COMTREND

www.comtrend.com

MB-21IR Outdoor Bullet IP Camera

User Manual

ONVIF S

Ver 2.0

CONTENTS

CONTENTS

Chapter 6. Appendix

Overview

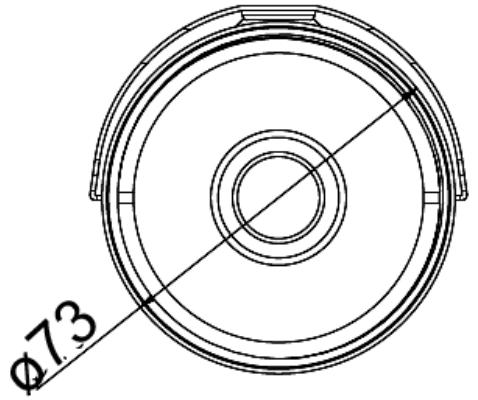
1.1. Read Before Use

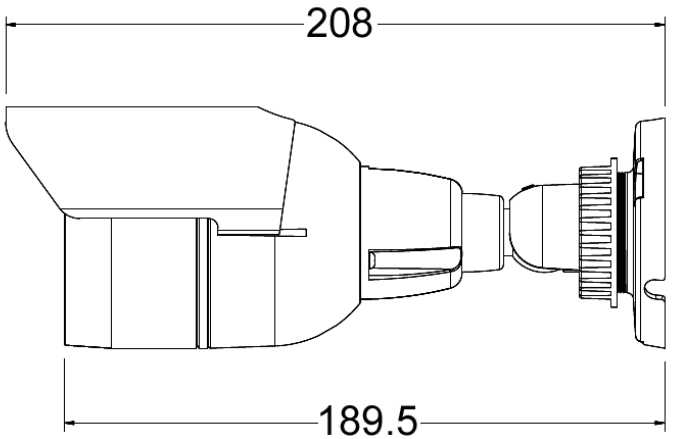
This network camera is a professional equipment for surveillance purpose. Please comply with each national laws to prevent from any relevant privacy violations before use.

In order to operate this network camera, it require a basic knowledge of network structure. For further use of project application, it requests an advance level of knowledge in lens optics selection, network structure design, storage planning and software capability.

This product service may be different since the diversity of distributors. We suggest to purchase SMAX product from SMAX direct distributors or system integrators to get the most complete after service.

Please first check the package contents are complete with nothing missing. Then, carefully read through all attentions and instructions before use.





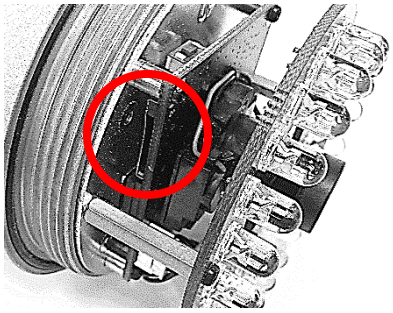
1.2. Physical Description

1.2.1. Mechanical and hardware interface

AU1 is an internal built fixed lens network camera. It can be placed on the wall or ceiling. With its mini and compact design, it is suitable to locate in a environment like department store or shop counter.

AU1 accept both POE power supply or DC 5V power supply. Please noted that the DC 5V adapter is an extra accessory which does not include in this package.

It has Micro SD/SDHC card slot built in for recording storage function.



MicroSD/SDHC Card Slot

DC 5V

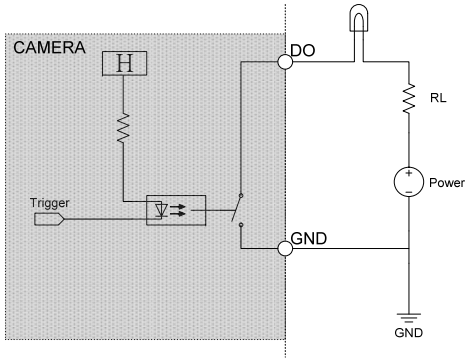
Ethernet 10/100 RJ45 port

1.2. Physical Description

1.2.2. Digital Input (DI)

Item	Description
1	DI
2	GND

Digital Input		
Pin	Notes	Specifications
	Trigger is “Off”, DO connect to GND Trigger is “On”, DO is floating	Max load: 30mA,30VDC



1.3. Safety Instructions

Carefully read through the safety instruction below.

- Network cameras are delicate. Handle with care.
- Do not store the camera in a high temperature or high humidity location. Avoid direct sun light.
- Keep away from children.
- Do not disassemble the camera. No serviceable components inside.
- When placing a camera in a high humidity or wet environment, select a product with an IP66/67 level weather proofing rating.
- Cameras will generate heat during normal operation. Avoid direct contact with hot camera components during or after operations.
- Do not attach DC/AC power directly to the camera's DI/DO port.
- Check the correct direction when inserting the Micro SDHC card into camera's Micro SDHC card slot.
- Contact your sales channel or find a regional Comtrend distributor for any warranty issues.

1.4. Package Contents

Description	Qty
Network Camera	1
Tools package (Screw Kit…etc.)	1
CD: A. Software: Comtrend Finder x 1 B. Doc: Datasheet, User Manual, Quick Installation Guide	1

Network Camera

CD

1.5. EMC (Electromagnetic Compatibility)

FCC Statement

This device compiles with FCC Rules Part 15. Operation is subject to the following two conditions.
(1.) This device may not cause harmful interference, and
(2.) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the installation manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

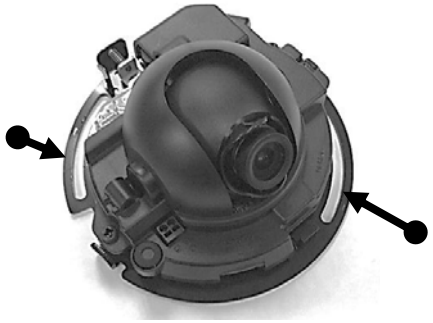
Installation

2.1. Installation

Follow the instructions below to setup your network camera.

Setup 1. Push the housing release tab and remove the cover. Insert a Micro SD card (Optional) for on device storage.

Setup 2. Fix the camera on the wall or ceiling with supplied screws and twist the camera to the desired viewing angle.



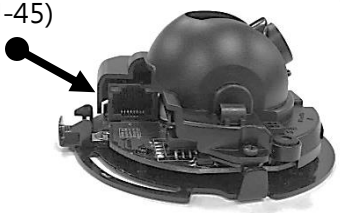
Setup 3. Adjust the tilt angle and focus as necessary.

Setup 4. Connect the camera to a *PoE switch or *PoE injector.
Make sure the network connection is stable .

＊. This network camera can only use PoE power.

Setup 5. Connect the network cable to the camera.

PoE (RJ-45)

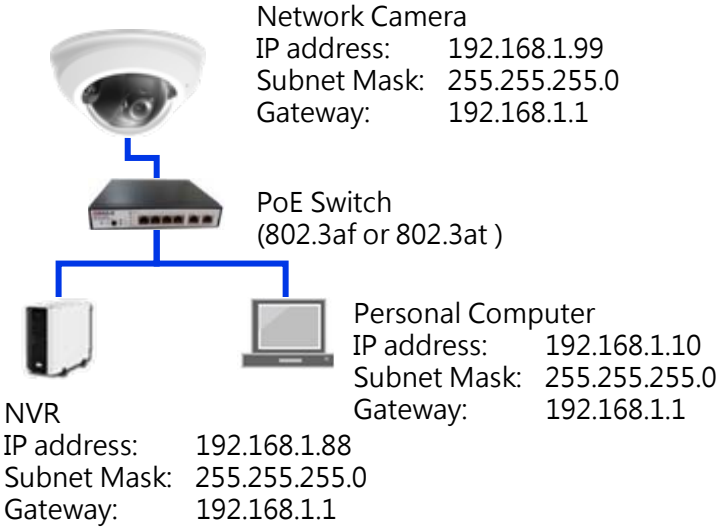


Setup 6. Re-mount the cover.

Setup 7. Make sure to keep the camera cover closed and the network cable output fed through the desired path.

2.2. Comtrend IPFinder Installation

A basic camera setup diagram is shown on the right:
（In a normal application, the camera only needs to be within a local LAN structure to meet the surveillance requirement.）



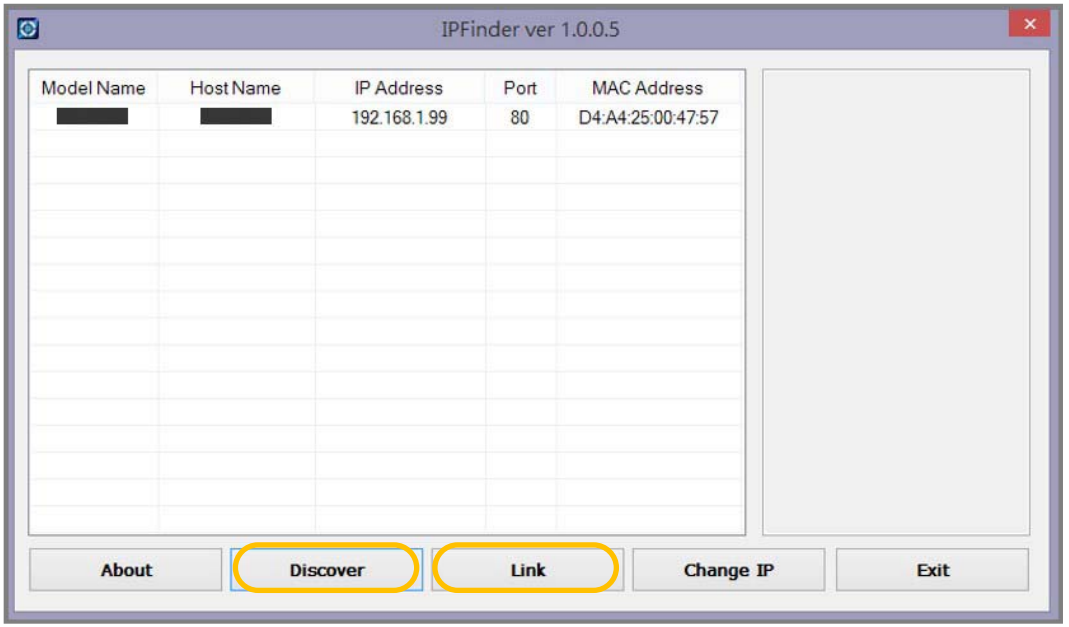
Comtrend Finder Installation：
Read the CD from the package content. Then copy **IPFinder.exe** file to your personal PC. Run the program until the Finder windows display as shown on the right picture.

Comtrend Finder procedure：

Step 1.
Press the **"Discover"** button so the program will search for all Comtrend IP cameras within the local network.

Step 2.
Choose a specific camera, then press the "**Link**" button. The program will launch the default browser and initiate connection to the camera's web UI access page.

Notification:
Comtrend camera default IP setting is DHCP mode. Default IP address is **192.168.1.99**. (if No DHCP Service)
Default username and password is both **admin.**



2.3. Ready to Use

Access procedure:

Step 1.

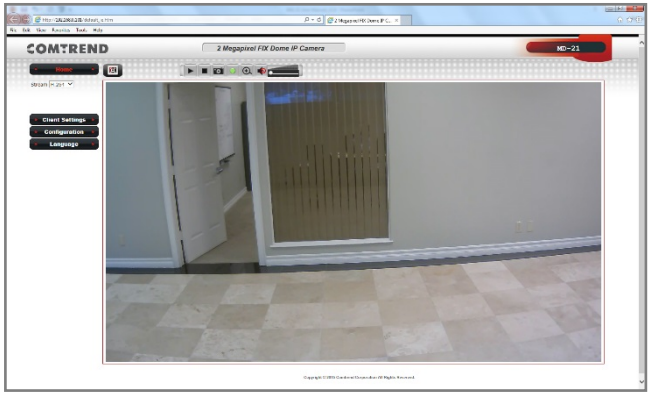
When linked from Comtrend's Finder to the camera's web UI access page, enter the default username and password (ID: admin / PW: admin) for further access.

Step 2.

When first connecting to a Comtrend camera, some plugin need to be installed on to your computer. Follow the instruction and press allowed to allow the installation to proceed.

Step 3.

After installation of ActiveX plugin, you should be able to see the video stream from camera as shown on the below picture.



Accessing

3.1. Network Deployment

Comtrend cameras support both intranet and internet structures.

A. True IP address setting
B. Transfer from UPnP router
C. PPPoE connection setting

Structure as shown on the right

Step 1.

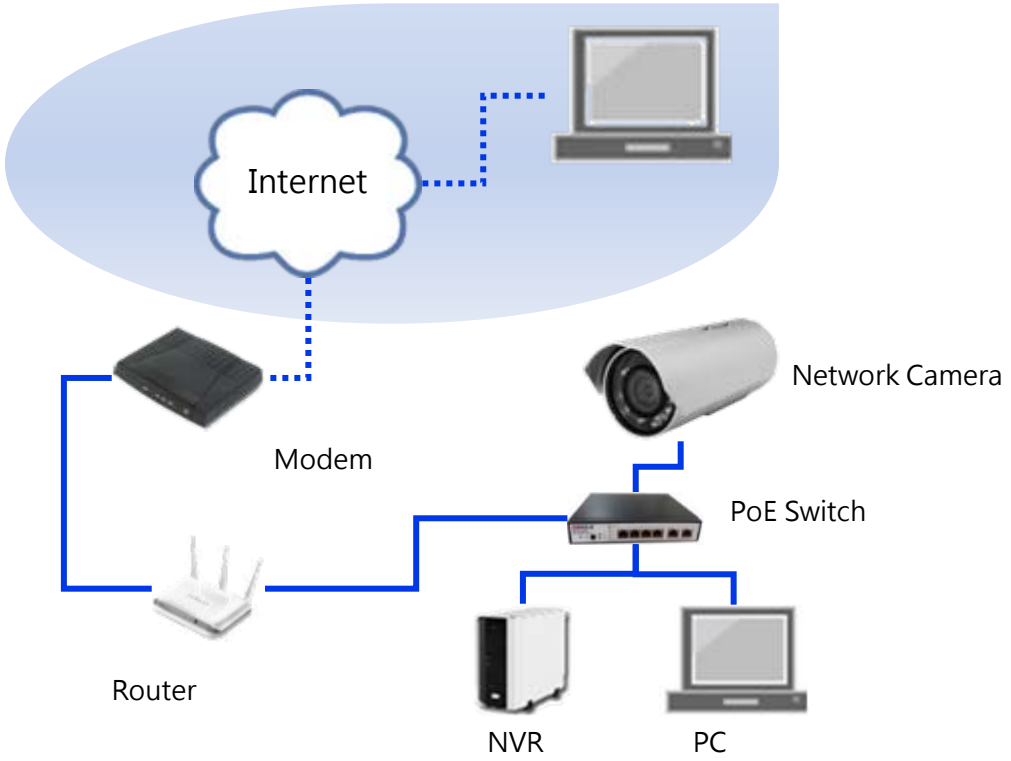
Run the IPFinder and search the local network for Comtrend cameras.

Step 2.

Enter you static true IP address which was provided by your ISP. Then press enter.

Notification：

Please contact your ISP vender for further static true IP address setting or service.



Internet and Intranet setting structure illustration

Notification：

When you have a true IP address, you may need set your camera to a static IP address. Then you may use an internet browser by entering this static true IP address to access your network camera.

If your true IP address is going to your router, you may need to use port forwarding. This is the solution that solves the problem when a surveillance project lacks a true IP address for management. The performance of the camera will be strongly dependent on the performance of the router. It may cause an abnormal connection.
<refer to 3.1. B. setting >

3.1. Network Environment Setting

A. True IP address setting

Step 1.

Run the Comtrend IPFinder and search for the camera within the local network.

Step 2.

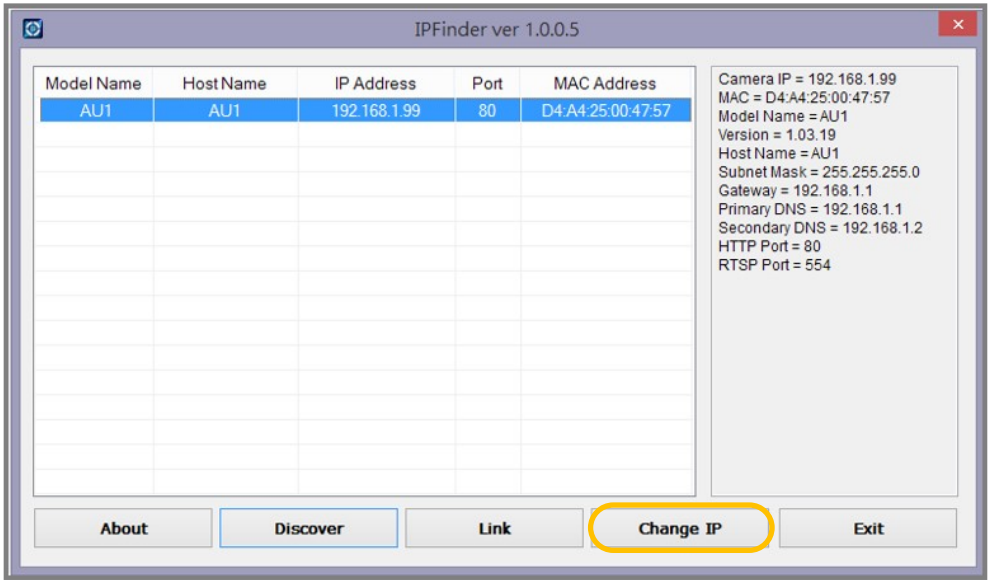
Select the camera and click "**Change IP**" button.

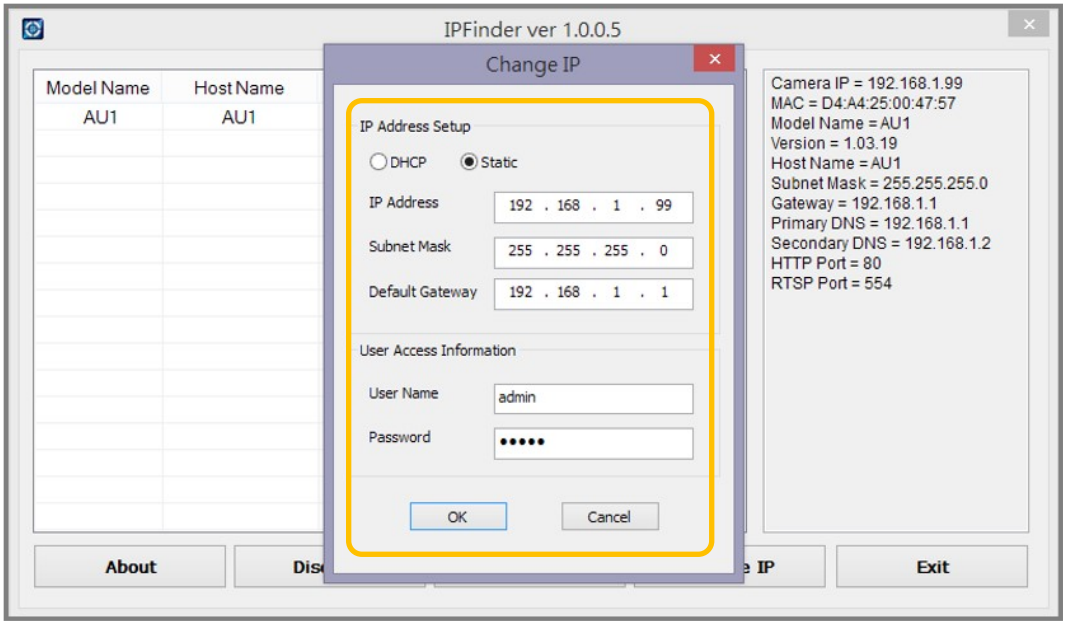
Step 3.

Select static mode and enter your true IP address, Subnet mask, Default gateway, and the username and password of the camera. Then press "**OK**" to finish. Once complete, the "Change IP Success!" message will display.

Notification：

Please contact your ISP vender for further static true IP address setting or service.





3.1. Network Environment Setting

A. Transfer from UPnP router

Step 1.

Access to the camera's web UI page and select the "**Configuration**" option.

Step 2.

Select the "**Network**" option.

Step 3.

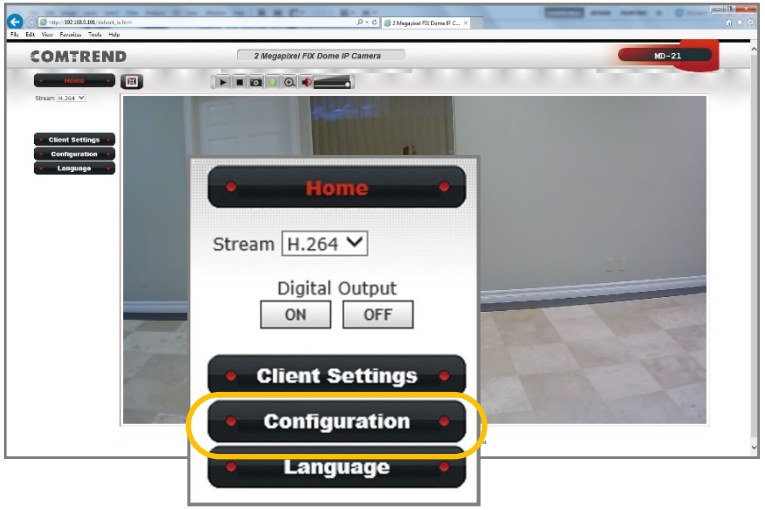
Assign a static IP address the fits your local network, then enter your gateway address and DNS information.

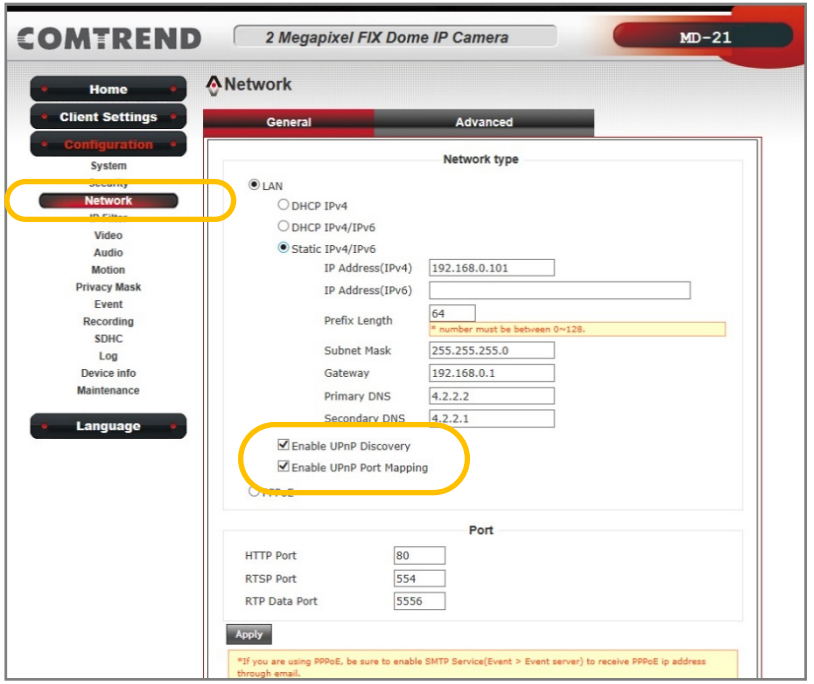
Step 4.

Select "**Enable UPnP Discovery**" and "**Enable UPnP Port Mapping**". Then press the "**Apply**" button to apply the setting.

Notification：

Network camera's UPnP function may have some compatible issue with certain routers. For your specific router refer to your router's instruction manual about Port Forwarding and other UPnP setting.





3.1. Network Environment Setting

A. PPPoE connection setting

Step 1.

Access to the camera's web UI page and select the "**Configuration**" option.

Step 2.

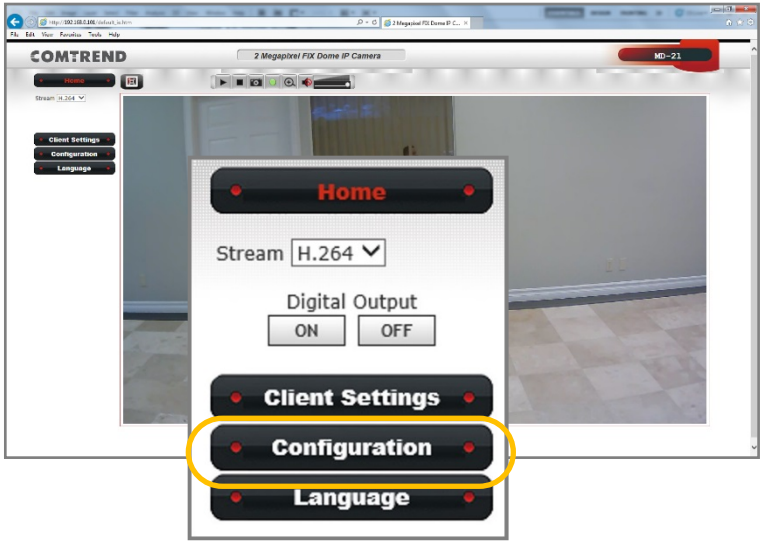
Select the "**Network**" option.

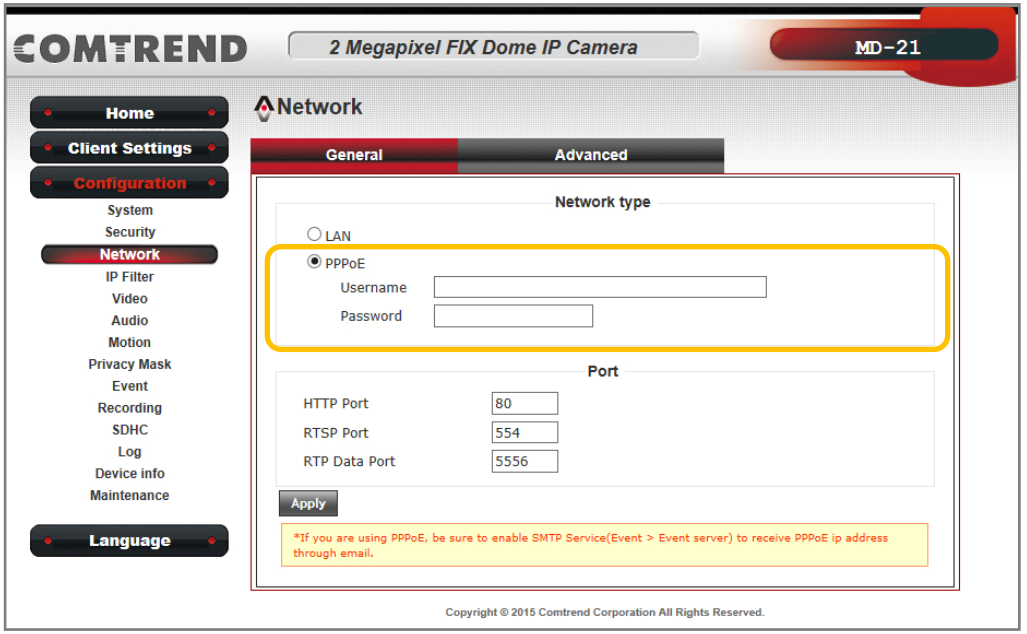
Step 3.

Select "**PPPoE**" and enter your username and password. Then press the "**Apply**" button to finish.

Notification :

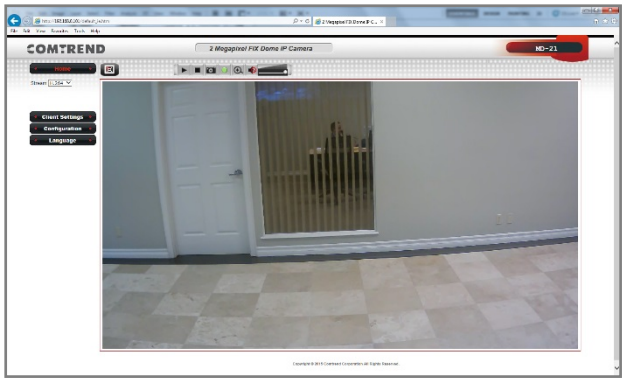
When select PPPoE connection, make sure your network camera is equipped with a true static IP address. If so, you can access to the camera by entering the IP address via internet. If not, refer to our DDNS setting.





Comtrend Network Camera connection：

Comtrend's network cameras support multiple connections for accessing. Including multiple browsers connection, video player connection that supports RTSP, and NVR access. Each connection fulfill different surveillance application for different purposes.



3.2. Accessing via Web UI

You can choose to view the Comtrend camera UI with a web browser to view live video, SD card recording and searching, local computer recording, audio functions and other advanced features.

Notification：

1)We suggest to use IE 9/10/11 and above version to access the Comtrend network camera.

2)Other than IE browser, Comtrend network cameras also support both Google Chrome and Mozilla Firefox browsers for accessing.

3)If using Google Chrome and Mozilla Firefox to access, those browsers will need Quick Time to play the live video. If your computer has not install Quick Time software, download and install it prior to viewing the Comtrend camera UI.

3.3. Accessing via RTSP Player

Comtrend network cameras support accessing via RTSP player. Below using VLC player as a reference instruction:

Step 1.

Run the VLC player and select the "**Media(M)**" button. Then select "**Open network stream(N)**". It will pop out the settings window.

Step 2.

Enter the **RTSP address** "ex. rtsp://**Camera's IP**/stream1 " and press the "**Play**" button. It should link to the camera for the live video as shown in below picture.

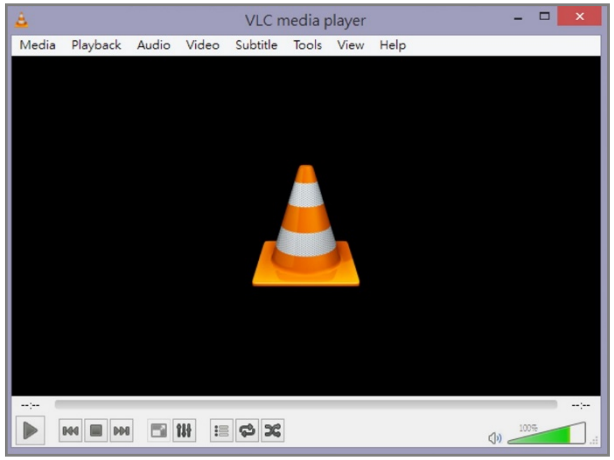
Notification :

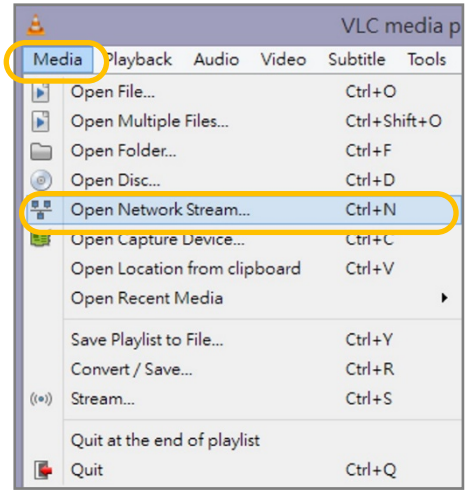
Comtrend network cameras provide three RTSP stream:

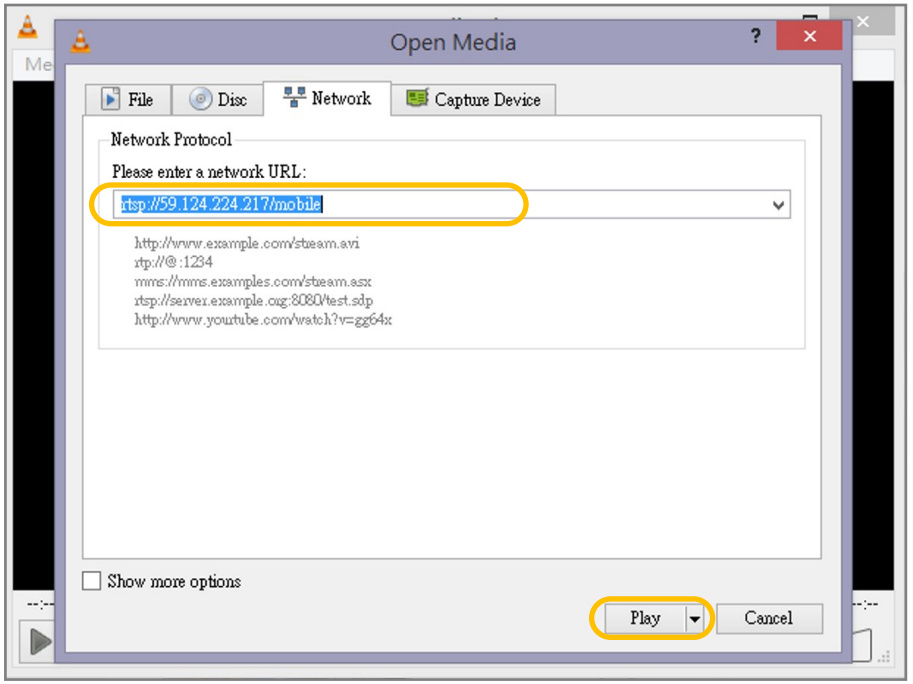
Main stream address: rtsp://**Camera's IP**/stream1

Second stream address: rtsp://**Camera's IP**/stream2

Mobile stream address: rtsp://**Camera's IP**/mobile







WEB UI

4.1. Home page

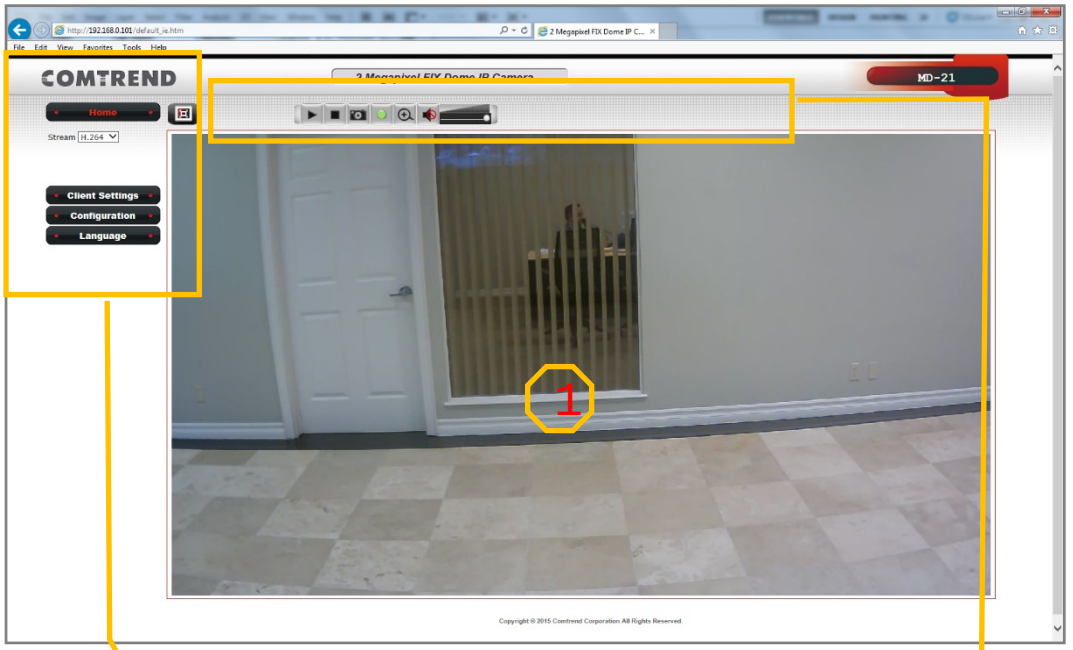
You can access the Comtrend network camera via a web browser to monitor live view, manage setting, SD card recording…etc. There is a complete introduction procedure of all function in the following chapters.

Homepage function list:

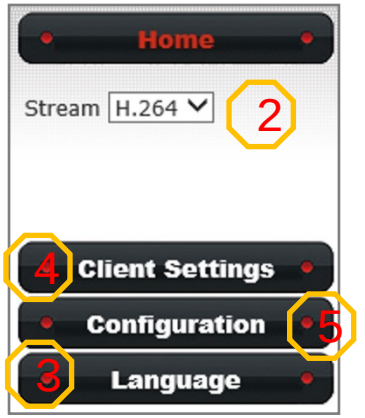
1)Live view screen
2)Select stream format
3)Select language
4)Client settings
5)System configuration
6)Live view operation control list

Notification：

Function list of icons is shown on the picture to the right.



Main function List



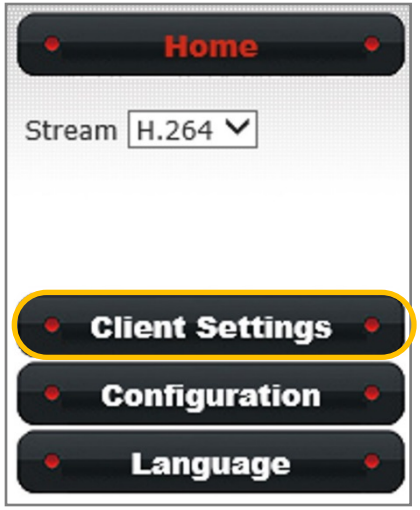
Live view operation list

	Original size display
	Stream play/stop Snapshot Recording
	Digital zoom
	Audio operations

4.2. Client Settings

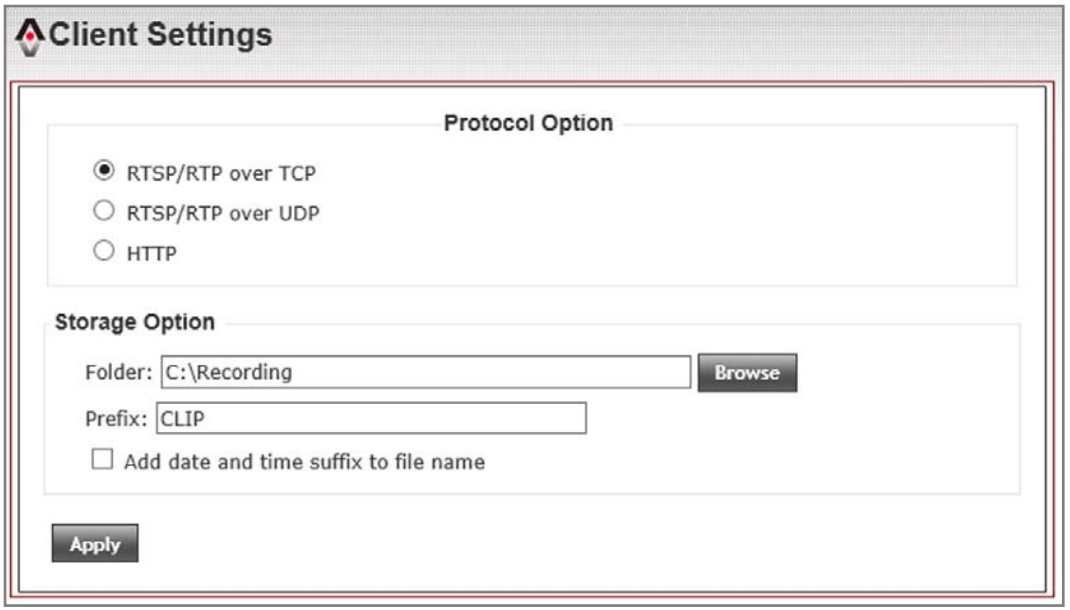
4.2.1. Protocol options

This setting is to define your protocol option. Default is set as **RTSP/RTP over TCP.** This protocol make sure that all image data must be transferred. But if you choose the image quality comes first, then you can change to **RTSP/RTP over UDP.** If your network environment only allows to connect with web page, then you can change to **HTTP** protocol.



4.2.2. Storage Options

This setting is to define your storage option. When doing a recording action, you can set where the recording file saves to. Press the "**Browse"** button to set your folder path. You can also name the **Prefix** of recording file and select to "**Add date and time suffix to file name**". Press "**Apply**" to save.



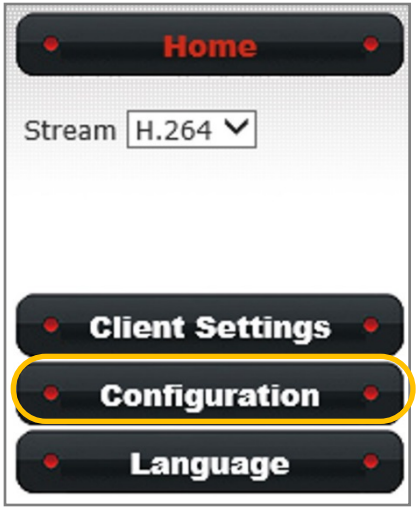
Configuration

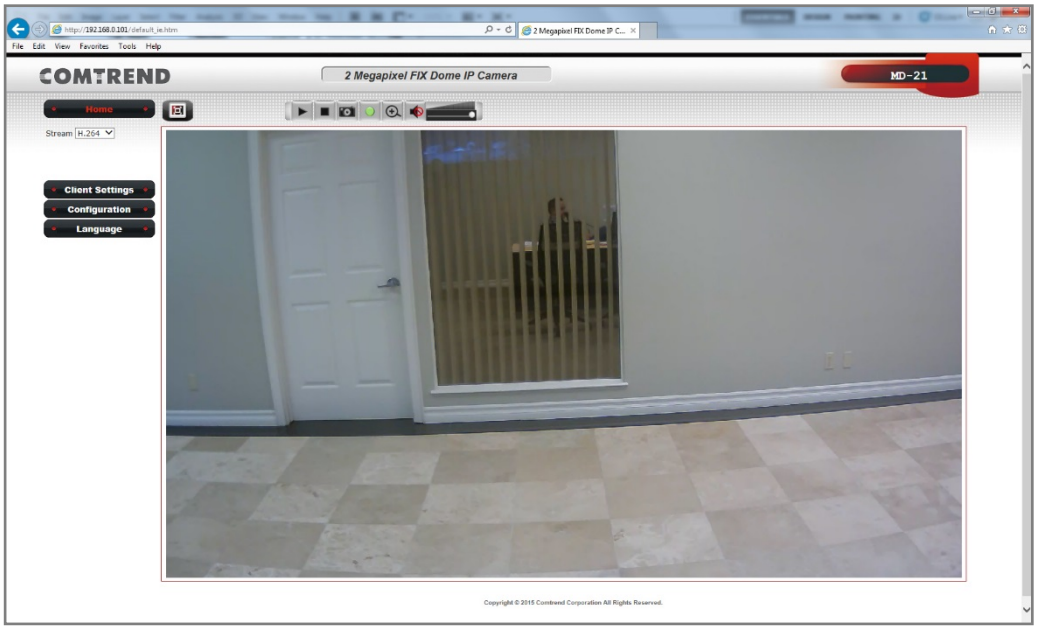
5.1. Configuration Settings

In the configuration menu, it includes all operating functions for settings, maintenance, log and device information…etc.

Configuration menu as shown below：

1)System
2)Security
3)Network
4)IP Filter
5)Video
6)Audio
7)Motion
8)Privacy Mask
9)Event
10)Recording
11)SDHC
12)Log
13)Device Info
14)Maintenance





5.1. Configuration Settings

5.1.1. System

This system page displays your network camera's **Host Name, LED Indicator ON/OFF Switch** and set the **Date and Time.**

Date and Time Setting procedure :

Step 1.

Select your network camera's **Time Zone** and enable **Daylight Saving** if desired.

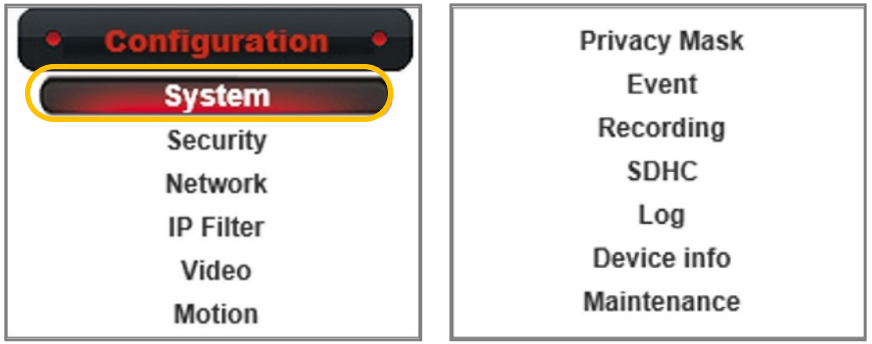
Step 2.

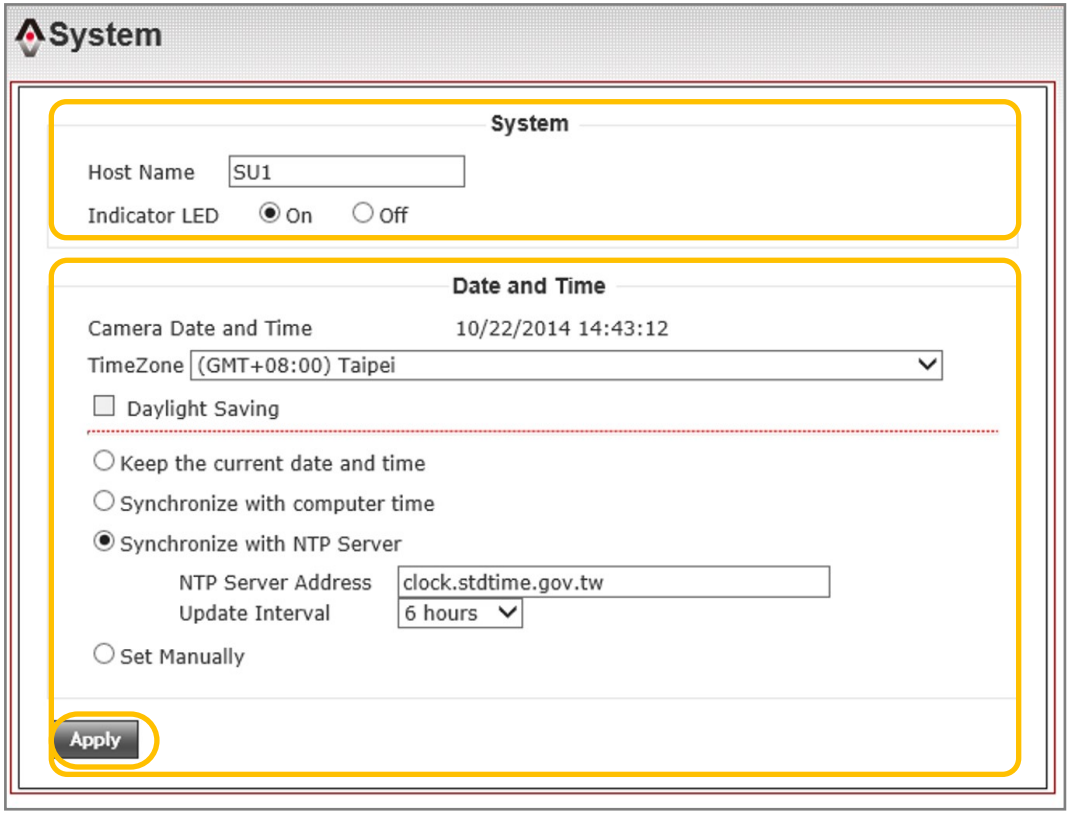
There are four ways to synchronize the camera's time: **Keep the current date and time, Synchronize with computer time, Synchronize with NTP Server** and **Set Manually.**

For a small surveillance system, we suggest **Synchronize with computer time**. Press the "**Apply**" button to save settings.

Step 3.

For a medium or larger surveillance system, we suggest to **Synchronize with NTP Server**. Enter your **NTP Server Address** and set the **Update Interval**. Then press "**Apply**" to save settings.





5.1. Configuration Settings

5.1.2. Security

Select the "**Security**" button under the "**Configuration**" menu. This function is to manage the Users of the camera by setting **Administrator** and **Account List.**

Administrator Setting Procedure :

Step 1.

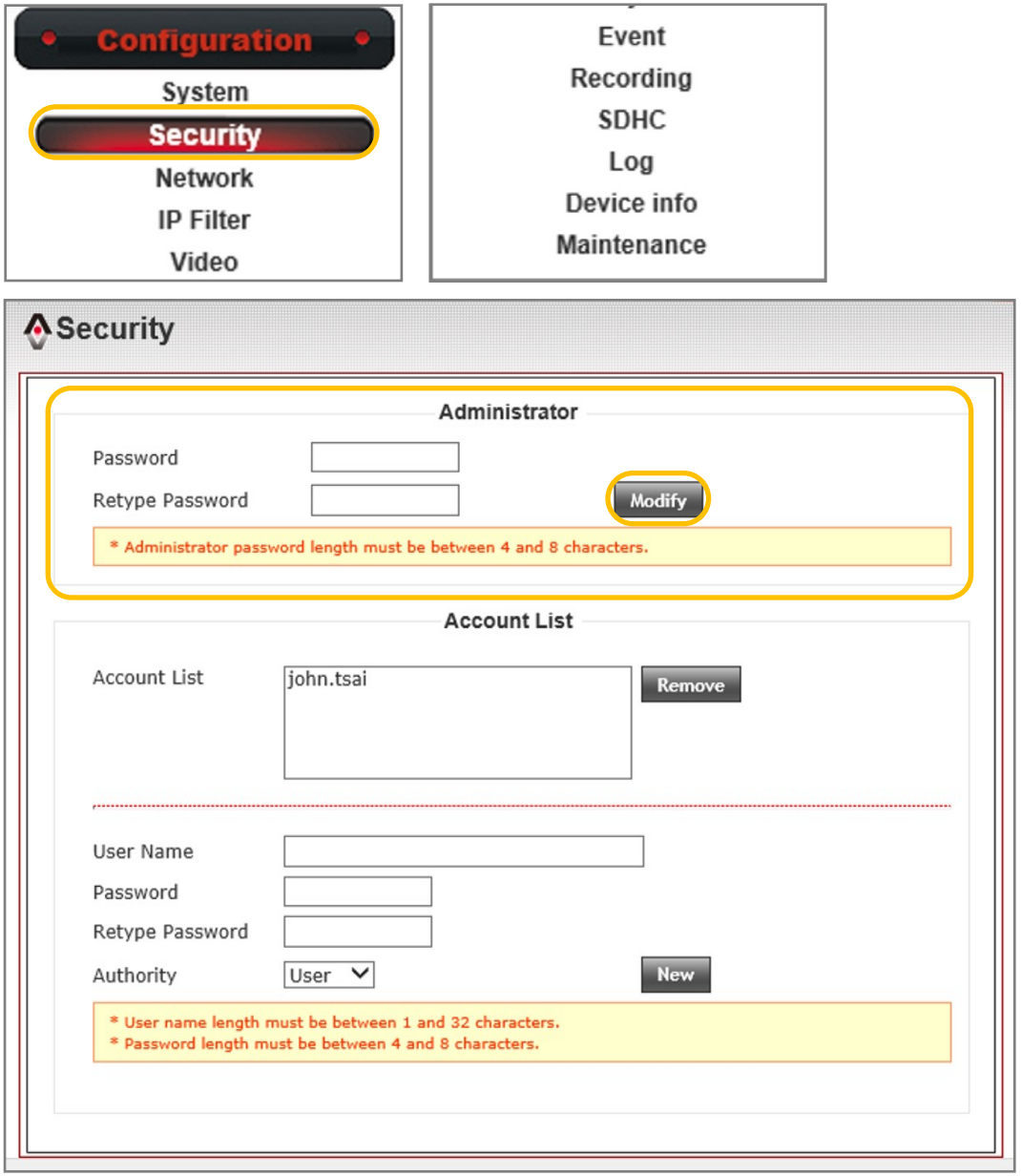
Enter a new **Password** and **Retype Password.**

Notification :

Administrator password can be a composition of letters and numbers. But the length must kept between 4 and 8 characters. No special character are allowed. The password is case sensitive.

Step 2.

Press the "**Modify**" **button** to save the settings.



5.1.2. Security

Account List Setting Procedure :

Step 1.

Enter a **Username, Password, Retype Password.**

Notification :

Username can be a composition of letters and numbers. The length must kept between **1 and 32** characters. No special character are allowed. The Username is case sensitive.

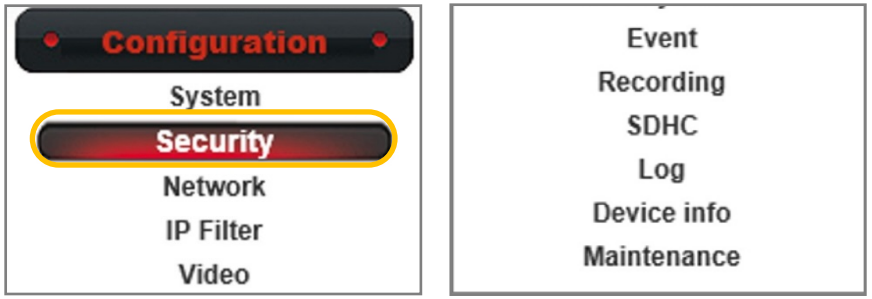
User password can be a composition of letters and numbers. The length must kept between **4 and 8** characters. No special characters are allow. The password is case sensitive.

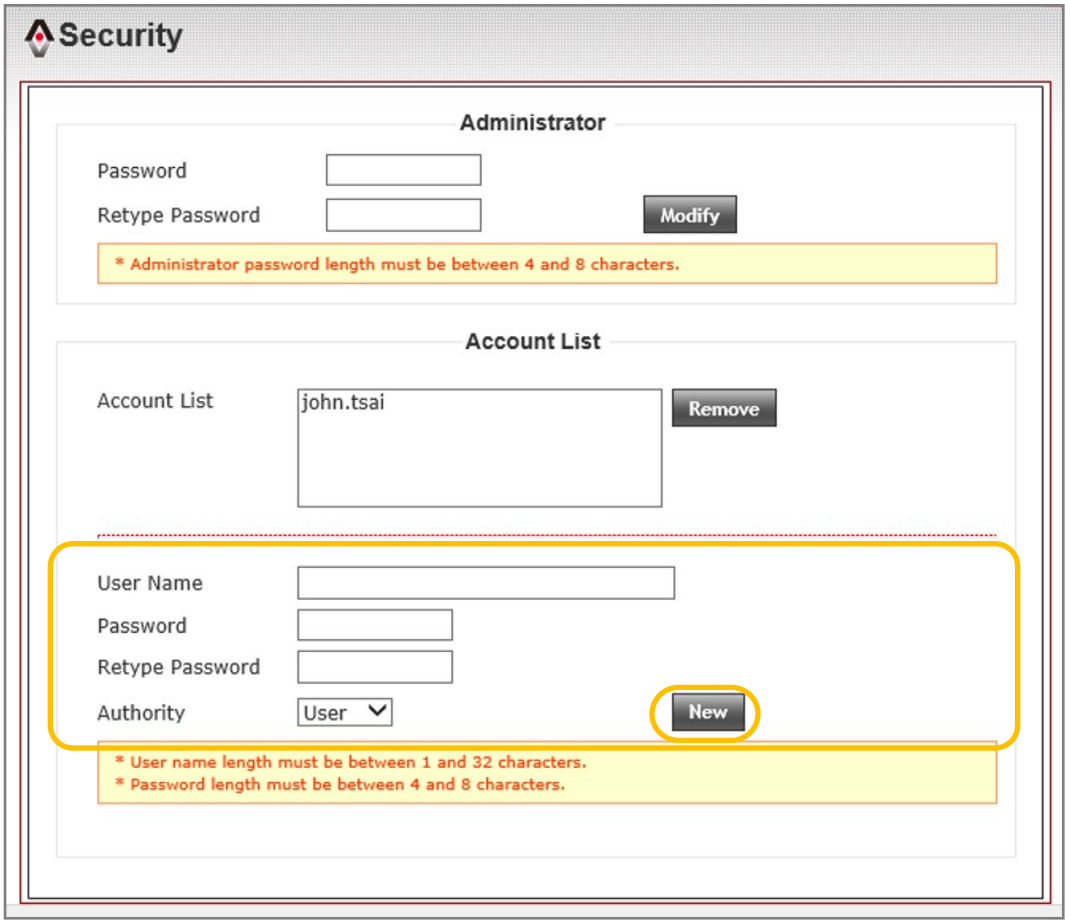
Step 2.

Select "**Authority**" then press "**New**" to add an account.

Notification :

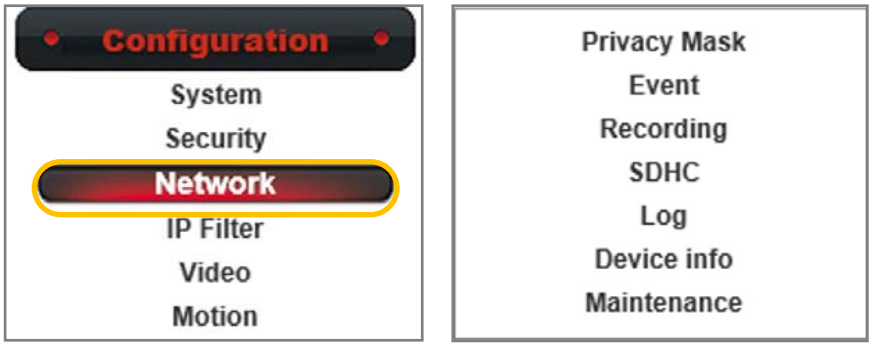
Authority has two types, "**User**" or "**Guest**". The privilege of a guest is limited to watch the live view from the home page only. A "**User**" is allowed to operate all function within the home page and modify the client setting. Access to configuration menu is limited to "**LOG**" and "**Device Info**".





5.2. Network Settings

Default network settings of the camera are **LAN** type, **DHCP IPv4/IPv6** and **Enable UPnP Discovery.** When this network camera is introduced to Local network environment, the camera will get a dynamic IP from the local DHCP server each time the camera turns on.



5.2.1. General Network Settings

5.2.1.1. General Network Settings Recommendation

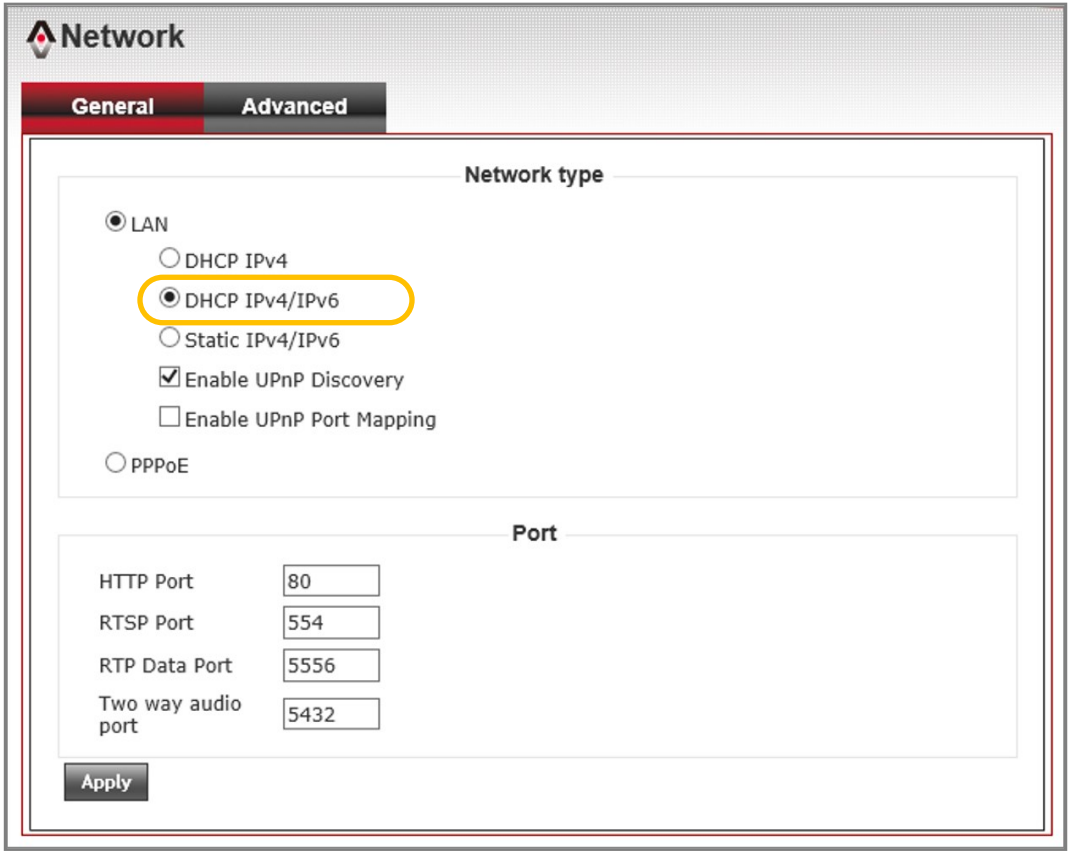
We suggest to use **Static IPv4/IPv6.**

Camera's port setting as shown below：

a)HTTP Port： 80

b)RTSP Port：554

c)RTP Data Port：5556



Notification：

If the default setting cannot connects to network camera properly, consult with you network administrator.

5.2.1.1. Intranet Static IPv4/IPv6 Setting

Static IPv4 Setting Procedure :

Step 1.

Select "**Static IPv4/IPv6**" under "**Network Type**".

Step 2.

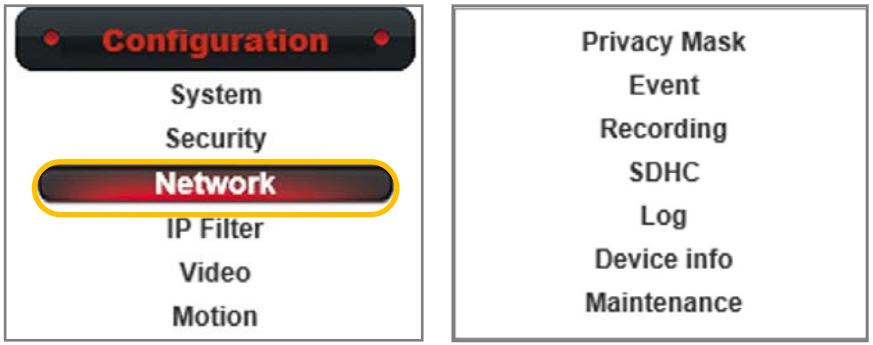
Enter an **IP Address (IPv4), Subnet Mask, Gateway, Primary DNS and Secondary DNS** settings.

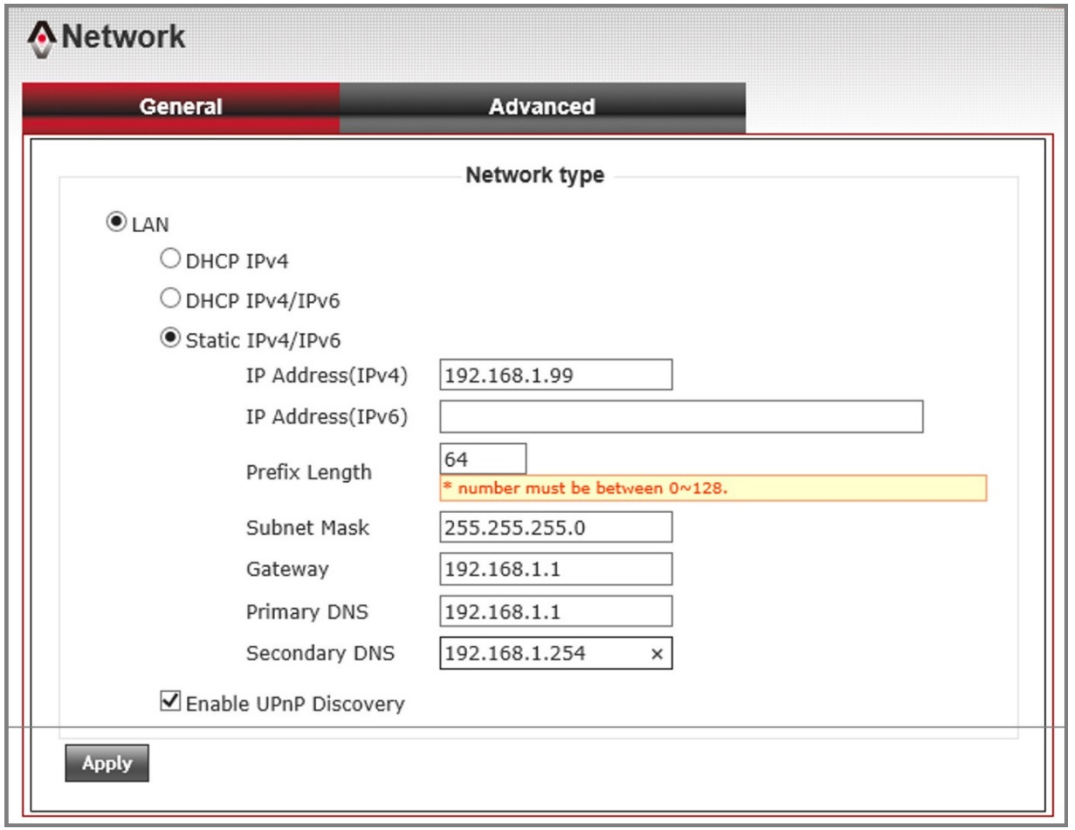
Step 3.

Then press "**Apply**" to save settings.

Notification :

For static IP setting, refer to the pictures as shown on bottom right. If the LAN IP segment is **192.168.1.xxx.** Enter your router's IP address for the **Gateway**.





5.2.1.2. Internet Static IPv4/IPv6 Setting

Static IPv4 Setting Procedure :

Step 1.

Select "**Static IPv4/IPv6**" under "**Network Type**".

Step 2.

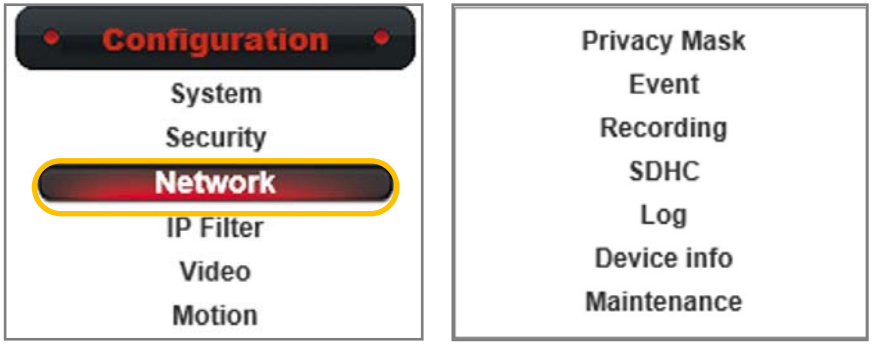
Enter the **IP Address (IPv4), Subnet Mask, Gateway, Primary DNS and Secondary DNS** settings.

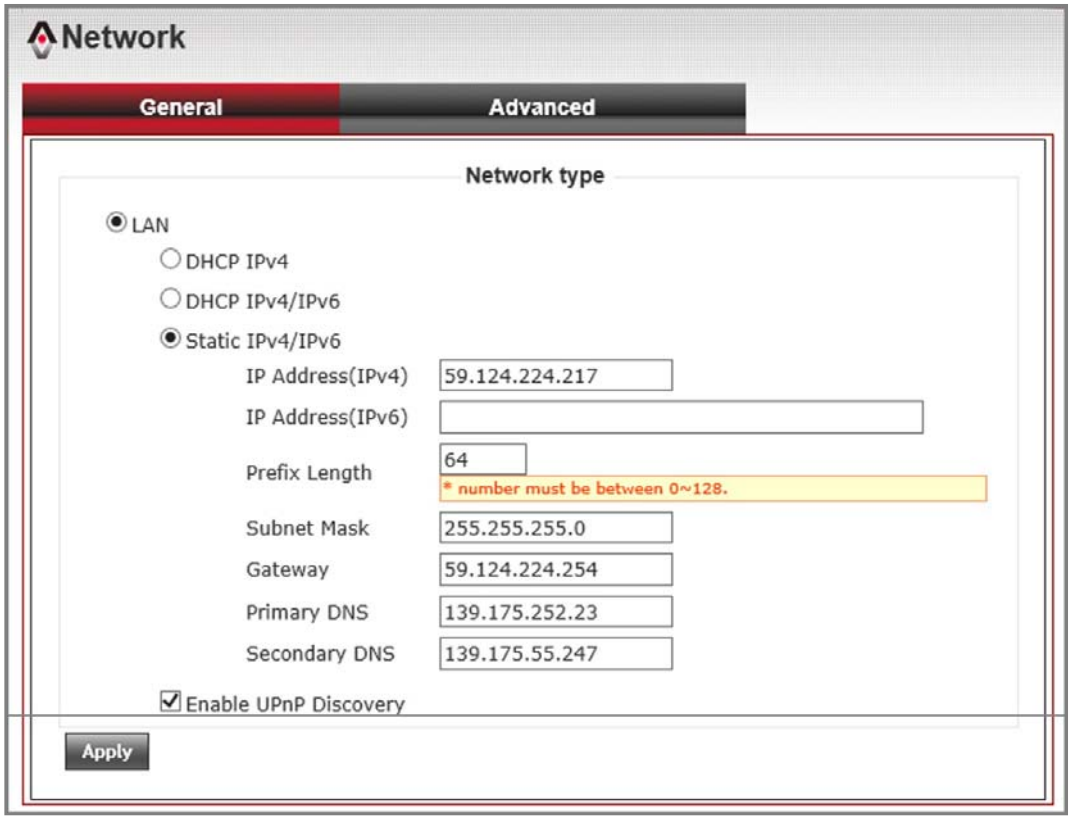
Step 3.

Then press "**Apply**" to save settings.

Notification :

Please contact your ISP service vender for further internet static IP settings.





5.2.1.3. PPPoE Setting

PPPoE Setting Procedure :

Step 1.

Select "**PPPoE**" under the "**Network Type**" column.

Step 2.

Enter your PPPoE **Username** and **Password.**

Step 3.

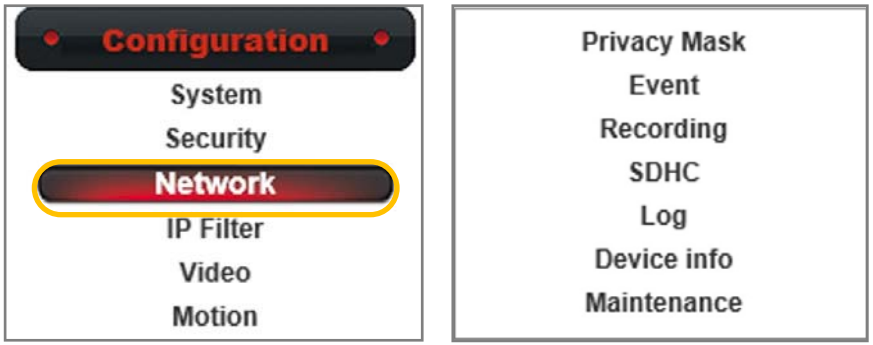
Press "**Apply**" to save settings.

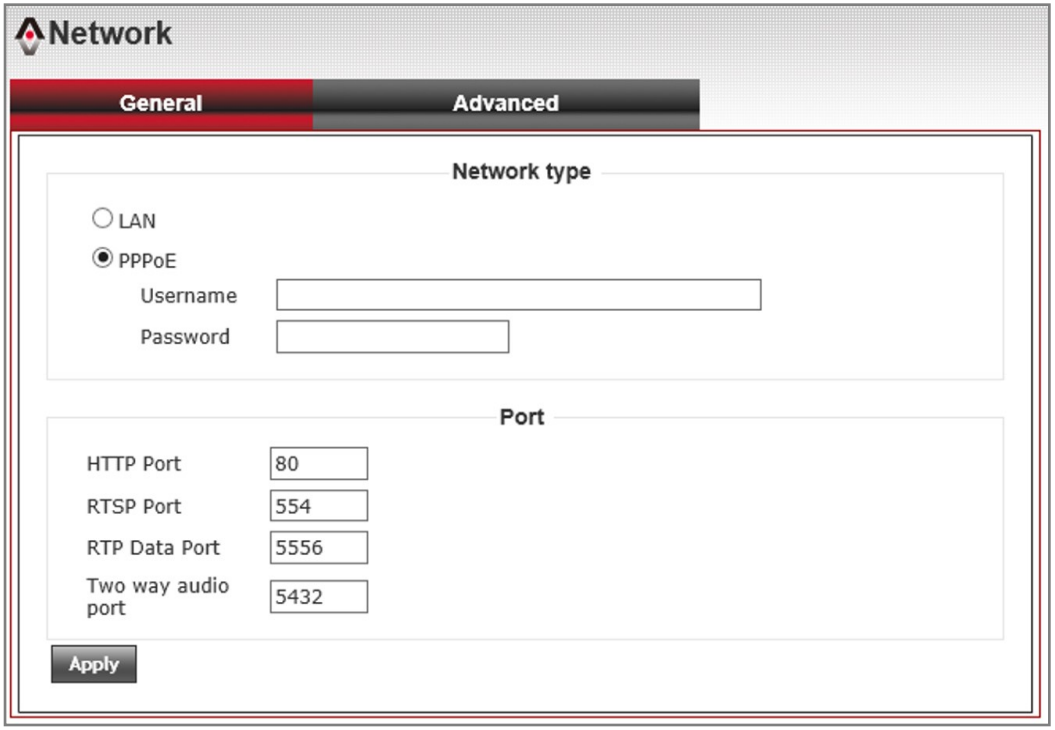
Notification :

PPPoE is a type that supports xDSL network connections. Contact your ISP service vender for the username and password.

For PPPoE connections, the network camera will get an IP Address from the ISP. Some ISP venders may provide a static IP address. The User only needs to enter that IP in to their browser, then you will able connects to the network camera.

If your ISP vender does not supply PPPoE static IP addresses, refer to the DDNS setting in Advanced Network Setting.





5.2.2. Advanced Network Setting

Advanced network setting includes **Multicast, Bonjour, QoS, DDNS, HTTPS function settings.**

5.2.2.1. HTTPS Settings

HTTPS Settings Procedure：

Step 1.

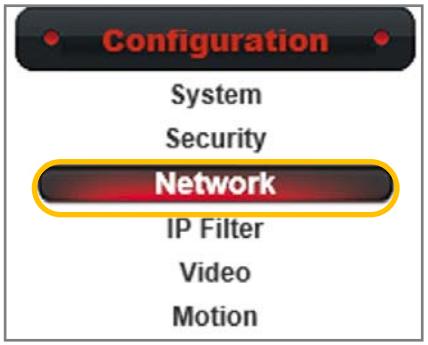
Select "**Advanced**" page under "**Network**" page.

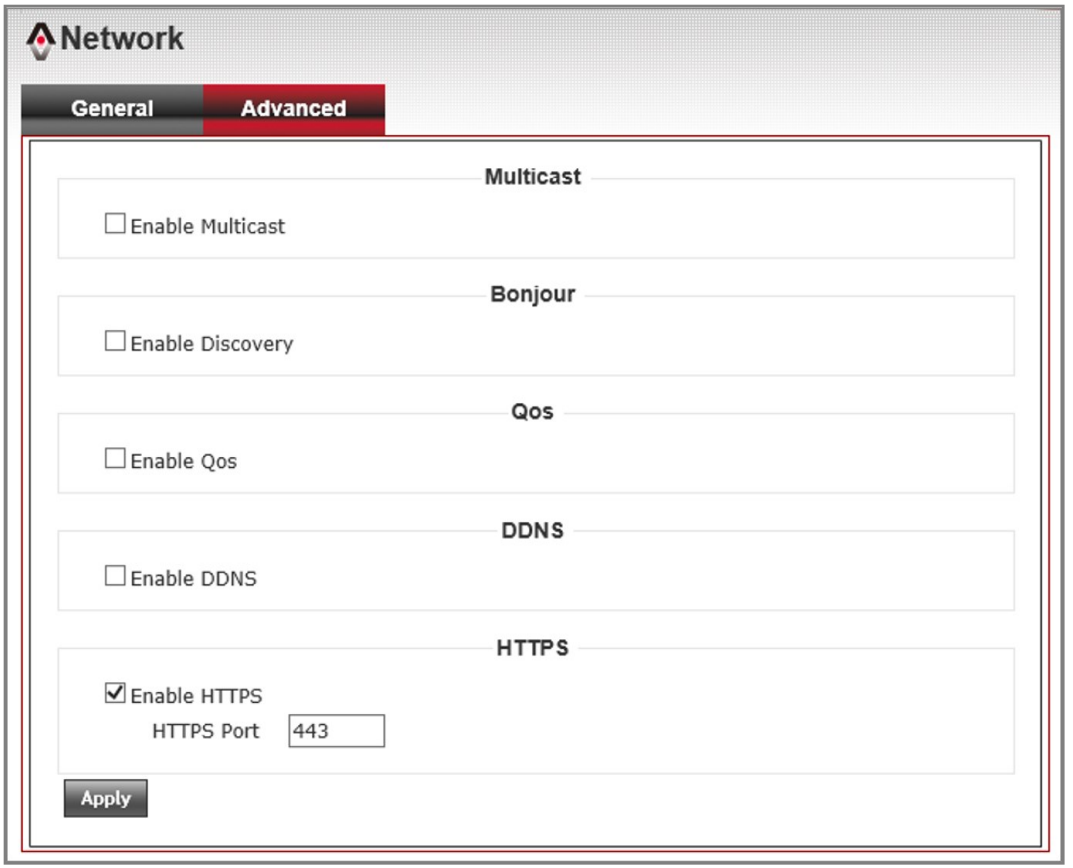
Step 2.

Select "**Enable HTTPS**". Default **HTTPS Port is 443**.

Step 3.

Press "**Apply**" to save settings.





5.2.2.2. DDNS Settings

You must first get DDNS address settings from a DDNS service provider. That DDNS service provider should provide you with a **Host Name,** and let you know the **Username** and **Password.**

Notification：

Comtrend network cameras support two DDNS service providers: **DynDNS.org** and **No-ip**. You can choose either one of these services to host your **DDNS Host Name**.

DDNS Settings Procedure：

Step 1.

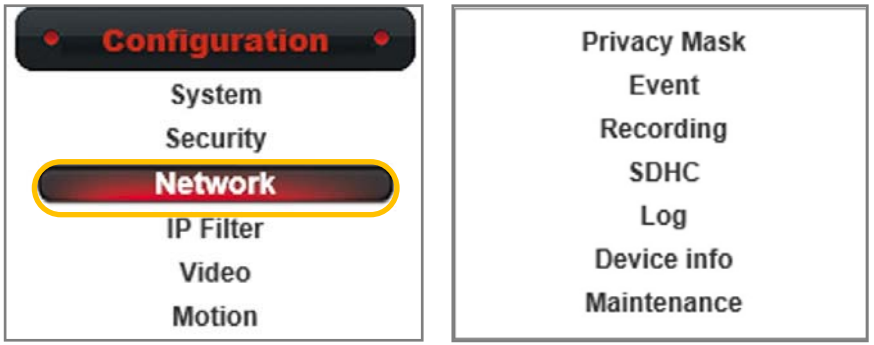
Select "**Advanced**" page under "**Network**" page.

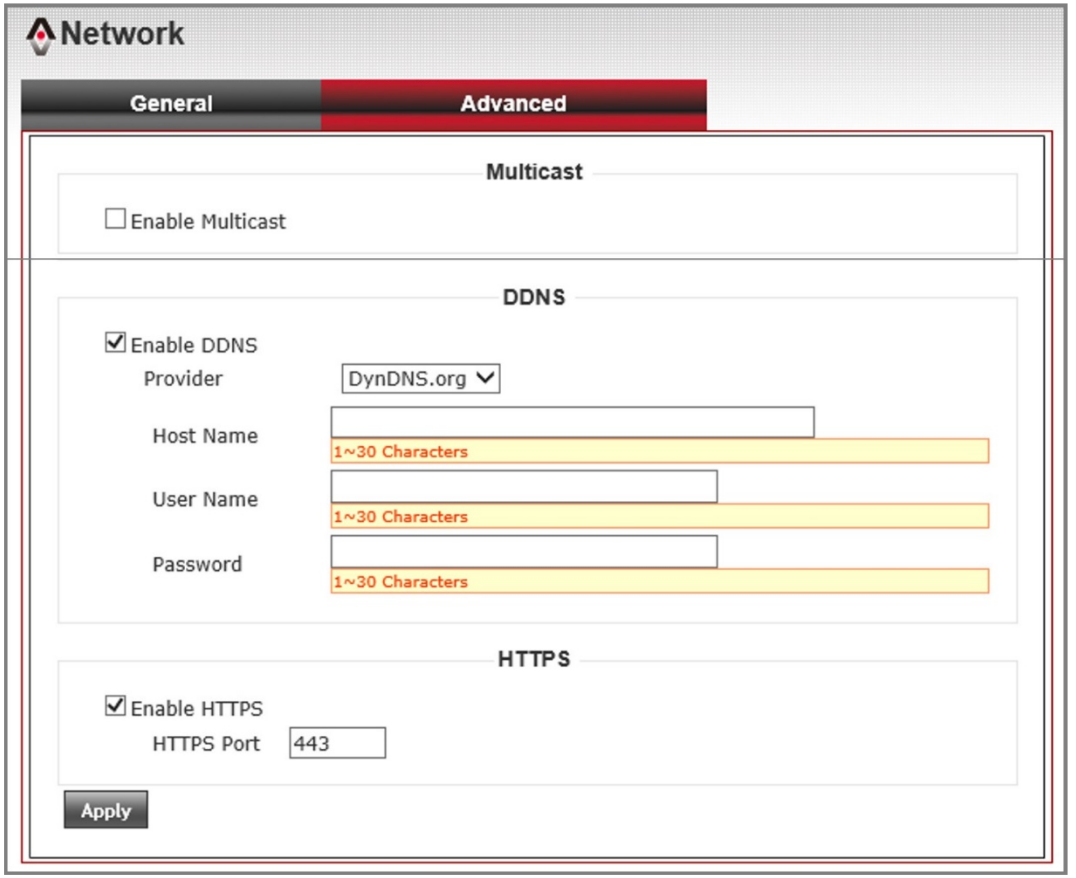
Step 2.

Select "**Enable DDNS**". Then enter the **Host Name, Username** and **Password.**

Step 3.

Press "**Apply**" to save settings.





5.2.2.3. Multicast Setting

Multicast Description：

A normal connection between computer to network camera is a single point delivery. Which means sending a stream packet from camera to one computer only. A multicast function is to send the stream data to one point, but you can set multiple computer as the recipient.

Comtrend network cameras support multicast group addresses. It's IP address range is from **232.0.0.0 to 232.255.255.255** in a class D. A class D is a group address which the network camera will send the stream packet to. Then the recipient will inform the router to join this group.

Multicast Setting Procedure：

Step 1.

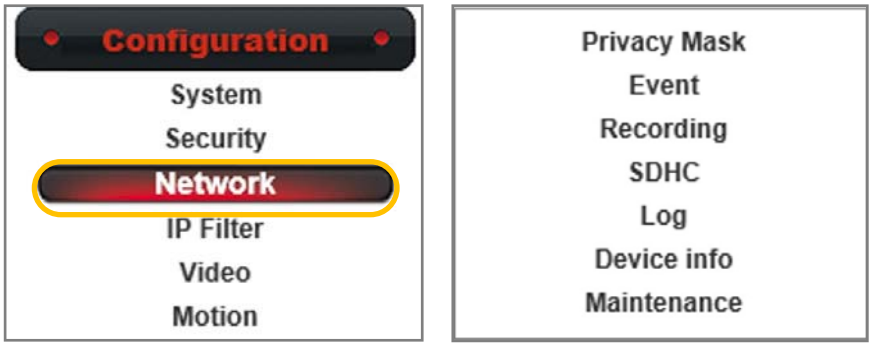
Select "**Advanced**" page under "**Network**" page.

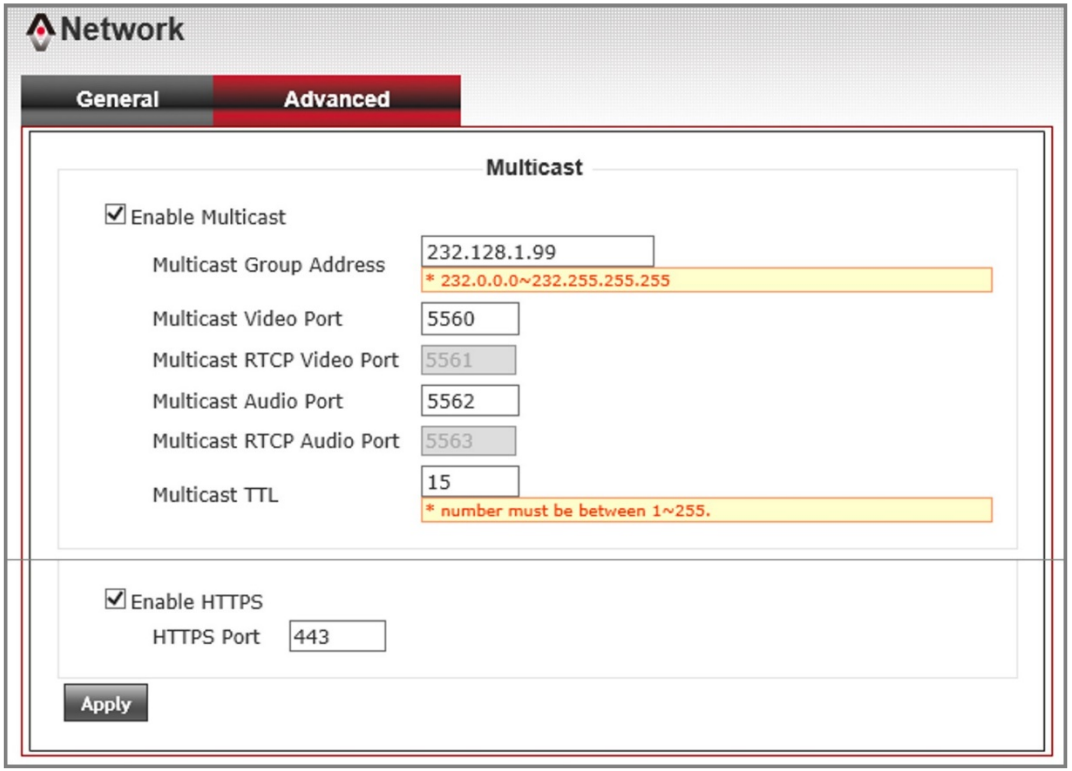
Step 2.

Select "**Enable Multicast**". Then enter "**Multicast Group Address**" and all Multicast parameters. Suggest to keep the default setting.

Step 3.

Press "**Apply**" to save settings.





5.2.2.4. QoS Setting

Via QoS settings, the camera can ensure the video image and audio stream comes first in bandwidth. So the transfer stability will not be effected by other network packets.

QoS Setting Procedure：

Step 1.

Select "**Advanced**" page under "**Network**" page.

Step 2.

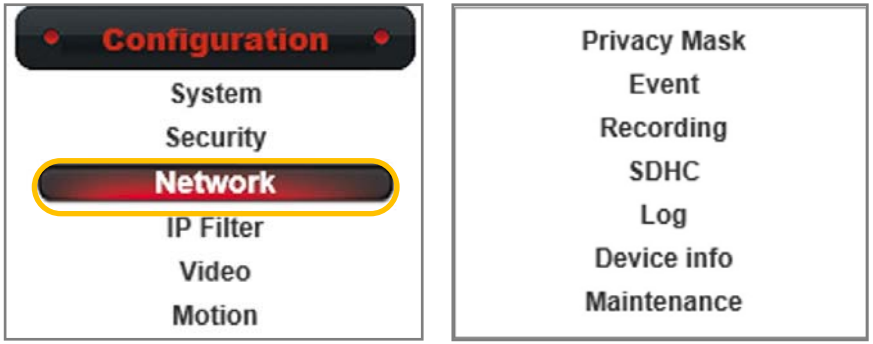
Select "**Enable QoS**". And select whether enable "**Video**", "**Audio**" or "**Both**", then enter its "**DSCP value**".

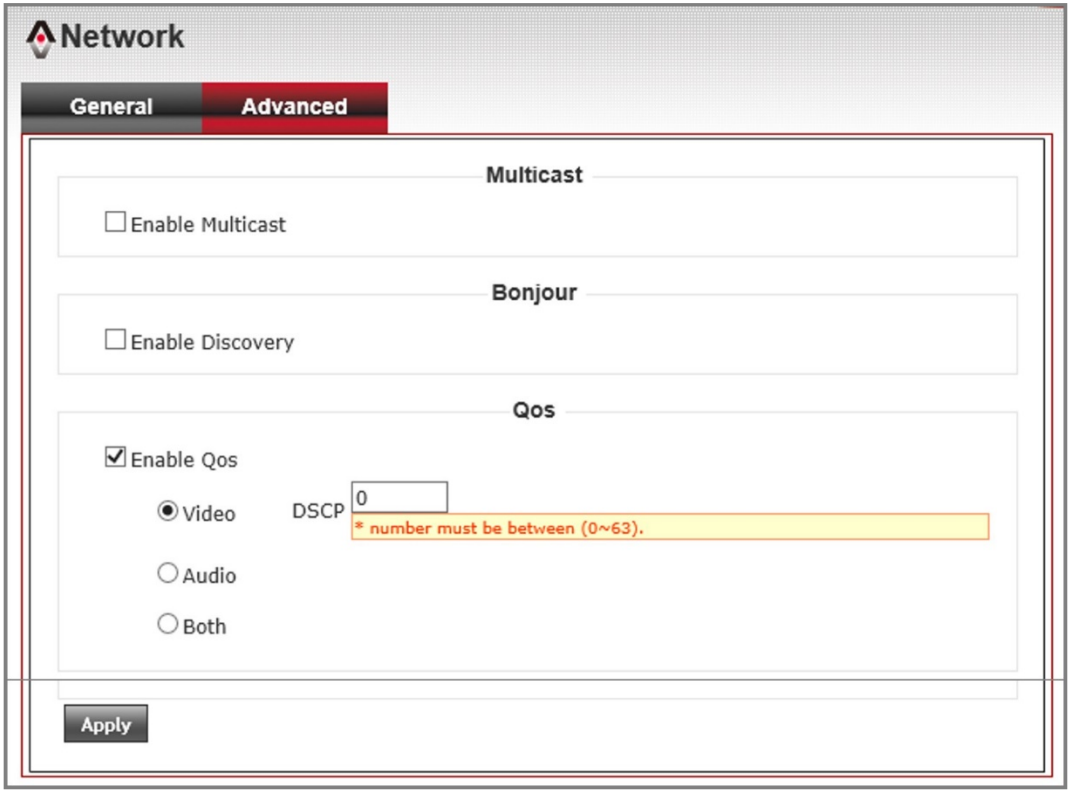
Step 3.

Press "**Apply**" to save settings.

Notification：

DSCP (Differentiated Services Code Point). In Dec. 1998, IETF published a QoS classification standard of Diff-Sery (Differentiated Service). DSCP using six bits and its range from 0~63.





5.2.2.5. Bonjour Setting

Bonjour is called a Zero-configuration networking tool, which can automatically find devices within local network. Bonjour is a standardize protocol that allows for each device to find each other without an IP address or DNS server.

Bonjour Setting Procedure：

Step 1.

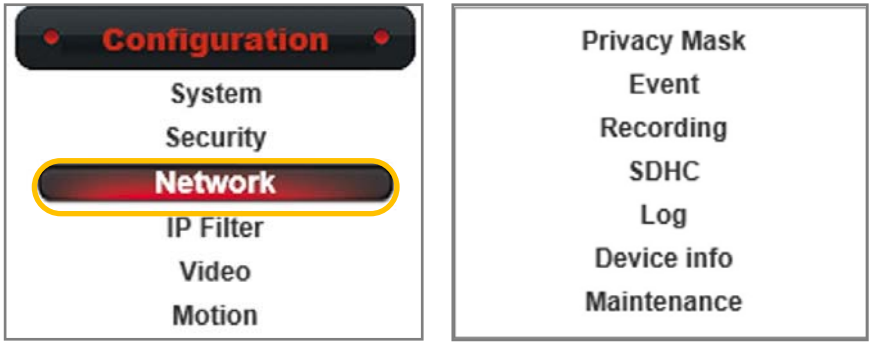
Select "**Advanced**" page under "**Network**" page.

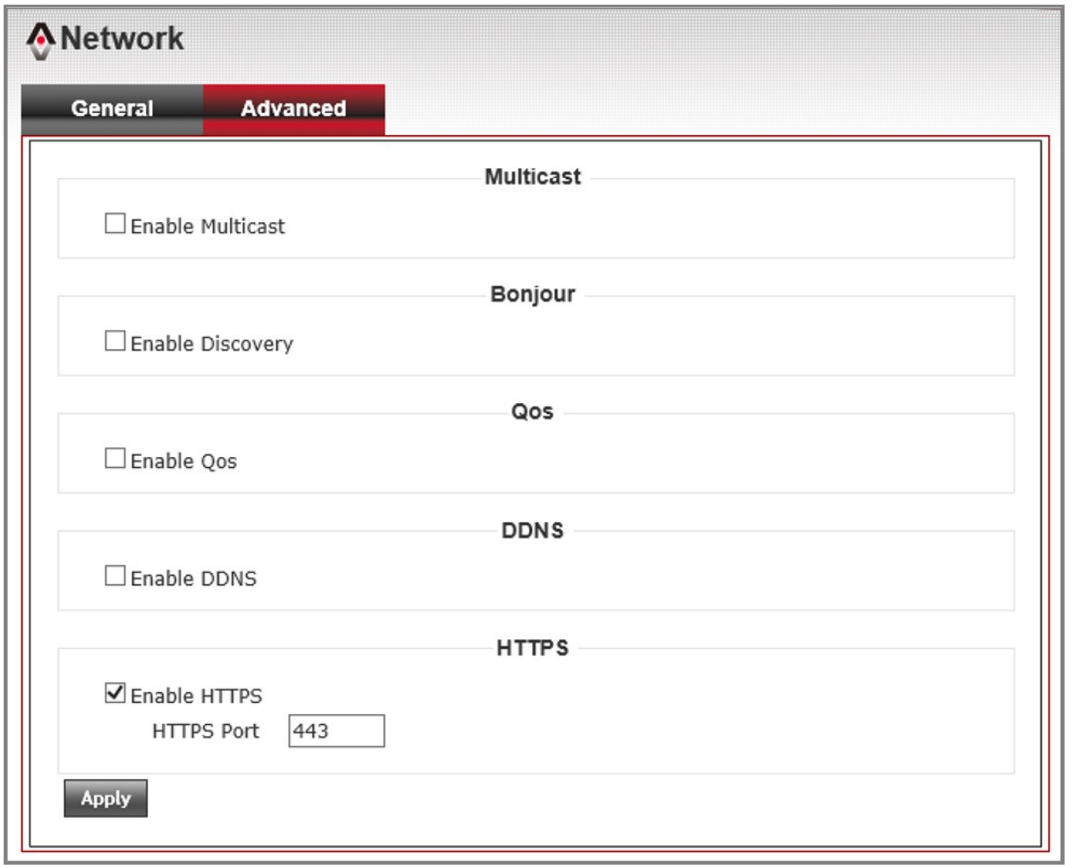
Step 2.

Select "**Enable Bonjour**".

Step 3.

Press "**Apply**" to save settings.





5.2.3. IP Filter

Comtrend network cameras have an "**IP Filter**" function. It can manage to set a white list for "**Accepted IP list**" or black list for "**Deny IP list**". It is recommended to use one rule only to keep the connection performance. The white list rule is the most common method used in a surveillance project.

IP Filter Setting Procedure：

Step 1.

Select "**IP Filter**" button under the "**Configuration**" menu. **Step 2.**

Select "**Enable IP Filter**".

Step 3.

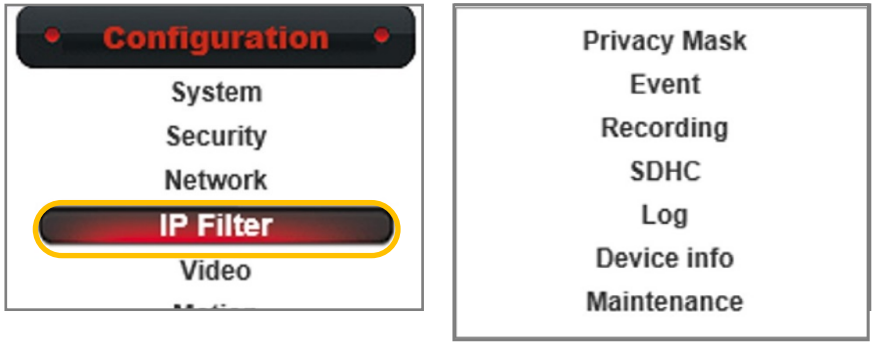
Enter the IP List under "**Accepted IP list**" column, then press "**New**" button to add into white list.

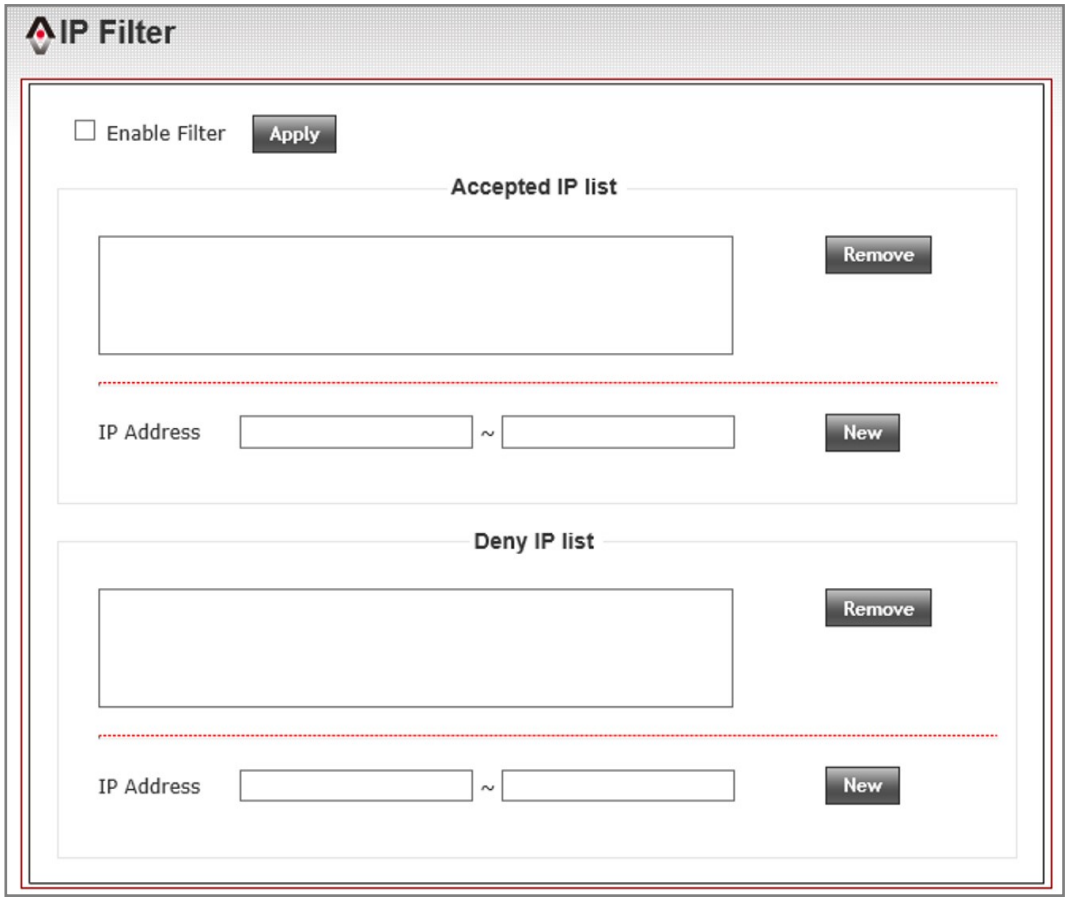
Step 4.

Press "**Apply**" to save settings.

Notification：

Setting black list for **Deny IP list** is same process as for Accepted IP List described above.





5.3. Video & Audio Setting

This chapter includes all video setting, image adjusting, and audio setting.

5.3.1. Video Setting

5.3.1.1. Main Stream Setting

Main Stream Setting Procedure：

Step 1.

Select the "**Video**" button under the "**Configuration**" menu.

Step 2.

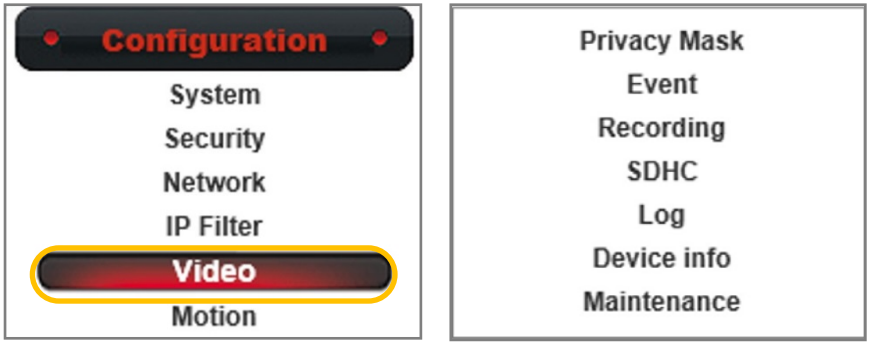
Select your desired format under the **Main Stream** column. Default is set as **H.264** format. It can be changed to **MPEG-4** format.

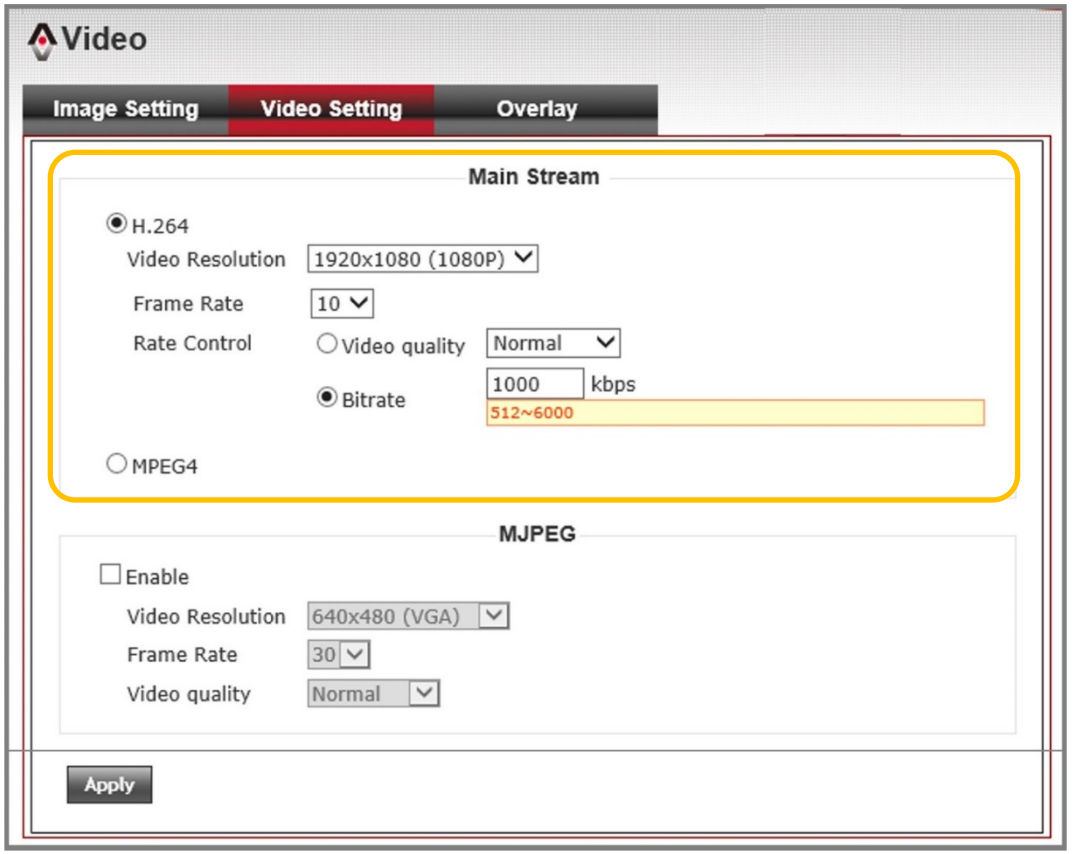
Step 3.

Define your **Resolution, Frame Rate(fps).** Default is set as **1920x1080 (1080P)** @ **30fps**.

Step 4.

Define your **Rate control** type. You can choose between **Video quality** or **Bitrate** comes first. Default is set as a constant Bitrate of **5000kbps.** Press "**Apply**" to save settings.





5.3.1.1. Main Stream Setting

Rate Control Setting Description:

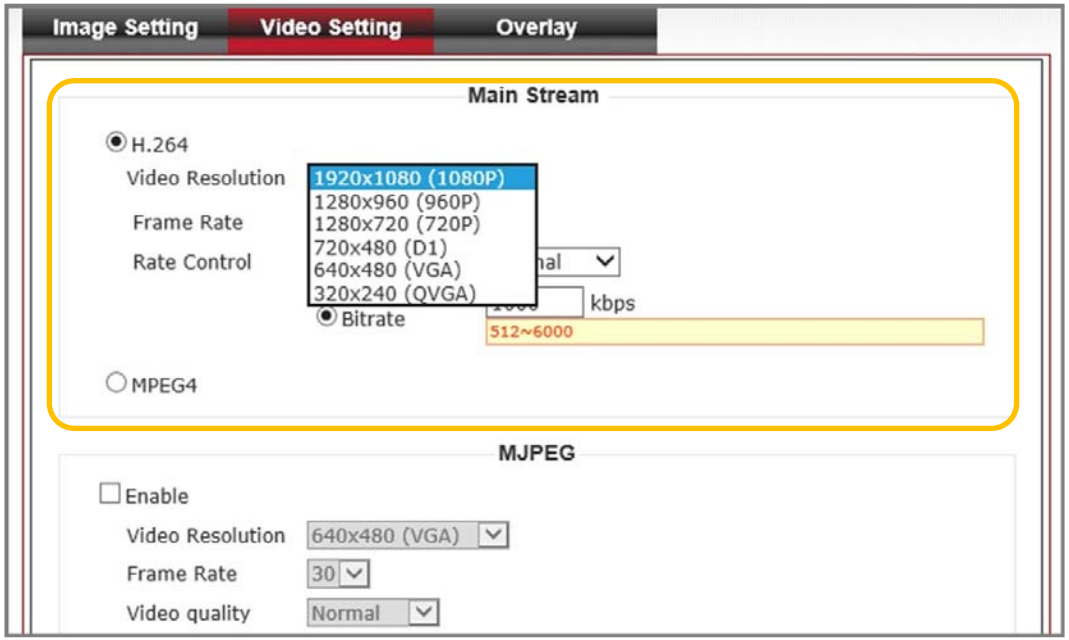
For a network camera only environment, we suggest setting the **Video quality to Normal.** If your surveillance environment is equipped with an NVR or NAS server for recording purposes, we suggest to set a constant **Bitrate** numbers**.**

Below is a suggestion chart for the video quality setting depending on your environment.

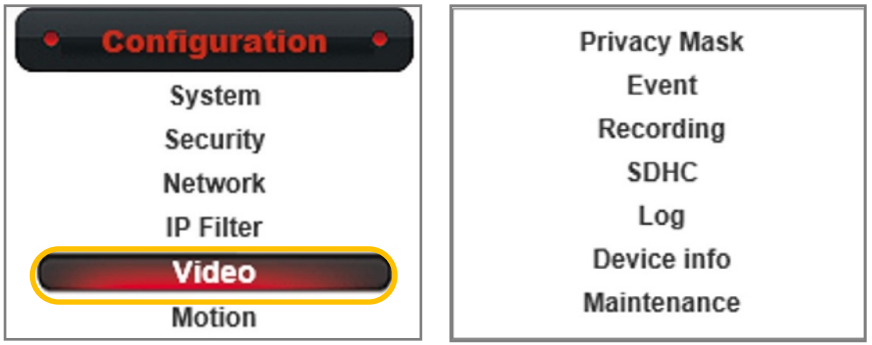
Notification：

When changing resolution settings will erase your privacy mask setting.

Resolution	Fps	Bitrate suggestion
1920 x 1080	30	4000~6000 kbps
1920 x 1080	15	2000~3000 kbps
1920 x 1080	10	1000~2000 kbps
1280 x 960	30	2000~3500 kbps
1280 x 960	15	1000~2500 kbps
1280 x 720	15	800~2300 kbps
720 x 480	15	768~1500 kbps
640 x 480	15	512~1200 kbps
320 x 480	15	256~900 kbps



5.3.1.1. Main Stream Setting



Main Stream and Storage Calculation:

It is best to set a constant **Bitrate** number to make calculating recording storage space easier.

Calculate the storage space as described below for each network camera recording for one hour.

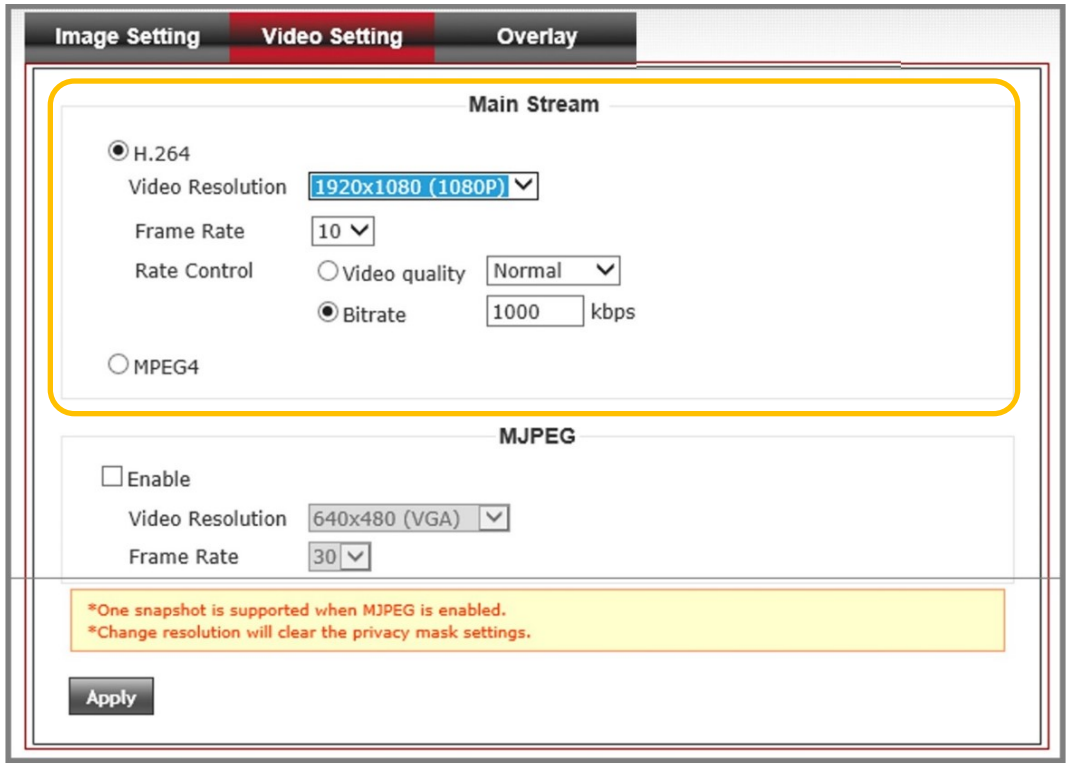
Bitrate(kbps) / 8 x 60(sec.) x 60(min.) / 1000 / 1000 = The storage space for each hour(GB)

Example Question：

If a camera is set at 1920x1080 (1080P)@ 10fps, 1000kbps as a Bitrate setting, how much space does a storage device need to hold at least a month (30days) of recording files?

Answer：

1000(kbps) / 8 x 60 x 60 / 1000 / 1000 x 24(hrs) x 30(days) = 324(GB) / 1000 = 0.324(TB)



5. 3 . 1 .2. Secondary Stream(MJPEG) Setting

Secondary Stream(MJPEG) Setting Procedure：

Step 1.

Select "**Video**" button under the "**Configuration**" menu. Then goes to "**Video Setting**" page and select "**Enable**" under "**MJPEG**" column.

Step 2.

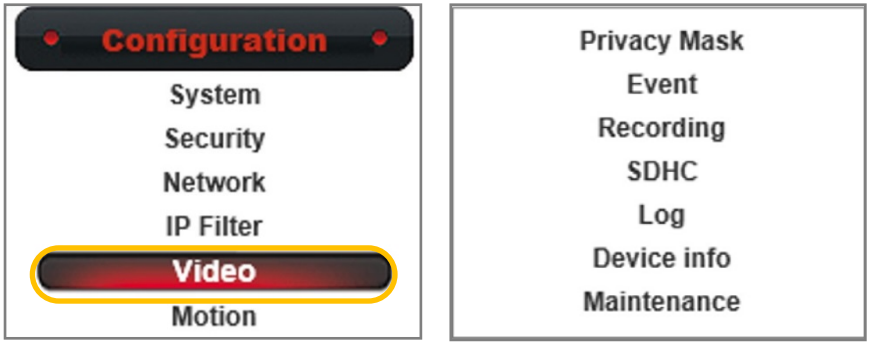
Define your "**Video Resolution**". There are three resolutions to choose from **720x480(Full D1)**, **640x480(VGA)** and **320x240(QVGA)**.

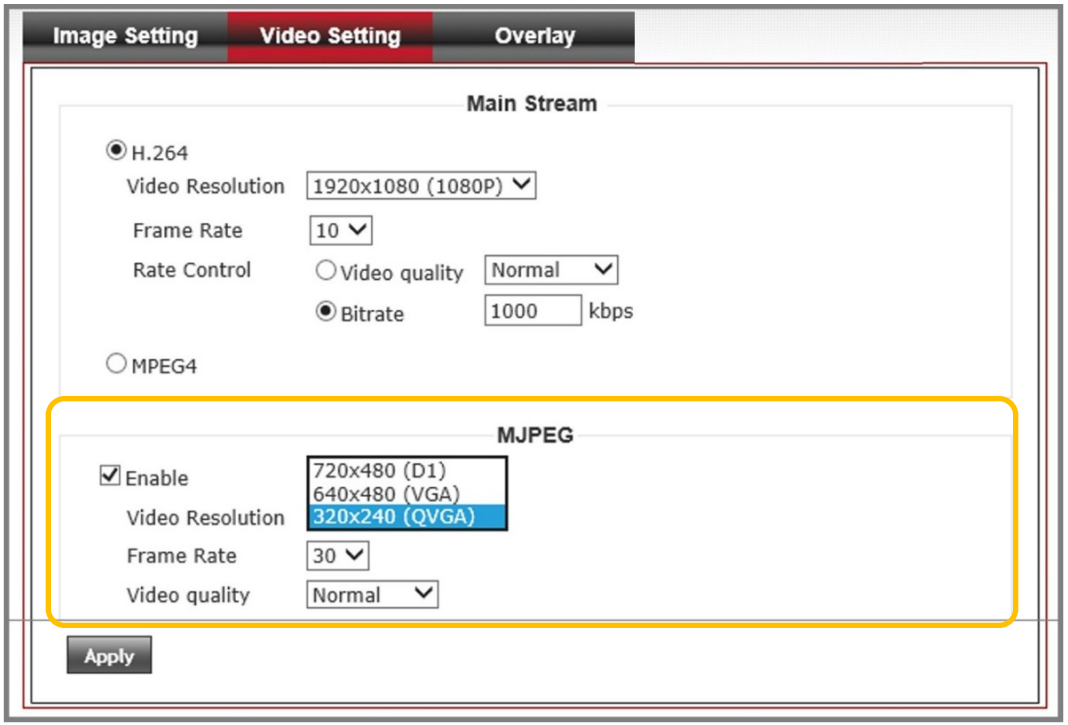
Step 3.

Define your "**Frame Rate**" and "**Video Quality**". There are five segment of video quality from lowest to highest that you can choose from. Then press "**Apply**" to save setting.

Notification：

MJPEG compression rate is lower than H.264 and MPEG-4. But is best format for computer CPU performance when handling the image. The snapshot function only supports MJPEG format.





Resolution	Fps	Bitrate suggestion
720 x 480	5	Normal (1000~2000 kbps)
640 x 480	5	Normal (800~1800 kbps)
320 x 480	5	Normal (200~600 kbps)

5. 3 . 1 .3. Mobile View Setting

Mobile View Setting Procedure：

Step 1.

Select the "**Video**" button under the "**Configuration**" menu. Select "**Enable**" under "**Mobile View**" column.

Step 2.

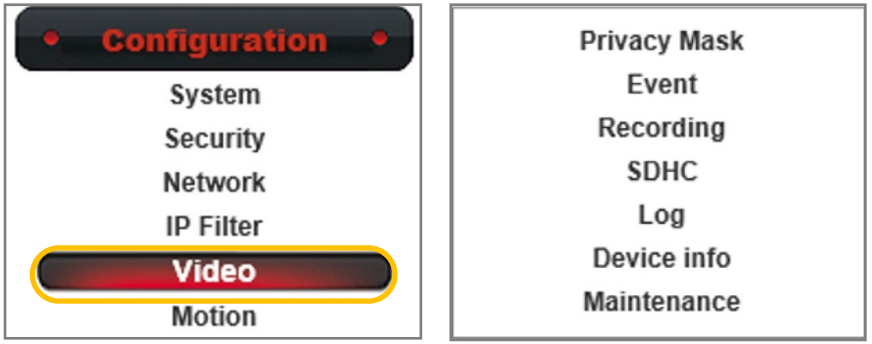
Select with or without audio depends on your application.

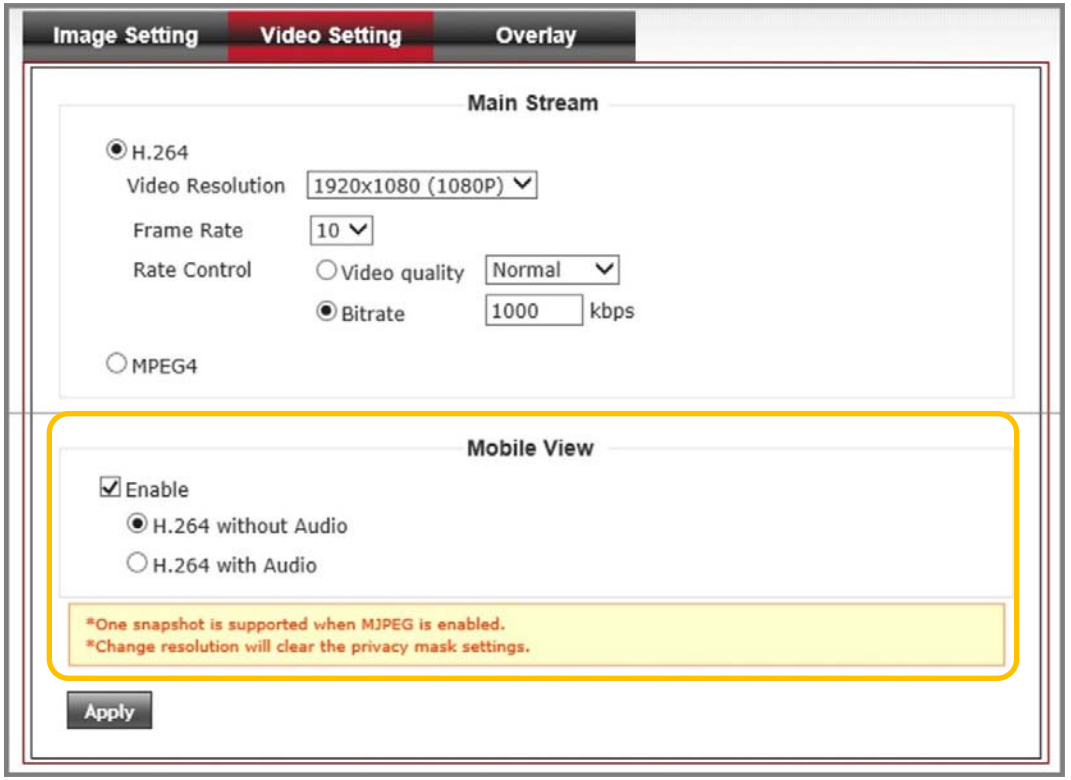
Step 3.

Press "**Apply**" to save changes.

Notification：

Mobile stream format is set to **H.264** for a better compression rate. Default resolution is set as **320x240, 30fps.** But the actual transfer speed is depends on your regional environment. Actual performance will vary depending on network performance factors.





Resolution	fps	Bitrate suggestion
320 x 240	Max. 30	Normal (500~1000 kbps)

5.3. 2 . Focus Setting

Comtrend MD-21 network cameras are equip with **f=3.6mm fixed Lens.** In order to adjust the focus point, you will need to remove the top cover.

Focus Setting Procedure：

Step 1.

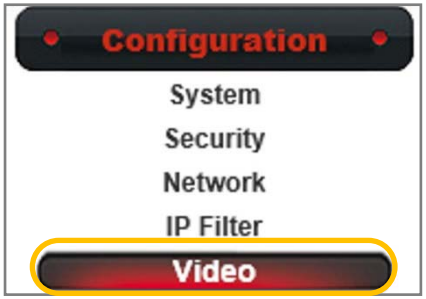
Please remove the top cover.

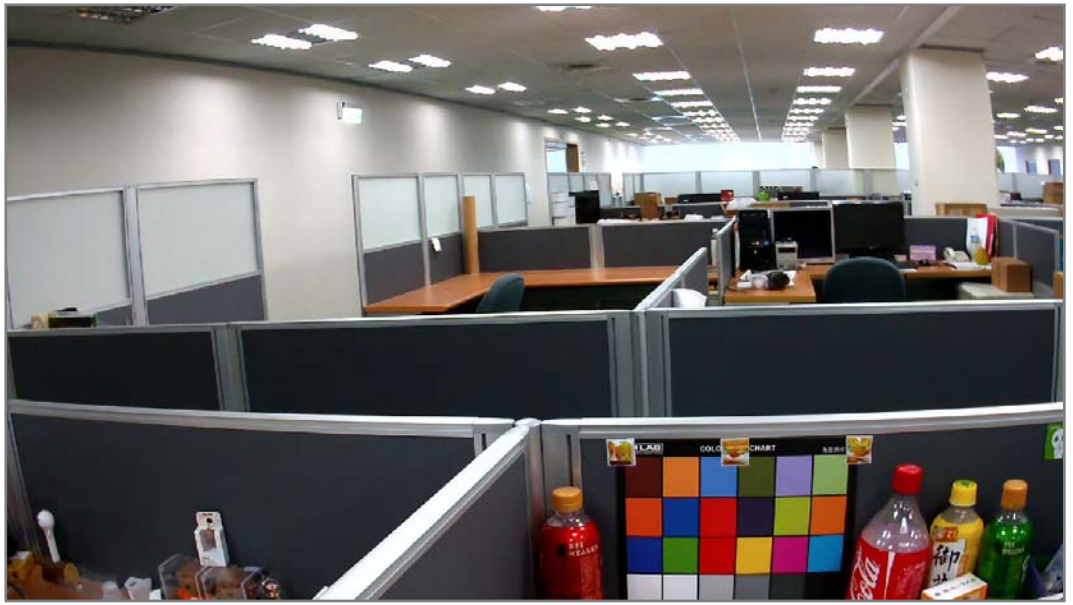
Step 2.

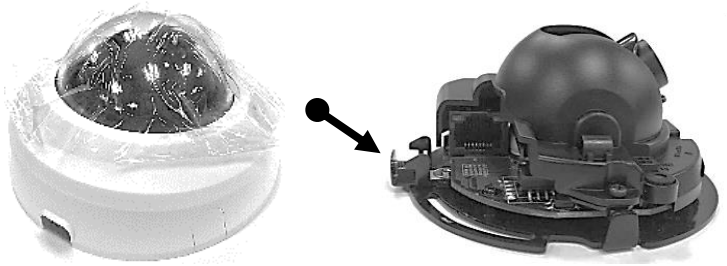
Set your browser to the main page and double click on the screen to the full screen mode.

Step 3.

Adjust the focus to get your desire clean view of your target by gently rotate the lens. Then put your top cover back on without touching the lens.





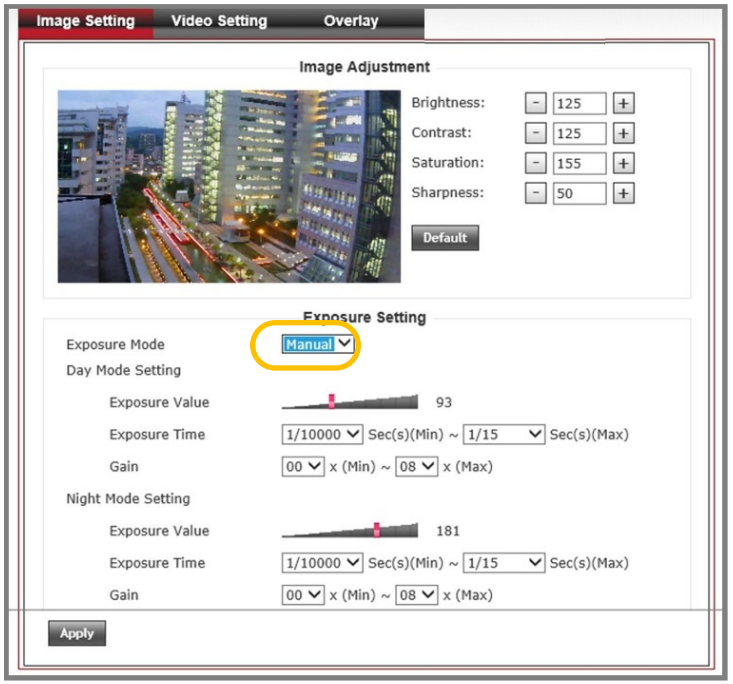


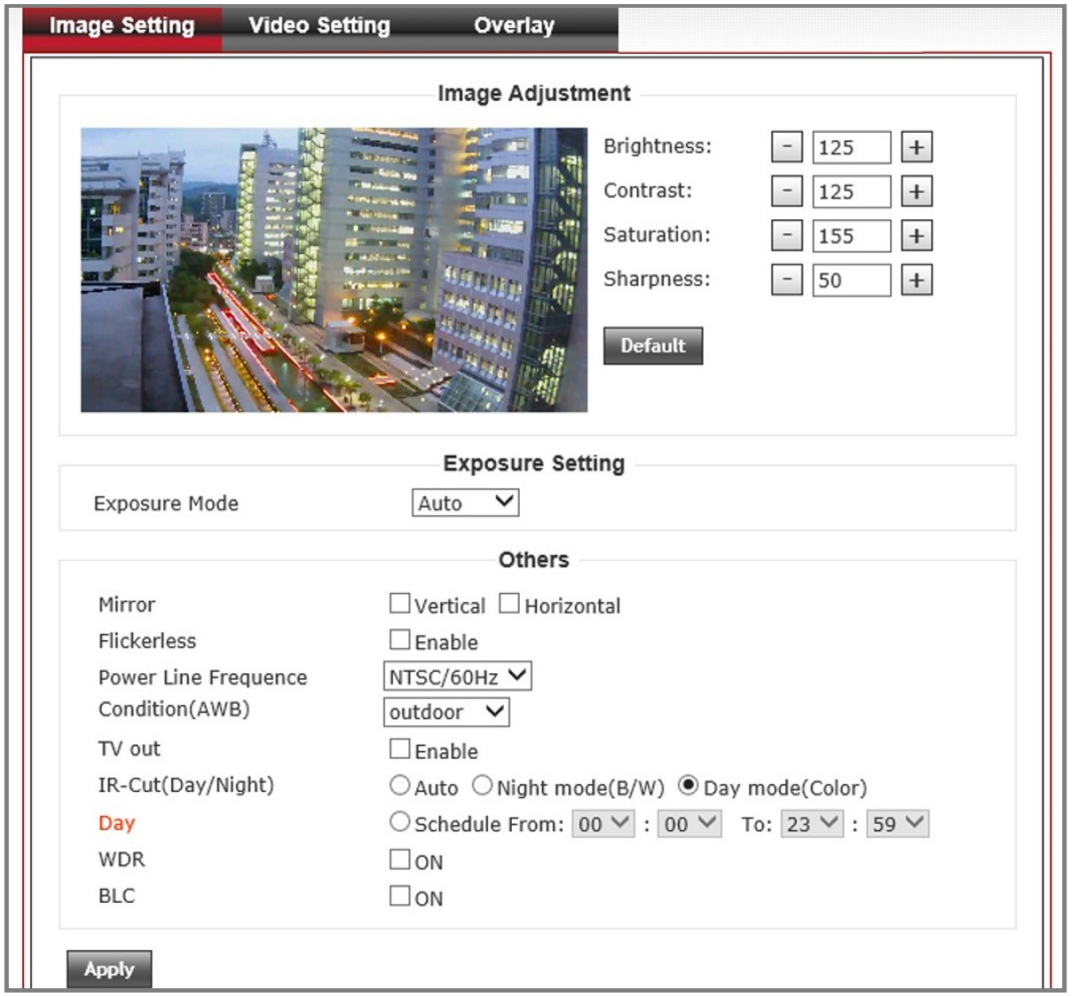
5.3.3. Image Setting

After completing your video setting, follow the instructions below to adjust your image settings.

5. 3 .3. 1 . Exposure Setting

Comtrend network cameras provide two **Exposure Modes.** Default setting as "**Auto"** mode. You can change to "**Manual"** mode for advanced exposure settings for day and night modes.





5. 3 .3. 1 . Exposure Setting

Exposure Setting Procedure :

Step 1.

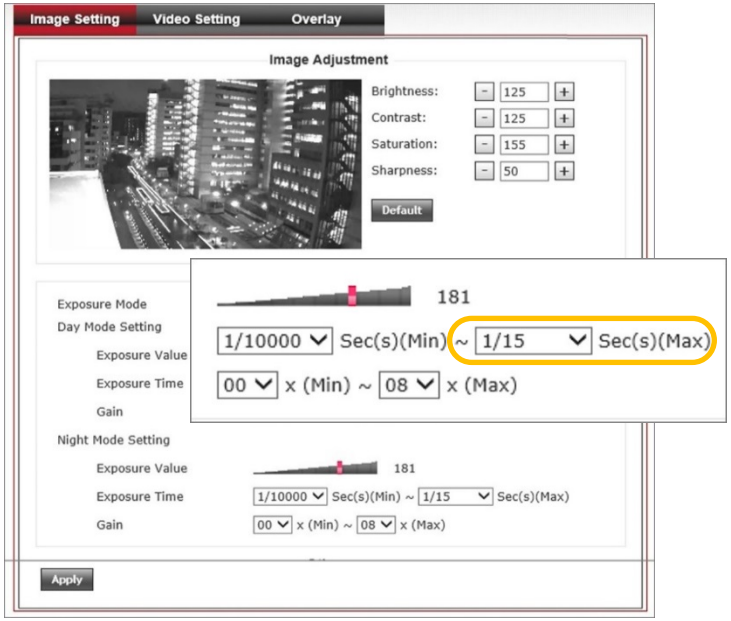
Select the "**Video**" button under the "**Configuration**" menu. Then go to "**Image setting**" and change the "**Exposure Mode**" from "**Auto**" to "**Manual**".

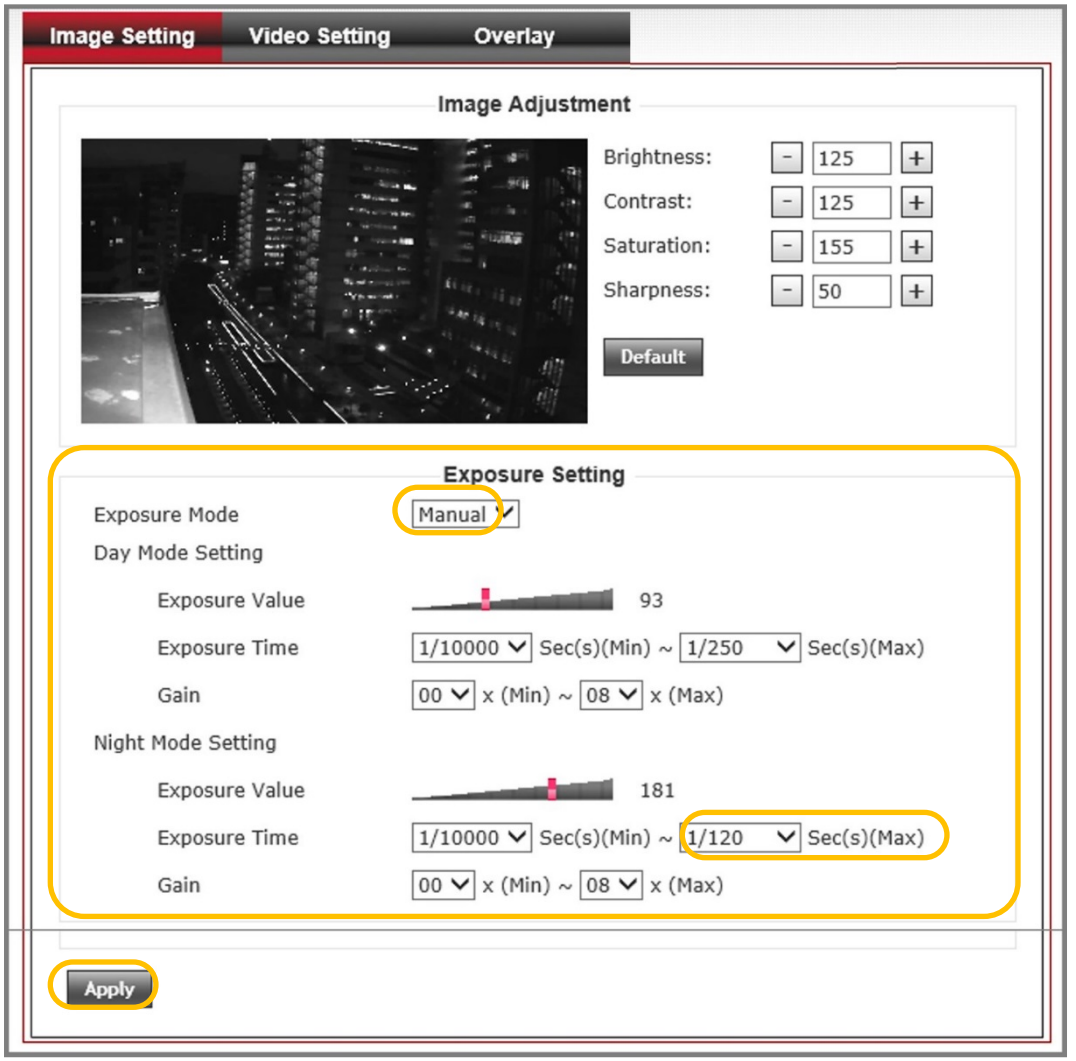
Step 2.

As an example, the picture to the right has an image that is too dark during night mode operations. We can manually adjust the maximum **Exposure Time** to **1/15 Seconds** to improve the night time image.

Step 3.

Press the "**Apply**" button to save settings and get a better image quality as shown below.





5. 3 .3.2. Image Setting

Image Setting Procedure：

Step 1.

Select the "**Video**" button under the "**Configuration**" menu. Then go to the "**Image setting**" tab.

Step 2.

Enter the desired **Brightness, Contrast, Saturation and Sharpness** numbers. Or use **+** and **–** button to do the adjusting incrementally.

Step 3.

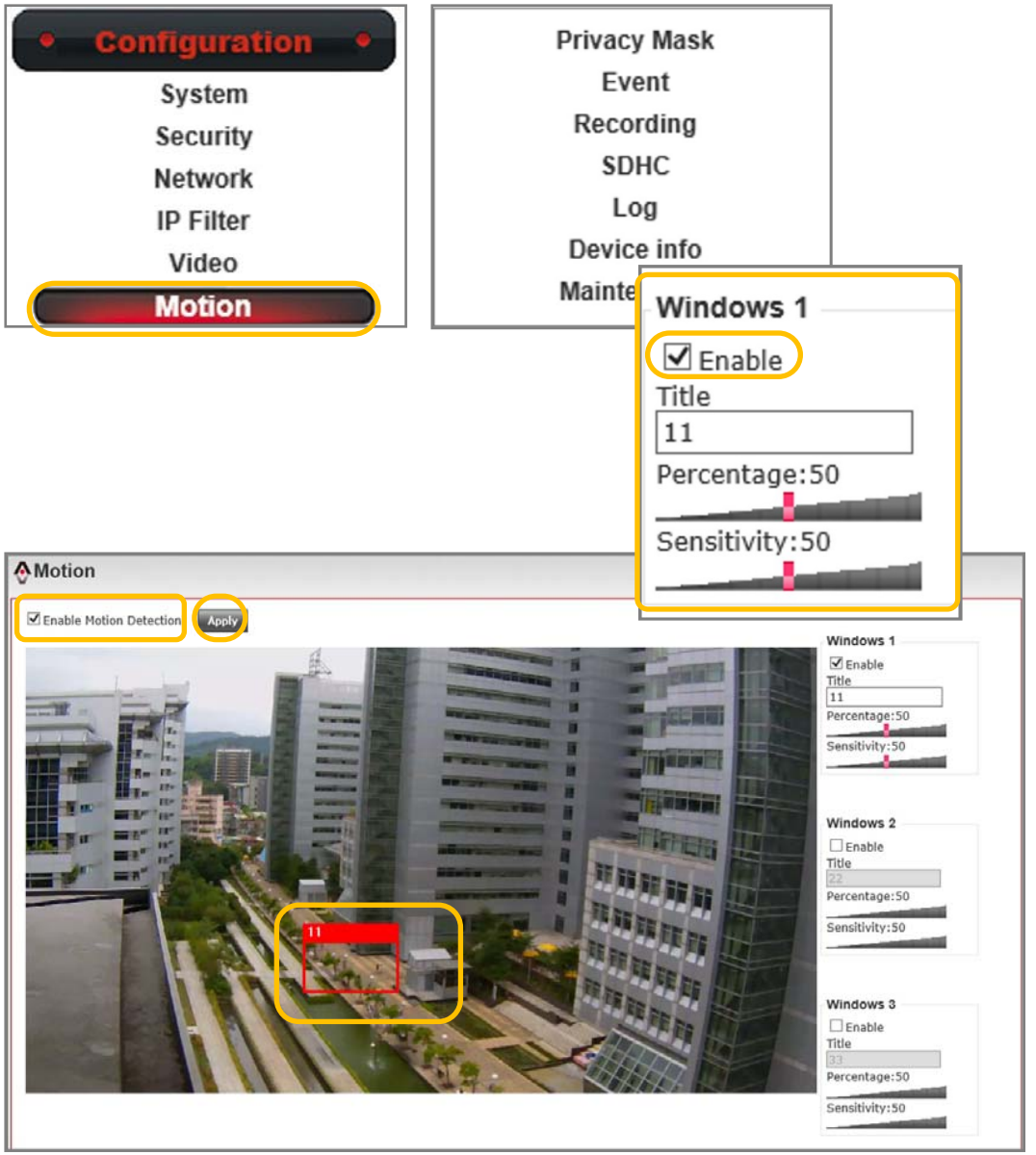
Verify your changes with the image. Once you have gotten your ideal results, press the "**Apply**" button to save your settings.

Notification：

The range of **Brightness, Contrast, Saturation and Sharpness** numbers are from **0 to 255.** Press the "**Default**" button if you wish to go back to the original factory settings. Press the "**Apply**" button to save your settings.

5.3.2. Motion Detection

The **Motion Detection** function allows you to set up to three motion detection windows on the screen. So these selected areas can detect motion base on the **Percentage** and **Sensitivity** numbers that are set.



Motion Detection Setting Procedure：

Step 1.

Select the "**Motion Detection**" button under the "**Configuration**" menu.

Step 2.

Select "**Enable Privacy Mask**", then select "**Enable**" under the "**Windows 1**" column and define a "**Title**" to this windows.

Step 3.

Resize the "**Windows 1**" frame and drag it to the area on the screen that you wish to monitor for motion.

Step 4.

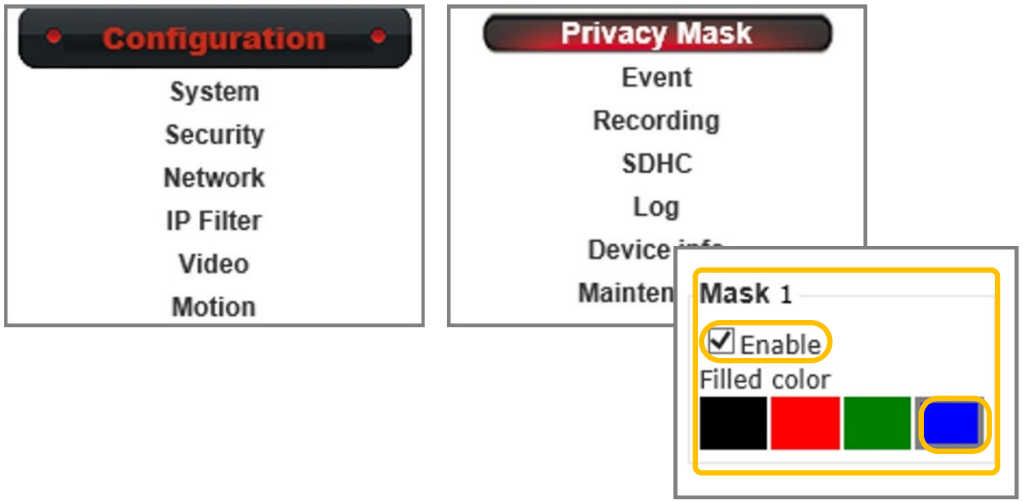
Adjust the "**Percentage**" and "**Sensitivity**" settings to optimize your motion detection triggers.

Step 5.

Press the "**Apply**" button to save your settings.

5.3.3. Privacy Mask

The "**Privacy Mask**" function allows you to set up to three privacy masks that cover on your live view screen. The color of the mask can be selected from one of the four available colors. Once the mask has been set, the live view screen will no longer display the masked area.



Privacy Mask Setting Procedure：

Step 1.

Select the "**Privacy Mask**" button under the "**Configuration**" menu.

Step 2.

Select the "**Enable Privacy Mask**", then select "**Enable**" under "**Mask 1**" column.

Step 3.

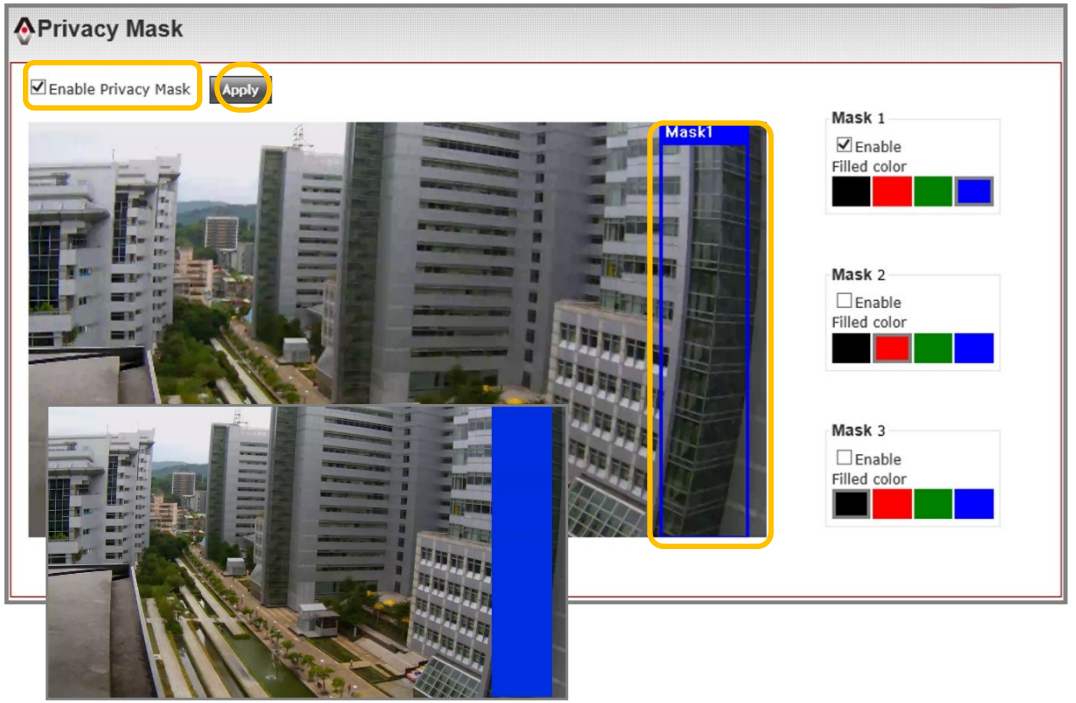
Resize the "**Mask 1**" frame and drag it to the place on the screen that you wish to cover.

Step 4.

Select the "**Filled Color**".

Step 5.

Press the "**Apply**" button to save "**Mask 1**" settings. If wish to set up "**Mask 2**" and "**Mask 3**", repeat the above procedure.



5.3.5. Audio Settings

Comtrend MD-21 network cameras are equipped with an internal microphone. You may enable the microphone function within the web UI.

One ways audio setting procedure：

Step 1.

Select the "**Audio**" button under the "**Configuration**" menu.

Step 2.

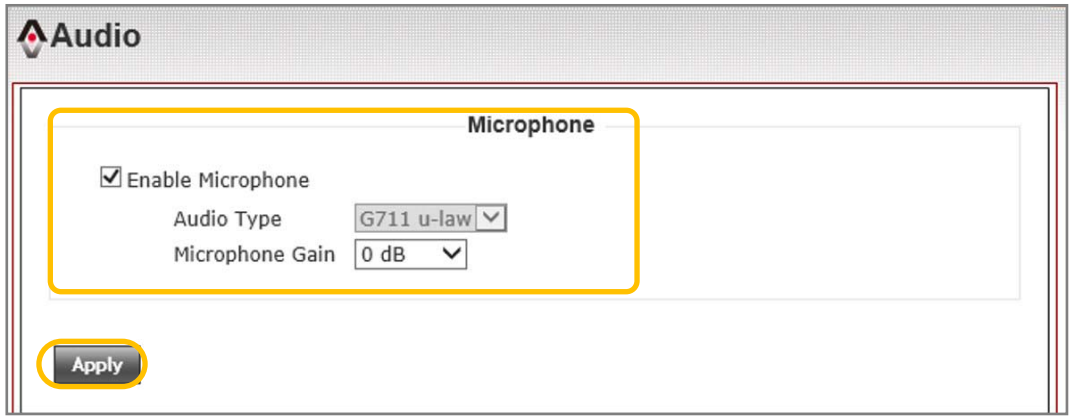
Select "**Enable Microphone**". Select the "**Audio Type**" and set the "**Microphone Gain**".

Step 3.

Press the "**Apply**" button to save the setting.

Notification：

Available audio features vary by camera models. Some models have a built-in microphone, speaker outputs or both.



5.4. SD Card Settings

The Comtrend MD-21 Camera has a built-in micro SD card slot for on camera recording. Micro SDHC cards up to 32GBs in capacity are supported.

5.4.1. SDHC

Setting new SD card procedure：

Step 1.

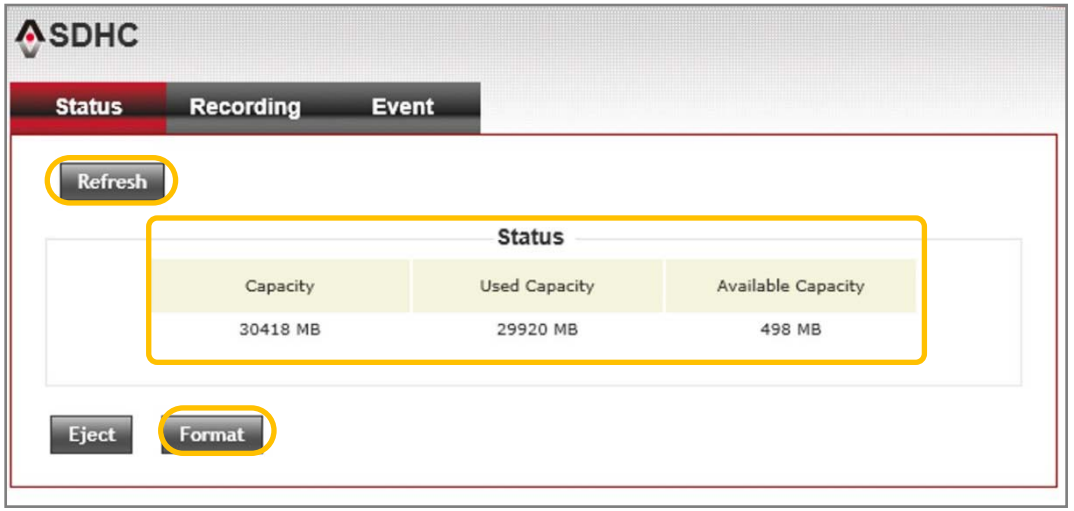
Select the "**SDHC**" button under the "**Configuration**" menu.

Step 2.

Select the "**Status**" page. If no SD card information is displayed, check that the SD card is properly inserted. Press the "**Refresh**" button to see SD card information.

Step 3.

When using an SD card for the first time, it is necessary to format the card. Press the "**Format**" button to start the format process. Once complete, your SD card will be ready for use.



5.4.2. Recording

Recording to SD card procedure：

Step 1.

Select the "**Recording**" button under the "**Configuration**" menu.

Step 2.

Select "**Enable External storage Recording**" function and set the maximum size of each recording file. The maximum file size must be set between 1MB and 50MBs in size.

Step 3.

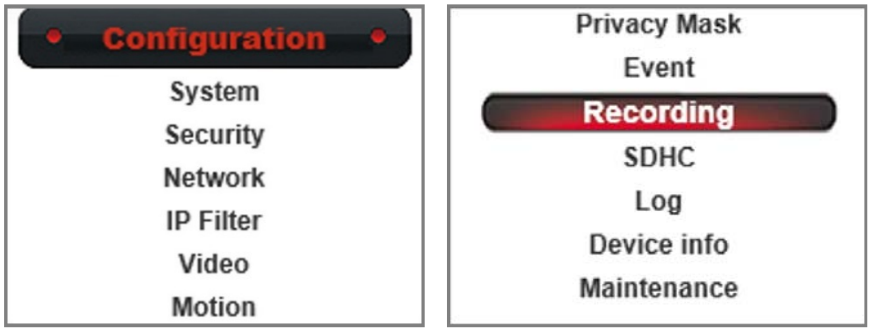
Set your recording schedule in the "**Recording Schedule" section**.

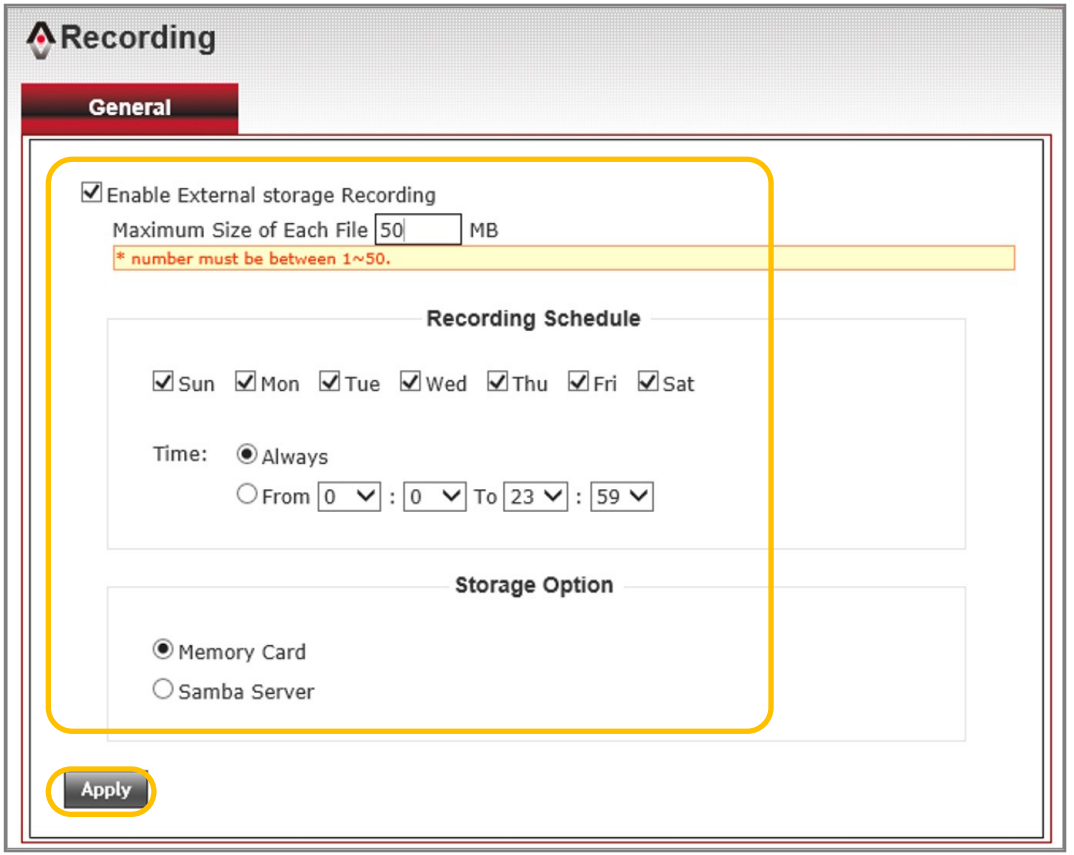
Step 4.

Select "**Memory card**" under the "**Storage Option**" section. Then press the "**Apply**" button to save setting.

Notification：

Under the "**Storage Option**" section, You can also choose to save your recoding files to a **Samba Server.** For the limitation of each recording file size is from 1~50MB. Each recording file length will depends on the setting of your recording stream.





5.4.3. SD Card Recoding Search

SD card recoding search procedure：

Step 1.

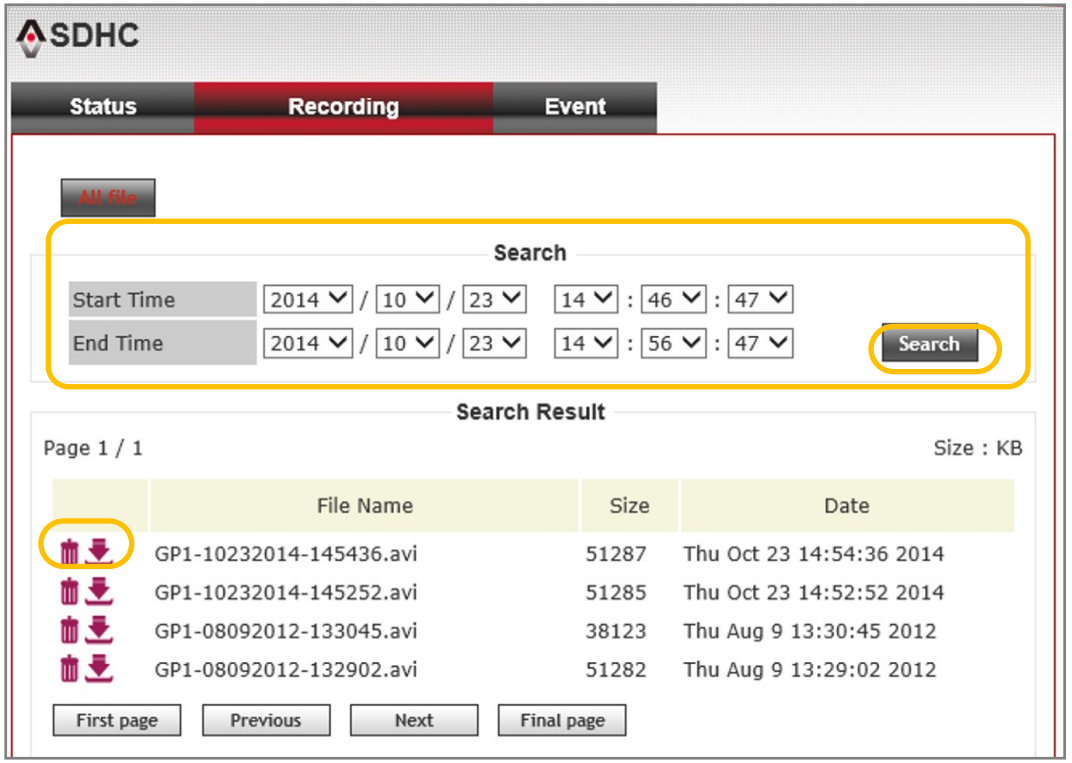
Select the "**Recording**" button under the "**SDHC**" page.

Step 2.

Press the "**All file**" button to see all recording files from the SD memory card. You can search a specific period of recording by setting a desired **Start Time** and **End Time.** Then press the "**Search**" button to sort the recording files within the specified period.

Step 3.

You can choose to download the recording files to your computer or to delete file from memory card.



5.4.3. SD Card Event Recoding Search

When event recording is triggered and saves to SD memory card, You can search all event files within the "**Event**" page.

SD card event recoding search procedure：

Step 1.

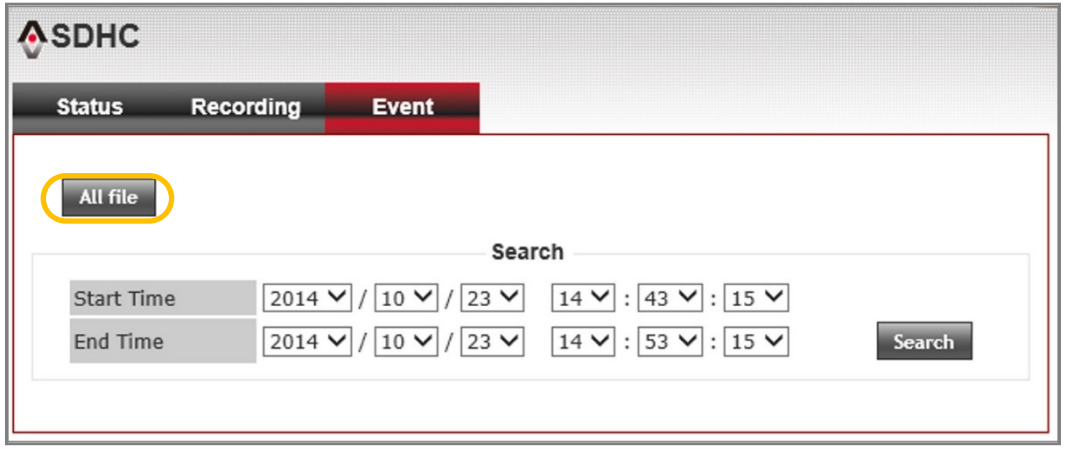
Select the "**Event**" button under the "**SDHC**" page.

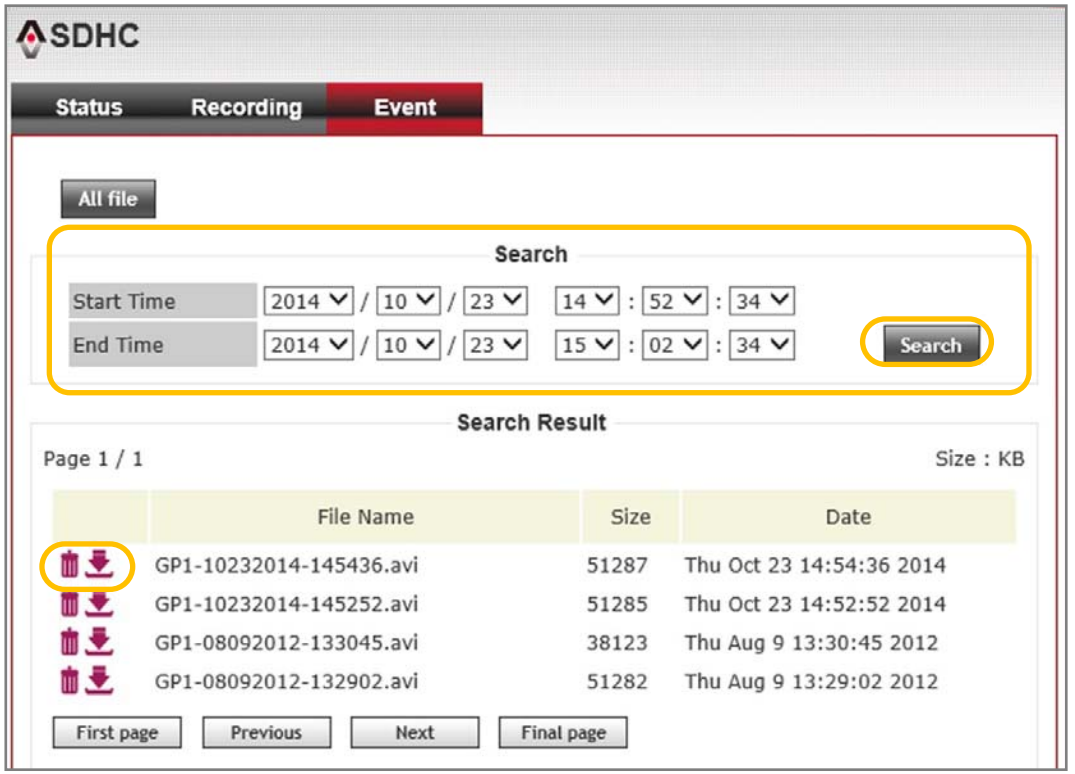
Step 2.

Press the "**All file**" button to see all event recording files on the SD memory card. You can search a specific period of recording by setting a desired **Start Time** and **End Time.** Then press the "**Search**" button to sort the recording files within the specified period.

Step 3.

You can choose to download the recording files to your computer or to delete file from memory card.





5.5. Event Settings

The Event Setting page allows you to define event triggers to cause the camera to perform an action. You can set multiple event based on your application.

Comtrend network cameras have two event triggers and 5 possible actions:

1)Motion Detection

2)Digital Input signal

Actions includes：

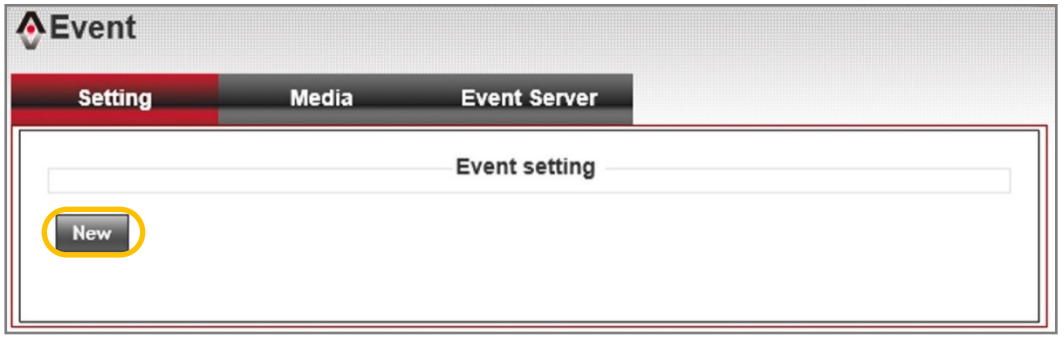
1)Send to FTP

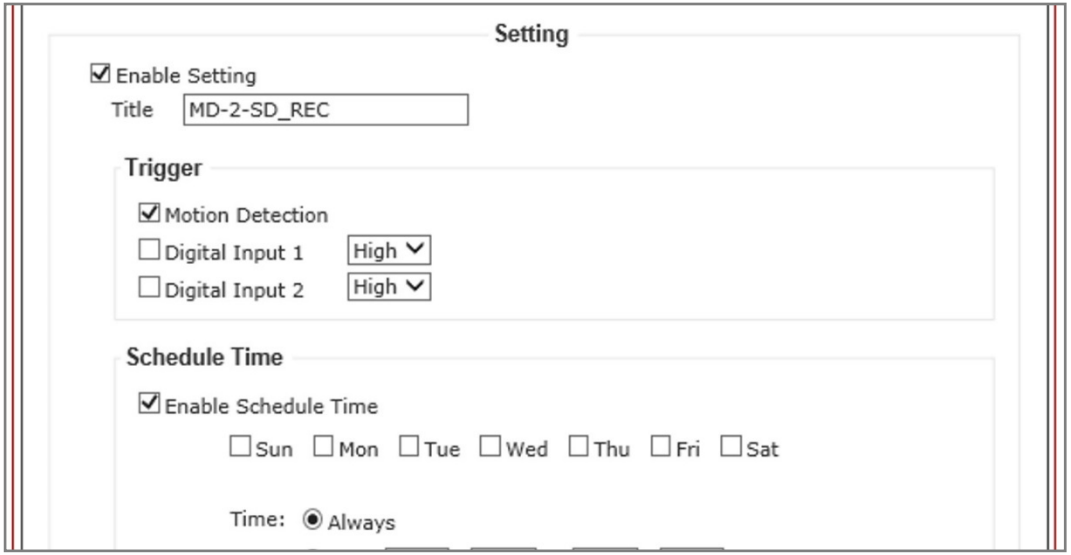
2)Send to Email

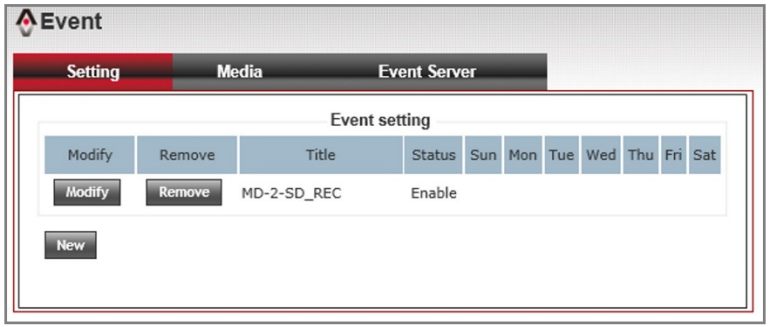
3)Record to Samba

4)Record to SD Card

5)Trigger Digital Output







5.5.1. Event Server

The "**Event Server**" tab is used to setup the media server that will support the "**Action**" from a "**Triggered Event**". FTP, SMTP and Samba are the three media server types that are supported.

5.5.1.1. FTP Server

FTP Server setting procedure：

Step 1.

Select the "**Event**" button under the "**Configuration**" menu. Then select "**Event server**" tab.

Step 2.

Select "**Enable FTP server**". Enter your FTP server's **IP address, Port, Username, Password and File path Name.** You may select "**Enable Passive Mode**" depending on your FTP server configuration.

Notification：

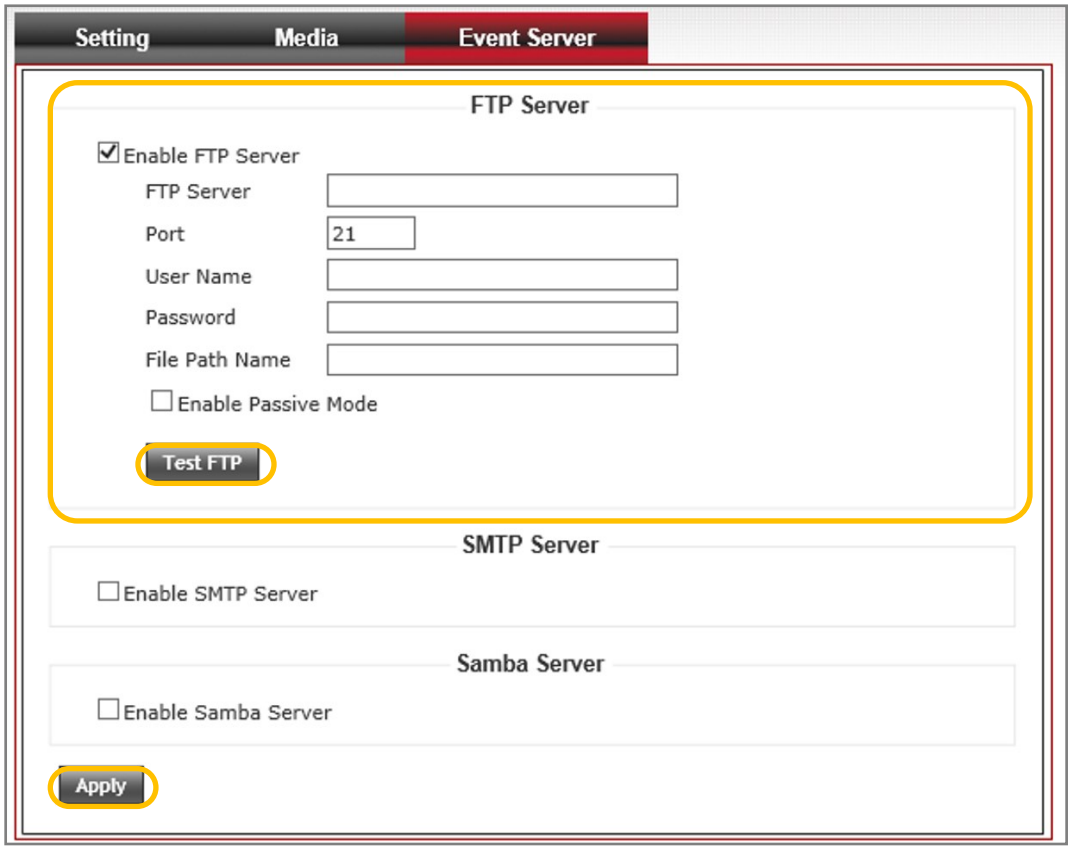
Default **FTP Port** is set to **21**.

Step 3.

Press the "**Test FTP**" button to check if the FTP connection was successfully established.

Step 4.

Press the "**Apply**" button to save settings.



5.5.1.2. SMTP Server

The main function of the SMTP server it to send an e-mail message when an event is triggered.

SMTP Server setting procedure：

Step 1.

Select the "**Event**" button under the "**Configuration**" menu. Then select the "**Event Server**" tab.

Step 2.

Select the "**Enable SMTP server**". Enter your SMTP server's **IP address, Port, Sender e-mail address, Receiver #1 and #2 e-mail address and Subject**. Indicate whether there is authentication required. Provide a **Username and Password** if necessary. You may select **Require SSL Encryption and StartTLS** if necessary for your server.

Notification：

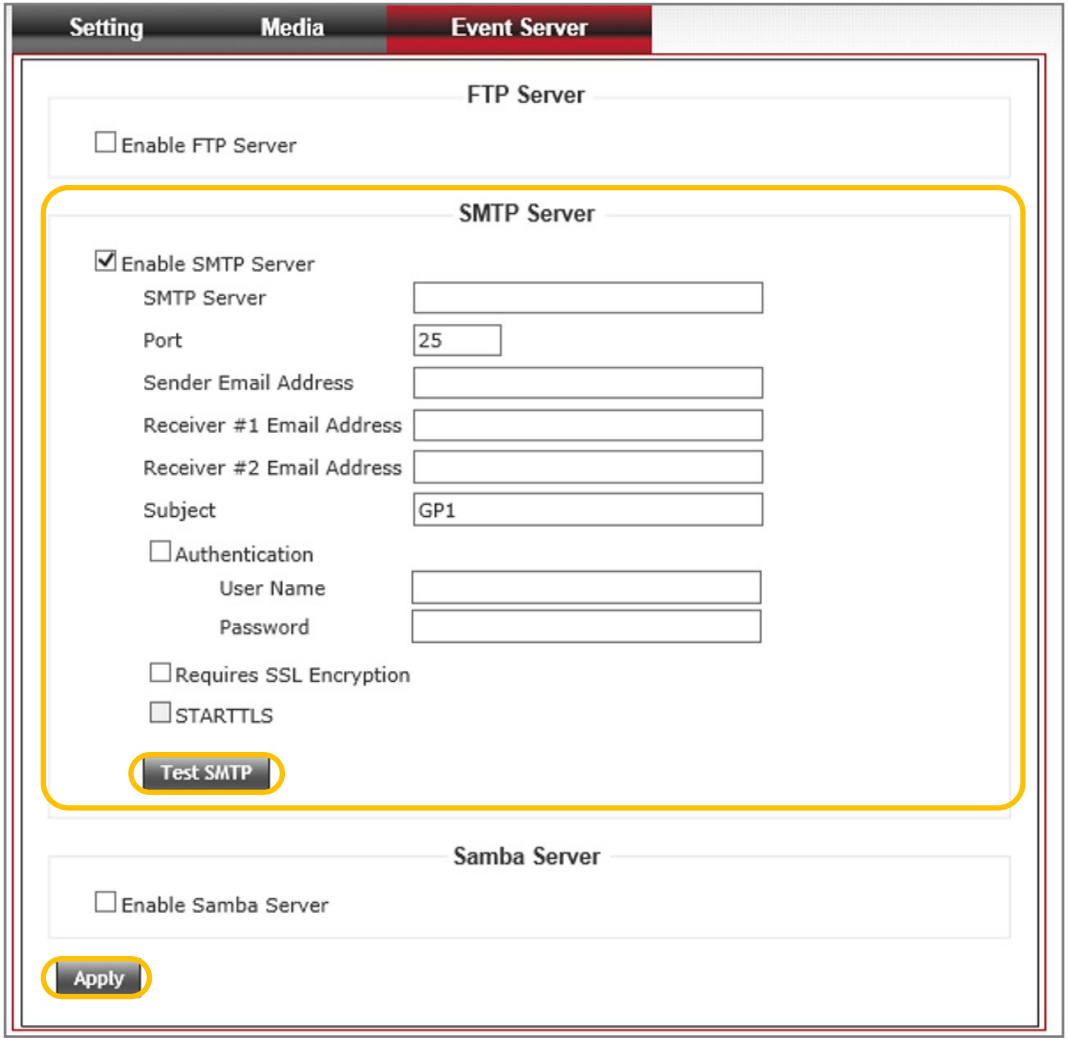
Default **SMTP Port** is set to **25**.

Step 3.

Press the "**Test SMTP**" button to check if the SMTP connection was successfully established.

Step 4.

Press the "**Apply**" button to save setting.



5.5.1.3. Samba Server

Samba Server setting procedure：

Step 1.

Select the "**Event**" button under the "**Configuration**" menu. Then select the "**Event Server**" tab.

Step 2.

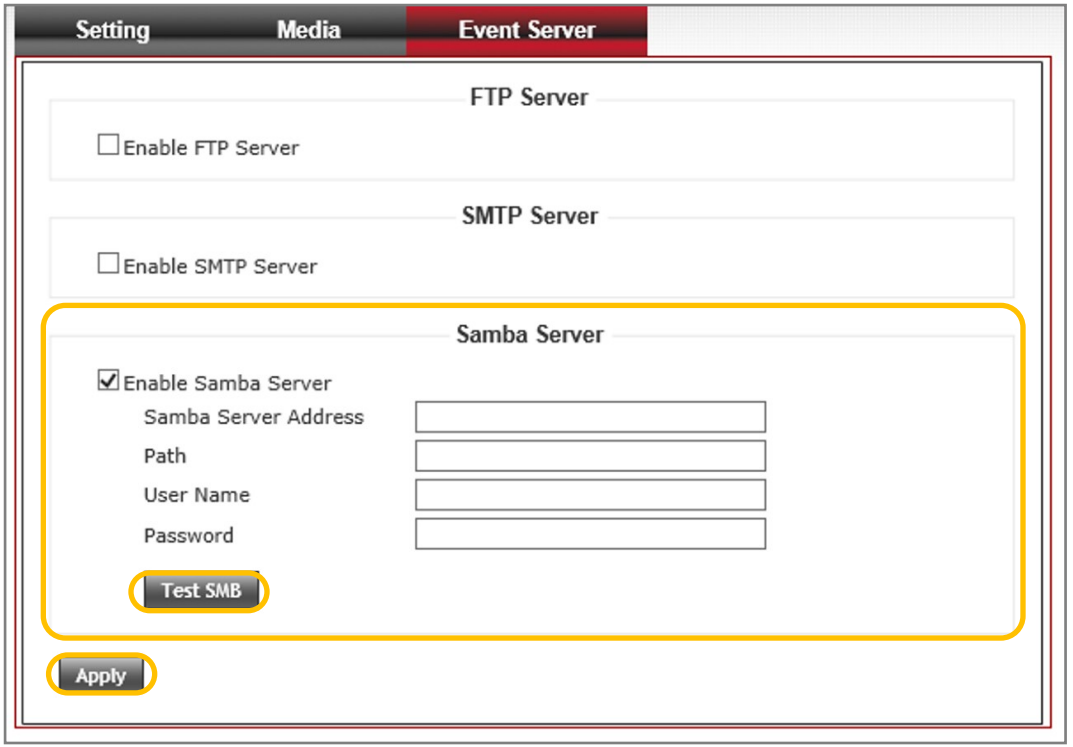
Select "**Enable Samba Server**". Enter your Samba server's **IP address, Storage Path, Username and Password.**

Step 3.

Press the "**Test Samba**" button to check if the Samba connection was successfully established.

Step 4.

Press the "**Apply**" button to save setting.



5.5.2. Media setting

Media settings are to define what kind of media files should be save when an event is triggered. You can send a snapshot or an event recording file to your event server.

Media setting procedure：

Step 1.

Select the "**Event**" button under the "**Configuration**" menu. Then select the "**Media**" tab.

Step 2.

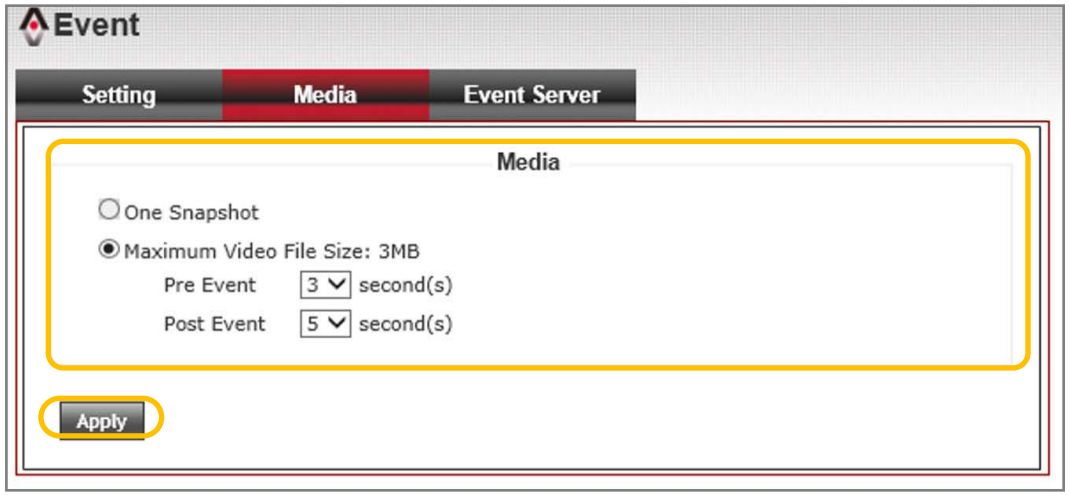
Select the "**Snapshot**" or "**Maximum Video File Size**". You can set the pre and post event time when selecting video as the media format. The length of "**Pre Event**" and "**Post Event**" are both configurable from 1 to 5 seconds.

Notification：

The maximum event recording file size is 3MB. Recommended "**Pre Event**" as 2 seconds and "**Post Event**" as 3 seconds.

Step 3.

Press the "**Apply**" button to save setting.



5.5.3. Adding New Event Settings

Event Settings will allow you to configure events that are triggered by either "**Motion Detection**" or "**Digital Input**". You can establish a "**Schedule Time**" for when the event will be active. Five "**Action**" types are available for each triggered "**Event**".

Example of adding new event procedure:

Step 1.

Select the "**Event**" button under the "**Configuration** menu". Then select the "**New**" button to open the "**Settings**" page.

Step 2.

Select "**Enable Setting**" and provide the "**Event**" title.

Step 3.

Select "**Motion Detection**" as a trigger.

Step 4.

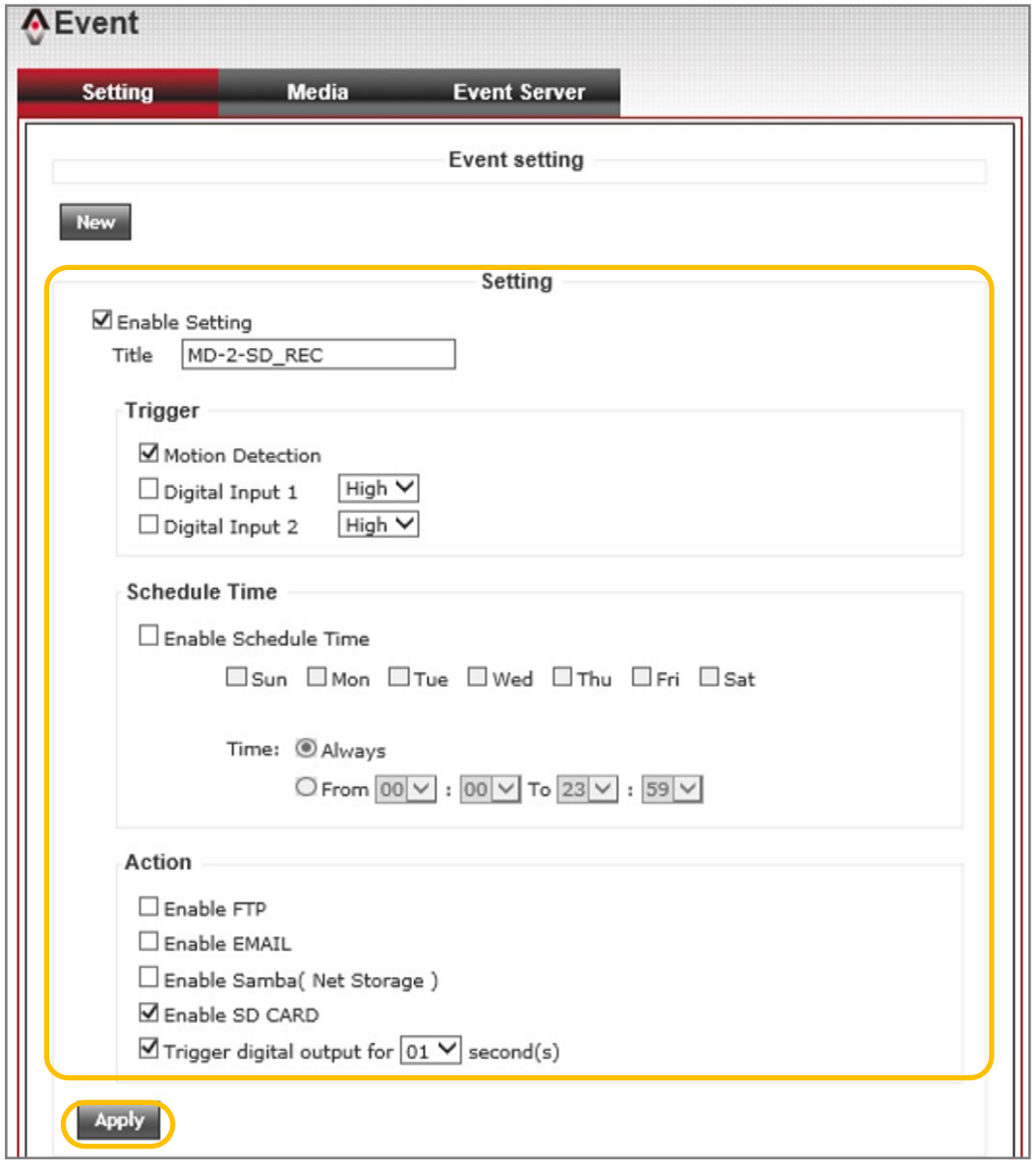
Select "**Enable Schedule Time**" and select all days from Sunday to Saturday. Then set the time as **Always.**

Step 5.

Select "**Enable SD Card**" and "**Enable Digital Output**" as your action. Also set your digital output time as 10 seconds.

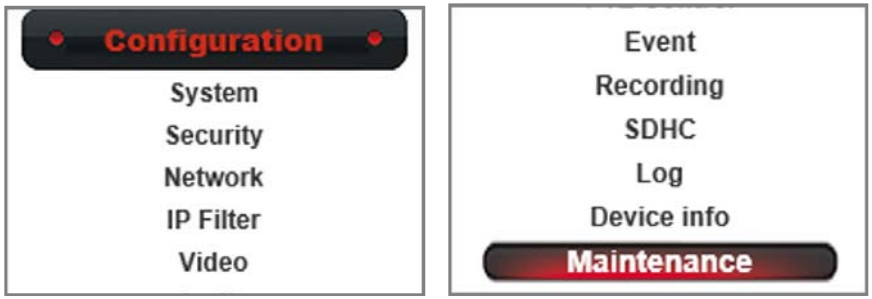
Step 6.

Press the "**Apply**" button to save setting.



5.6. Maintenance Settings

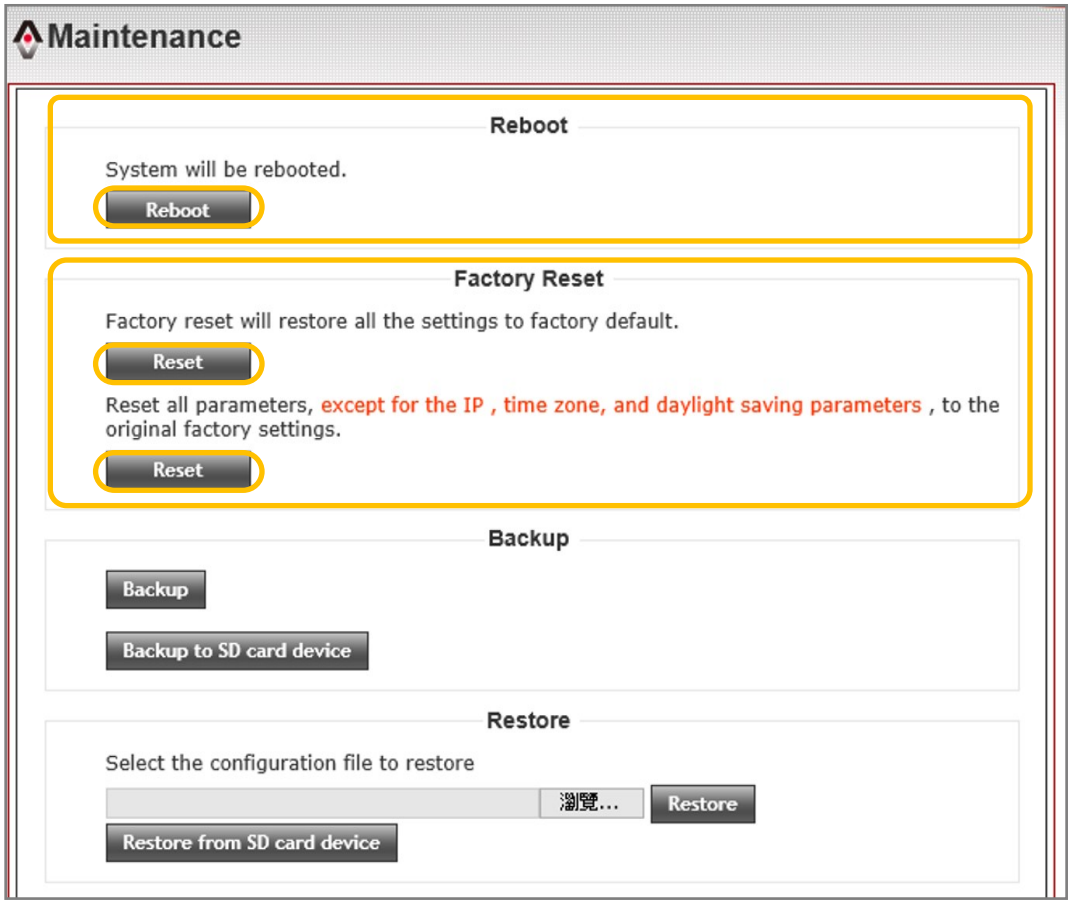
This maintenance page includes **Reboot, Factory Reset, Backup, Restore,** and **Upgrade** functions.



5.6.1. Reboot

Reboot procedure:

The "**Reboot**" feature is used to remotely reboot the camera.



5.6.2. Factory reset

There are two "**Factory Reset**" options. The first option will reset all camera parameters to factory default. The second option will reset all parameters, except for the IP address, time zone and daylight savings parameters.

Reboot and Reset procedures:

To "**Reboot**" or "**Reset**" the camera, press the "**Reboot**" or "**Reset"** buttons.

5.6.3. Backup

Comtrend cameras can back-up your camera settings to either local computer or on to an installed SD card.

Backup procedure:

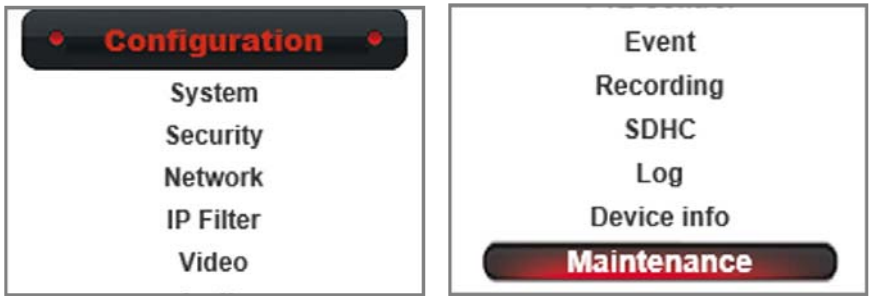
When you press the "**Backup"** button, the Comtrend camera will back-up it's setting to your computer. When you press the "**Backup to SD card device"** button, the Comtrend camera will back-up it's settings to the installed SD card.

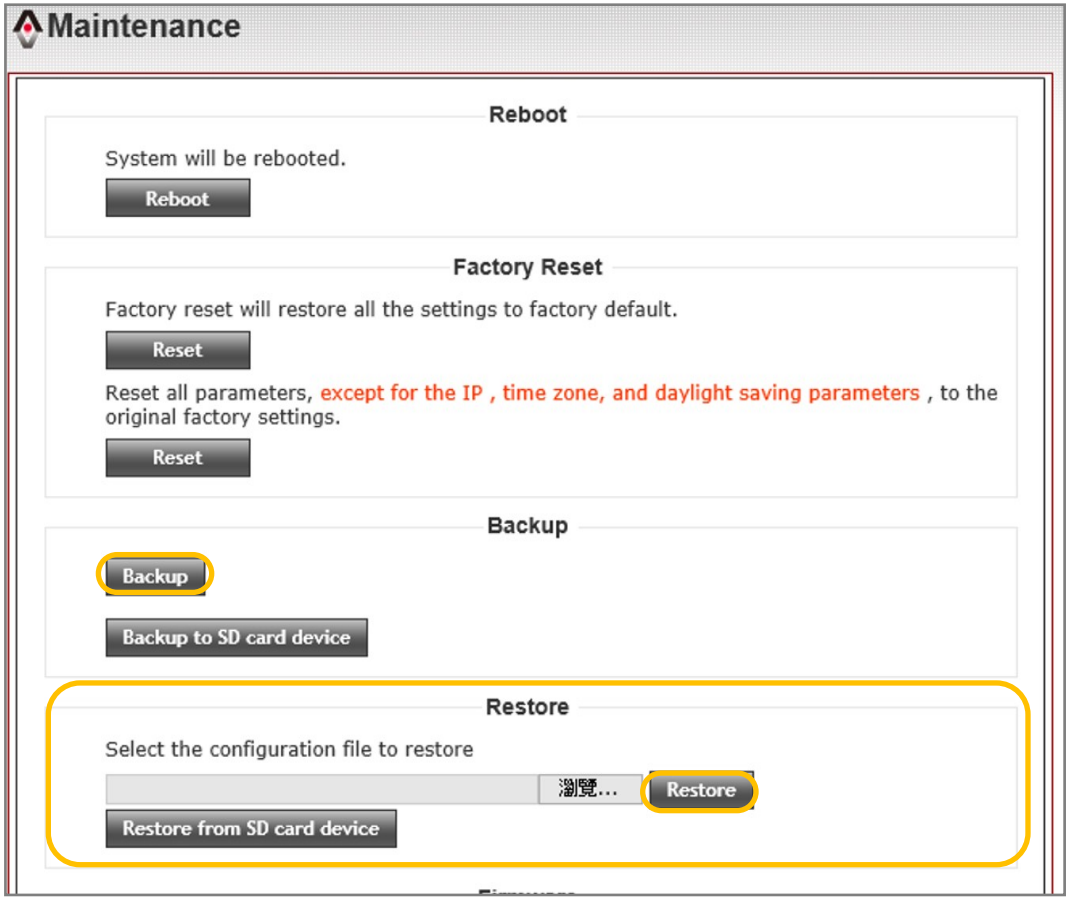
5.6.4. Restore

Comtrend cameras can restore back-up files from the procedure above.

Restore procedure:

When restoring files from your computer, press the "**Browse**" button and select the backup file that you saved. Then press the "**Restore"** button. When restoring settings from the SD card, press "**Restore from SD card device**" button.



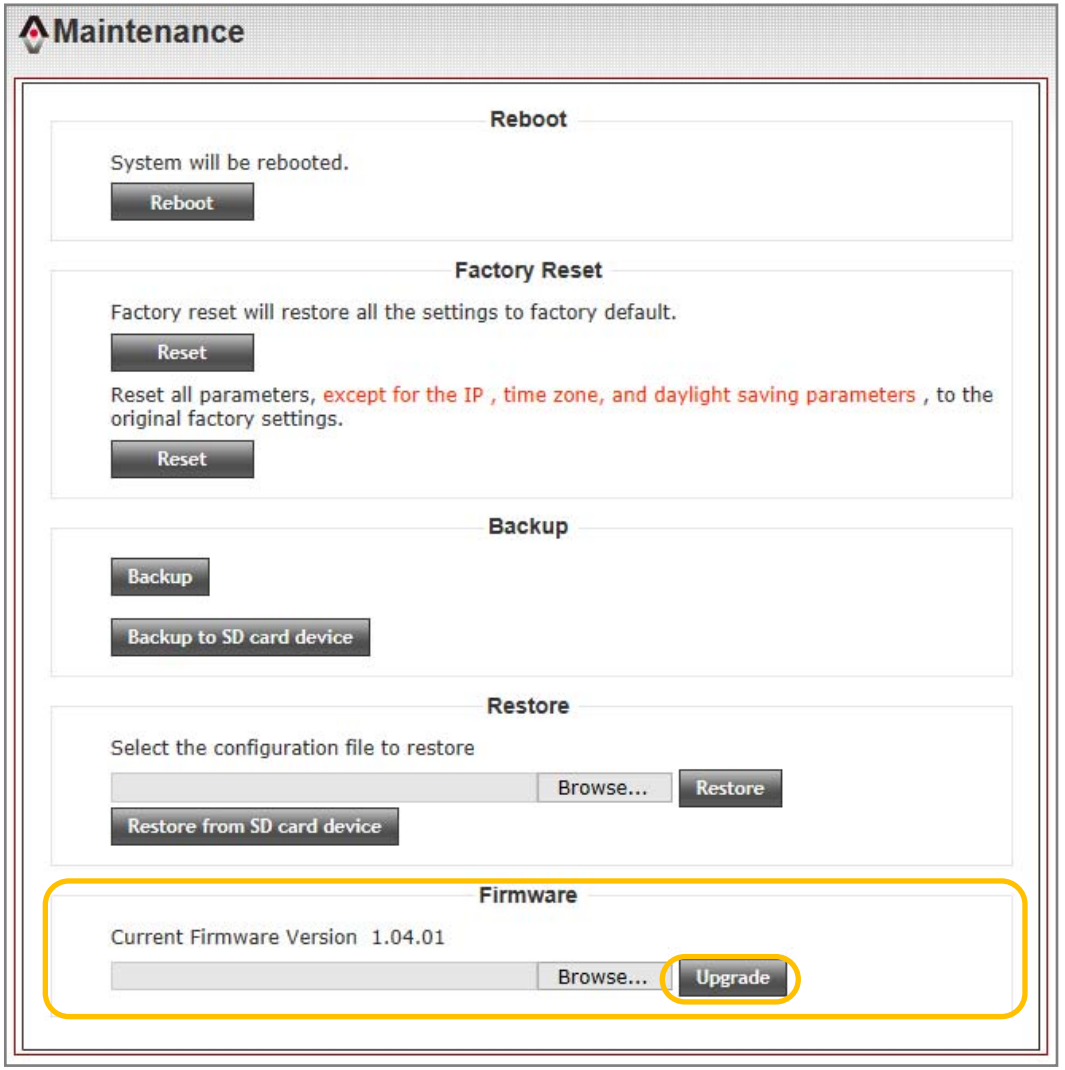


5.6.5. Upgrade

Comtrend cameras contain its original firmware version when they first leave the factory. Comtrend will have the latest firmware version on the Comtrend website.

Firmware upgrade procedure:

Download the latest firmware version to your computer. Click the "**Browse**" button and select the firmware you want to upload to the camera. Click the "**Upgrade**" button to begin the upgrade. Once the upgrade is complete, "**Reboot**" your camera.



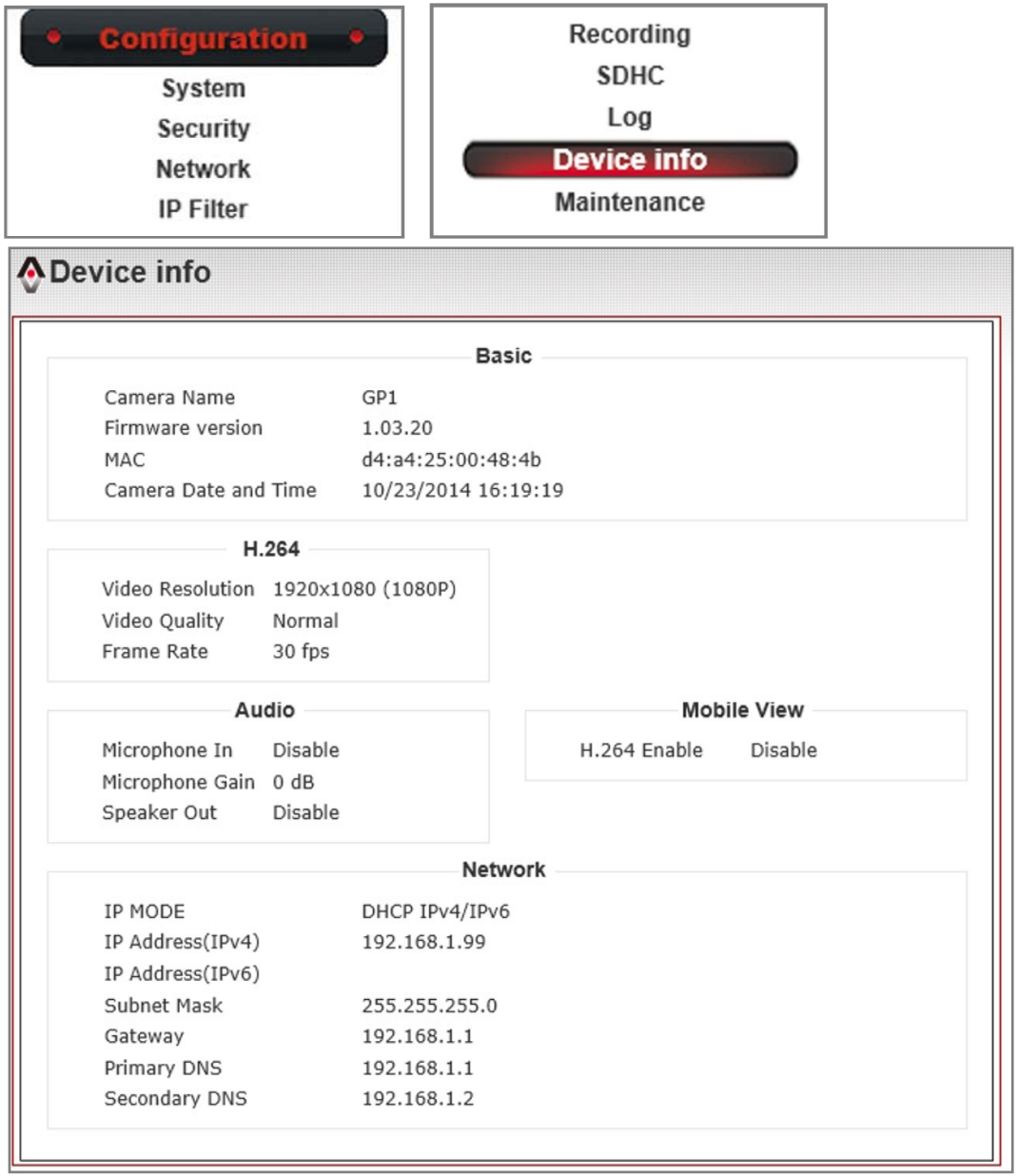
5.7. Camera Information

Comtrend network cameras provide two ways of checking information. One is form the device information, it includes the fundamental of network setting and basic function of the camera. The other one is in the system log, it records all the operation and event history.

5.7.1. Device information

Device info display procedure:

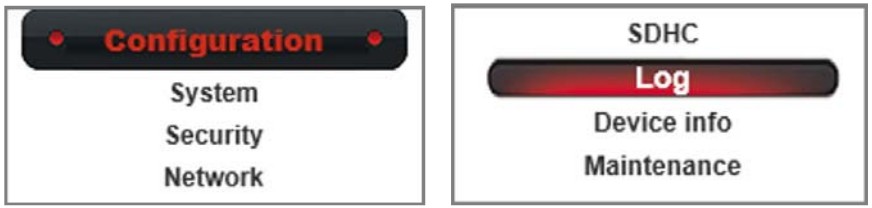
To access device info, click "**Configuration**" from the menu then click the "**Device Info**" button.

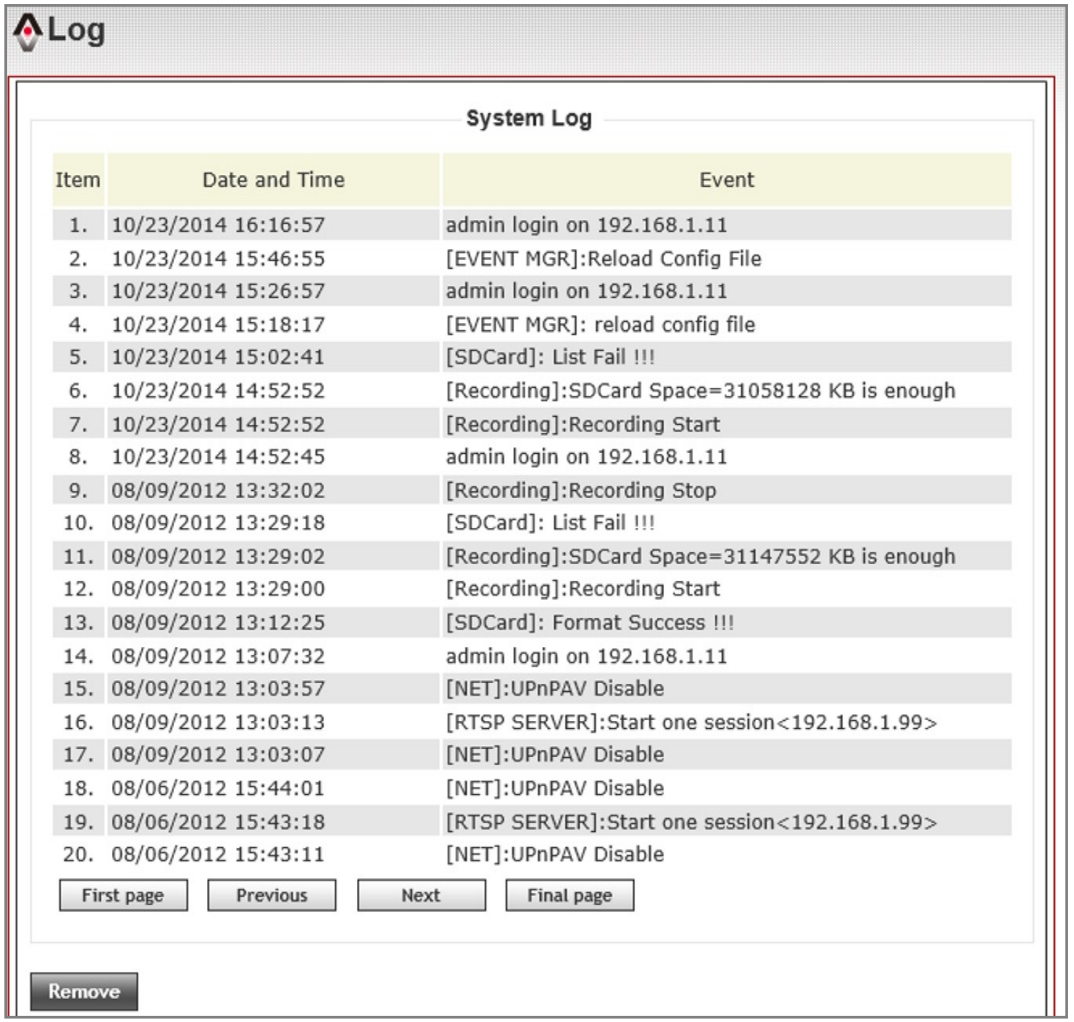


5.7.2. System Log

System log display procedure:

To access system log, click **"Configuration"** from the menu then click the "**Log"** button.





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