.264-2**	**H.264-3**	**H.264-4 / MJPEG**
1280 x 720 (15 fps)	1280 x 720 (15 fps)	1280 x 720 (15 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		1280 x 720 (30 fps)	352 x 240 (30 fps)
		800 x 600 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
	1280 x 720 (30 fps)	800 x 600 (30 fps)	352 x 240 (30 fps)
		720 x 480 (30 fps)	352 x 240 (30 fps)
		640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	1024 x 768 (15 fps)	800 x 600 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
	1024 x 768 (30 fps)	800 x 600 (30 fps)	352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
	800 x 600 (30 fps)	800 x 600 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
1280 x 720 (30 fps)	1024 x 768 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
	800 x 600 (30 fps)	720 x 480 (30 fps)	352 x 240 (30 fps)
		640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
1024 x 768 (15 fps)	1024 x 768 (15 fps)	800 x 600 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
	1024 x 768 (30 fps)	800 x 600 (30 fps)	352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
	800 x 600 (30 fps)	800 x 600 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)

H.264 + H.264 + H.264 + H.264 / MJPEG			
H.264-1	**H.264-2**	**H.264-3**	**H.264-4 / MJPEG**
1024 x 768 (30 fps)	1024 x 768 (30 fps)	640 x 480 (30 fps)	352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	800 x 600 (30 fps)	800 x 600 (30 fps)	352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
800 x 600 (30 fps)	800 x 600 (30 fps)	800 x 600 (30 fps)	352 x 240 (30 fps)
		720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
720 x 480 (30 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)
			640 x 480 (30 fps)
			352 x 240 (30 fps)
		640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
			352 x 240 (30 fps)
		352 x 240 (30 fps)	352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)
352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)

2M- Triple Streams

H.264-1 + H.264-2 + H.264-3 / MJPEG		
H.264-1	**H.264-2**	**H.264-3 / MJPEG**
1920 x 1080 (15 fps)	1280 x 1024 (15 fps)	800 x 600 (15 fps)
		720 x 480 (15 fps)
		640 x 480 (15 fps)
		352 x 240 (30 fps)
	1280 x 720 (15 fps)	1280 x 720 (15 fps)
		800 x 600 (15 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	1024 x 768 (15 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
	1024 x 768 (30 fps)	352 x 240 (30 fps)
	800 x 600 (15 fps)	800 x 600 (30 fps)
	800 x 600 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	352 x 240 (30fps)	352 x 240 (30fps)
1280 x 1024 (15 fps)	1280 x 1024 (15 fps)	1280 x 720 (15 fps)
		800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	1280 x 720 (15 fps)	1280 x 720 (15 fps)
		800 x 600 (30 fps)
	1280 x 720 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	1024 x 768 (30 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	800 x 600 (30 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)
1280 x 1024 (30 fps)	800 x 600 (30 fps)	352 x 240 (30 fps)
	720 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)
1280 x 720 (15 fps)	1280 x 720 (15 fps)	1280 x 720 (30 fps)
	1280 x 720 (30 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
	1024 x 768 (30 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)

H.264-1 + H.264-2 + H.264-3 / MJPEG		
H.264-1	**H.264-2**	**H.264-3 / MJPEG**
1280 x 720 (30 fps)	1280 x 720 (30 fps)	352 x 240 (30 fps)
	1024 x 768 (30 fps)	352 x 240 (30 fps)
	800 x 600 (30 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)
1024 x 768 (15 fps)	1024 x 768 (30 fps)	800 x 600 (30 fps)
1024 x 768 (30 fps)	1024 x 768 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	800 x 600 (30 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)
800 x 600 (30 fps)	800 x 600 (30 fps)	800 x 600 (30 fps)
		720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	720 x 480 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)
720 x 480 (30 fps)	720 x 480 (30 fps)	720 x 480 (30 fps)
		640 x 480 (30 fps)
		352 x 240 (30 fps)
	640 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)
640 x 480 (30 fps)	640 x 480 (30 fps)	640 x 480 (30 fps)
		352 x 240 (30 fps)
	352 x 240 (30 fps)	352 x 240 (30 fps)
352 x 240 (30 fps)	352 x 240 (30 fps)	352 x 240 (30 fps)