BEWARD
IP SURVEILLANCE

Operations User Manual

www.beward.eu

IP CAMERA
N520



Full HD resolution
MicroSD/SDHC card slot
WI-FI 802.11 b/g/n. WPS support
Recording to network attached storage

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Chapter 1. Safety Instructions

Before using this product

This camera complies with all safety rules. However, improper use of any electric device can be a cause of fire and bring to property damage. Before you start using this camera, please study this user manual carefully.

IMPORTANT!

Use accessories recommended by the manufacturer only. Use of the improper accessories may cause camera's breakdown.

Follow the operating instructions

- Do not use and store this camera in severe environment:
- avoid extremely low or high ambient temperatures (the camera's operating temperature is 0°C to +50°C)
- avoid exposure to direct sunlight and do not locate the camera near any heat sources
- avoid exposure to high humidity
- do not locate the camera near any electrical appliances which can be electromagnetic transmitters
- avoid exposure to high vibration

IMPORTANT!

In case of malfunction of the product contact our Service Center.

In case of:

- detection of a strange smell or smoke
- penetration of any liquid or foreign objects into the camera
- the camera has been dropped or damaged

Do the following:

- unplug the power cord and disconnect all other cords from the camera
- contact our Service Center. You can find contact information on our website: http://www.beward.eu/.

Transportation

Ttransport the camera carefully, using the original box and protective packing.

Ventilation

To prevent overheating of the device, keep free air circulation in the area where the camera is located.

Cleaning

Use a soft, dry cloth for cleaning camera's external surfaces. It is acceptable to use some detergent for removing persistent dirt, but not the volatile cleaners such as the alcohol-containing solvents, benzene and so on, because of the risk to damage the camera's housing.

BEWARD

Chapter 2. Overview

2.1. BEWARD N520 Overview

BEWARD N520 is a compact 2-megapixel IP camera (*Pic. 2.1*) with a built-in Wi-Fi IEEE 802.11 b/g/n wireless interface, H.264/MPEG-4/MJPEG multi-stream video, a built-in microphone, a built-in PIR sensor, the microSD/SDHC card slot, a new generation highly sensitive CMOS image sensor with the WDR (Wide Dynamic Range) technology support.



Pic. 2.1

BEWARD N520 makes possible watching real-time video recording from any part of the world by means of the most standard operating systems and web browsers.

The web interface of this camera allows you to create and customize up to 3 different video profiles for more flexible and comfortable operation. Specifying characteristics such as a compression type, a resolution, a frame rate and at al. for each profile, you get optimal image quality according to the current channel bandwidth.

There are H.264, MPEG-4, MJPEG compression types the camera supports and simultaneous multi-streaming can be provided.

H.264 (also known as MPEG-4 Part 10) offers higher video resolution than Motion JPEG or MPEG-4 at the same bit rate, or the same video quality at a lower bit rate.

Motion JPEG provides a high quality video stream but it requires relatively big channel capacity and enough free space for recording.

High image quality is provided by the new generation highly sensitive progressive scan CMOS image sensor with the WDR (Wide Dynamic Range) technology support and effective methods of video encoding.

There are two ways to connect the camera to a network: 1) using a 10/100BASE-TX Ethernet wire interface; 2) using a Wi-Fi IEEE 802.11 b/g/n wireless interface. To make Wi-Fi connection process simpler the camera supports the WPS function.

In the large video surveillance systems it can be difficult for operator to react promptly if somebody or something impairs a camera's field of view. This camera supports tampering detection which helps to prevent such undesirable actions.

The microSD/SDHC memory cards support improves camera's capabilities and makes its operation safer. In case of disconnection all important information will be saved to the card.

2.1.1. Features

- Optimal quality-price ratio
- Progressive scan CMOS image sensor with WDR support
- MicroSD/SDHC memory cards support
- Wi-Fi IEEE 802.11b/g/n with WPS support
- Professional 16-channel software included
- Simultaneous multi-streaming H.264/MPEG-4/M-JPEG
- Viewing recorded files via the web interface with a built-in player
- PIR sensor
- Built-in microphone
- Built-in speaker
- Built-in motion, audio and tampering detectors
- Sending of images or video data by e-mail and transmission by FTP
- Recording of images and video data to a shared folder (Windows or Linux OS) or to NAS (Network Attached Storage)
- ONVIF support

2.1.2. Specifications

- 1/2.7" progressive scan 2-megapixel CMOS image sensor with WDR support
- Lens (optionally): f4.0 mm, F1.8 (angle of view: 72° (horizontal))
- Resolution: 1920x1080, 1280x720, 640x480, 320x240
- Sensitivity: 0.05 lux @ F1.8
- Electronic shutter time:, 1/2 to 1/10000 s
- Automatic Gain Control (AGC): 1x to 64x
- Frame rate: up to 30 fps at all resolutions
- Video encoding: H.264, MPEG-4, MJPEG
- Simultaneous multi-streaming: H.264/MPEG-4/M-JPEG

- Two-way audio streaming; compression: G.711 μ-law, α-law, AMR
- Wi-Fi IEEE 802.11b/g/n with WPS support
- Protocols supported: Bonjour, TCP/IP, DHCP, PPPoE, ARP, ICMP, FTP, SMTP, DDNS, NTP, UPnP, RTSP, RTP, RTCP, HTTP, TCP, UDP, 3GPP/ISMA RTSP
- Power: 5 V, 0.75 A DC
- Operating temperature: 0°C to +50°C
- Operating humidity: 20-80% (without condensation)
- ONVIF 2.2 support

2.1.3. Package Contents

- IP camera with a pre-installed lens (M12, f4.0 mm, F1.8)
- Power supply 5 V, 1 A DC
- Patch cord (1 m length)
- Terminal block (4 contacts; digital input/output)
- Wi-Fi antenna
- Bracket with a mounting kit
- CD with user manuals and software
- Quick Installation Guide

ATTENTION!

Package contents and camera specification are subject to change without notice.

2.1.4. Default Settings

- **IP address:** 192.168.0.99
- **Subnet Mask:** 255.255.255.0
- **Network gateway:** 192. 168.0.1
- **User Name:** admin
- **Password:** admin
- **HTTP-port:** 80
- **RTSP:** 554

2.2. What Does This User Manual Need For

You can view real-time video played back by this camera both trough a standard web browser and by means of free software included in the package contents. The current User Manual contains full information about the first way of camera exploitation. It explains the setting of a camera web interface for operation in a local network or Internet. For recommendations on how to use the different capabilities of the camera software, please, see Software User Manuals.

2.3. Minimum System Requirements

For normal operation and viewing of the network camera, it is recommended that your system meet these minimum requirements:

Item	Requirements
CPU	2.8 GHz Intel Pentium 4 or AMD Athlon 3000+
Graphic Card	256 MB RAM (or equivalent on-board graphic card)
RAM	1 GB (2GB and above is recommended)
Operating System	Microsoft ® Windows Vista, Windows 7 Mac OS Leopard 10.5
Web Browser	Internet Explorer 9.0 or later

NOTE:

1. If it is not able to view the recorded video file, please install Xvid codec or free VLC player (http://www.videolan.org/vlc/). Also, you can use a player from the camera web interface (**[SETTING] – *Playback – Client PC***).
2. For proper operation you may need to update some Windows applications and services (Net Framework, Windows Media Player).

Chapter 3. Using Third Party Clients

The N520 supports RTSP/RTP streaming.

You can use RTSP client for getting access to video in H.264, MPEG-4, MJPEG. You can use real-time RTSP players such as VLC, Quick time, Real Player etc. as RTSP clients.

RTSP (Real Time Transfer Protocol) is a network control protocol designed for use in entertainment and communications systems to control streaming media servers. The protocol is used for establishing and controlling media sessions between end points. Clients of media servers issue VCR-like commands, such as play and pause, to facilitate real-time control of playback of media files from the server.

NOTE:
When connecting to the camera trough Internet, the rate of connection (bit rate) depends on the parameters of a network access channel.

You can get the access to the stream via RTSP clients by the following command: **rtsp://<IP>:<PORT>/<XXXX>** where <IP> is the camera IP address, <PORT> is the camera RTSP port (default value - 554), <XXXX> is an ordinal number of profile which is used for video stream viewing. For example, rtsp://192.168.0.99:554/video.pro. An encoding type (H.264/MPEG-4/MJPEG) for this profile should be set in profile settings. Go to **[SETTING] – *Live View – Video – Profile***. Also, you can create several profiles with different encoding type and resolution.

NOTE:
Detailed information about RTSP and profile setting is given in paragraphs 8.2.1, 9.1.2.

For getting separate frames in JPEG format use the following command: **http://<IP>:<PORT>/cgi-bin/view/image?res=<Res>** where <IP> is the camera IP address, <PORT> is the camera HTTP port (default value is 80), <Res> – the resolution of a frame. For example, http://192.168.0.99/cgi-bin/view/image?res=320x240. The following resolutions are available: 1920x1080, 1280x720, 640x480, 320x240.

NOTE:
For getting frames you should be authorized.

Chapter 4. Managing the IP Camera via Internet Explorer

Step 1: connect your camera according to the Installation User Manual.

Step 2: open Internet Explorer, type your camera's IP address in the address bar. The default IP address is **192.168.0.99**.

NOTE:

There are two ways to assign an IP address to an IP camera.

1. An IP address can be obtained automatically from a Dynamic Host Configuration Protocol (DHCP) according to the network parameters.
2. Use a manually specified IP address. See paragraph 8.1.1 for details. Contact your system administrator to avoid IP address conflict.

Step 3: enter user name and password in the authorization window (*Pic. 4.1*).

The default username is «**admin**», the default password is «**admin**».



Pic. 4.1

IMPORTANT:

You can change username and password at **[SETTING] – *System* – *Security***. If you forgot your username or password, you can reset your camera to factory settings by holding **[RESET]** button during 15 seconds.

By default, Windows prevents ActiveX add-ons from running which are required to operate an IP camera. Therefore, you need to install the ActiveX add-on to operate your camera.

4.1. Installing ActiveX Control Module

To view camera image trough Internet Explorer, you need to install ActiveX add-on. To do so, follow these steps:

IMPORTANT:
The installation of ActiveX components is available to the 32 bit version of Internet Explorer only.

NOTE:
The installation is shown for Internet Explorer 9.0 and Windows 7.

Step 1: open Internet Explorer, type the IP address of your camera in the address bar. Press **[Enter]** or click **[Go To]** button.

NOTE:
Before using the camera check that the camera and PC IP addresses are in the same subnet. In other words the IP address of your PC should be 192.168.0.xxx.

Step 2: you will see an authorization window where you should enter your username and password (*Pic. 4.2)*

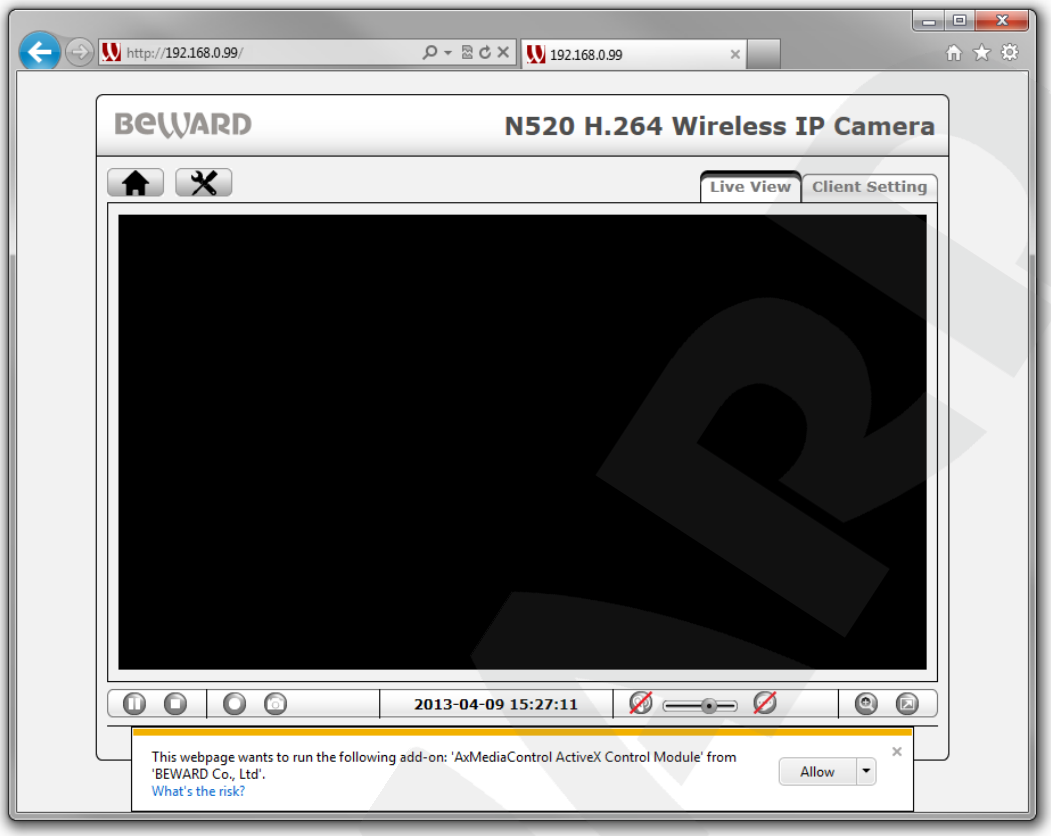


Pic. 4.2

IMPORTANT:
Default username is **admin**, default password is **admin**.

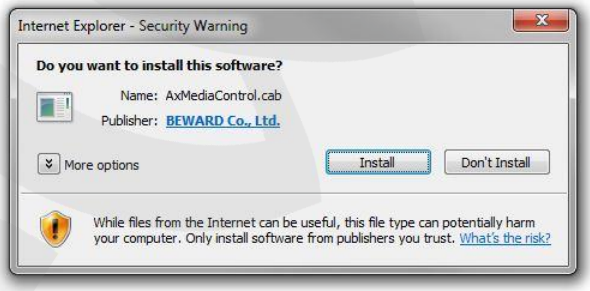
Step 3: after first successful authorization, Windows 7 blocks the ActiveX add-on installation on default. You will see a system notification at the bottom of the window: **"This webpage wants to run the following add-on: "AxMediaControl ActiveX Control Module" from "BEWARD Co., Ltd."** (*Pic. 4.3*).

Click **[Allow]** button to continue the installation.



Pic. 4.3

Step 4: On default, Internet Explorer security system blocks ActiveX components installation too. Click **[Install]** to continue (*Pic. 4.4*).



Pic. 4.4

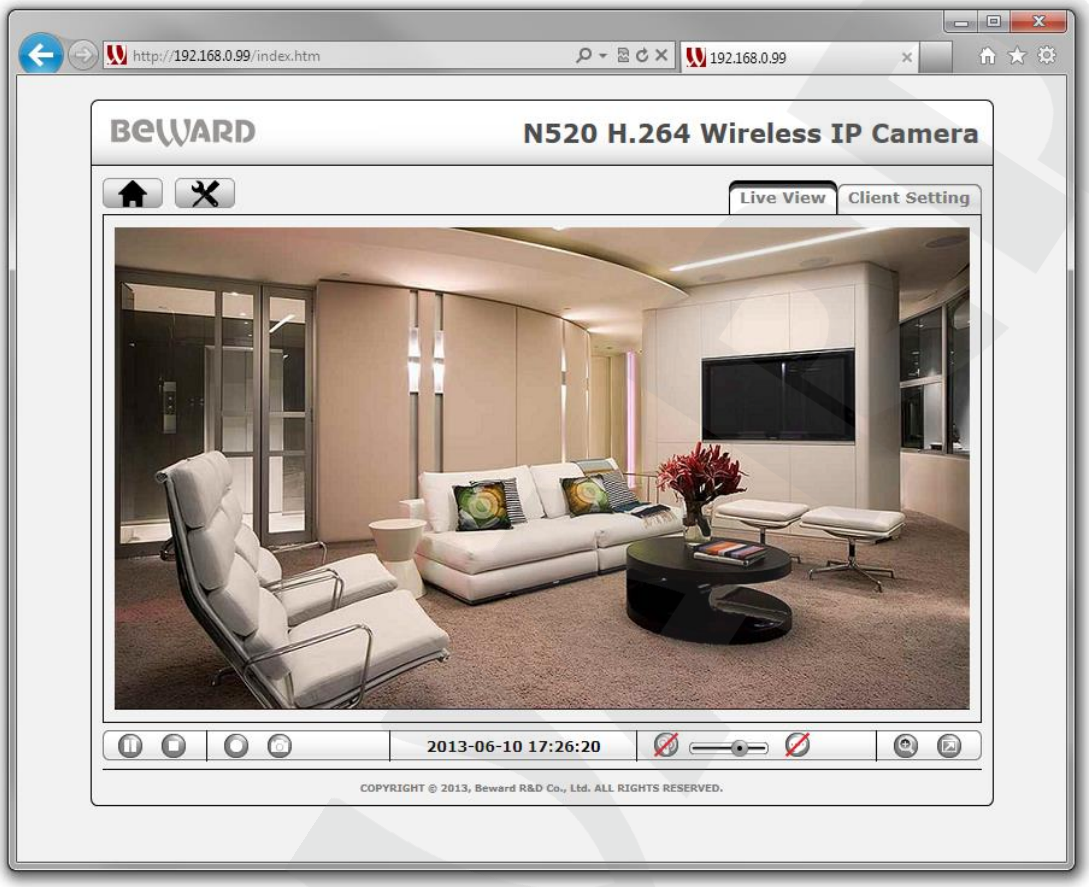
NOTE:

There will be additional installation blocking when installing ActiveX components in Windows 7 with enabled user account control. In this case you will see an additional system notification. To permit installation you should give a positive answer in the appeared window.

NOTE:

In the other operating systems and browsers, menu titles or system notifications may be differ from the same in the systems/browsers of Windows family. This note is applicable to different versions of operating systems and browsers within Windows family also.

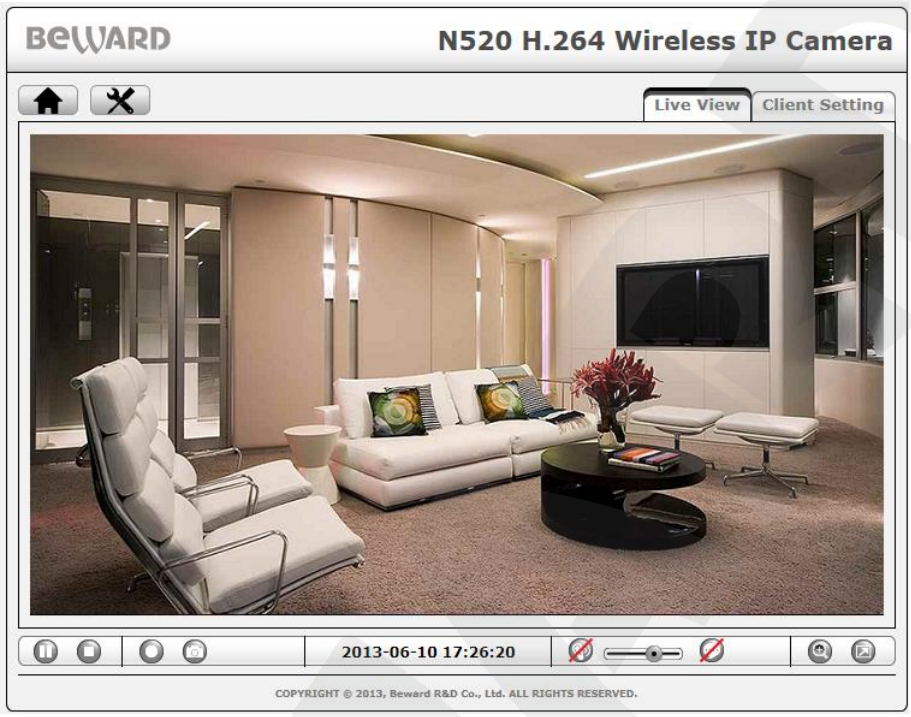
Step 6: if everything was done correctly, you should get a camera image on your display (*Pic. 4.5*).



Pic. 4.5

Chapter 5. Web Interface Main Page

5.1. Main page toolbar



Pic. 5.1

Icon	Function
[Home]	Click this button to return to the page of live view.
[Setting]	Click this button leads to set up all the configuration.
[Pause]	Click this button to hold the current video stream for a moment.
[Stop]	Click this button to stop the video from being displayed.
[Record]	This button is used to record the current video stream. It turns red when the record starts.
[Snapshot]	This button is used to take a snapshot of the current image.
[Sound]	This is a listen button, click it to switch to the mute mode. Use the slider to control the volume.
[Talk]	This is a talk button, click it to switch to the mute mode. Use the slider to control the volume.
[Fullscreen]	Click this button to stretch the view to the entire screen. Press the **[ESC]** on the keyboard to exit.

5.2. [Zoom] button

Click the button to enlarge the specific area of the image. Drag the slider to the magnification level that you want (W means wide (no magnification)/T means tele (maximum magnification)). Move the frame to select the desired area. Click the button to exit the digital zoom mode and save the selected magnification. (*Pic. 5.2*)



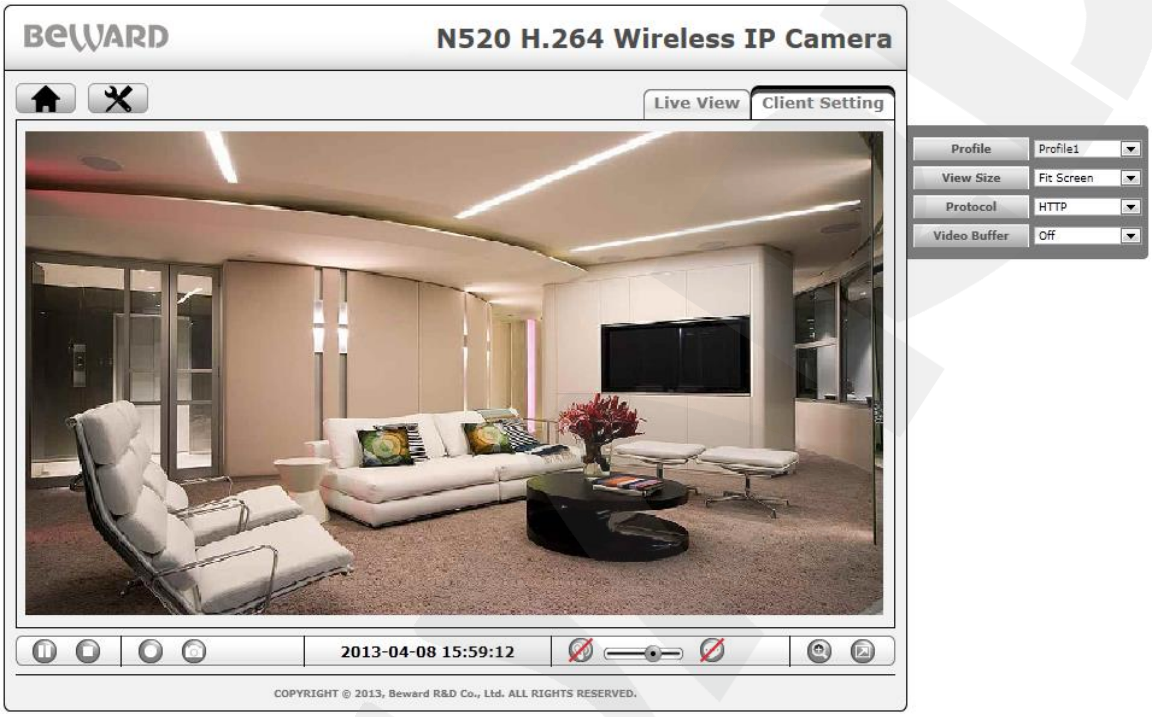
Pic. 5.2

NOTE:

The image zoom is applied only for the current image in a browser. Its parameters are saved in the browser's temporary folder. The next time you open the browser, the image will be with magnification that was set when you previously closed the browser (if the option for saving settings is enabled in the browser). If the image is viewed in software, these magnification settings will not be applied.

5.3. Client Settings

This menu is used to configure an IP camera (*Pic. 5.3*). The menu is divided into four sections, the **[Profile]**, **[View Size]**, **[Protocol]** and **[Video Buffer]** which are used to adjust and configure the IP camera. These settings only influence on video but not on the camera settings.



Pic. 5.3

5.3.1. Profile

In this item you can select necessary video stream profile with the parameters set in advance such as: resolution, encoding type, frame rate, quality etc. The parameters for each profile can be set in **[SETTING] – *Live View – Video – Profile*** (see paragraph 9.1.2).

5.3.2. View Size

Select image zoom on the screen.

Fit Screen: a small image size which is used for viewing in browser window when there is one of the most used screen resolutions.

Full Screen: full image size which corresponds to 1:1 resolution which is stated in profile settings.

5.3.3. Protocol

Select a protocol of transport level transmitting: **TCP**, **UDP**, **HTTP**.

HTTP: select this item to stream video over HTTP protocol.

TCP: select this item to stream video over TCP, RTSP is used as a control protocol.

UDP: select this item to stream video over UDP, RTSP is used as a control protocol.

When selecting any of available transport protocols, it automatically assigns data port: HTTP – 80, TCP – 554. If UDP is selected, it uses strictly defined port numbers range. The port number is assigned when the camera establishes connection with a client.

NOTE:
«HTTP» protocol is for networks where port number restriction is used. When such a security policy is applied, most of the nonstandard ports are closed but port 80 is often open (443, 554, etc) and is used by this connection type.

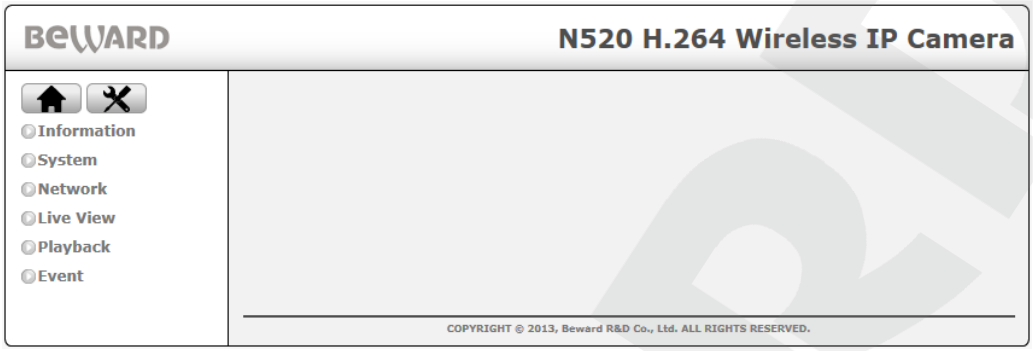
5.3.4. Video Buffer

This item allows you to enable or disable video buffer function. When this function is enabled, it makes the video stream from the IP camera smoother when the connection is unstable but may cause image delays up to several seconds.

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Chapter 6. The [SETTING] Menu: Information

The Settings item includes the following groups: **[Information], [System], [Network], [Live View], [Playback], [Event]**, each of them is described below.

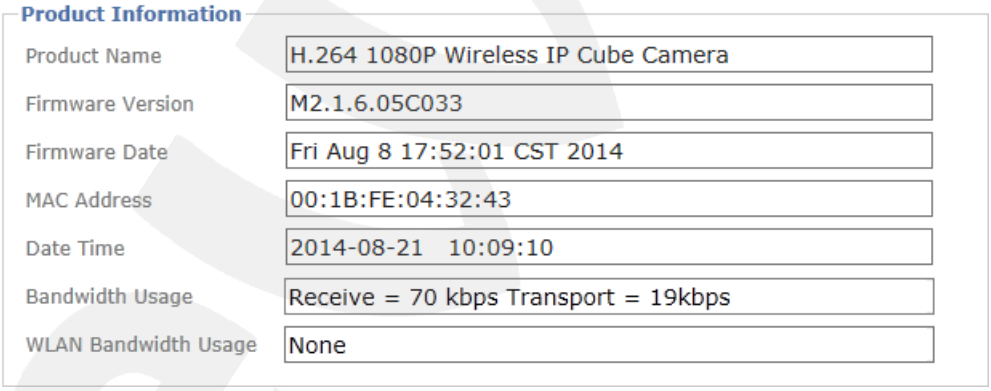


Pic. 6.1

[Information] does not contain any elements of camera operation but only has information function. It shows a lot of necessary information about the IP camera and its settings, for example: device name, date/time, software version, etc. The whole page is divided into several groups: **[Product Information], [Security], [Video Setting], [Event List], [Network], [Port]**.

6.1. Product Information

Product Information shows general information about the camera.



Pic. 6.2

Product Name: the full name of the IP-camera which gives information about its main features.

Firmware Version: shows the current version of firmware.

Firmware Date: shows the date of firmware release.

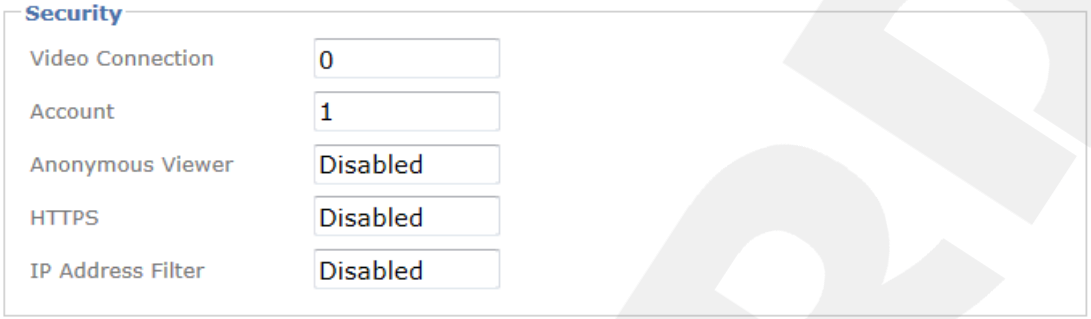
MAC Address: shows the IP-camera MAC-address.

Date Time: shows the current date and time set on the IP-camera.

Bandwidth Usage: gives information about incoming and outgoing traffic.

6.2. Security

Security contains the information about camera security settings and external users work with camera video stream.



Pic. 6.3

Video Connection: displays the number of users connected to the IP-camera at the present moment.

Account: shows the number of accounts created on the IP-camera.

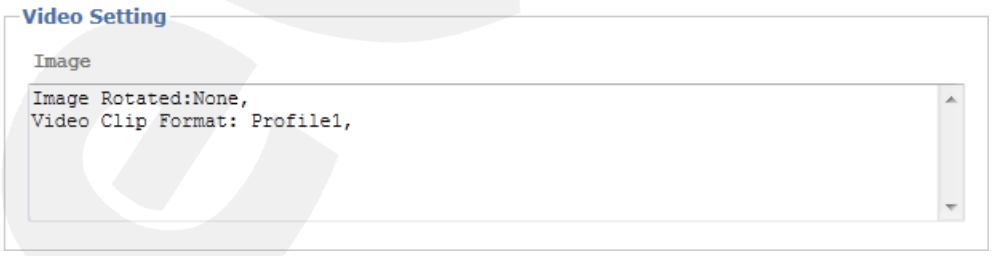
Anonymous Viewer: shows the current status of the **[Anonymous Viewer]** function (Enabled/Disabled).

HTTPS: displays the names of account categories which can connect to the IP-camera using HTTPS-protocol.

IP Address Filter: shows the current status of the **[IP Address Filter]** function (Enabled/Disabled).

6.3. Video Setting

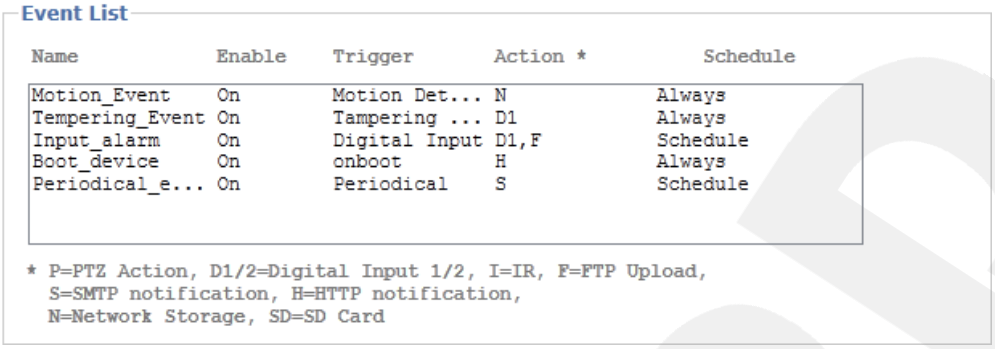
Video settings group contains an information field called **"Image"** which shows the information about image position and image profile which is used for recording.



Pic. 6.4

6.4. Event list

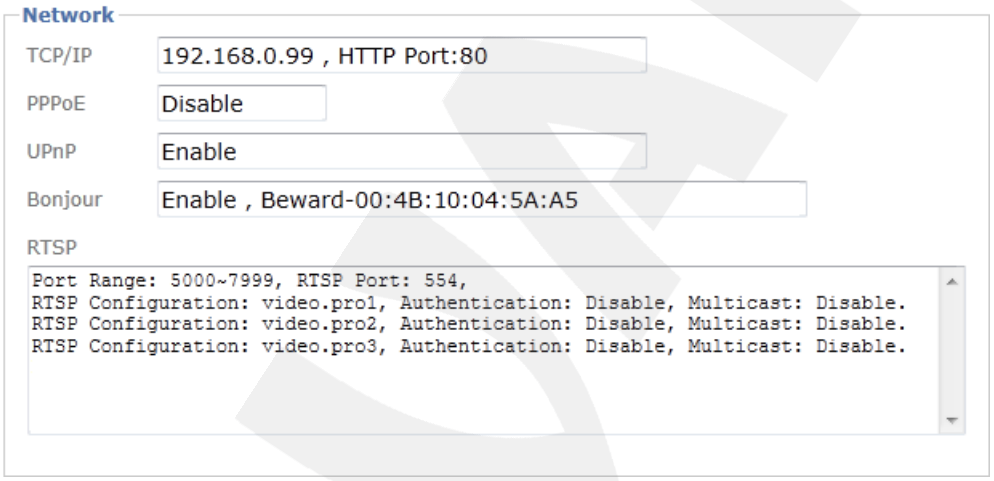
This group contains an information field which shows the information about the status and type of the settings of current alarm events and scheduled recordings.



Pic. 6.5

6.5. Network

This group contains the information about IP camera network setup.



Pic. 6.6

TCP/IP: this field displays the current IP-address of the camera and the current HTTP-port.

PPPoE: shows the current status of the PPPoE-connection (Enabled/Disabled).

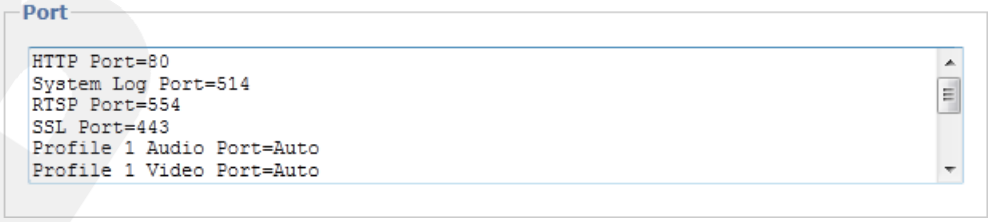
UPnP: shows the current status of the **[UPnP]** function (Enabled/Disabled).

Bonjour: shows the current status of the **[Bonjour]** function (Enabled/Disabled).

RTSP: an information window which contains specific RTSP stream data for each profile.

6.6. Port

This group contains an information field about current port values corresponding to specific protocols or IP camera services.



Pic. 6.7

Chapter 7. The [SETTING] Menu: System

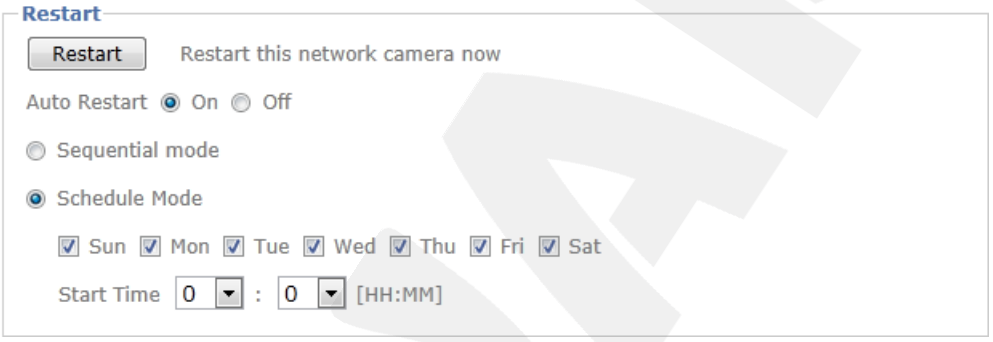
System menu contains the following sections: Maintenance, Date/Time, Security, Digital I/O, LED, System Log.

7.1. Maintenance

This menu contains such groups as Restart, Backup/Restore, Firmware Upgrade, Language.

7.1.1. Restart

This group is for setting parameters of camera reboot.



Pic. 7.1

[Restart]: click this button to restart the camera without reset to default settings. The camera takes 1-2 minutes to restart. If you click the **[Restart]** button, the confirmation dialog box appears. You will be prompted to continue or cancel the reboot. Click **[OK]** to continue or click **[Cancel]** to cancel the reboot.

[Auto Restart]: select “On” to set the modes of auto camera reboot.

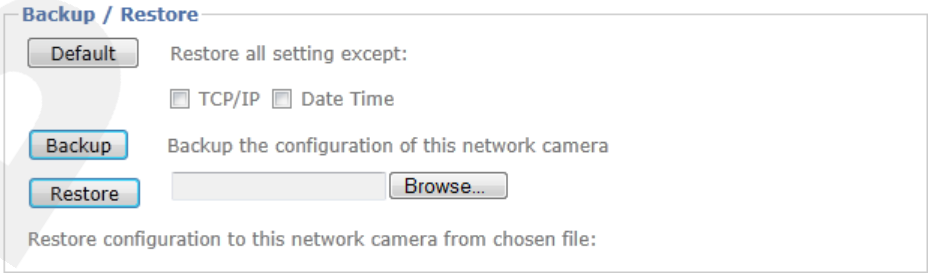
Sequential mode: select an interval for auto camera reboot (7 days are maximum).

Schedule Mode: select the days and time for auto camera reboot.

NOTE:
Press the **[Save]** button at the bottom of the page for saving the changes.

7.1.2. Backup/Restore

This group contains the following control elements:



Pic. 7.2

Default: reset the camera to the default settings by pressing this button. After that the camera will reboot automatically. Click this button to reset the camera to factory defaults. After that, the camera will restart. All settings including IP address, username and password will be reset to their defaults.

IMPORTANT:
Do not turn off power to the camera until the reboot is completed.

If you click the **[Default]** button, the confirmation dialog box will appear. You will be prompted to continue or cancel the reset to factory defaults. Click **[OK]** to continue or click **[Cancel]** to cancel.

NOTE:
Also, the camera could be reloaded by pushing the [Reset] button located on the rear side of the housing. For details, please, see Installation User Manual.

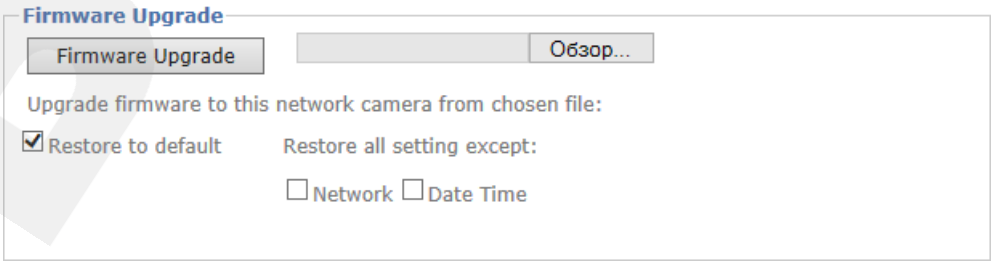
Backup: you can save the camera settings to a file. Click **[Save]** and specify the path where you want to save the settings and enter the file name.

NOTE:
When specifying the path, check the permissions on a folder where you want to save a snapshot. If you do not have the permissions, you cannot save snapshots there.
In Windows 7, you need to start Internet Explorer as an administrator to save records on your local HDD.

Restore: allows you to restore previously saved settings. Click **[Browse]** or specify the path of the saved file manually. In the appeared window select the required file by clicking your left mouse button on the name of the file and click **[Open]**. Click **[OK]** to start restoring the settings. When the restoration is completed, the camera automatically restarts to apply the settings.

7.1.3. Firmware Upgrade

This item allows you to upgrade the camera firmware. Click **[Browse]** or specify the path of the firmware manually. In the appeared window select the required file by clicking your left mouse button on the name of the file and click **[Open]**. Click **[OK]** to start updating the firmware.



Pic. 7.3

IMPORTANT:
When the update is completed, it is recommended to reset camera settings to their factory defaults.

Choose **“Restore by default” (“Восстановление умолчанию”)** to allow camera set its parameters by default after firmware upgrading. You can save the current date, time and camera’s IP address by putting check marks below.

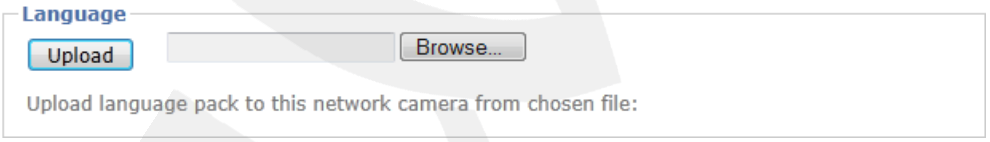
When the update is completed, the camera automatically restarts.

IMPORTANT:
Do not switch off the camera and do not close a browser’s window till process completing. Process interrupting may cause a device failure.

IMPORTANT:
Be careful when you update camera firmware. Make sure that you use only the firmware designed for your IP camera. Using the wrong firmware file may cause your camera to become inoperable. The manufacturer is not liable for the incorrect firmware update. Do not disconnect your camera until the update is completed.

7.1.4. Language

Change the web interface language by uploading a language file pack.



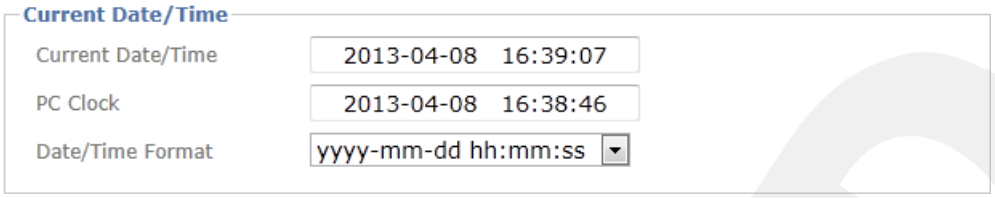
Pic. 7.4

NOTE:
The language pack files are on the disk included in the package contents.

IMPORTANT:
Be careful when you uploading a language pack. Make sure that you use only the language pack designed for your IP camera. Using the wrong language pack may cause your camera to become inoperable. The manufacturer is not liable for the incorrect loading of a language pack.

7.2. Date/Time

This menu allows you to set device date and time and consist of several settings groups, which are **[Current Date/Time]**, **[Synchronization Method]** and **[Time zone]**.



Pic. 7.5

Current Date/Time: displays the current date and time of the IP Camera.

PC Clock: displays date and time on a computer, which is used to connect to the camera (client computer).

Date/Time Format: allows you to select date/time format.

NOTE:
To apply new settings click the [Save] button.

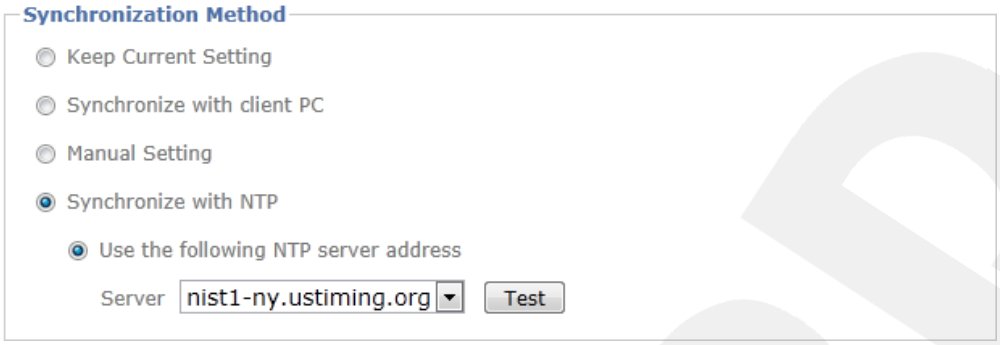
7.2.1. Synchronization Method

Synchronization Method allows you to select how to set the camera date and time.

- **Keep Current Setting**: leaves the current date and time as they are.
- **Synchronize with client PC**: use the same date and time as on a computer, which is used to connect to the camera.
- **Manual setting**: select this mode to adjust the camera the date and time manually.
- **Synchronize with NTP**: allows you to synchronize your camera clock with an NTP server (Network Time Protocol) located in the Internet (e.g. time.windows.com, time.nist.gov, etc). Select an NTP server name and a time update interval (by default, camera clock is typically updated once an hour).

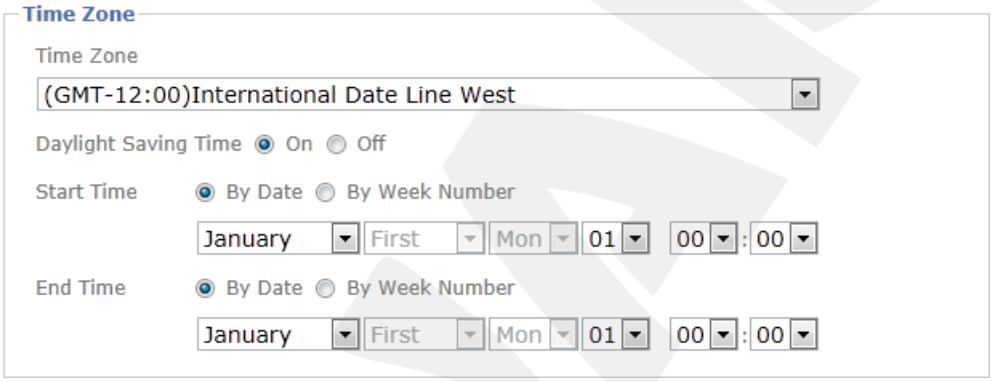
IMPORTANT:
To synchronize time with an Internet time server, an NTP server must be located in a local network or in the Internet. The camera must be connected to the Internet to synchronize time with an Internet time server.

You can choose a NTP server from the list below or specify it manually. Then check its availability by clicking **[Test]** button.



Pic. 7.6

7.2.2. Time zone



Pic. 7.7

Time Zone: select your current time zone for the camera. The correct time zone is important for the correct synchronization with an NTP server.

Daylight Saving Time: this item allows your camera's clock to be automatically adjusted when daylight saving time changes. This parameter is important for the correct synchronization with an NTP server. You can specify the start time and the end time so that the camera's clock could be adjusted by date or by week number.

7.3. Security

The camera has a built-in Administrator Account and its user name and password are «**admin** / **admin**». This is a main user account and you cannot change its privileges but you can change its user name and password. Besides, an administrator can add new user accounts with different privileges.



Pic. 7.8

NOTE:

If the user name and/or the password of the Administrator Account are changed a Windows authorization window will be opened where you need to enter a new user name and/or a new password.

[Add] button**:** add a new user.

User name: type a user name (1-16 characters).

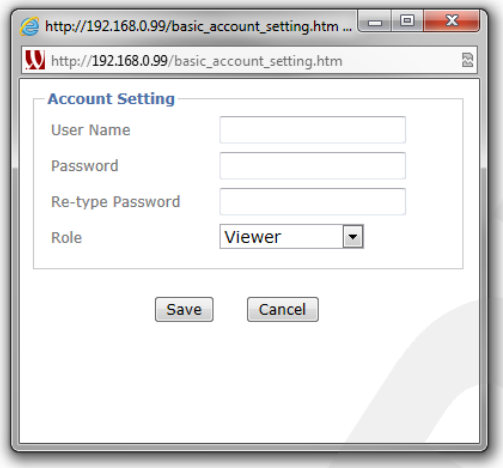
Password: type a password (1-16 characters). You can use a blank password.

Re-type Password: re-type the entered password to avoid mistakes in password assignment. If you re-type the password incorrectly, you will see an error message.

[Edit] button**:** edit the information about selected user.

[Remove] button**:** delete the information about selected user.

To add a new user click the **[Add]** button (*Pic. 7.9*).



Pic. 7.9

IMPORTANT:

A user name and a password must contain only Latin letters.

Role: allows you to set user permissions. The following options are available:

- **Administrator**: is able to change any parameters
- **Operator**: is able to view camera image and adjust image parameters. The Operator can access the **[Client setting]** and **[Image setup]** menu.
- **Viewer**: is able only to view camera image. The Viewer can access only the **[Client setting]** menu.

Anonymous Setting: this item allows anyone to access a camera image without authorization, but the main **[SETTING]** menu will be inaccessible.

The **[Anonymous Viewer]** field includes two values:

- **Disabled**: when this option is selected, you need to enter the user name and password to access the camera.
- **Enabled**: when this option is selected, you do not need to enter a user name and password to access the camera.

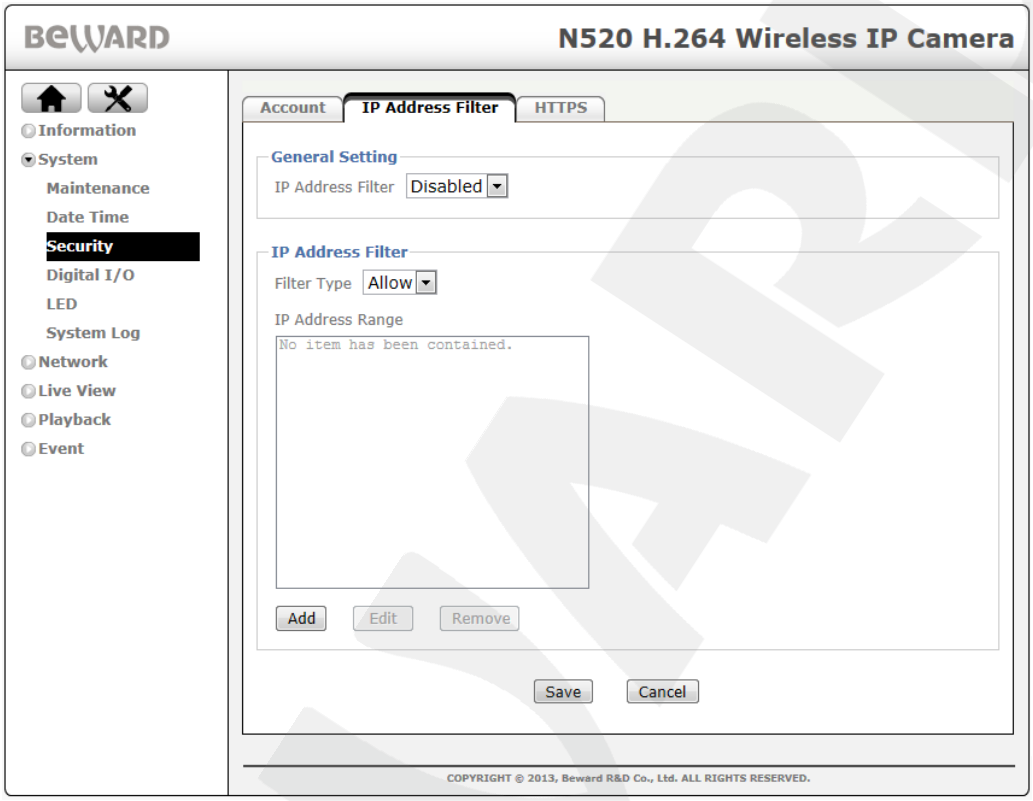
When your account does not have sufficient permissions to access a menu, you receive an authorization window that prompts you to login as an account that has the sufficient privileges.

NOTE:

It is recommended to change the default user name and password to help preserve image privacy and provide configuration change protection.

7.3.1. IP Address Filter

You can allow access to the camera from specific IP addresses, which provides additional security to your data. To enable or disable this option choose the corresponding value in the **[IP Address Filter]** field (*Pic. 7.10*).



Pic. 7.10

The following settings are available: **Filter Type** and **IP Address Range.**

Filter Type:

Allow: access to camera web interface is allowed only from the addresses mentioned in the IP range blank.

Deny: access to camera web interface is forbidden from the addresses mentioned in the IP range blank.

IP Address range: a list of IP (or just one IP) which were added to filter.

For working with the **[IP Address filter]** function you should add IP addresses by pressing the **[Add]** button (*Pic. 7.11*).



Pic. 7.11

Rule: you can choose the type of the IP filter – **[Single]**, **[Network]**, **[Range]**.

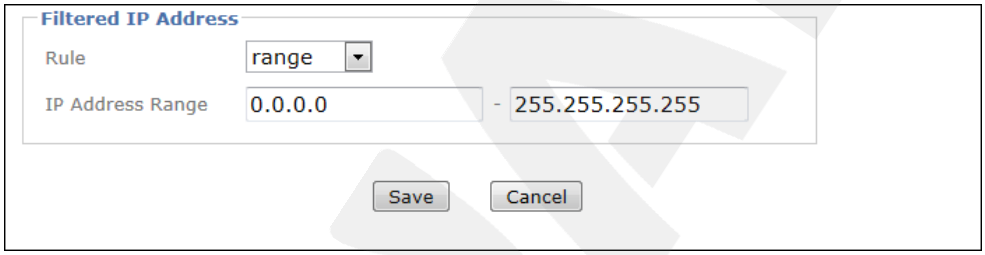
The **[Single]** type allows you to specify only one IP address.

If you choose the **[Network]** type in addition to the **[IP address]** field the **[CIDR Notation]** field will be available (*Pic. 7.12*). In this field you need to enter the value for *Classless Inter-Domain Routing* (CIDR) (for details, please, see Appendix E. Glossary).



Pic. 7.12

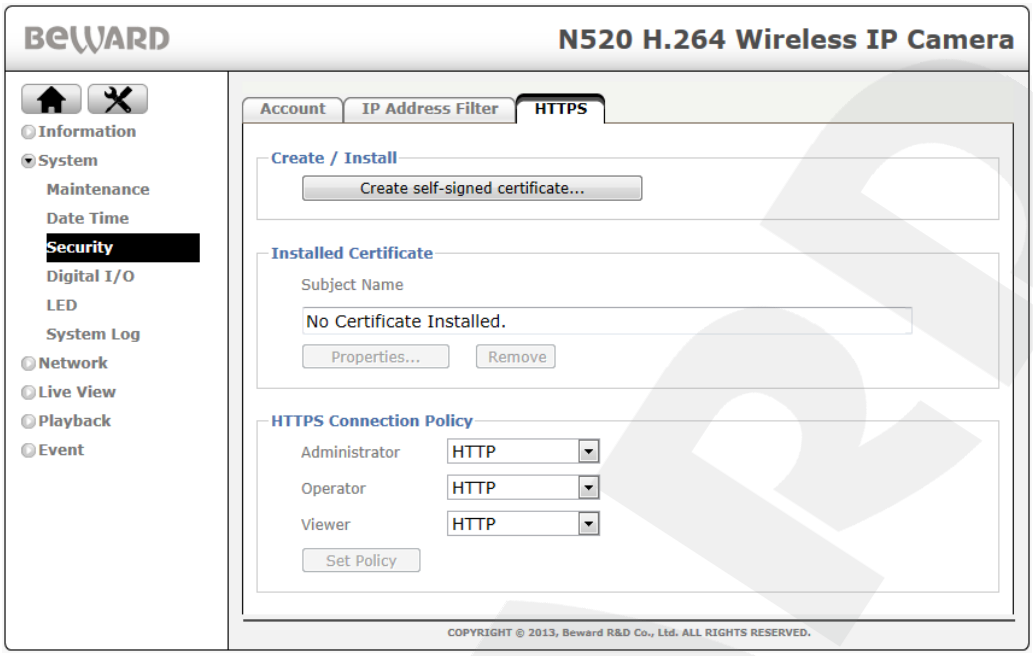
Having chosen the **[Range]** type you can specify the range of IP addresses (*Pic. 7.13*).



Pic. 7.13

7.3.2. HTTPS

This section allows you to access the camera over HTTP (when the camera address resembles the following: http://<IP>/) as well as over a secure connection (when the camera address resembles the following: https://<IP>/) using port 443. Therefore, this connection type provides better security. You can specify a connection type for a certain account, for example provide an HTTP connection for a Viewer and an HTTPS connection for an Administrator.



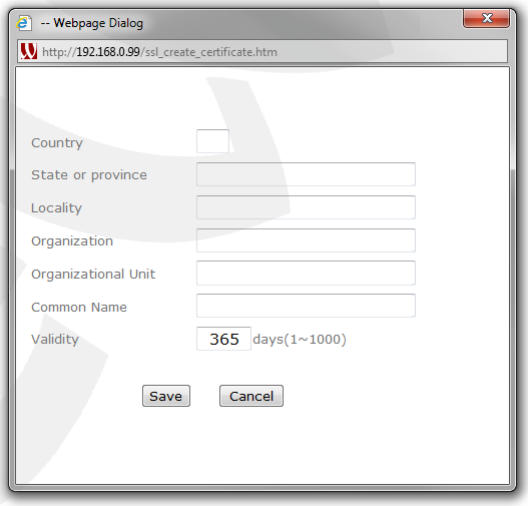
Pic. 7.14

Create / Install: allows you to create and install a certificate for a secure HTTPS connection.

Installed Certificate: displays the installed certificate and allows you to delete it.

HTTPS Connection Policy: allows you to specify a connection type for the user accounts.

To create a secure HTTPS connection, you need to create a certificate first. Click the **[Create self-signed certificate…]** to create a certificate (*Pic. 7.15*).



Pic.7.15

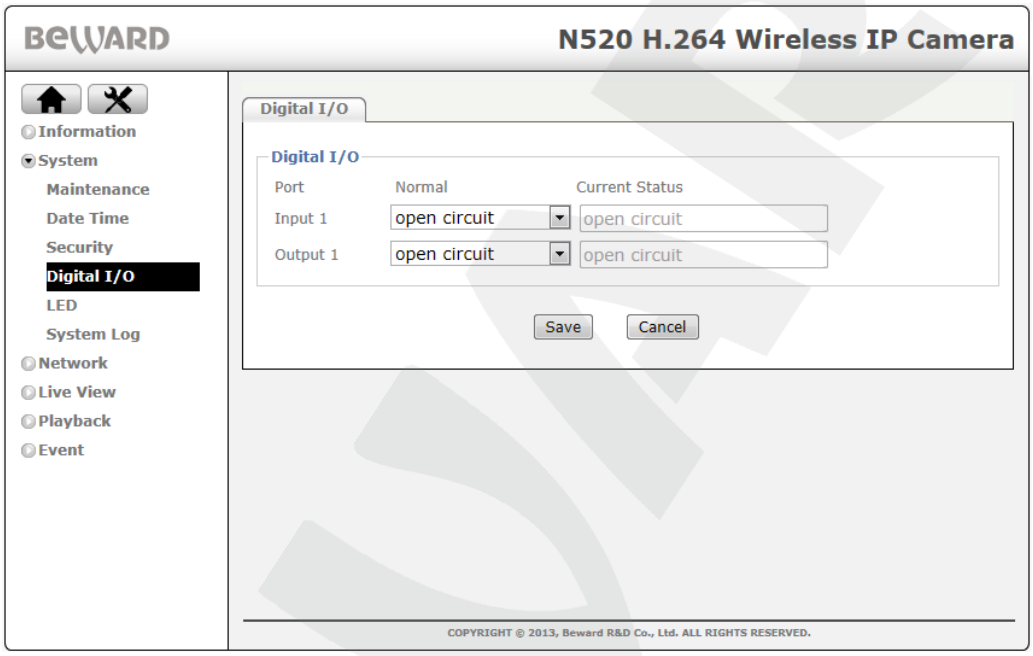
The **[Create self-signed certificate…]** window appears, so that you need to complete all the fields and then click **[Save]** to save the certificate. Click the **[Properties]** button to view the certificate properties.

IMPORTANT:

When using an HTTPS connection and the option for RTSP is enabled, it secures only the parameters transferred between a computer and the camera but the video and audio streams are not secured. To secure the parameters and streams, you need to disable the option for RTSP.

7.4. Digital I/O

This tab contains alarm input/output settings. **[Normal]** fields allow selecting the status of digital input/output. **[Current status]** shows the status of input/output at the moment.



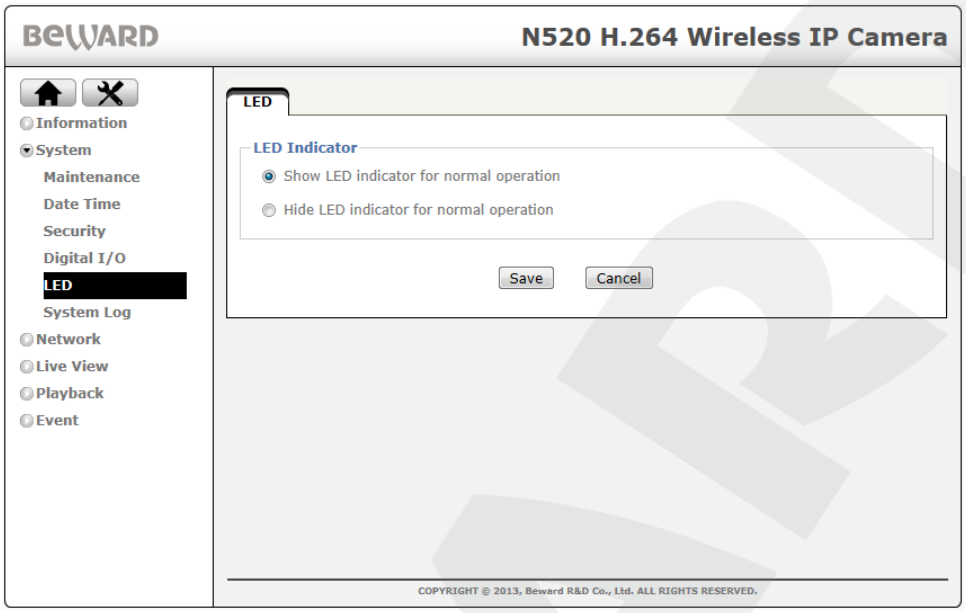
Pic. 7.16

NOTE:

Click **[Save]** to apply new settings. If you do not want to save the changes click **[Cancel]**. For detailed information about Digital Input/Output, please, see the Installation User Manual.

7.5. LED

In this menu you can select if the LED is used or not.



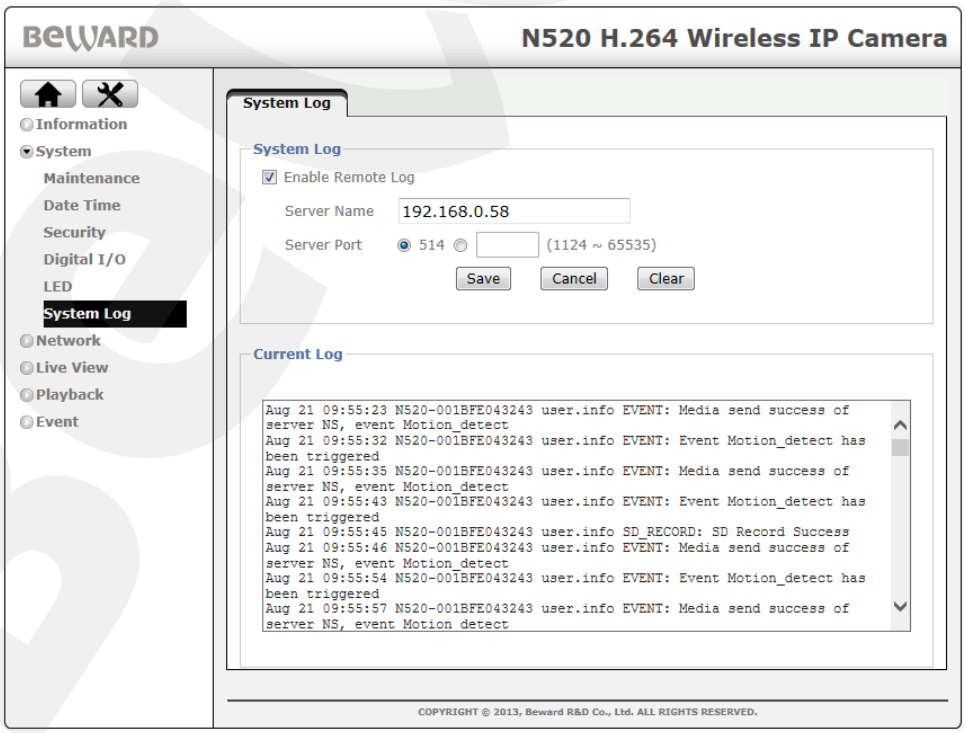
Pic. 7.17

Show LED indicator for normal operation: indication is on.

Hide LED indicator for normal operation: indication is off.

7.6. System Log

The system log contains all the changes of camera parameters as well as the events. The entries are added automatically after the camera is turned on (*Pic. 7.18*).



Pic. 7.18

Enable Remote Log: allows you to send information from the system log to a remote server.

Server Name: type the remote server name or IP address.

Server Port: type a port value to access the server (the default value is 514).

Current Log: this field contains system log entries.

BEWARD

Chapter 8. The [SETTING] Menu: Network

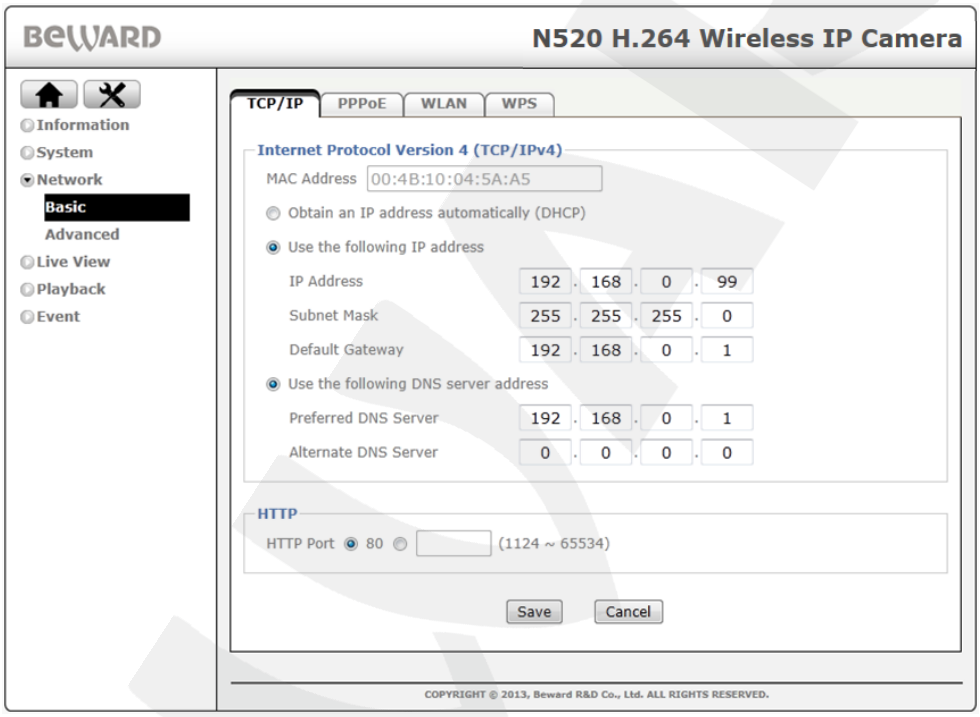
This menu is used for network parameters setting and includes two settings groups: **“Basic”** and **“Advanced”**.

8.1. Basic

This settings group includes the following tabs: **“TCP/IP”, “PPPoE”, “Wi-Fi”** and **“WPS”**.

8.1.1. TCP/IP

This menu is for setting of basic wired connection parameters (*Pic 8.1*).



Pic. 8.1

MAC Address: displays the current MAC address. This parameter cannot be changed and is provided for informational purposes only.

Obtain an IP address automatically (DHCP): select this option to obtain an IP address automatically from a DHCP server on your network. When this option is selected, the **[Obtain DNS server address automatically]** option is available, which allows a DNS address to be automatically obtained.

NOTE:
The **[Obtain DNS server address automatically]** option is available only when the **[Obtain an IP address automatically (DHCP)]** option is selected.

Use the following IP address: select this option to type the IP address manually. The following items are available:

- **IP address**: type the IP address. The default IP address is 192.168.0.99.
- **Subnet mask**: type the subnet mask. The default value is 255.255.255.0.
- **Default Gateway**: type the gateway IP address. The default value is 192.168.0.1.

Use the following DNS server address: select this option to type DNS servers' addresses manually. This option is available when the option for static IP address is used as well as when it is obtained automatically from a DHCP server.

- **Preffered DNS server**: type the preffered DNS server IP address.
- **Alternate DNS server**: type the alternate DNS server IP address.

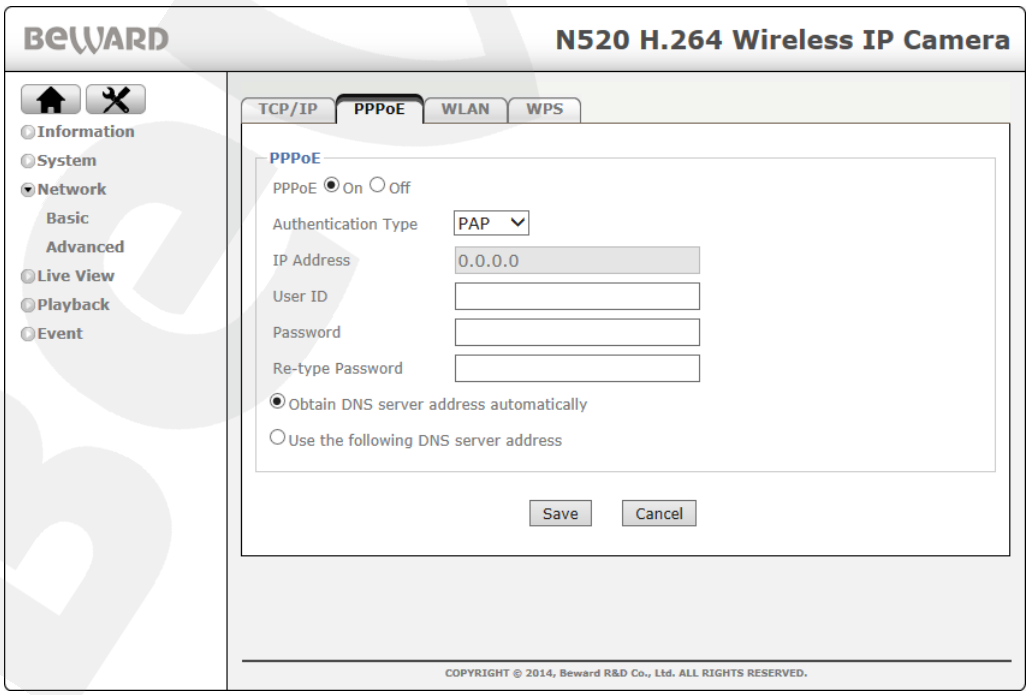
HTTP Port: the default value is 80. You can set the value of the port between the values of 1124 and 65534.

NOTE:
If you use the HTTP port number other than 80, you need to type both your camera IP address and HTTP port number. For example, if your camera's address is 192.168.1.100 and its HTTP port is 8081, you need to type http://192.168.1.100:8081 in your browser's address bar to access the camera.

8.1.2. PPPoE

This section allows you to configure the PPPoE connection. It can be used to connect the camera to the Internet when the Internet service provider assigns it a dynamic IP address and user name and password PPPoE authentication is used.

To enable PPPoE feature, switch the option to **[On]**. It also will make PPPoE options available (*Pic. 8.2*).



Pic. 8.2

Authentication protocol (Тип аутентификации): make choice in accordance with your ISP (or PPPoE service provider) recommendations.

IP address: IP address from PPPoE server (assigned by server).

User ID: type a user name for PPPoE connection. The maximum length is 64 characters (assigned by your Internet service provider or PPPoE provider).

Password: type a password for PPPoE connection. The maximum length is 32 (assigned by your Internet service provider or PPPoE provider).

Re-type password: re-type the entered password to avoid mistakes in password assignment.

Obtain DNS server address automatically: select this option to obtain a DNS address automatically.

Use the following DNS server address: select this option to type DNS servers' addresses manually.

- **Preffered DNS server**: type the preffered DNS server IP address.
- **Alternate DNS server**: type the alternate DNS server IP address.

IMPORTANT:

After a PPPoE connection is established, the IP address you specified in ***SETTING – Network – Basic – TCP/IP*** is unavailable and you need to type the IP address assigned by PPPoE server to access the camera (***SETTING – Network – Basic – PPPoE***).

Use the **[IP notification]** option to check the IP address assigned after PPPoE connection is established (see paragraph 11.2.1 for details).

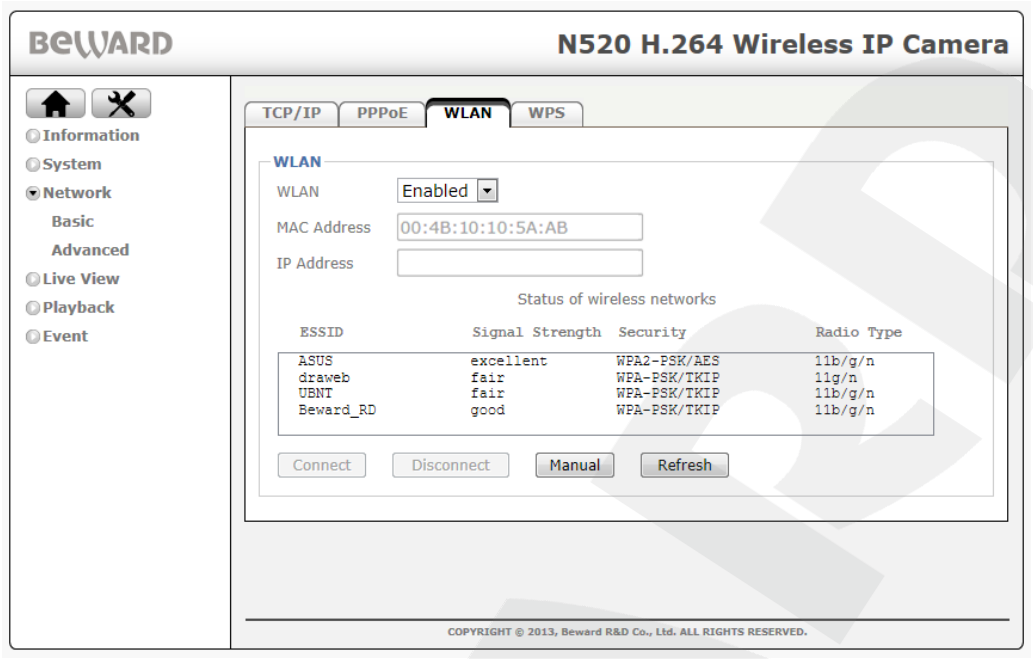
8.1.3. WLAN

This menu is for setting of wireless connection with the devices which support Wi-Fi technology. Before setting you should adjust the parameters of wireless connection using cable connection. After finishing, you will have an opportunity to use wireless connection as well as wired.

To start setting the wireless connection, allow this type of connection by selecting **[Enable]**. After that, the parameters of Wi-Fi connection are available for editing (*Pic. 8.3*).

NOTE:

The present user manual describes the menus of the camera web-interface and gives general information about the settings you can change through it. For details about IP-camera wireless connection, please, see the Installation User Manual.



Pic. 8.3

MAC address: displays the current MAC address of camera wireless adapter.

IP address: displays the current IP address of camera for wireless connection.

Status of wireless networks: displays a list of identified wireless devices. The devices, which are connected, have a check mark on their left. The list provides the following information;

ESSID: displays a name of wireless network (or Ad hoc device). It is an identifier of wireless network.

Signal Sthrength: displays a signal level (excellent, good, poor, fair values are available).

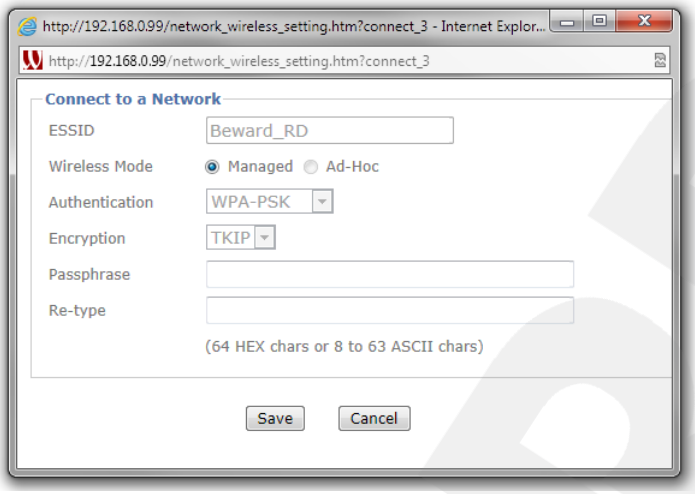
Security: displays a type of the used security system of wireless connection.

Radio Type: displays the classes of Wi-Fi standard which are supported by wireless network.

For working with the identified wireless networks there are a row of buttons.

[Connect]: this button is for connection to selected wireless network in semi-auto mode (with auto identification of network settings excluding a password or a key).

For connection in semi-auto mode, select wireless network and press the **[Connect]** button. All values in a dialog box (*Pic. 8.4*) excluding **[Password]** and **[Re-type]** will be received from an access point and added to the corresponding blanks automatically (these values are unavailable for editing). For finishing, type a password in the **[Password]** blank and then re-type it in the **[Re-type]** blank and press the **[Save]** button.



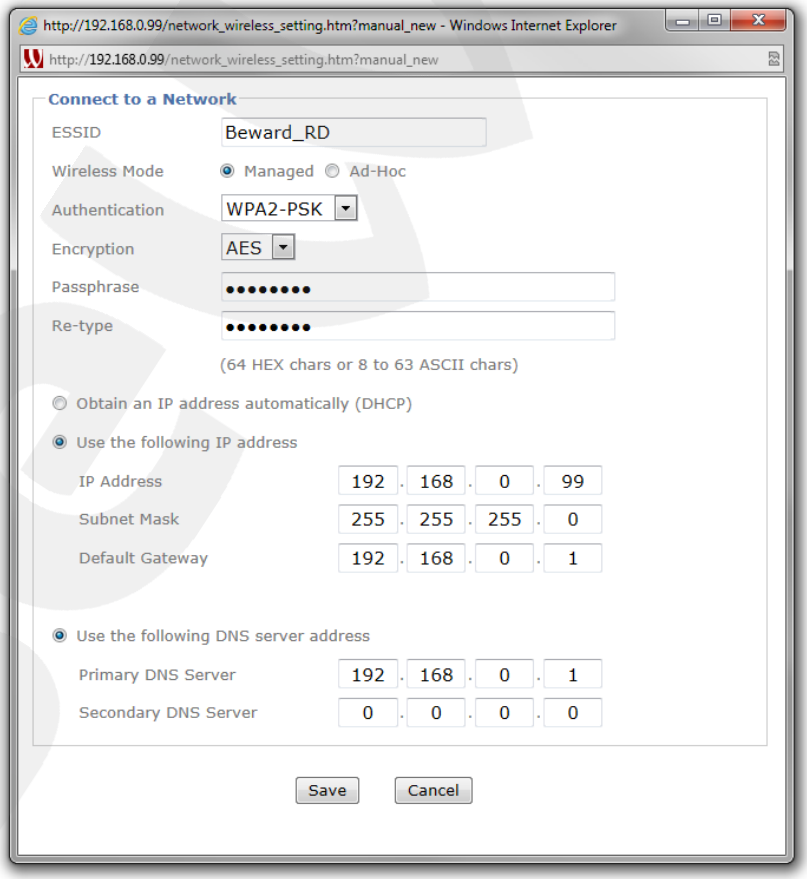
Pic. 8.4

After successful connection there will be an IP address for wireless access to the camera in **[IP address]** field. The network to which the camera is connected will be marked with a check mark.

[Disconnect]: this button is for breaking connection with a wireless network.

[Refresh]: a search of the network which are available for connection.

[Manual]: this button is for connection to wireless network with manual settings. It can be useful if your access point does not provide you with IP address automatically by DHCP (*Pic. 8.5*).



Pic. 8.5

ESSID: type a name of wireless network.

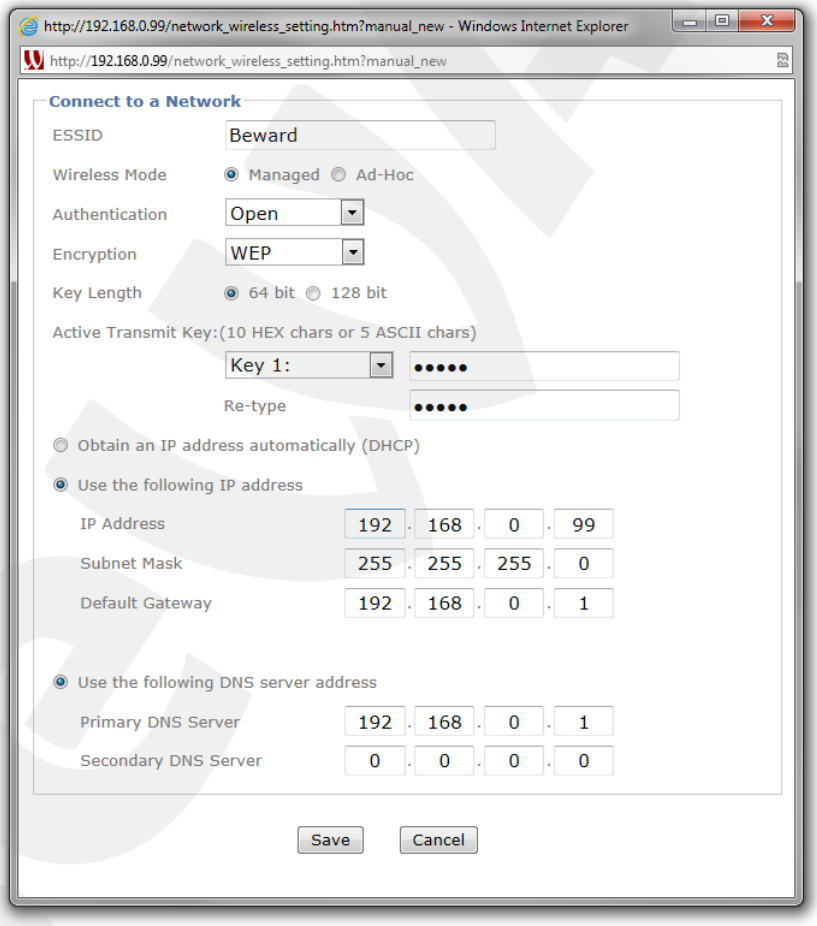
Wireless Mode: identify working mode of built-in Wi-Fi module: **[Client]** or **[Ad Hoc]**.

[Managed]: wireless network consists of one access point minimum which is connected to wireless network, and of several wireless stations. In this mode the IP camera is a wireless station (client).

[Ad Hoc]: each device or station can connects with each other without using access point. It is also called peer-to-peer mode and allows creating a small local network (no more than 5 hosts) without using additional access points.

Authentication: select a method of authentication when connecting wireless devices: **"Open" (without authentication)**, **"Shared key" (for WEP encryption)**, **"WPA-PSK"**, **"WPA2-PSK"**.

In case of the **Open/Shared Key** method has been chosen the following items are available (*Pic. 8.6*):



Pic. 8.6

Encryption: setting a data encryption mode. It is determined automatically but could be changed also by a user.

Key Length: choose the required length of an active transmit key.

Active Transmit Key: type a password.

Re-type: re-type the password to avoid occasional mistakes.

In case of the **WPA-PSK/WPA2-PSK** method has been chosen the following items are available (*Pic. 8.5*):

Encryption: setting a data encryption mode. It is determined automatically but could be changed also by a user.

Passphrase: the network can be password-protected, therefore you may need to enter a password to connect to.

Re-type: re-type the password to exclude any mistakes.

The IP address settings do not depend on the methods of authentication.

Obtain an IP address automatically (DHCP): select this option to obtain an IP address automatically from a DHCP server on your network. When this option is selected, the **[Obtain DNS server address automatically]** option is available, which allows a DNS address to be automatically obtained.

Use the following IP address: manual assigning an IP address.

IP Address: enter the required IP address.

Subnet Mask: enter the required subnet mask.

Default Gateway: enter the IP address of a default gateway.

Use the following DNS server address: select this option to specify DNS servers' addresses manually.

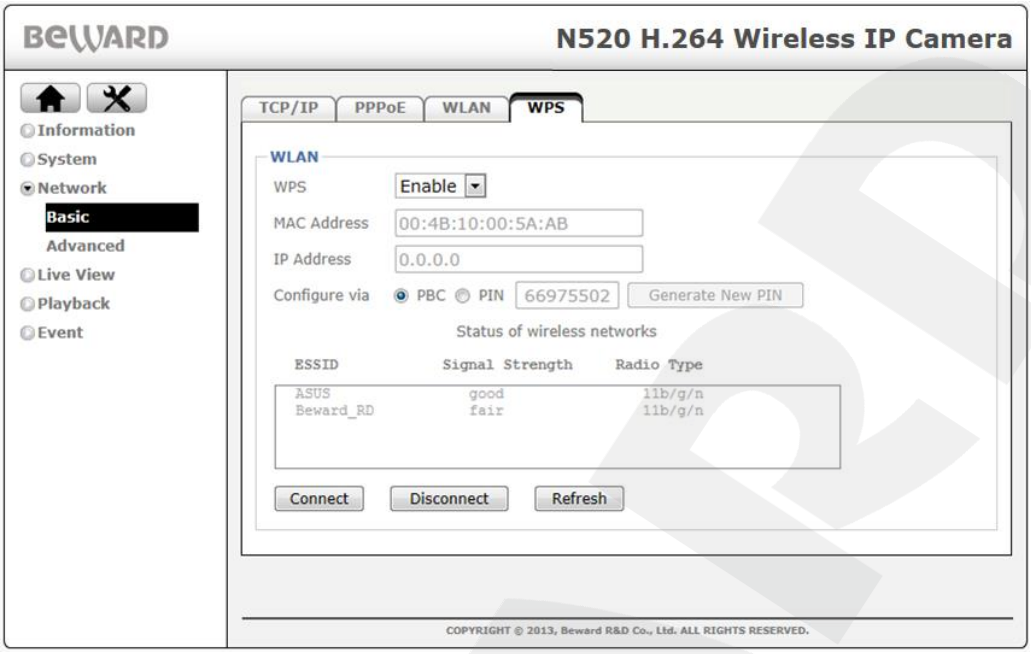
- **DNS server 1**: enter the primary DNS server IP address.
- **DNS server 2**: entrer the secondary DNS server IP address.

IMPORTANT:
IP addresses of wired and wireless connections should not be the same. It is strongly recommended to use fixed IP address for stable work.

8.1.4. WPS

This menu is for semi-auto setting of Wi-Fi wireless connection with the help of WPS technology (Wi-Fi Protected Setup) (*Pic. 8.7*). Use a cable connection for connection setting, after finishing you can use wireless connection as well as wired.

IMPORTANT:
If this option is **[On]** then the connection to the camera can be set without wired connection. Firstly, press **[WPS]** button on the device to which you want to connect the camera and then press the **[WPS]** button on the camera case. After that, wireless connection between two devices will be established automatically in 2 minutes.



Pic. 8.7

WPS: select **[Enabled]** to activate this function or **[Disabled]** to deactivate it.

MAC Address: displays current MAC address of the camera for wireless connection.

IP Address: displays current IP address of the camera for wireless connection.

Configure via: allows you to select a method of setting wireless connection with WPS:

- **PBC:** the connection is established with the help of WPS button. Select the **[PBC]** option and press **[Connect]** button. Then press **[WPS]** button for 2 minutes on the other Wi-Fi device.

NOTE:
After pressing a button, the right indicator on the front camera panel will blink with red light showing that the camera is ready for Wi-Fi connection.

- **PIN:** enter a verification code which is generated by pressing **[New PIN code]** button and displayed in a blank near the main position.

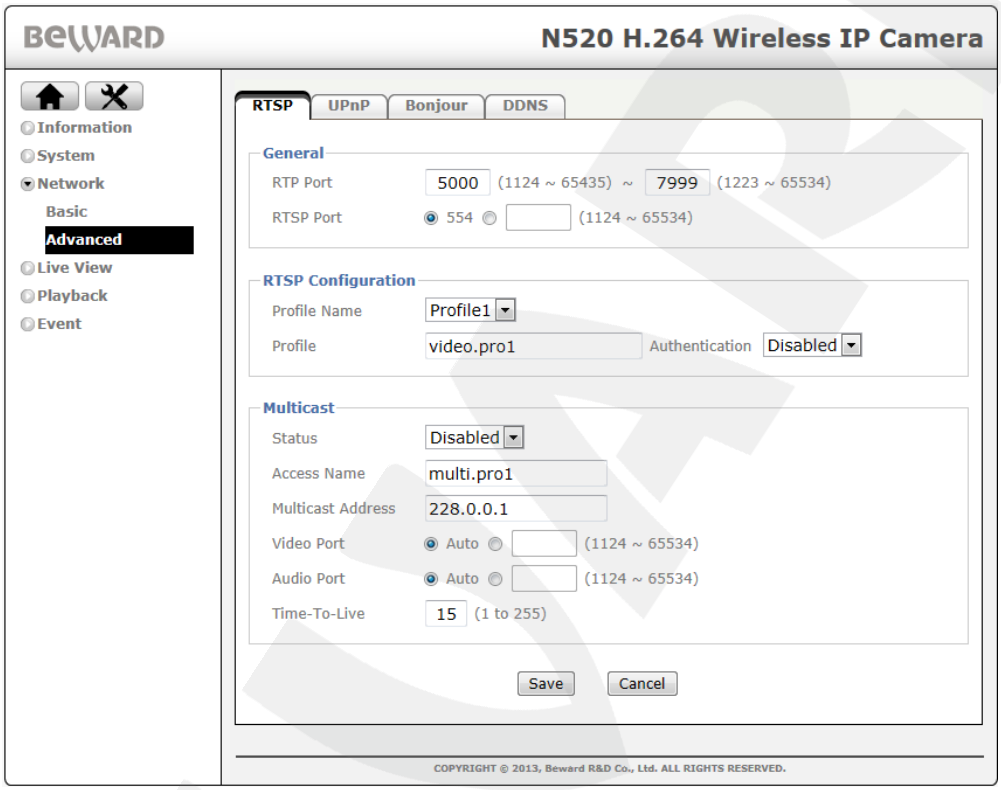
For connection to the network via WPS protocol, press **[Connect]** button, or press **[Disconnect]** to break the connection.

8.2. Advanced

The **[Advanced]** menu includes four tabs: **[RTSP]**, **[UPnP]**, **[Bonjour]**, **[DDNS]**.

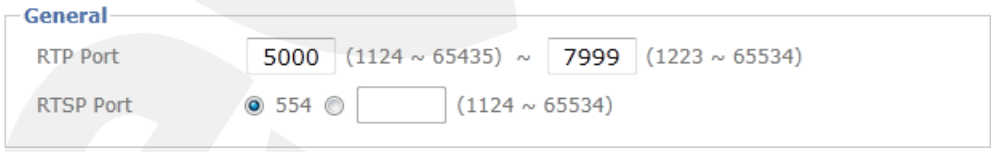
8.2.1. RTSP

This menu has three settings groups: **"General"**, **"RTSP Configuration"** and **"Multicast"** (*Pic. 8.3*).



Pic. 8.3

In the **"General"** group you have access to the following parameters (*Pic. 8.4*):

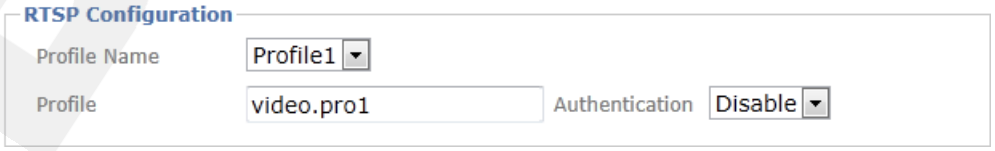


Pic. 8.4

RTP Port: default range – 5000 – 7999. You can change the value from 1124 to 65534.

RTSP port: this item allows setting RTSP port value (default is 554). This is a standard port, that is why despite it can be changed, it is strongly recommended not to change this value. You can set the value from 1124 to 65534.

"RTSP Configuration".group includes (*Pic. 8.5*):



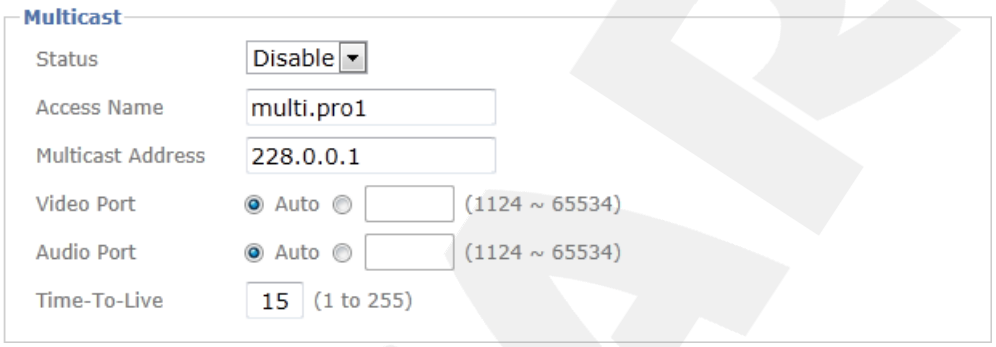
Pic. 8.5

Profile Name: select a profile for which RTSP settings will be active.

Profile: enter profile name. This name should be entered in address line for viewing video with settings of corresponding profile. You can change a profile name. To access to the stream from the camera you should enter in address line, for example: **rtsp://<IP>/video.pro1**, where **<IP>** is a public camera IP-address, "**video.pro1**" is used profile name.

Authentication: authorization on/off when attempting to view video from the camera with profile settings.

"Multicast" group includes (*Pic. 8.6*).



Pic. 8.6

Status: turn on/off multicast stream.

IMPORTANT:
The router of your network should support a multicast protocol.

Access Name: displays a value for access to multicast. You can change current value.

Multicast Address: IP address of multicast. In this window you can set IP address for current profile.

Video port: a video port for multicast. It can be selected automatically or manually from 1124 to 65534.

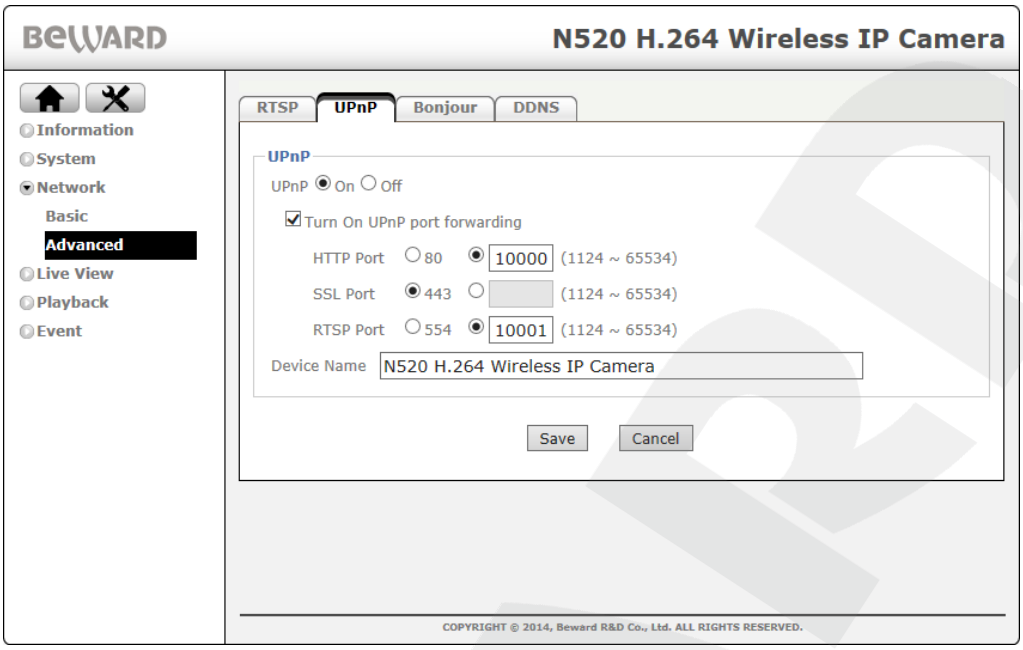
Audio port: an audio port for multicast. It can be selected automatically or manually from 1124 to 65534.

Time-To-Live: set a time to live for packets. TTL value can be set from 1 to 255.

NOTE:
TTL is a parameter corresponding to maximum period of packets existing.

8.2.2. UPnP

If your camera is connected to the Internet through a router, you need to use a router with UPnP support to automatically forward the ports. You also need to enable the option for UPnP on your IP camera and router and adjust their settings (*Pic. 8.7*).



Pic. 8.7

To activate the option switch it to **[On]**.

Turn On UPnP port forwarding: select this item with a check mark to change port numbers within the range from 1124 to 65534.

NOTE:
To use UPnP, your network router must support it.

HTTP Port: type your camera HTTP port to access it over the Internet. For example, the value of the port you assigned is 10000. In this case, port 80 is used to access the camera over a local network and port 10000 is used to access the camera over the Internet. The default value is 80.

SSL Port: type the SSL port number to access the camera through a secure connection HTTPS over the Internet. The default value is 443.

RTSP Port: type the RTSP port number to access the camera over the Internet. The default value is 554.

Device Name: you can change the name of camera which is displayed in ***My Network Places*** of Windows.

NOTE:
To enable and configure the UPnP option on your router, please, refer to its user manual.

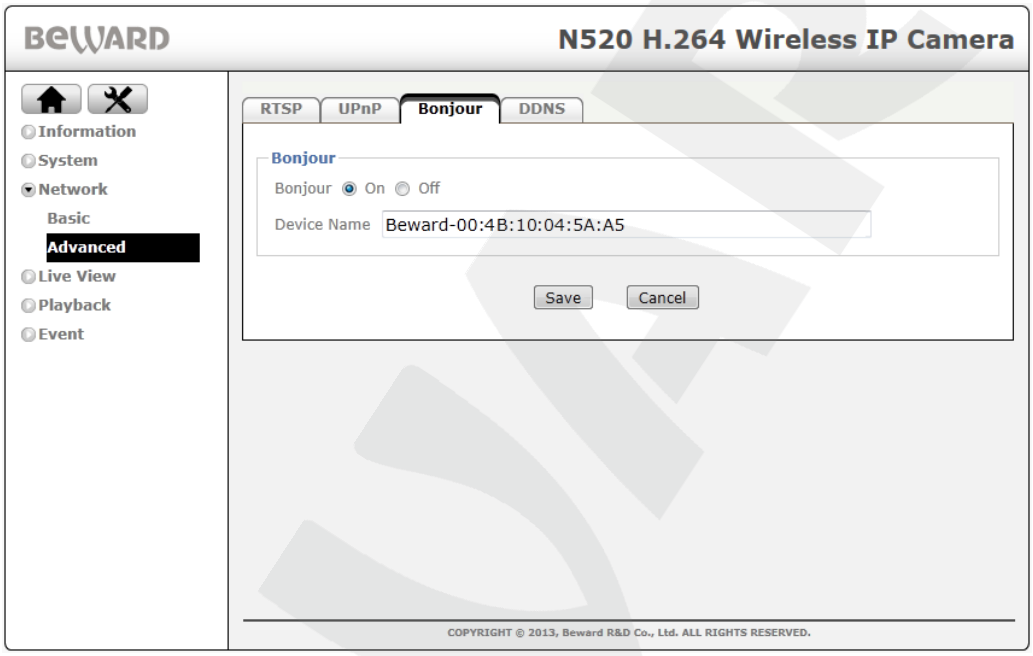
IMPORTANT:
Some routers do not support UPnP to forward LAN and WAN ports. Make sure your router supports this option.

8.2.3. Bonjour

This section allows you to enable “Bonjour” protocol. After this option is enabled, it allows the IP cameras to be automatically discovered using this protocol.

NOTE:

“Bonjour” is a protocol of auto identification which is used in local networks to identify other network devices. Now, it is a basic service for auto searching for Mac OS X from 10.2 version.



Pic. 8.8

Bonjour: select **[On]** to turn on this function or select **[Off]** to turn it off (*Pic. 8.8*).

Device Name: type a device name to discover the camera in the Internet (*Pic. 8.8*).

NOTE:

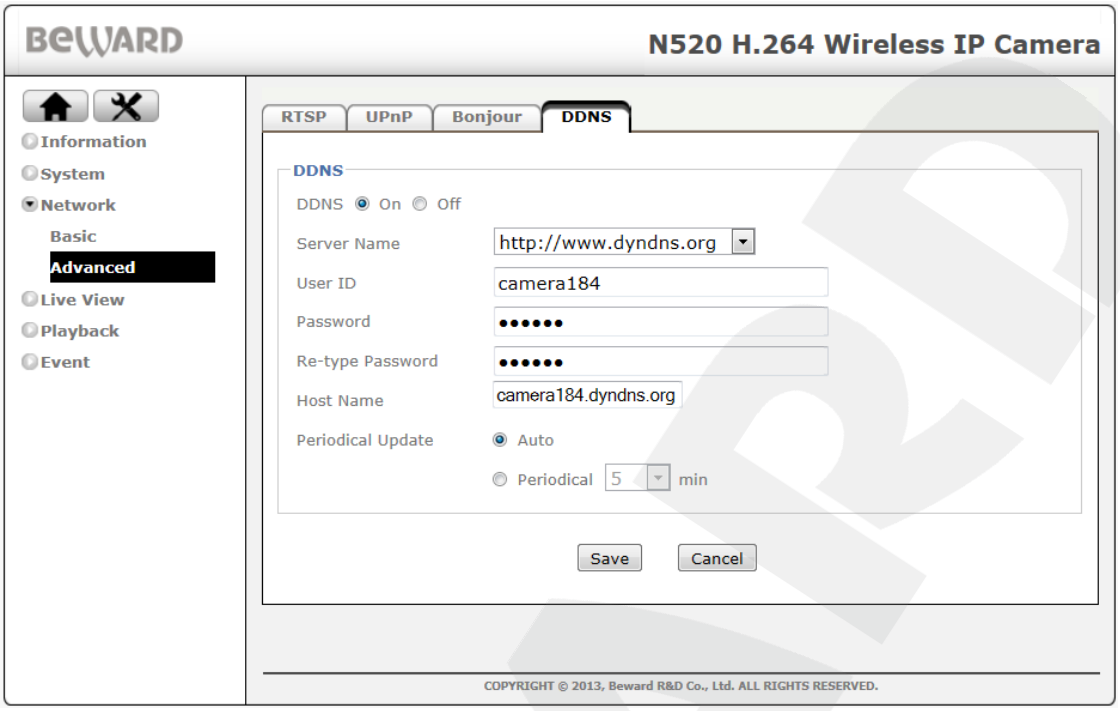
Go to www.apple.com for detailed information about using Bonjour for OS Windows.

8.2.4. DDNS

This menu allows you to configure the DDNS connection. This feature allows the IP camera to be easily accessible over the Internet even if you use a public dynamic IP address.

The IP address is linked with a domain name. So, if your current IP address changes, it automatically links to your domain name, which you can use any time to access your IP camera over the Internet. Therefore, the camera must be assigned with a public dynamic IP address.

To activate the option switch it to **[On]** (*Pic. 8.9*).



Pic. 8.9

IMPORTANT:

To use the DDNS feature, your IP camera must be connected to the Internet directly or through a router.

Server name: select a DDNS provider. For example, http://www.dyndns.org.

User ID: type a user name obtained during the registration at the DDNS provider website.

Password: type a password obtained during the registration at the DDNS provider website.

Re-type password: re-type the entered password to avoid mistakes in password assignment.

Host name: type a host name obtained during the registration at the DDNS provider website.

Periodical Update: select a period for the device to update IP address on DDNS server. The following values are available:

- **Auto:** auto IP address updating on DDNS server.
- **Periodical:** set the time to IP address updating on DDNS server until it updates successfully. The following values are available: 5, 10, 15, 30, 60 minutes.

IP address updates if the device is connected to the Internet, the camera is turned on and dynamic IP address updating (DHCP).

Chapter 9. The [SETTING] Menu: Live View

This menu consists of such items as **“Video”**, **“Audio”** and **“Camera Setting”**.

9.1. Video

This menu includes **“Video Setting”** and **“Profile”**.

9.1.1. Video Setting

This menu allows you to adjust a video image and other functions (*Pic. 9.1*) and contains the following groups of settings: **[Image]**, **[Overlay]**, **[Privacy Mask]**.



Pic. 9.1

Image group includes the following items:

Image Rotated: this item allows you to adjust an image rotation. The following values are available:

- **None:** an image without any transformations.
- **Flip:** an image is turned over 180°.
- **Mirror:** an image is turned over vertically.

- **Mirror + Flip:** mirror and turning over 180°.

Video Clip Format: select a profile which will be used for video recording when working with the event servers (FTP, NAS, memory card etc.).

Snapshot Format: select a profile with image adjustment which will identify parameters of the frames saved on FTP, NAS, memory cart etc.

Overlay group allows you to adjust subtitles (the camera name, date/time) and includes the following items:

Overlay: can take on the following values

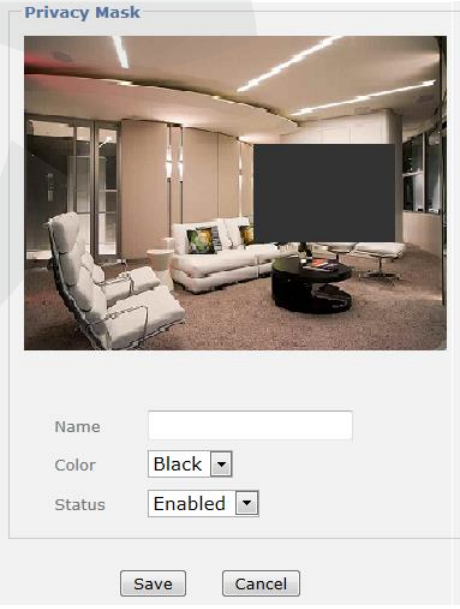
- **None:** date/time will not be displayed.
- **Time Stamp:** only adjusted date/time will be displayed.
- **Title:** only the text which is entered in **"Text"** blank will be displayed.
- **Tilte & Time Stamp:** date/time and text will be displayed.

After choosing a type the following fields are available for setting:

- **Title:** enter any text (e.g.: the camera name) which will be displayed when selecting corresponding options in **[Overlay]** item.
- **Text color:** select a color of the text: black or white.
- **Background color:** select a color of background: black, white or transparent.
- **Display Position:** select a position of the text and date/time.

Privacy Mask: a group of settings which allows you to set a **"Privacy Mask"** – an area which will not be displayed on the screen when viewing or recording. You can set several privacy masks which will be displayed in the list which contains a name and status for each privacy mask.

To add a privacy mask in the list you should press the **[Add]** button to call a dialog box for setting a privacy mask (*Pic. 9.2*).



Pic. 9.2

To set an area which you want to hide, you should drag a low-right corner of a frame with the mouse and set necessary size. You can change the size by dragging a low-right corner of a mask frame or move the whole area to other place.

The dialog box contains the following items:

Name: enter a name of a privacy mask.

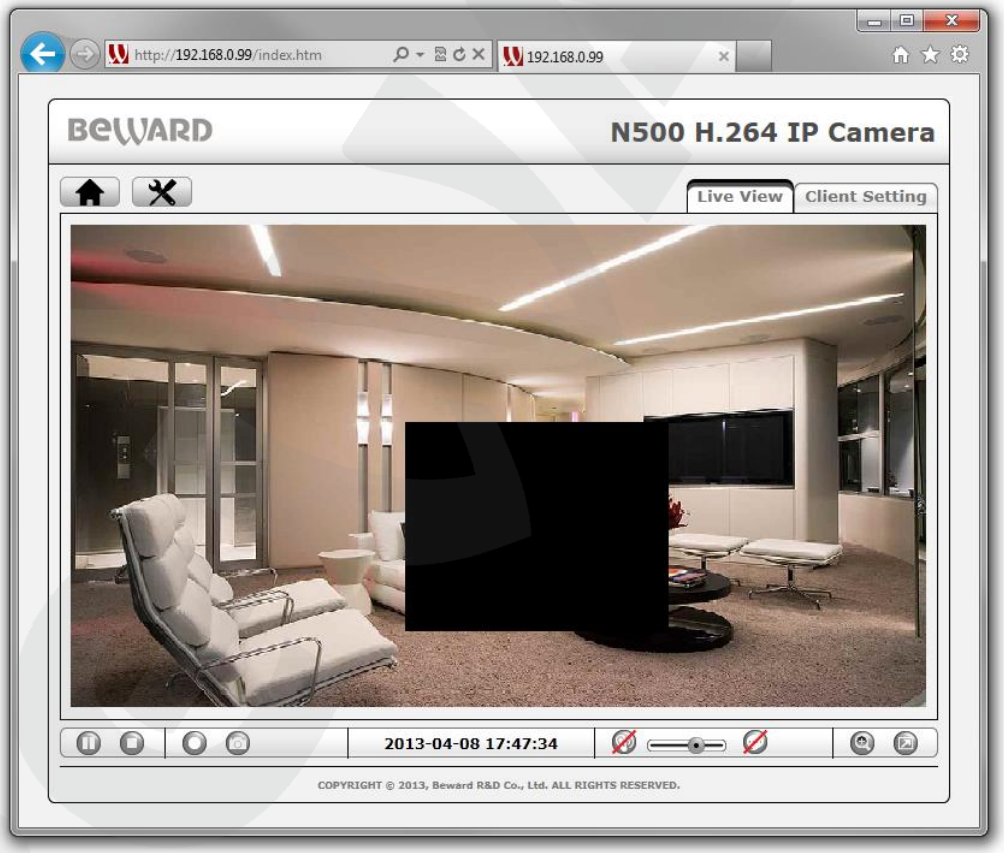
Color: select a color of a privacy mask: black, white, grey or red.

Status: select **[Enabled]** to use a privacy mask or **[Disabled]** if you do not want to use it.

To save the parameters press the **[Save]** button and the mask will be displayed in the list of privacy masks.

To edit the privacy mask press the **[Edit]** button (*Pic. 9.1*). To save changes press the **[Save]** button. If you do not want to save any changes press the **[Cancel]** button.

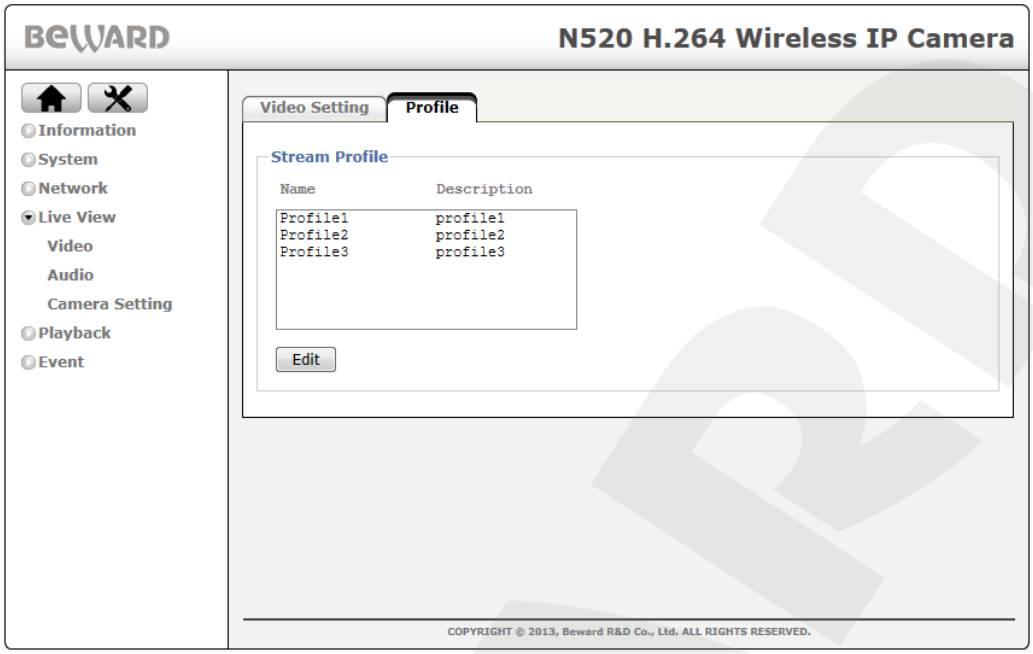
If you want to see how a privacy mask looks on the image, press the **[Home]**  button to enter main menu (*Pic. 9.3*).



Pic. 9.3

9.1.2. Profile

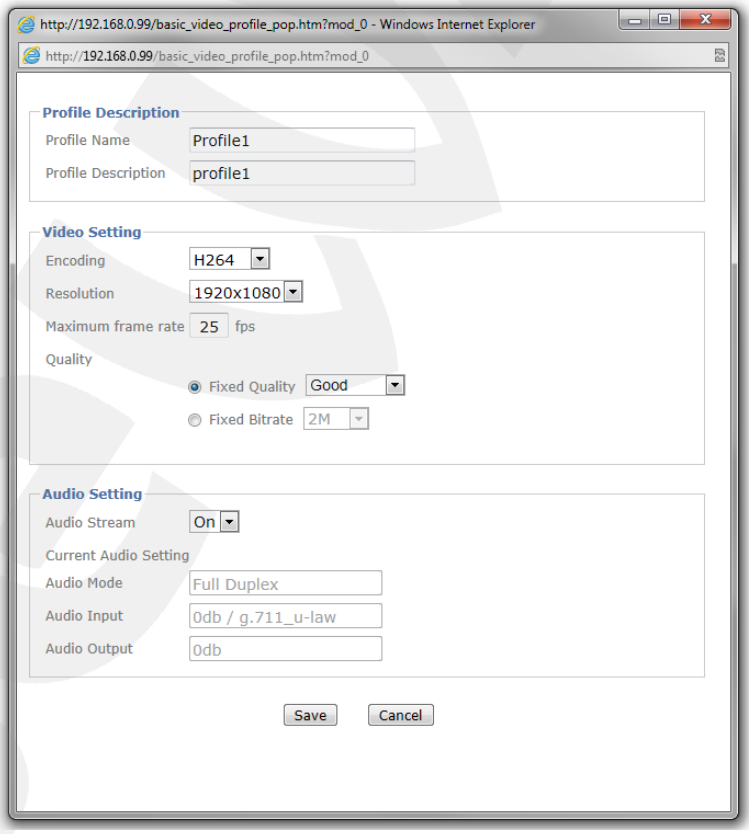
This menu displays a list of available profiles, in which you can set corresponding image settings. Also, you can add new profiles in this list or delete them (*Pic. 9.4*).



Pic. 9.4

Profile field displays a profile name and its description.

To edit a profile press the **[Edit]** button. After pressing a setting profile menu will be opened (*Pic. 9.5*).



Pic. 9.5

Profile description group allows you to set the following parameters:

- **Profile Name:** enter a profile name.

- **Profile Description:** enter a profile description.

Video Setting group allows you to adjust a video for current profile. It includes the following:

- **Encoding:** select a type on stream encoding: H.264, MPEG4 or MJPEG.
- **Resolution:** set an image size: 1920x1080 (FULL HD), 1280x720 (HD 720P), 640x480 (VGA), 320x240 (QVGA).

NOTE:
Only 640x480 (VGA) and 320x240 (QVGA) resolutions are available for MPEG4.

NOTE:
You can set one video stream profile with resolution of 1920x1080 (FULL HD)/1280x720 (HD 720P) and two video stream profiles with the resolution 640x480 (VGA).

- **Maximum frame rate:** set the rate of frames transmission: 1 to 30 frames per second.
- **Quality:** set the video stream quality:

Fixed quality: **[Excellent]**, **[Detailed]**, **[Good]**, **[Standard]** or **[Medium]**. Also **[Customize]** value is available – you can set the value from 0 to 100 by dragging **[Compression]**. In fact, selecting **[Fixed quality]** you choose a *VBR* mode which sets the upper limit of a bitrate value.

Fixed Bitrate: set the fixed rate of video transmission: 10M, 8M, 6M, 4M, 3M, 2M, 1.5M, 1M Mb/sec and 768k, 512k, 256k, 128k, 64k, 32k Kb/sec.

NOTE:
"Fixed Bitrate" option is not available for MJPEG.

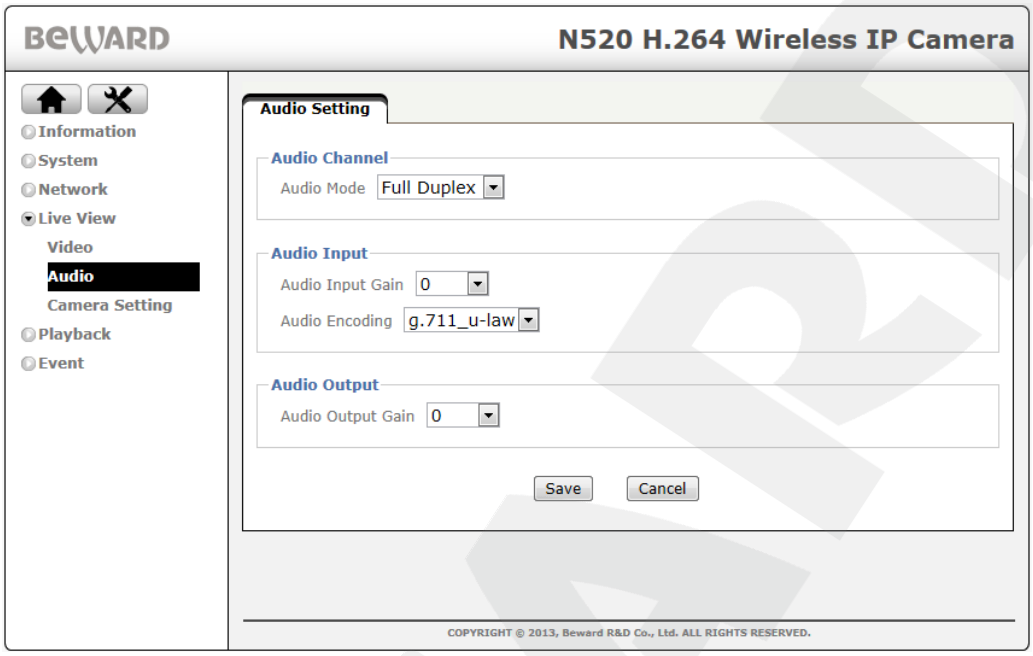
Audio Setting group allows you to turn on/off the sound in current profile and set some parameters for sound track.

- **Audio Stream:** select **[On]** to turn on the audio stream an **[Off]** to turn it off.
- **Current Audio Setting:** displays detailed information about the parameters of audio profile.
- **Audio Mode:** displays audio mode for the current profile: **[Full duplex]**, **[Half duplex]**, **[Counter audio]**, **[Direct audio]**.
- **Audio Input:** displays audio input parameters.
- **Audio Output:** displays gain level.

To apply changes press the **[Save]** button, to cancel changes press the **[Cancel]** button.

9.2. Audio

This menu allows you to set the sound parameters (*Pic. 9.6*).



Pic. 9.6

Audio mode: set the audio transmission mode.

- **Full duplex:** two-way audio channel.
- **Half duplex:** one-way audio channel.
- **Talk Only:** only audio transmission from the PC to the camera.
- **Listen Only:** only audio transmission from the camera to the PC.

Audio Input Gain: set the audio input gain: +12, +9, +6, +3, 0, -12, -9, -6, -3. Select **[mute]** to turn the sound off.

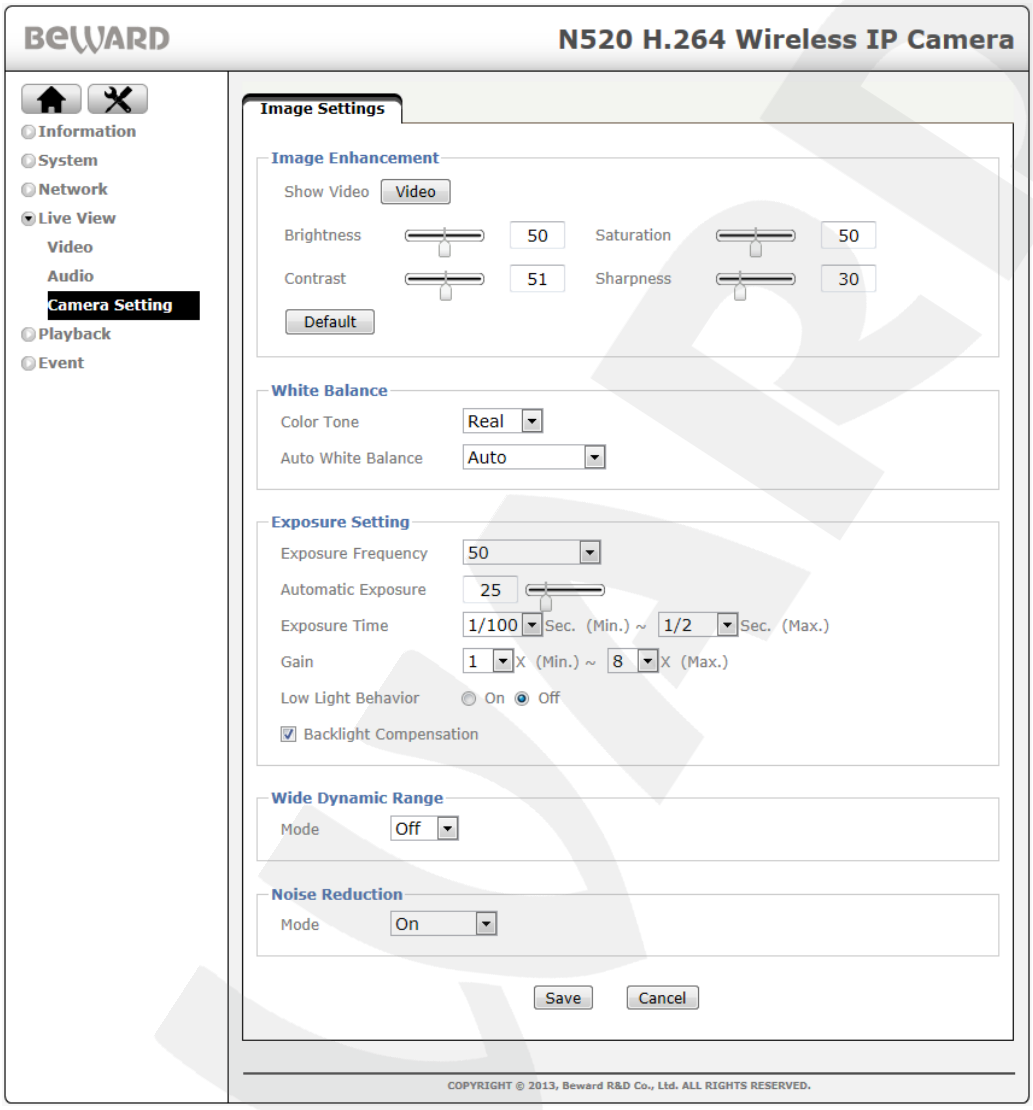
Audio Encoding: allows you to identify audio encoding sound on the camera input:

- **g.711_u-law:** set the audio encoding according to the g.711 μ-law.
- **g.711_a-law:** set the audio encoding according to the g.711 α-law.
- **AMR:** set the audio encoding according to the current standard. Select this item and you will see the **[Bit Rate]** field where you can choose one of the following values: 4.75, 5.15, 5.9, 6.7, 7.4, 7.95, 10.2, 12.2 kbps. The higher bitrate the better sound quality.

Audio Output Gain: set the audio output gain: +12, +9, +6, +3, 0, -12, -9, -6, -3. Select **[mute]** to turn the sound off.

9.3. Camera Setting

This menu allows you to adjust an image and includes **[Image Setting]** tab:(*Pic. 9.7*).



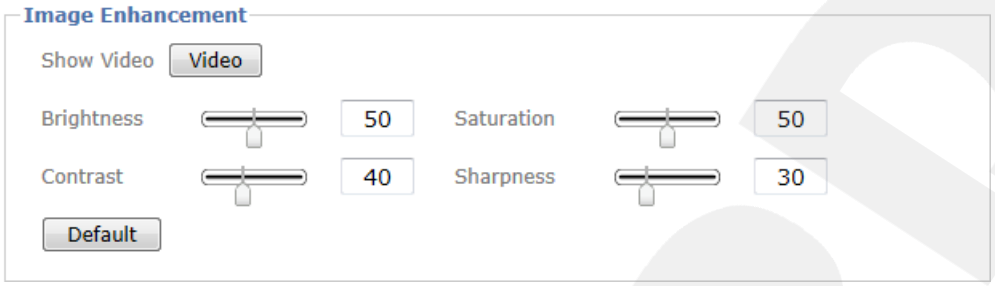
Pic. 9.7

9.3.1. Image Settings

This item allows you to adjust an image and includes the following elements: **“Image Enhancement”**, **“White Balance”**, **“Exposure Setting”**, **“Wide Dynamic Range”**, **“Noise Reduction”**.

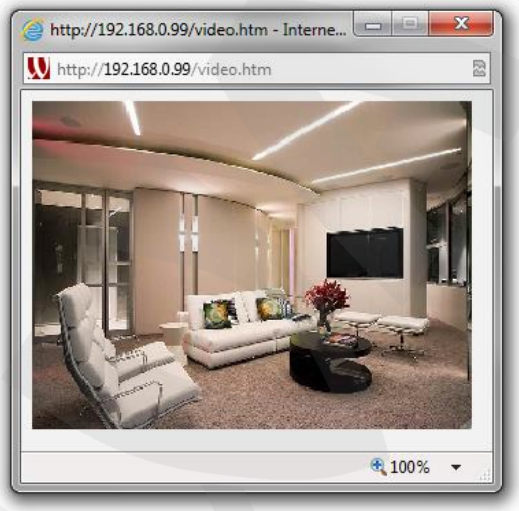
9.3.1.1. Image Enhancement

This group includes the following items (*Pic. 9.8*):



Pic. 9.8

Show video: press the **[Video]** button to call the window with real-time image of the camera video stream (*Pic. 9.9*). It allows you to watch image changes during adjustment of its parameters.



Pic. 9.9

Brightness: this item allows you to increase or decrease the image brightness from 0 to 100. To apply the changes click in any place on the page by left mouse button.

Contrast: this item allows you to set the image contrast from 0 to 100. To apply the changes click in any place on the page by left mouse button.

Saturation: this item allows you to set the saturation from 0 to 100. To apply the changes click in any place on the page by left mouse button. If the value is 0, the image mode is black and white.

Sharpness: this item allows you to set the image sharpness from 0 to 100. To apply the changes click in any place on the page by left mouse button.

[Default]: this button restores all the image parameters to default settings.

9.3.1.2. White balance

This menu allows you to set the right image color and natural color correction (*Pic. 9.10*).



Pic. 9.10

Color Tone: allows you to correct color hue at different lighting:

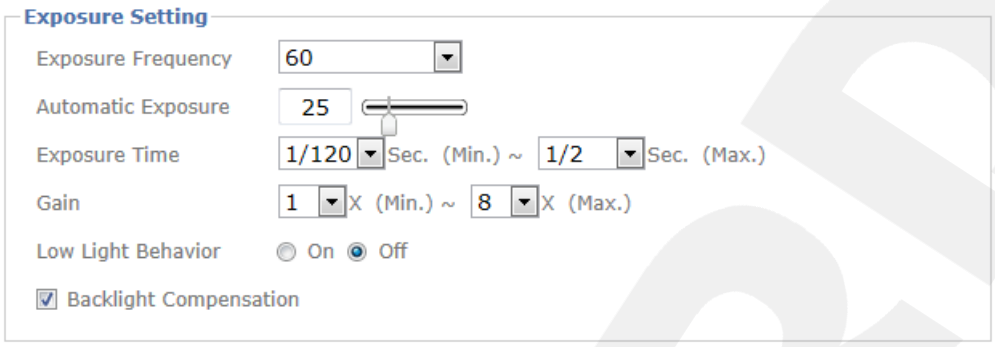
- **Cool:** this item should be selected when the object is illuminated by fluorescent lamps (cold light).
- **Real:** this item should be selected when the object is illuminated by day light without additional light sources.
- **Warm:** this item should be selected when the object is illuminated by incandescent lamps (warm light).

Auto white balance: select white balance mode which will correct the color rendition from the camera at different light sources:

- **Auto:** auto color correction. It is recommended in the most cases.
- **Hold Current:** the white balance is fixed at the current level.
- **Fluorescent:** this item should be selected when the object is illuminated by fluorescent lamps (cold light).
- **Incandescent:** this item should be selected when the object is illuminated by incandescent lamps (warm light).
- **Sunny:** this item should be selected when the object is illuminated by day light when the weather is sunny.
- **Cloudy:** this item should be selected when the object is illuminated by day light when the weather is cloudy.
- **Sun Shade:** this item should be selected when the object is in the shadow.

9.3.1.3. Exposure Setting

This item allows you to adjust the electronic shutter (*Pic. 9.11*).



Pic. 9.11

Exposure Frequency: select the parameter settings mode taking into account the illumination:

- **Auto:** auto illumination mode.
- **50:** this item should be selected if all lighting sources are powered by electrical supply network with 50 Hz frequency. This parameter is actual for Russia as the frequency of alternating voltage in domestic networks is 50 Hz.
- **60:** this item should be selected if all lighting sources are powered by electrical supply network with 50 Hz frequency. This parameter is actual to the USA as the frequency of alternating voltage in domestic networks is 60 Hz.
- **Hold current:** keeps the current exposure settings and allows you to set exposure time himself.

Automatic Exposure: set the exposure by dragging the slider or enter the exposure value from 0 to 100. The smaller the value the darker an image.

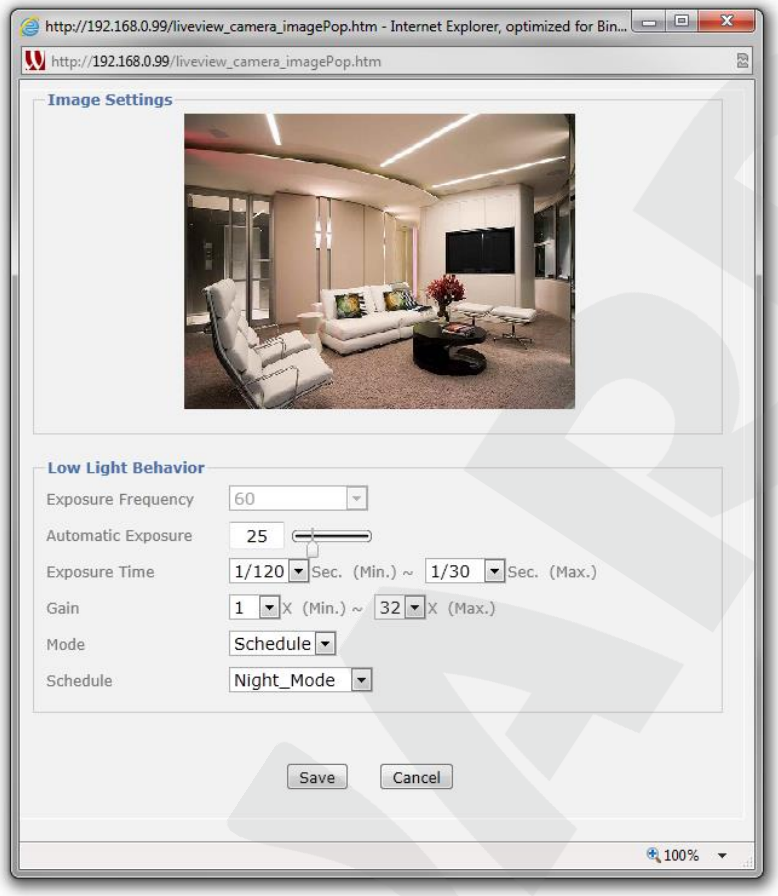
Exposure Time: set the exposure time range from 1/10000 to 1/2 (depending on the Exposure Frequency value).

Gain: set the signal gain: 1, 2, 4, 8, 16, 32 or 64. Available range for maximum gain value: 8, 16, 32, 64.

Low Light Behavior: this option allows turning on/off and setting the camera working mode in low lighting conditions according to a schedule. Turn this option on and you will see the **[Setting]** button.

Backlight Compensation (BLC): if you want to turn on back light compensation function then select it with a check mark.

After clicking the **[Setting]** button of the **[Low Light Behavior]** option the following window will opened (*Pic. 9.12*)



Pic. 9.12

Image Settings: displays current image from the camera.

Three parameters in the **[Low Light Behavior]** settings group, which are **Automatic Exposure**, **Exposure Time** and **Gain**, have the same meaning as in the **[Exposure Setting]** group.

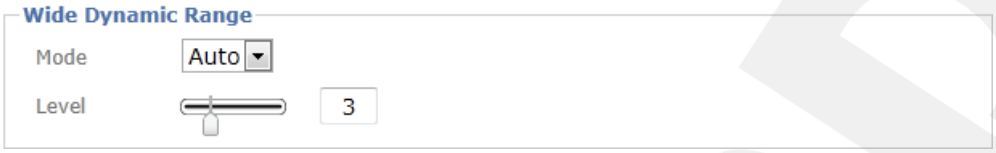
Mode: set the order of turning on low light function.

Schedule: select the schedule of low light function working. By default the following values are available: **"Working Day"**, **"Weekend"**, **"Night Mode"**. Moreover, you can add a new schedule at ***SETTING – Event – Schedule*** (see paragraph 11.6).

NOTE:
To apply new settings click the **[Save]** button.

9.3.1.4. WDR

The **Wide Dynamic Range** function provides the best image quality when the illumination is irregular, for example, when one of the image parts is bright while the other is dark (*Pic. 9.13*).



Pic. 9.13

Mode: select working mode of WDR function:

- **Auto:** WDR function is on.
- **Off:** turning WDR function off.

Level: set the width of dynamic range of WDR function by a special slider or enter a value in a field nearby.

9.3.1.5. Noise reduction

Noise reduction (*Pic. 9.14*) allows you to set the image in low light conditions by decreasing the noise level.



Pic. 9.14

Mode: there are three noise reduction modes:

- **On:** noise reduction function is turned on.
- **Off:** noise reduction function is turned off.
- **Schedule:** noise reduction function turns on or off according to the schedule.

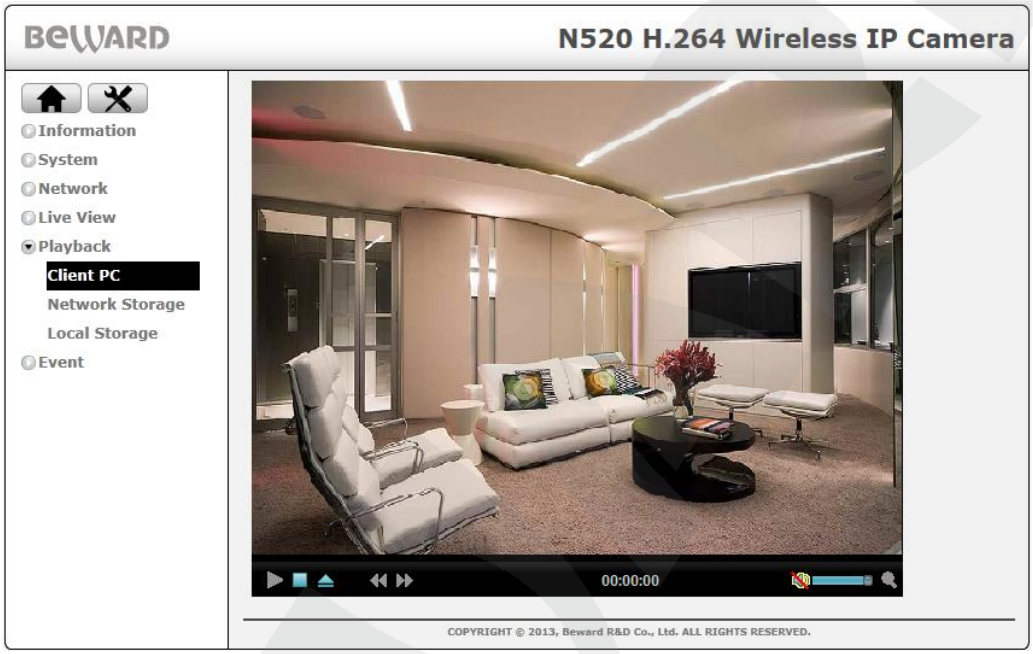
Schedule: select a schedule mode the noise reduction function will turn on according to. On default you can set **"Working Day", "Weekend"** or **"Night Mode"**. You can add a new schedule at ***SETTING – Event – Schedule*** (see paragraph 11.6).

Chapter 10. The [SETTING] Menu: Playback

This menu allows you to view video recorded by the camera and includes the following sections: **“Client PC”**, **“Network Storage”** and **“Local Storage”**.

10.1. Client PC

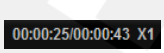
This item allows you to view video recorded by camera web interface functions.



Pic. 10.1

NOTE:

This item allows you to playback video in AVI format.

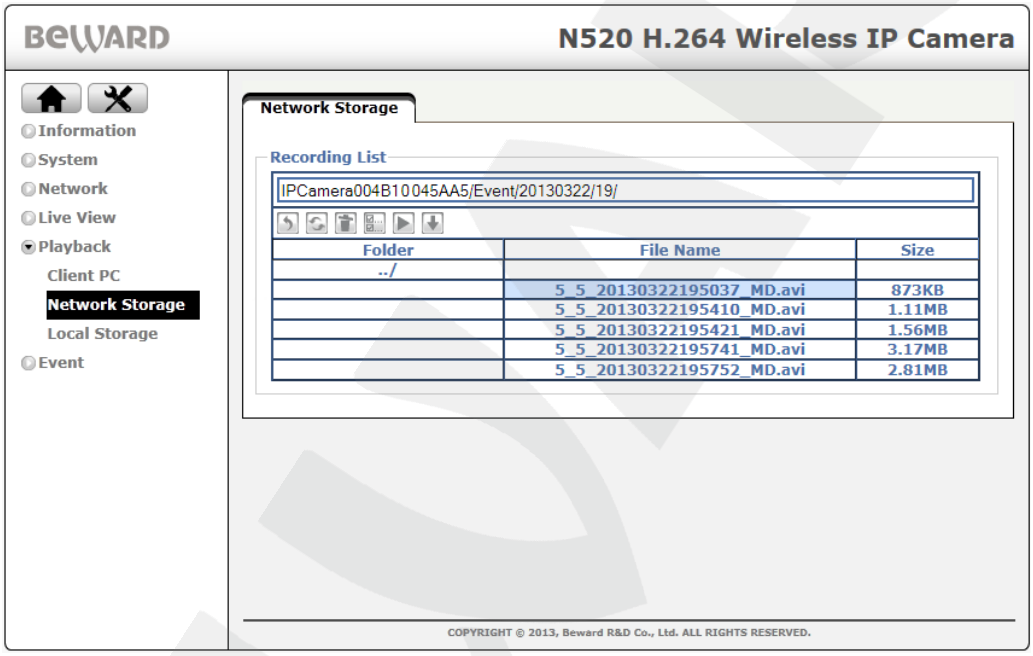
Icon	Function
	**[Play]/[Pause]**: click this button to playback video and pause it if you need.
	**[Stop]**: click this button to stop viewing camera image.
	**[Open]**: click this button to open a recorded file.
	click this button to decrease the playback speed.
	click this button to increase the playback speed.
	**[Time]**: shows the file duration and current time of video viewing.
	**[Audio Control]**: adjust the sound of recorded file.
	**[Zoom]**: zoom in the image of video.

To playback video press the **[Open]** button and select a file in the appeared dialog box, the press the **[OK]** button and the **[Playback]** button to start playback.

10.2. Network Storage

This item allows you to view video recorded to the camera network storage. To view video from the network storage it should be added and set in the ***SETTING – Event – Event Server*** menu (see paragraph 11.1.1.5). Also the network storage should contain the recordings to view.

This menu includes the **"Network Storage"** item which contains a **"Recording List"** setting group (*Pic. 10.2*).



Pic. 10.2

Recording list: allows you to access to the folders with recorded video, which are stored at the network storage. To open the file list enter to a necessary folder at the network storage by pressing on the links with folder names in **"Folder"** column by left mouse button. After entering a necessary folder you will see a list of files in **"File Name"** column and their size in the **"Size"** column. The description of this group buttons is below.

Item	Function	Note
	**[Back]**	Return to the previous folder.
	**[Update]**	Update the information on the current page.
	**[Delete]**	Delete selected files from the list. To select several files press them by left mouse button keeping **«Ctrl»** key pressed.
	**[Select All]**	Select all files displayed in the file list.

	[Play]	Open file playback window.
	[Download]	Clock this button to download selected files to the current PC.

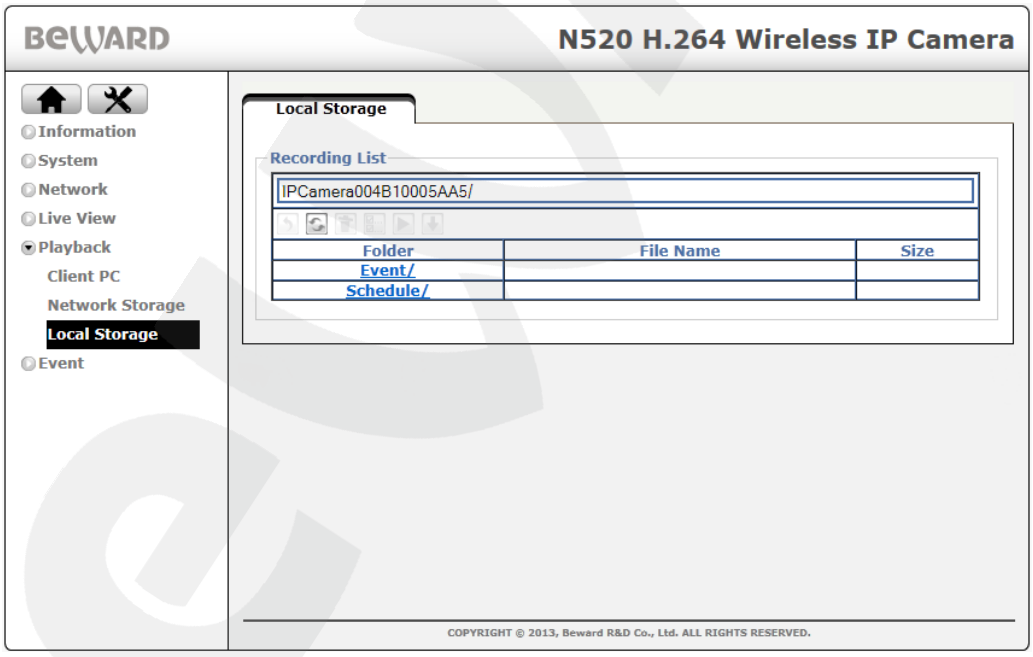
The table below contains the description of control playback buttons in the view window of the selected file.

Item	Function	Note
	[Play/Pause]	Click this button to play video and press again it to pause.
	[Stop]	Click this button to stop playing video.

10.3. Local Storage

This item allows you to view video recorded to a memory card which is installed in the camera. To view video from the memory card it should be inserted in the camera and set in the ***SETTING – Event – Event Server – Local Storage*** (see paragraph 11.1.2).

This menu includes the **"Local Storage"** item which contains **"Recording list"** setting group (*Pic. 10.3*).



Pic. 10.3

Recording list: allows you to access to the folders with video which are stored on the memory card. The detailed description of the buttons and functions of this group are the same as for the setting group of the network storage and described in paragraph 10.2.

Chapter 11. The [SETTING] Menu: Event

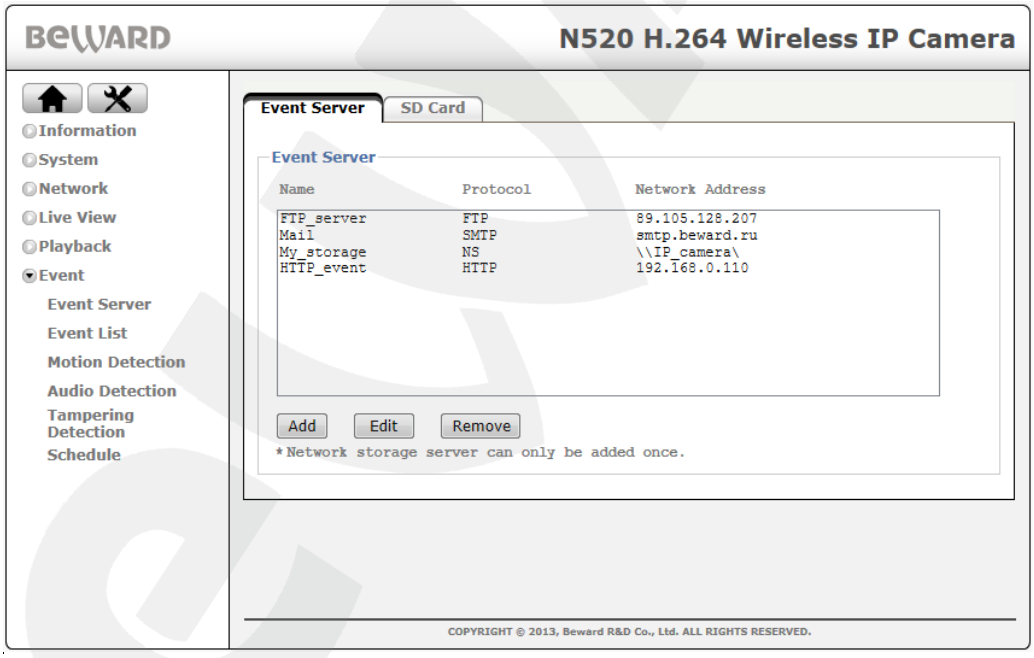
This menu allows you to set the alarm events from the IP camera, scheduled files recording and attendant settings such as motion detection, audio detection, tampering detection and schedule. It includes the following items: **“Event Server”, “Event List”, “Motion Detection”, “Audio Detection”, “Tampering Detection”** and **“Schedule”**.

11.1. Event server

This menu allows you to set the event servers and recording to a memory card. The event server can be set to send video files to e-mail (SMTP), recording to the network storage (NAS), to the HTTP-server (HTTP) or to the FTP server (FTP). “Event Server” menu contains the following items: **“Event Server”** and **“SD Card”**.

11.1.1. Event server

This menu allows you to add, delete and set different event servers and includes **“Event Server”** setting group (*Pic. 11.1*).



Pic. 11.1

Event Server: allows you to add, delete and set different event servers and includes a field which displays a list of added event servers. This field has three columns with the following functions:

Name: displays the event server name.

Protocol: displays the protocol of data transmission which defines a type of the vent server (NAS, FTP, HTTP or SMTP).

Network Address: displays the IP address of the event server.

There are three buttons below the field:

[Add]: click this button to create a new event server. It calls a window for setting the event server.

[Edit]: click this button to open a window for editing the selected event sever.

[Remove]: click this button to delete the selected event server.

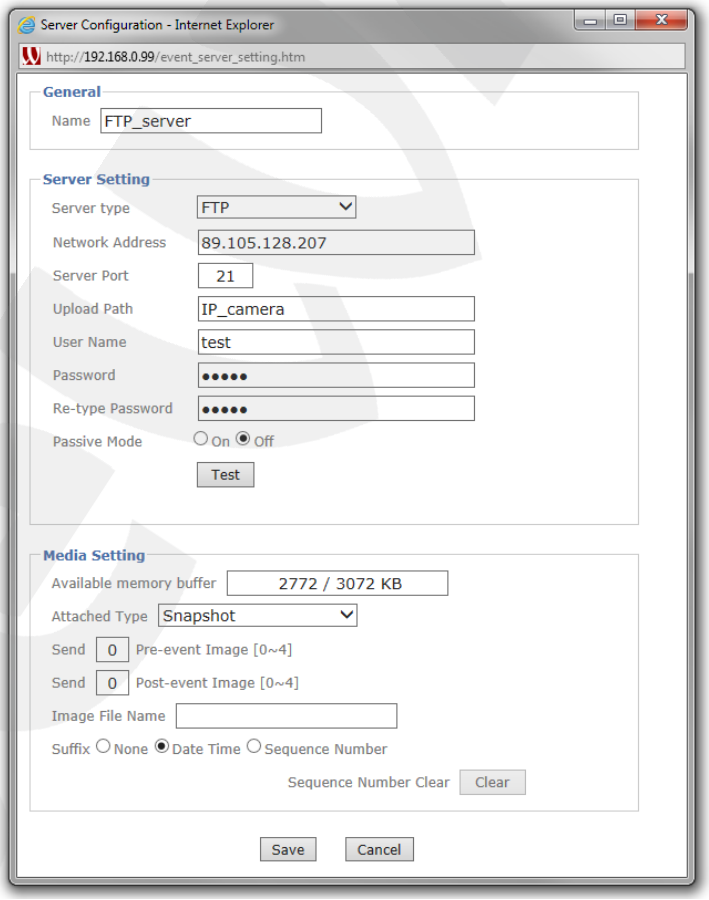
Configuration window can include several setting groups according to the selected server type. There are four event server types: **FTP, SMTP, HTTP, Network Storage**.

IMPORTANT:

The maximum number of the event servers is five. Moreover, there are some additional limitations which will be described next.

11.1.1.1. FTP

To set the FTP server go to ***SETTING – Event – Event Server – Event Server*** (*Pic. 11.1*) and press the **[Add]** button to open the configuration window (*Pic. 11.2*). In the **[Server Type]** field choose **[FTP]**. The following settings groups will be available: **"General", "Server Setting", "Media Setting"**.



Pic. 11.2

Name: enter the server name which you will see in the **[Name]** column of the **[Event Server]** field (*Pic. 11.1*).

Server Type: select a server type: **FTP, SMTP, HTTP, Network Storage**.

Network Address: enter an IP address or the domain name of the FTP server (up to 64 symbols).

Server Port: enter a port of the FTP server (default value is 21).

Upload Path: enter the path to a recorded files store folder on the FTP server (up to 64 symbols). For example: IP_camera/example.

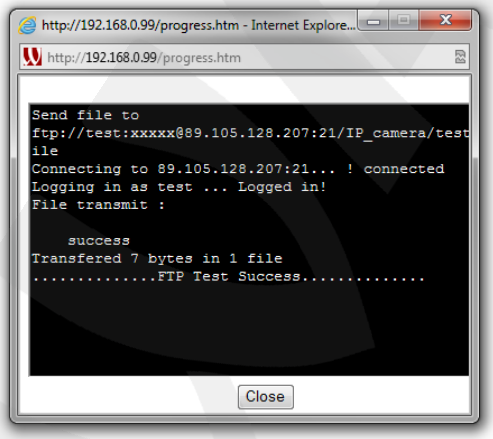
User Name: enter the user name to access to the FTP server.

Password: enter the password to access to the FTP server.

Re-type Password: enter the password again to avoid a mistake.

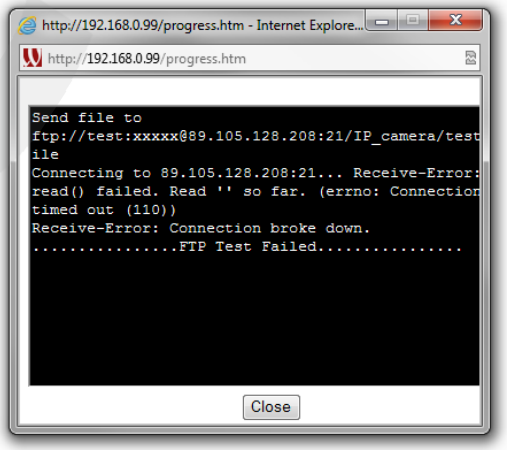
Passive Mode: [On] – a passive mode to access the FTP server (the same as in the web browser), **[Off]** – use an active mode to access to the FTP server.

[Test]: click this button sent a test file to the FTP server for checking the connection parameters. If everything was done correctly, you will see a window with an inscription about the successful test passing: **"FTP Test Success"** (*Pic. 11.3*).



Pic. 11.3

If the settings are incorrect or there is the other reason, then you will see a window with the information about an error: **"FTP Test Failed"** (*Pic. 11.4*).



Pic. 11.4

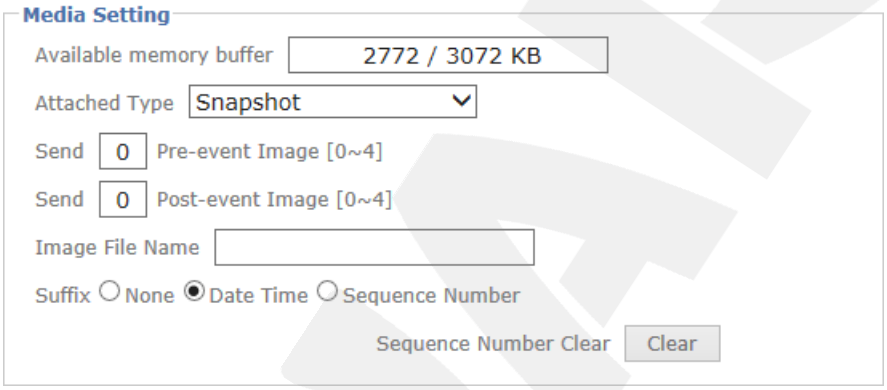
"Media Setting" group allows you to set a type of sent records.

Available Memory Buffer: displays free and total volume of the internal camera memory which is used for temporary video data storing.

Attached Type: select a type of sent file. The available types are the following:

- **Shapshot:** in this case there are frames which are recorded to the FTP (a static image) in the JPG format.
- **Video:** there are video files in the AVI format which are sent to the FTP.
- **System log:** the system log is recorded in the specified directory.

If the **"Snapshot"** type is selected the following items are available (*Picture 11.5*):



Pic. 11.5

Send Pre-event Image: enter the number of files (from 0 to 4) recorded by the camera before an alarm event triggered which will be included to the total number of files sent to the server (*Pic. 11.5*).

Send Post-event Image: enter the number of files (from 0 to 4) recorded by the camera after an alarm event triggered which will be included to the total number of files sent to the server (*Pic. 11.5*).

IMPORTANT:
The number of the frames which are recorded to a memory card will be equal to the sum of shown frame values before and after alarm event triggered and also a frame at the moment of alarm event triggering. So, the total number of the frames included to the sending by alarm event is **Pre-event Image number + Post-event Image number + 1 frame**.

Image File Name: enter a file name which will correspond to the names of all files sent to the FTP server.

Suffix: select suffix which will be added to the file:

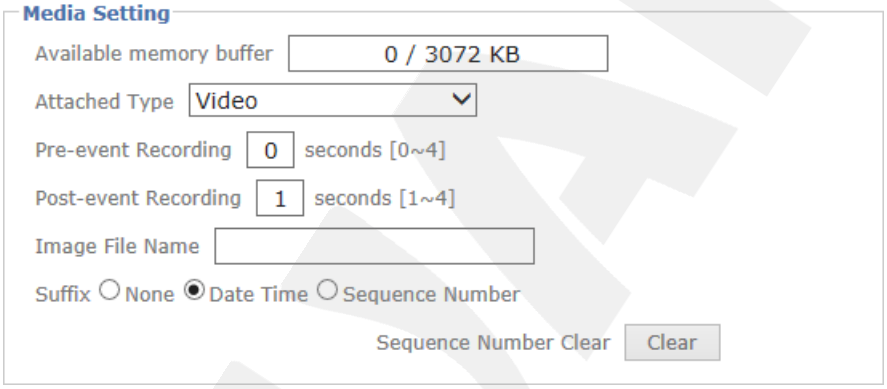
- **None:** no suffix added.
- **Date/Time:** add date and time of file creation. The suffix includes: 4 numbers for a year, 2 numbers for a month, 2 numbers for a date, 2 numbers for hours, 2 numbers

for minutes, 2 numbers for seconds. As a result 14 numbers will be added to the suffix.

- **Sequence Number:** add a sequence number to the file name. it starts from 000001 and is a number sequence with increasing of the next values for 1. You can reset this number by pressing the **[Clear]** button.

IMPORTANT:
When you add the FTP server with "Snapshot" as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **"Video" as a** file type the following items are available (*Picture 11.6*).



Pic. 11.6

Pre-event Recording: set the duration of video recorded by the camera before alarm event triggered (values: 0 to 4).

Post-event Recording: set the duration of video recorded by the camera after alarm event triggered (values: 1 to 4).

IMPORTANT:
The size of the file recorded to the server by the alarm event is equal to the sum of time intervals which were set in **"Pre-event recording"** and **"Post-event recording"** items.

IMPORTANT:
For correct video playing you may need to play them by the free VLC player (http://www.videolan.org/vlc/). Also, you can use a player fro, the camera web interface in the ***Setting – Playback – Client PC***.

Image File Name: enter a file name which will correspond to the names of all video files sent to the FTP server.

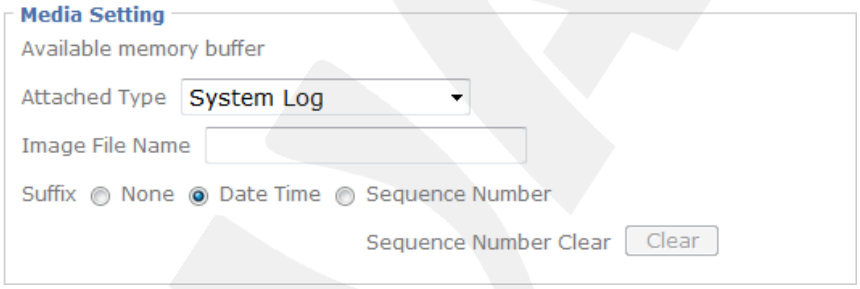
Suffix: select suffix which will be added to the file:

- **None:** no suffix added.

- **Date/Time:** add date and time of file creation. The suffix includes: 4 numbers for a year, 2 numbers for a month, 2 numbers for a date, 2 numbers for hours, 2 numbers for minutes, 2 numbers for seconds. As a result 14 numbers will be added to the suffix.
- **Sequence Number:** add a sequence number to the file name. it starts from 000001 and is a number sequence with increasing of the next values for 1. You can reset this number by pressing the **[Clear]** button.

IMPORTANT:
When you add the FTP server with "Video" as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **"System log"** as a file type the following items are available (*Picture 11.7*)



Pic. 11.7

Image File Name: enter a file name which will correspond to the names of all log files sent to the FTP server.

Suffix: select suffix which will be added to the file:

- **None:** no suffix added.
- **Date/Time:** add date and time of the file creation. The suffix includes: 4 numbers for a year, 2 numbers for a month, 2 numbers for a date, 2 numbers for hours, 2 numbers for minutes, 2 numbers for seconds. As a result 14 numbers will be added to the suffix.
- **Sequence Number:** add a sequence number to the file name. it starts from 000001 and is a number sequence with increasing of the next values for 1. You can reset this number by pressing the **[Clear]** button.

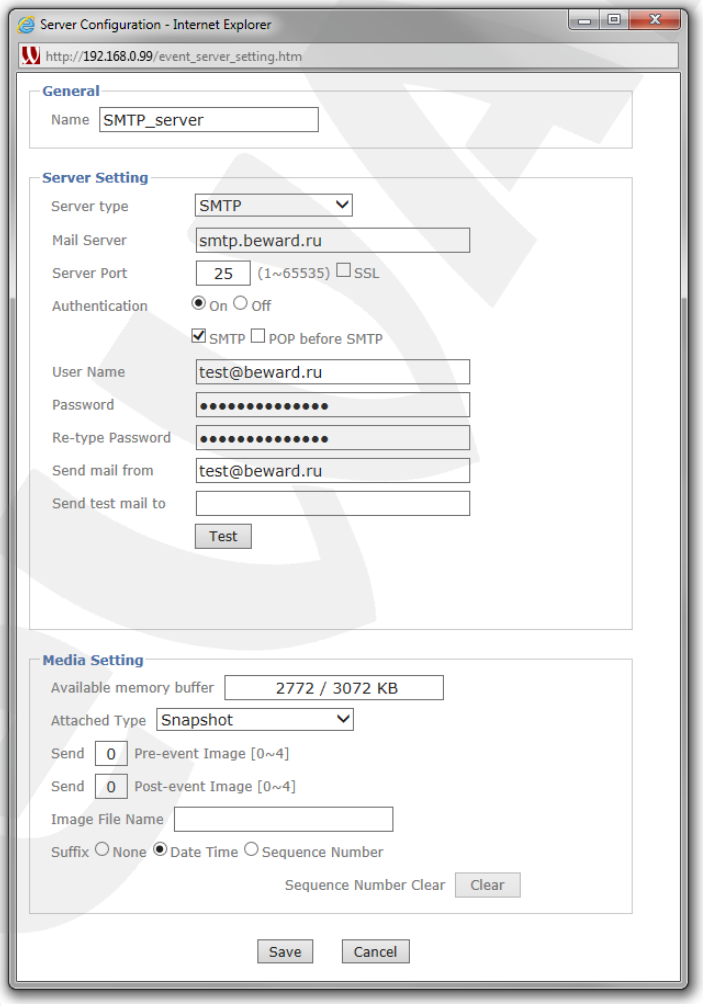
NOTE:
To save changes press the **[Save]** button, the FTP server window will be closed. If you do not want to save any changes press the **[Cancel]** button.

IMPORTANT:
Recording files to the FTP server may cause the decreasing of frame rate when low bitrate data channels are used.

11.1.1.2. SMTP

To configure SMTP server go to ***SETTING – Event – Event Server – Event Server*** (Pic. 11.1) and press the **[Add]** button to open the configuration window (Pic. 11.2). Then select SMTP as a server type. This menu allows you to configure e-mail sending. You can attach an image, a video record or a system log to an e-mail. You can specify a scheduled or alarm triggered sending by e-mail.

The menu contains the following sections: **"General", "Server Setting", "Media Setting"** (*Pic. 11.8*).



Pic. 11.8

Name: enter the server name.

Server Type: select a server type: FTP, SMTP, HTTP, Network Storage. In this case the SMTP type is selected.

Mail Server: enter an IP address or a SMTP server domain name (up to 64 symbols).

Server Port: enter a port of the SMTP server (the default value is 25) from 1 to 65535.

SSL: select it if your provider demands SSL-protocol usage.

Authentication: select a type of the authorization which is needed to send the letters to e-mail:

Off: no authorization needed.

On: authorization is necessary. Select between **[SMTP]** or **[POP before SMTP]** depending on your provider demands.

POP server name: this item displays when selecting **[POP before SMTP]**. In this case use a POP server name (up to 64 symbols) for authorization.

User name: enter the user name to get an access to the e-mail server.

Password: enter a password (up to 64 symbols).

Re-type password: enter the password again to avoid a mistake.

Send mail from: enter the sender name (up to 64 symbols).

Send test mail to: enter the reciever name.

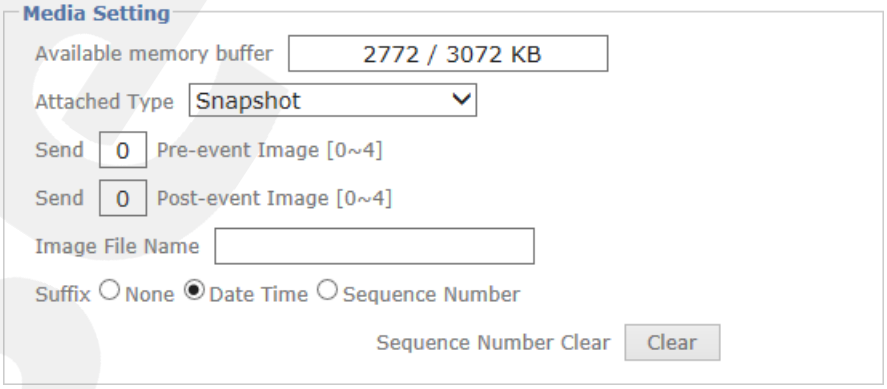
[Test]: click this button to send a test message to check if the parameters are correct or not.

Available Memory Buffer: displays free and total volume of the internal camera memory which is used for temporary video data storing.

Attached type: select a type of a file which will be send:

- **Snapshot:** send the frames to e-mail (static image) in the JPG format.
- **Video:** send video to e-mail in avi. format.
- **System log:** send the camera system log to e-mail.

If the **"Snapshot"** type is selected then **"Setting"** group looks as shown in the *Picture 11.9* and contains the following settings:



Pic. 11.9

Send Pre-event Image: enter the number of files (0 to 4) recorded by the camera before an alarm event triggered which will be included to the total number of files sent to the server (*Pic. 11.9*).

Send Post-event Image: enter the number of files (0 to 4) recorded by the camera after an alarm event triggered which will be included to the total number of files sent to the server (*Pic. 11.9*).

IMPORTANT:
The number of the frames which are recorded to a memory card will be equal to the sum of shown frame values before and after alarm event triggered and also a frame at the moment of alarm event triggering. So, the total number of the frames included to the sending by alarm event is **Pre-event image number + Post-event image number + 1 frame**.

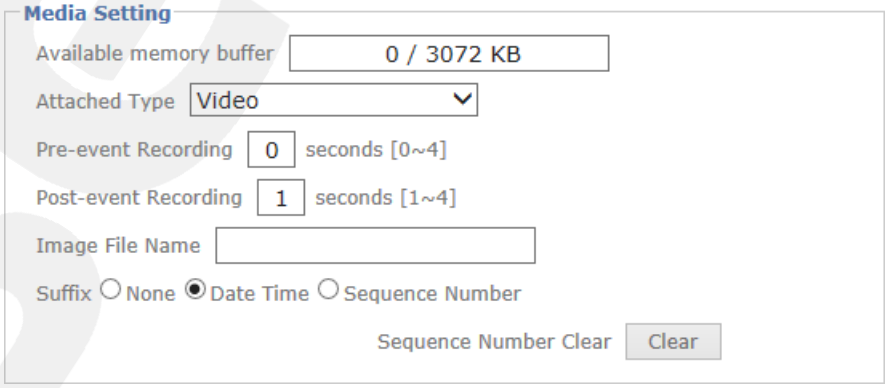
Image File Name: enter a file name which will correspond to the names of all files sent to e-mail.

Suffix: select suffix which will be added to the file:

- **None:** no suffix added.
- **Date/Time:** add date and time of the file creation. The suffix includes: 4 numbers for a year, 2 numbers for a month, 2 numbers for a date, 2 numbers for hours, 2 numbers for minutes, 2 numbers for seconds. As a result 14 numbers will be added to the suffix.
- **Sequence number:** add a sequence number to the file name. it starts from 000001 and is a number sequence with increasing of the next values for 1. You can reset this number by pressing the **[Reset]** button.

IMPORTANT:
When you add the SMTP server with “Snapshot” as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **“Video”** file type then setting group looks as shown in the *Picture 11.10*:



Pic. 11.10

Pre-event recording: set the duration of video recorded by the camera before alarm event triggered (values: 0 to 4).

Post-event recording: set the duration of video recorded by the camera after alarm event triggered (values: 1 to 4).

IMPORTANT:
The size of the file recorded to the server by the alarm event is equal to the sum of time intervals which were set in **"Pre-event recording"** and **"Post-event recording"** items.

IMPORTANT:
For correct video playing you may need to play them by the free VLC player (http://www.videolan.org/vlc/). Also, you can use a player fro, the camera web interface in the ***Setting – Playback – Client PC*** menu.

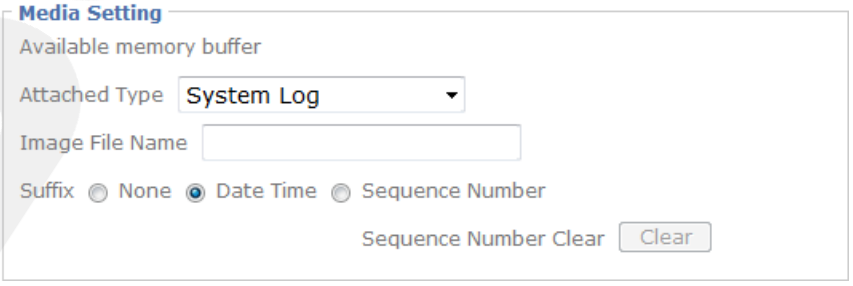
Image File Name: enter a file name which will correspond to the names of all files sent to e-mail.

Suffix: select suffix which will be added to the file:

- **None:** no suffix added.
- **Date/Time:** add date and time of the file creation. The suffix includes: 4 numbers for a year, 2 numbers for a month, 2 numbers for a date, 2 numbers for hours, 2 numbers for minutes, 2 numbers for seconds. As a result 14 numbers will be added to the suffix.
- **Sequence number:** add a sequence number to the file name. it starts from 000001 and is a number sequence with increasing of the next values for 1. You can reset this number by pressing the **[Reset]** button.

IMPORTANT:
When you add the SMTP server with "Video" as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **"System log"** as a file type, then setting group looks as shown in the *Picture 11.11*:



Pic. 11.11

Image File Name: enter a file name which will correspond to the names of all files sent to the FTP server.

Suffix: select suffix which will be added to the file:

- **None:** no suffix added.
- **Date/Time:** add date and time of the file creation. The suffix includes: 4 numbers for a year, 2 numbers for a month, 2 numbers for a date, 2 numbers for hours, 2 numbers for minutes, 2 numbers for seconds. As a result 14 numbers will be added to the suffix.
- **Sequence number:** add a sequence number to the file name. it starts from 000001 and is a number sequence with increasing of the next values for 1. You can reset this number by pressing the **[Reset]** button.

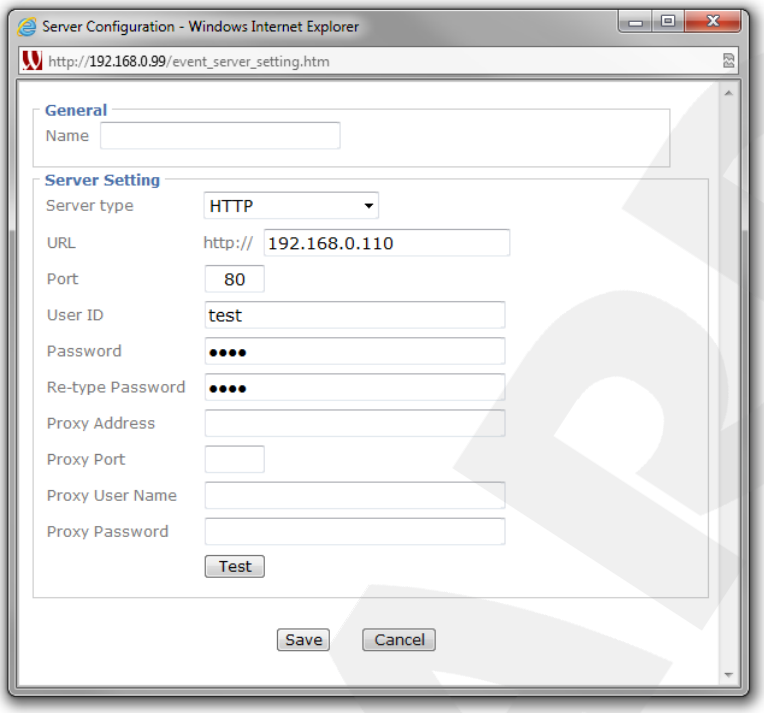
NOTE:
To save changes press the **[Save]** button, the FTP server window will be closed. If you do not want to save any changes press the **[Cancel]** button.

11.1.1.3. HTTP

To configure HTTP server go to ***SETTING – Event – Event Server – Event Server*** menu and press the **[Add]** button to open the configuration window. Then select HTTP as a server type (*Pic. 11.12*).

This menu allows you to configure sending of HTTP (CGI) commands to an external alarm device. This device, in turn, sends a command to another external device or closes relay contacts. For example, the camera sends an HTTP (CGI) command to the device, which, in turn, closes relay contacts and triggers an alarm.

The menu contains the following sections: **"General"** and **"Server Setting"** *(Pic. 11.12)*.



Pic. 11.12

Name: enter the server name.

Server type: select a server type: FTP, SMTP, HTTP, Network Storage.

URL: enter IP address and a prefix of demanded command (up to 64 symbols).

NOTE:
IP addresses should correspond to the IP address of the device which is used to receive CGI commands.

Port: enter a port of the HTTP server (the default value is 80) from 1 to 65535.

User ID: enter the user name to get an access to the e-mail server (up to 64 symbols).

Password: enter a password (up to 64 symbols).

Re-type password: enter the password again to avoid a mistake.

Proxy Address: if proxy server is used then enter a name or IP address (up to 64 symbols).

Proxy Port: if proxy server is used then enter a port to access to the server (1 to 65535).

Proxy User Name: if proxy server is used then enter user name to access to the server (up to 64 symbols).

Proxy Password: if proxy server is used then enter a password to acces to the proxy server (up to 32 symbols).

NOTE:
If proxy server is not used then do not fill the last four fields.

[Test]: click this button to check if the connection to the device and all commands are correct.

NOTE:

To save changes press the **[Save]** button, the HTTP server window will be closed. If you do not want to save any changes press the **[Cancel]** button..

11.1.1.4. HTTPS-сервер

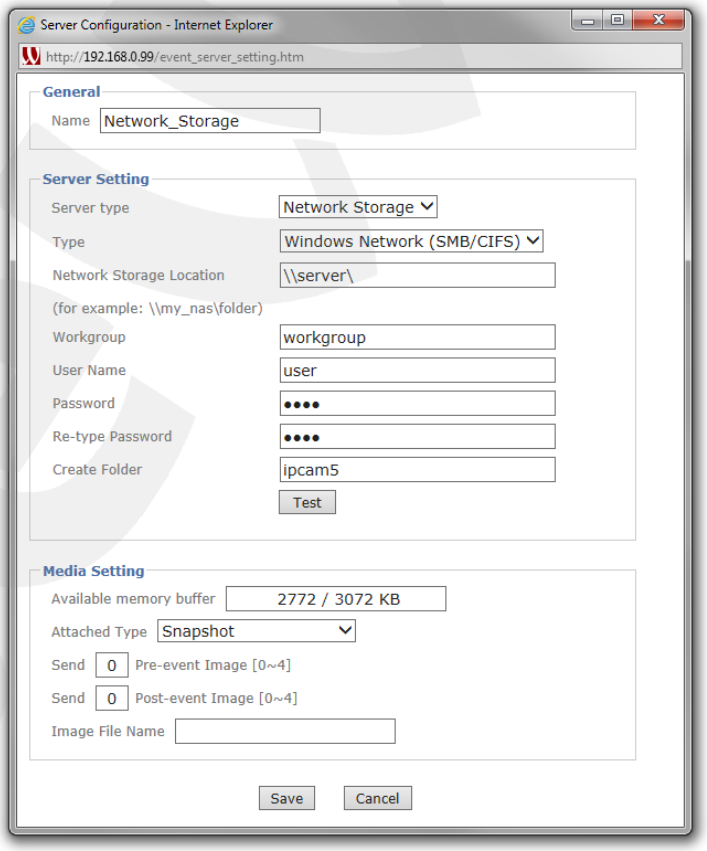
HTTPS server is used and set in the same manner as HTTP. The difference between them is that the HTTPS protocol supports data encryption and uses port 443 by default.

11.1.1.5. Network Storage

To configure NAS server go to ***SETTING – Event – Event Server – Event Server*** menu and press the **[Add]** button to open the configuration window. Then select **"Network Storage"** as a server type (*Pic. 11.13*).

IMPORTANT:

Only one network storage could be added as an event server. If it is already added this item will be not available in the **[Server type]** field.



Pic. 11.13

This menu allows you to configure recording to a network attached storage (NAS) or to a network shared folder. When this function is enabled, the camera can record files continuously, with a certain time interval or when an event occurs. This menu contains the following sections: **"General", "Server Setting", "Media Setting"**.

Name: enter the server name.

Server Type: select a server type: FTP, SMTP, HTTP, Network Storage.

Type: select an access protocol to network storage device:

- **Windows Network (SBM/CIFS):** this item corresponds to the network storage based on Windows OS.
- **Unix Network (NFS):** this item corresponds to the network storage based on OS similar to Unix OS (for example, Linux OS).

Network Storage Location: enter a path to a network folder named in the **[Recording Folder]** field which will be created for recorded video files storing.

NOTE:
Entering the path, take into account that for the Windows OS based storage the path should be the following: **\\NAS server\Record**; for Unix OS based storage: **NAS server:\Record** – where NAS server is IP address of the network storage or PC with the open-access folder.

When using Windows OS based networks you should enter additional parameters.

Workgroup: enter a name of working group for Windows networks. This name should be the same with PC working group with the open-access folder or NAS server.

User name: enter user name to authorization on the remote PC or NAS server.

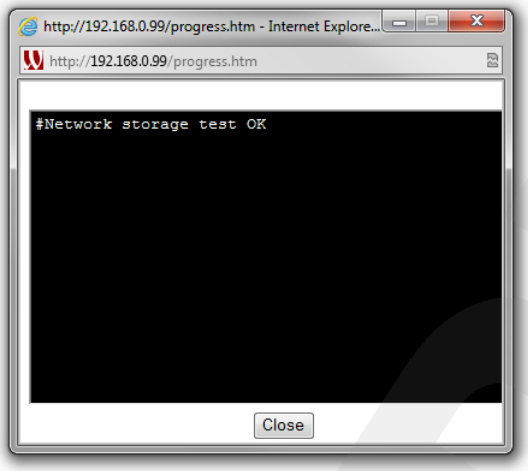
Password: enter a password.

Re-type password: enter the password again to avoid a mistake.

Recording Folder: enter a name for the folder which will be created for file recording.

NOTE:
Be sure that the selected user has the right to create the folders and record the files.

After entering all parameters you can check their correctness by pressing **[Test]** button. If all parameters are correct then the window with the information of successful test will appear (*Pic. 11.14*).



Pic. 11.14

If the test failed, check the network device address, its availability and account settings.

The **[Media Setting]** section allows setting the sent files.

Available Memory Buffer: displays free and total volume of the internal camera memory which is used for operating the specified type files.

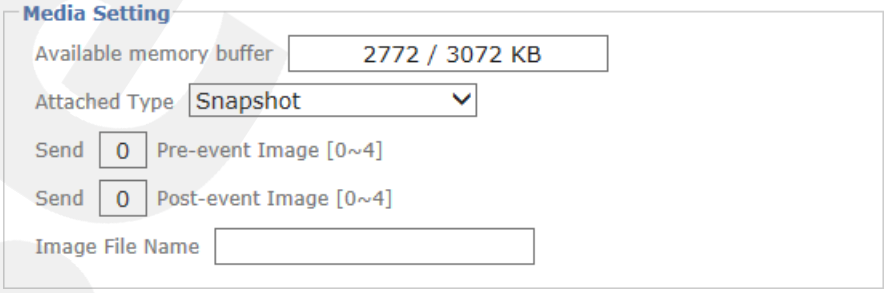
Attached type: select a type of a file which will be sent:

- **Snapshot:** send to NAS the frames (static image) in the JPG format.
- **Video:** send to NAS video in AVI format.
- **System log:** send to NAS the camera system log.

If the **"Snapshot"** type is selected then the following settings are available:

Send Pre-event Image: enter the number of files (0 to 4) recorded by the camera before an alarm event triggered which will be included to the total number of files sent to the storage (*Pic. 11.15*).

Send Post-event Image: enter the number of files (0 to 4) recorded by the camera after an alarm event triggered which will be included to the total number of files sent to the storage (*Pic. 11.15*).



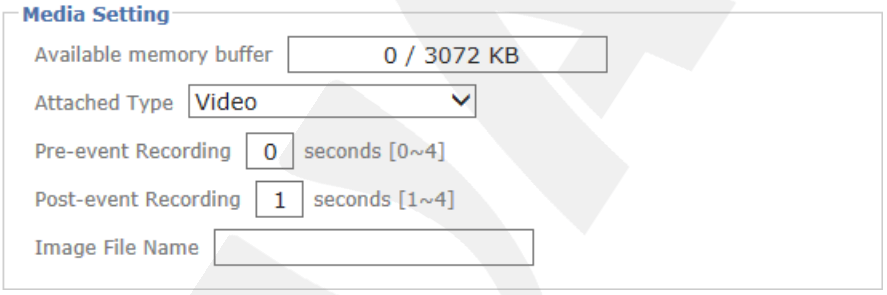
Pic. 11.15

IMPORTANT:
The number of the frames which are recorded to a memory card will be equal to the sum of shown frame values before and after alarm event triggered and also a frame at the moment of alarm event triggering. So, the total number of the frames included to the sending by alarm event is **Pre-event Image number + Post-event Image number + 1 frame**.

Image File name: enter a file name which will correspond to the names of all files sent to NAS.

IMPORTANT:
When you add the NAS server with "Snapshot" as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **"Video"** file type then setting group contains the following items (*Pic. 11.16*):



Pic. 11.16

Pre-event Recording: set the duration of video recorded by the camera before alarm event triggered (values: 0 to 4).

Post-event Recording: set the duration of video recorded by the camera after alarm event triggered (values: 1 to 4).

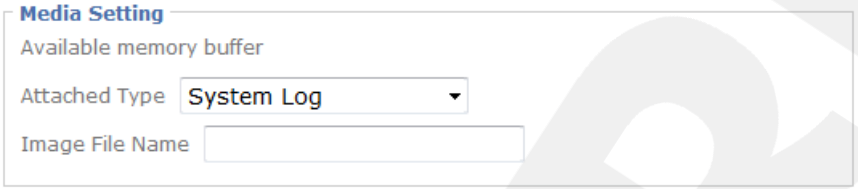
IMPORTANT:
The size of the file recorded to the server by the alarm event is equal to the sum of time intervals which were set in **"Pre-event recording"** and **"Post-event recording"** items.

IMPORTANT:
For correct video playing you may need to play them by the free VLC player (http://www.videolan.org/vlc/). Also, you can use a player fro, the camera web interface in the ***Setting – Playback – Client PC*** menu.

Image File name: enter a file name which will correspond to the names of all files sending to NAS.

IMPORTANT:
When you add the NAS server with "Video" as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **"System log"** as a file type, then setting group looks contains the following items (*Pic. 11.17*).



Pic. 11.17

File name: enter a file name which will correspond to the names of all system log files sent to NAS.

NOTE:
To save changes press the **[Save]** button, the FTP server window will be closed. If you do not want to save any changes press the **[Cancel]** button.

IMPORTANT:
Recording files to the FTP server may cause the decreasing of frame rate when low bitrate data channels are used.

11.1.2. SD card

To configure memory card recording go to ***SETTING – Event – Event Server – SD Card***. This menu contains the following sections: **"SD card"** and **"Settings"**. When a memory card is used for the first time, the **[Settings]** section is not available.

After installing a memory card you should format it. To do so you need at first to turn it off (*Pic. 11.18*).



Pic. 11.18

NOTE:

There could be such situations when the **[SD Card]** section is not available. It means that the memory card is initialized wrong. It may be caused by some difficulties with a card file system or by its defects. To find the reason check the card on the PC (using a card reader). If the card is operable format it with FAT32. After that it will be accessible in the present menu.

To format a memory card press the **[Execute]** button to call a dialog box for format confirmation. Press the **[OK]** button to confirm a memory card formatting or the **[Cancel]** button to cancel it.

IMPORTANT:

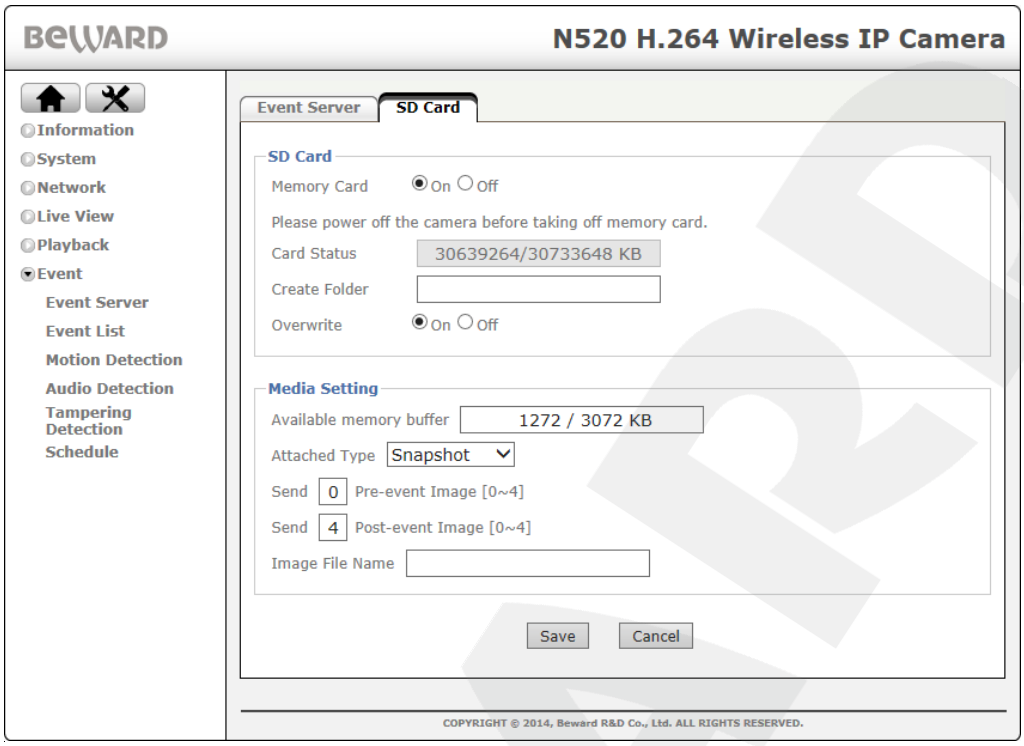
Before formatting, be sure that a memory card does not contain any important information because formatting leads to loss of all data!

NOTE:

Memory card formatting can take a few minutes and needs camera rebooting.

After formatting the memory card is ready to use. To start working with the memory card select **[On]** for **[SD card]** item. To save the settings press the **[Save]** button to make the menu of setting memory card work available.

The following settings are available (*Pic. 11.19*):



Pic. 11.19

Memory card: turn a memory card on or off.

Card Status: displays the information of free space on the memory card and its total volume in kilobytes.

Create Folder: enter a name of folder to which the files will be recorded if it is needed.

Overwrite: turn overwriting on/off.

Capacity Warning: allows you to turn on a notification if the free space on the memory card is over. This item is available only if overwriting is turn off:

[Off]: no notification.

5%: notify when there is less than 5% of free space.

10%: notify when there is less than 10% of free space.

25%: notify when there is less than 25% of free space.

50%: notify when there is less than 50% of free space.

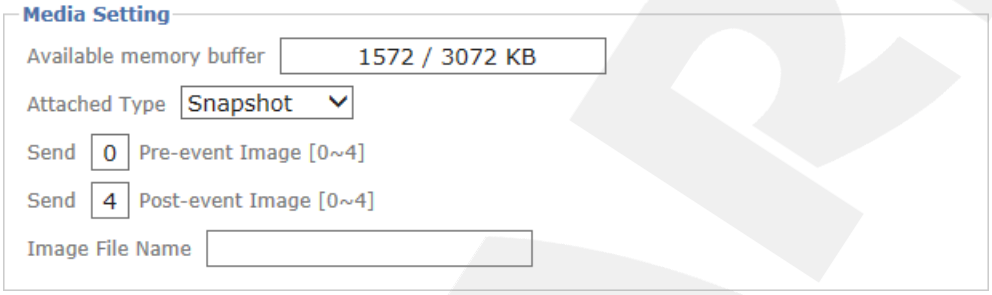
NOTE:
To save changes press the **[Save]** button, to cancel changes press the **[Cancel]** button.

NOTE:
To keep the **"Capacity Warning"** function when the memory card space is over operable it is necessary to add the **"Capacity Warning"** event type in ***SETTING – Event – Event list – Event list*** menu.

Attached Type: select a type of sent file. The available types are the following:

- **Snapshot:** in this case there are frames which are recorded to the memory card (a static image) in the JPG format.
- **Video:** there are video files in the avi. format which are recorded to the memory card.
- **System log:** the system log is recorded in the specified directory.

If the **"Snapshot"** type is selected then **"Setting"** group looks as shown in the *Picture 11.20* and contains the following settings:



Pic. 11.20

Send Pre-event Image: enter the number of files (0 to 4) recorded by the camera before an alarm event triggered which will be included to the total number of files sent to the server.

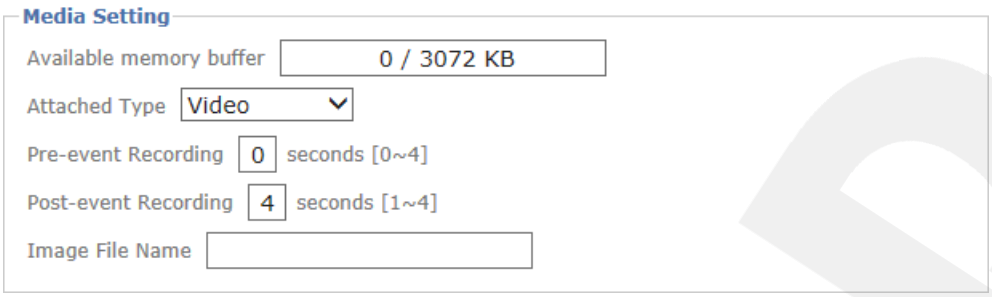
Send Post-event Image: enter the number of files (0 to 4) recorded by the camera after an alarm event triggered which will be included to the total number of files sent to the server.

IMPORTANT:
The number of the frames which are recorded to a memory card will be equal to the sum of shown frame values before and after alarm event triggered and also a frame at the moment of alarm event triggering. So, the total number of the frames included to the sending by alarm event is **Pre-event Image number + Post-event Image number + 1 frame**.

Image File Name: enter a file name which will correspond to the names of all files sent to the FTP server.

IMPORTANT:
When you add the event server with "Snapshot" as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **"Video"** file type then setting group looks as shown in the *Picture 11.21*:



Pic. 11.21

Pre-event recording: set the duration of video recorded by the camera before alarm event triggered (values: 0 to 4).

Post-event recording: set the duration of video recorded by the camera after alarm event triggered (values: 1 to 4).

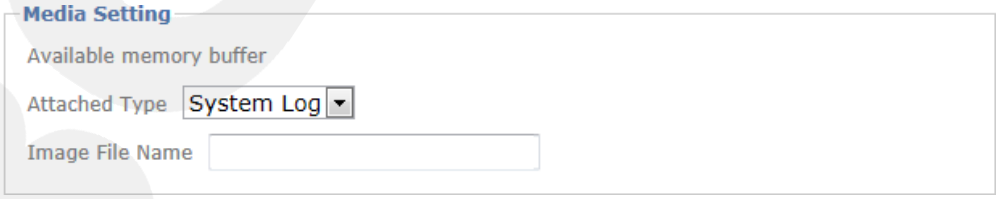
IMPORTANT:
The size of the file recorded to the memory card by the alarm event is equal to the sum of time intervals which were set in **"Pre-event recording"** and **"Post-event recording"** items.

IMPORTANT:
For correct video playing you may need to play them by the free VLC player (http://www.videolan.org/vlc/). Also, you can use a player fro, the camera web interface in the ***Setting – Playback – Client PC*** menu.

Image File Name: enter a file name which will correspond to the names of all files sent to the FTP server.

IMPORTANT:
When you add the event server with "Video" as the type of attached files it is important to control the volume of available buffer memory. In case of buffer overfilling a notification will be sent.

If you select **"System log"** as a file type, then setting group looks as shown in the *Picture 11.22*



Pic. 11.22

Image File Name: enter a file name which will correspond to the names of all files sent to the FTP server.

NOTE:

To save changes press the **[Save]** button, the FTP server window will be closed. If you do not want to save any changes press the **[Cancel]** button.

11.2. Event List

This menu allows you to create and adjust alarm events and actions, such as scheduled data recording, triggered by these events. The data are recorded to event server configured in ***SETTINGS – Event – Event Server*** menu (see paragraph 11.1).

The **[Event List]** menu contains two tabs: **"Event List"** and **"Scheduled Recording"**.

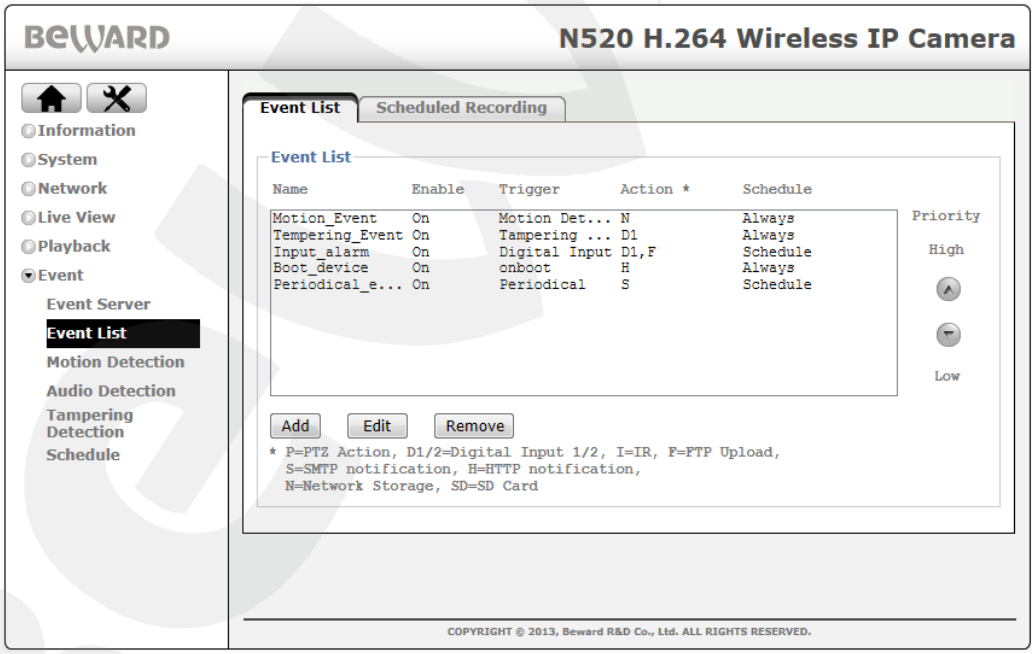
11.2.1. Event List

This item allows you to configure the alarm events and conditions of data recording (sending) to the event servers such as NAS, FTP, SMTP, HTTP.

IMPORTANT:

You can add only five events in the list at once.

The **[Event List]** settings group (Pic. 11.23) includes a field with an event list and five control buttons.



Pic. 11.23

The field contains five columns: **"Name"**, **"Enabled"**, **"Trigger"**, **"Action"** and **"Schedule"**.

Name: displays an event name.

Enabled: displays the status of the current event (On/Off).

Trigger: displays an alarm event.

Action: displays the short name of the action which will be accomplished as the alarm event happened.

Schedule: displays the operation mode of the alarm event (by schedule/always).

To prevent simultaneous calls to the same resources (for example, sending the same file to NAS and to FTP servers) events prioritization is used. It means that you add events to the list according to their importance: the most important – at the top of the list, the less important – at the bottom. The most prioritized events will be always accomplished but the less ones will be accomplished only if there will be no calls from the more important events at the same time and because of that they may remain unprocessed.

Prioritization helps to allocate camera resources when several events happen at once.

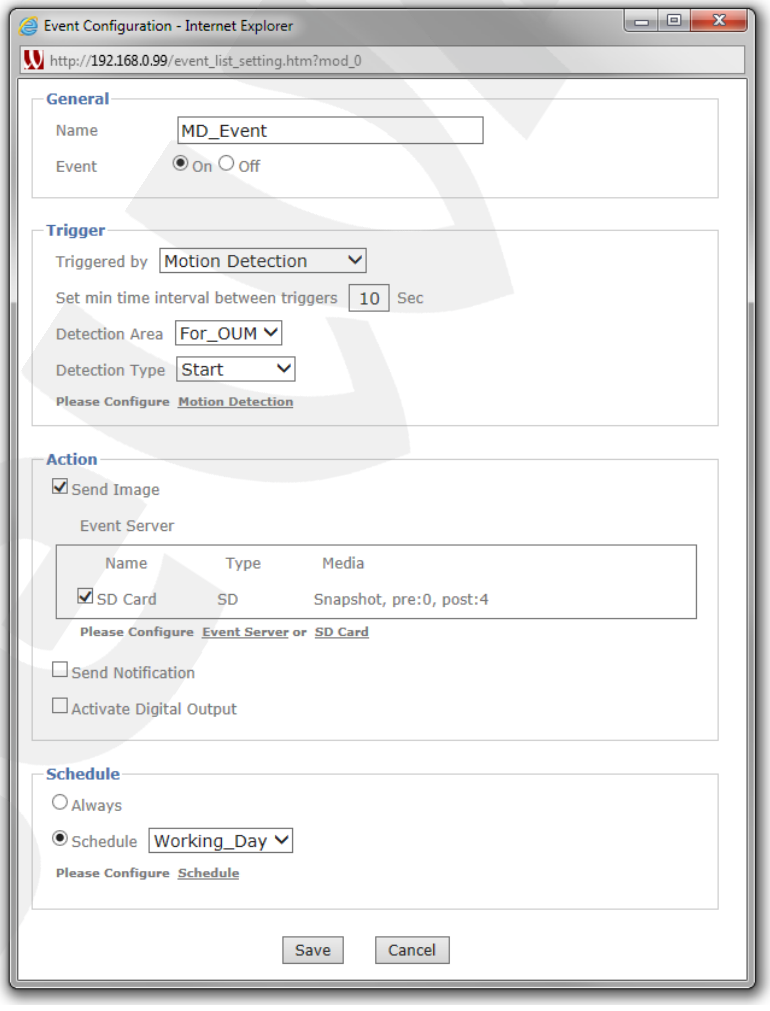
[High]: click this button to increase the priority of the selected alarm event.

[Low]: click this button to decrease the priority of the selected alarm event.

[Add]: click this button to create a new event in the list.

[Edit]: click this button to edit the event selected from the list (*Pic. 11.23*).

[Remove]: click this button to delete the event selected from the list (*Pic. 11.23*).



Pic. 11.24

Press **[Add]** or **[Edit]** button and **"Event Configuration"** window will open (*Pic. 11.24*). It contains 4 settings groups: **"General", "Trigger", "Action", "Schedule"**.

Name: enter the name of the created event.

Event: [On] – the current event is active. **[Off]** – the current event is inactive.

Trigger: select alarm event type to execute an action set in **"Action"** setting group. The following event types are available. **"Motion Detection", "Audio Detection", "Tampering Detection", "Digital Input", "Periodical", "Onboot", "Capacity Warning", "IP Notification"**, **"PIR"**.

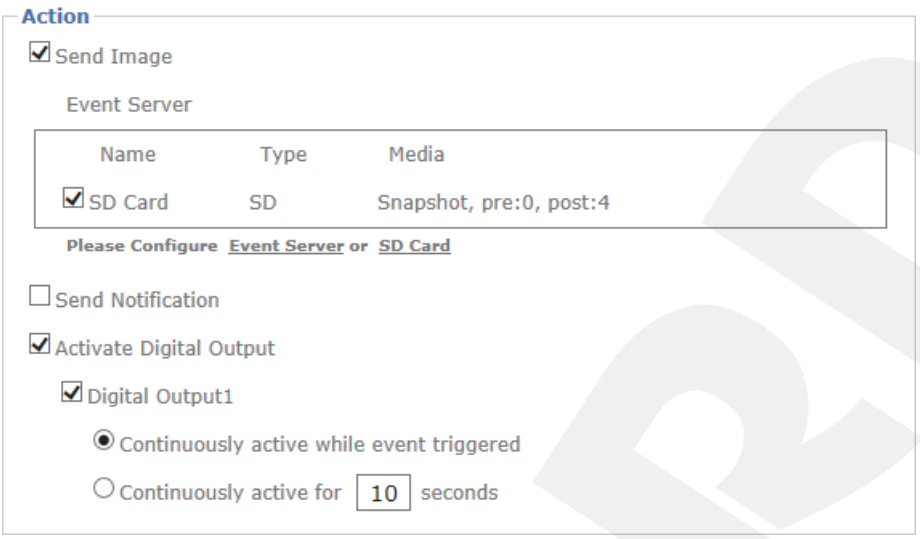
Depending on the type of an alarm event the different items of this settings group will be available.

If you set data sending triggered by some alarm event then sent files will be named according to this event. It makes further data operation simpler. Look at the table below. It contains events names and their abbreviations.

№	Abbreviation	Meaning
1	MD	Motion Detection
2	AD	Audio Detection
3	TD	Tempering Detection
4	DI	Digital Input
5	PE	Periodical
6	RB	Onboot
7	CW	Capacity Warning
8	IP	IP Notification
9	PIR	Passive Infrared Sensor detection

The detailed description of alarm event types and their setting is given in paragraphs 11.2.1.1 – 11.2.1.9.

"Action" settings group allows adjusting actions triggered by alarm events. To select an action check the corresponding item (*Pic. 11.25*).



Pic. 11.25

Send Image: selected this action you will see a table with the configured event servers. Select a server the files should be sent to.

To configure the event server go to ***SETTING – Event – Event Server*** and press **[Add]** or **[Edit]** button (see paragraph 11.1).

Send Notification: this function allows you to send notifications to the HTTP server when alarm event triggers off. To use this function you need to set the HTTP server at first (see paragraph 11.1.1.3)

Activate Digital Output: after selecting this action, the additional options will appear:

- **Digital Output1:** choose the specific digital output (only one digital output is available in this camera model).
- **Continuously active while event triggered:** the digital output will be only active during the period of activity of the selected alarm event.

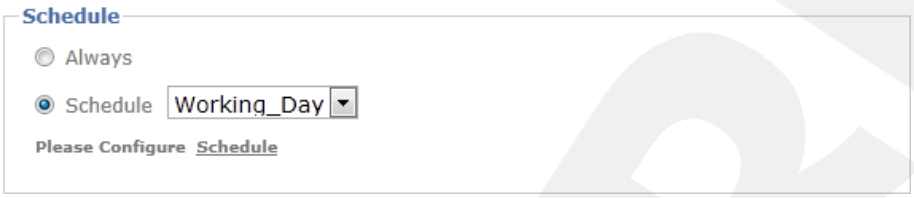
NOTE:
If the **[Continuously active while event triggered]** option and the **[Periodical]** or **[Digital Input]** event type in the **[Change]** mode are selected the digital output will always stay in the "Active" status after the first event triggering. It is done for proper operation of some devices' types. When setting an event it is important to remember about this feature.

- **Continuously active for … seconds**: the digital output will be active during a certain period of time from the moment of alarm event activation.

NOTE:

You can set the normal status of the digital output in ***SETTING – System – Digital I/O*** (see paragraph 7.4).

"Schedule" settings group allows setting the operation mode of the chosen alarm event. It includes the following items (*Pic. 11.26*).



Pic. 11.26

- **Always**: an alarm event is always active.
- **Schedule**: an alarm event will be active only according to the schedule (see paragraph 11.6).

NOTE:

To save changes press the **[Save]** button, to cancel changes press the **[Cancel]** button.

11.2.1.1. Motion Detection

Motion Detection: the action is executed when motion detector triggers (*Pic. 11.27*).

Adjust this trigger properly and you will be able not only to save your hard drive free space but, moreover, to optimize your data operation in future (by viewing only the records where motion was detected).



Pic. 11.27

When selecting this event type the following settings are available.

Set min time interval between triggers: when this time interval ends, the alarm event can be restarted. The values from 1 to 999 seconds are available.

Detection Area: select a zone for detection.

To set motion detection go to ***SETTING – Event – Motion Detection*** (see paragraph 11.3).

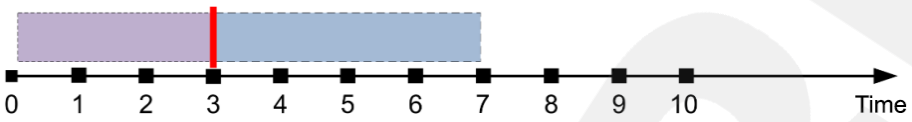
Detection Type: specify the moment of alarm event triggering:

- **Start:** alarm triggers at the moment when the motion starts.
- **Stop:** alarm triggers at the moment when the motion ends.

- **Start-Stop**: alarm triggers at the moment when the motion starts and lasts until it ends.

Please Configure Motion Detection: a link which allows you to open motion detection configuration window.

To get a clear idea of data recording process triggered by motion detection with the **[Start]** detection type, please, look at the Picture 11.28:

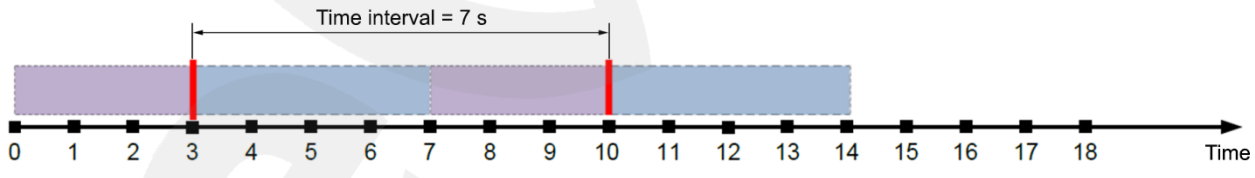


Pic. 11.28

Let the **[Pre-event Recording]** time is 3 seconds and the **[Post-event Recording]** time is 4 seconds. Because of such values it is required to specify the "minimum time interval between triggers" not less than 7 seconds (*Pic. 11.27*). If this interval is less and several events trigger one by one, then some part of recorded information from the **[Post-event Recording]** interval will be duplicated in the **[Pre-event Recording]** interval of the next file.

IMPORTANT:
It is recommended to specify the time interval between triggers as equaled to the sum of [Pre-event Recording] and [Post-event Recording] intervals.

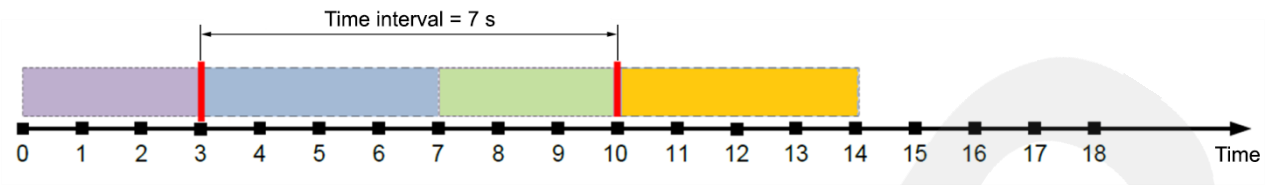
As an alarm event triggers the recording file is assembled from pre- and post-event recording time periods. And the next event can trigger only after time specified as "minimum time interval between triggers" (*Pic. 11.27*).



Pic. 11.29

The **[Stop]** detection type works in the same manner as the **[Start]**. The only difference is that alarm triggers at the moment when the motion ends.

The **[Start-Stop]** detection type includes the two previous. Alarm triggers twice, at the moment when the motion starts and when it ends (*Pic. 11.30*). Camera records the whole event (colored in blue and green), the previous time period (violet) and the period after (orange). The record data are divided between two files, each file is for one trigger. The duration of each file in the present example is 7 s (*Pic. 11.30*).



Pic. 11.30

11.2.1.2. Audio Detection

Audio Detection: the action is executed when audio detector triggers. This alarm event, unlike the motion detection, operates without taking a detection area into account and triggers when a certain preset sound level is exceeded.

NOTE:
Before adding the [**Audio Detection]** event make sure that the detector is set up and turn on.

To set audio detection go to ***SETTING – Event – Audio Detection*** (see paragraph 11.4).



Pic. 11.31

When selecting this type the following settings are available.

Set min time interval between triggers: when this time interval ends, the alarm event can be restarted. The values from 1 to 999 seconds are available.

Detection Type: specify the moment of alarm event triggering:

- **Start:** an alarm triggers at the moment when sound starts.
- **Stop:** an alarm triggers at the moment when sound ends.
- **Start-Stop**: alarm triggers at the moment when the sound starts and lasts until it ends.

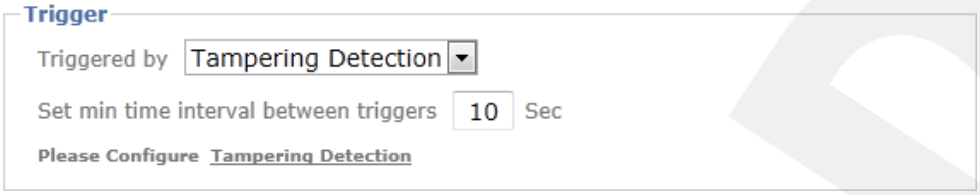
Please Configure Audio Detection: a link which allows you to open motion detection configuration window.

The specificity of the different detector types operation is the same as for the motion detector.

NOTE:
To save changes press the **[Save]** button, to cancel changes press the **[Cancel]** button.

11.2.1.3. Tampering Detection

Tampering Detection: the action is executed when tampering detector triggers off.



Pic. 11.32

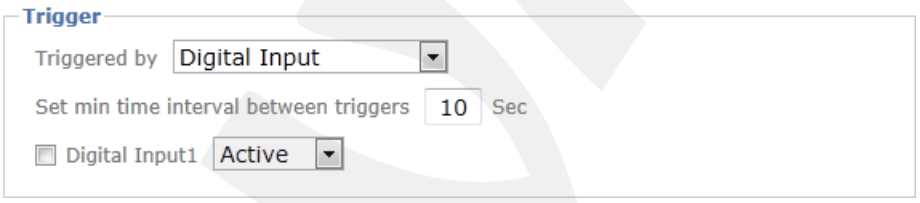
When selecting this type the following items are available:

Set min time interval between triggers: when this time interval ends, the alarm event can be restarted.

Please Configure Tampering Detection: a link which allows you to open motion detection configuration window.

11.2.1.4. Digital Input

Digital Input: the action is executed by the selected type of status changing of the digital input.



Pic. 11.33

The following settings are available:

Set min time interval between triggers: when this time interval ends, the alarm event can be restarted.

Only one digital input is available in this camera model. **[Digital Input1]** item has the following parameters:

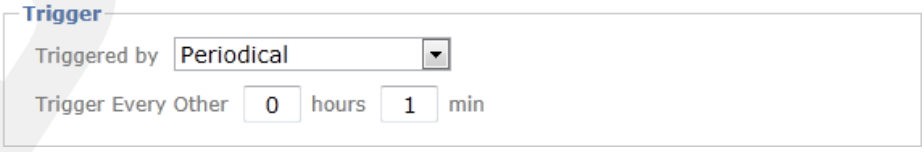
Active: an action executes when digital input status corresponds to the normal status.

Inactive: an action executes when digital input status is opposite to the normal status.

Change: an action executes by any changing of the digital input status.

11.2.1.5. Periodical

Periodical: the action is executed periodically according to specified time period.



Pic. 11.34

When selecting this type the following settings are available.

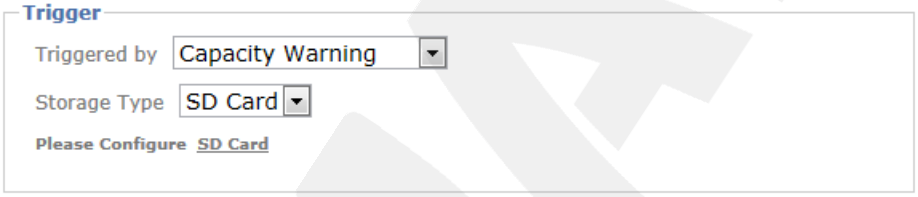
Trigger Every Other: specify a time interval in hours and minutes. The action will be repeated by the end of this interval.

11.2.1.6. On boot

On boot: the action is executed when the camera is loaded after turning on. By selecting this event type you can notice the number of camera reboots.

11.2.1.7. Capacity Warning

[Capacity Warning] event is very useful when data record to a memory card without overwriting. The action is executed when a free space on a memory card is nearly over. The volume of the free space can be specified in ***SETTING – Event – Event Server – SD Card*** (see paragraph 11.1.2).



Pic. 11.35

NOTE:
To activate this event type you need to put a memory card in the slot.

Please Configure SD Card: a link which allows you to open memory card configuration window.

11.2.1.8. IP-notification

IP-notification: the action is executed if the camera's IP address changes (the type of connection changes).

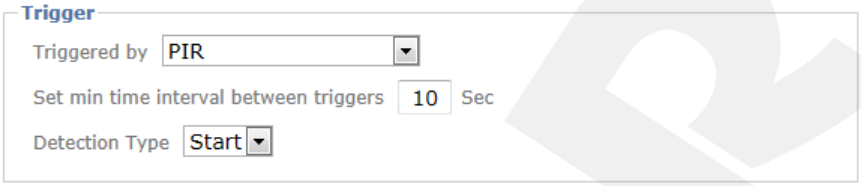
- **DHCP:** an action is executed when IP address is changed by DHCP server.
- **Static IP:** an action is executed when a static IP address or the type of connection is changed by a user.
- **PPPoE:** an action is executed in case of changing the IP address assigned by PPPoE connection.



Pic. 11.36

11.2.1.9. PIR

This type of the event is used for motion detection with the help of **PIR-sensor**. When the camera works in low light conditions there can be motion detection false trigger as well as no trigger at all. To exclude such situations use a PIR-sensor. Its work is based on electric field generation when an object emits infrared rays. Due to these rays the PIR-sensors is able to detect moving people in the controlled area independently on external lighting level. The following settings are available:



Pic. 11.37

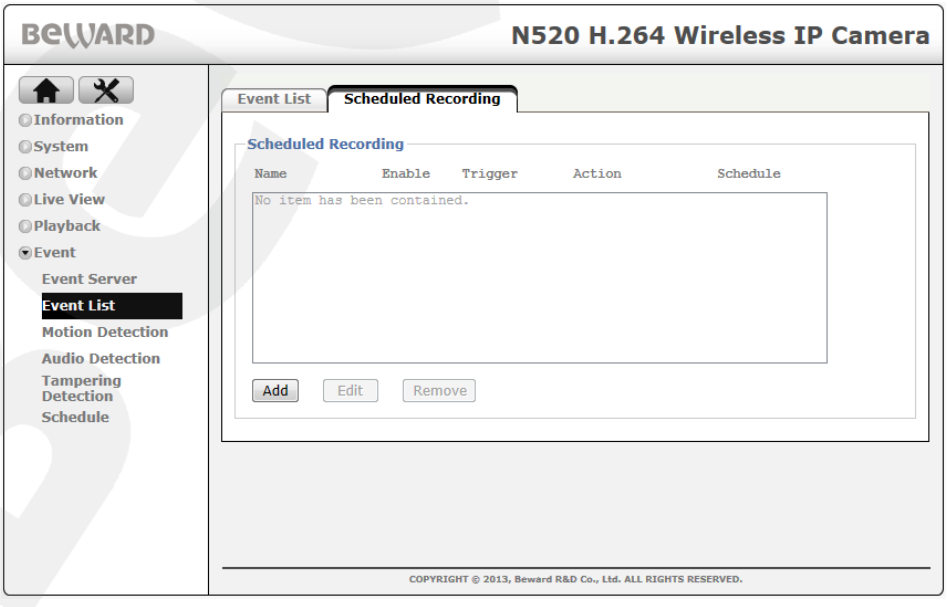
Set min time interval between triggers: time interval between events. When it ends, the alarm event can be restarted.

Detection Type: responsible for a moment of alarm event triggering:

- **Start:** alarm triggers at the moment when PIR starts triggering.
- **Stop:** alarm triggers at the moment when PIR stops triggering.
- **Start-Stop**: alarm triggers at the moment when PIR starts triggering and lasts until it ends.

11.2.2. Scheduled Recording

«Scheduled Recording» item allows you to set continuous recording by alarm events to a network attached storage and a memory card. It contains a field with a list of adjusted event servers and the buttons to control these servers (*Pic. 11.38*).



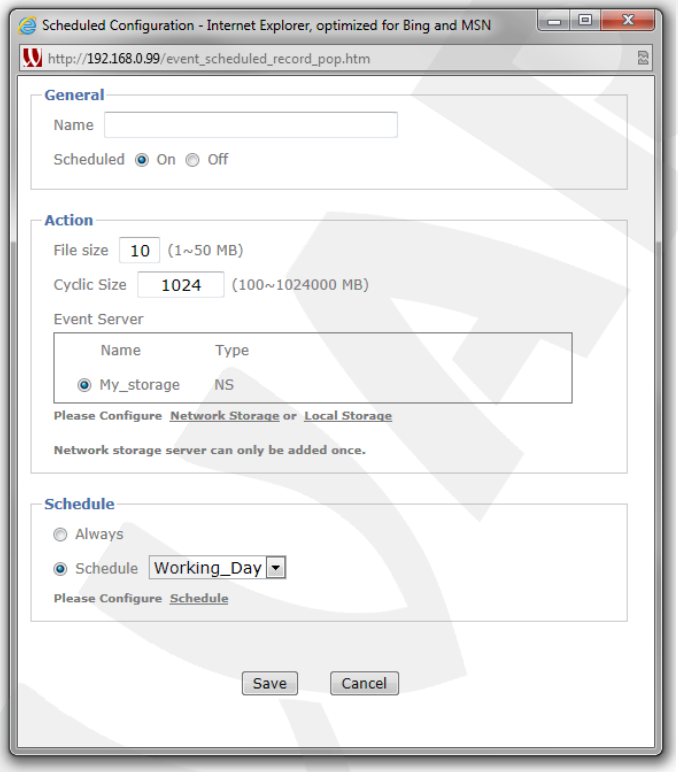
Pic. 11.38

[Add]: this button is for primary continuous recording. After pressing this button a **«Scheduled Configuration» window will appear** (*Pic. 11.39*).

NOTE:
You can add one network storage only as well as one setting profile for a memory card.

[Edit]: click this button to edit the continuous recording settings.

[Delete]: click this button to delete the continuous recording settings.



Puc. 11.39

«Scheduled Configuration» window (*Pic 11.39)*, includes 3 sections: **«General»**, **«Action» and «Schedule»**.

Name: enter an event server name.

Scheduled: select **«On»** to use continuous recording settings for the current event server. If you select **«Off»** this settings will be inactive.

File size: enter the size of video file which will be recorded to a memory card or network storage (1 to 50 MB).

Cyclic Size: As the volume specified here will be exceeded during recording process new information will be recorded over the old files. You can specify a value from 100 MB to 1 TB.

IMPORTANT!
«Cyclic Size» is available only if the NAS server is selected in **«Event Server»** field.

Event Server: select an event server to set continuous recording. You need to set a NAS server or a memory card previously (please see paragraphs 11.1.1.5, 11.1.2).

Always: an alarm event is always active.

Schedule: an alarm event will be active only according to the schedule (for detailed information about schedule setting, please, see paragraph 11.6).

NOTE:
To save changes press the **[Save]** button, to cancel them press the **[Cancel] button**.

11.3. Motion Detection

To set motion detection go to ***SETTINGS – Event – Motion Detection***. You can set up to 10 independent detection zones which can also cross. To each zone you can set its own parameters. Motion detection can trigger message or file sending to e-mail, FTP or network storage, or CGI-command can be sent to HTTP-server. (*Pic. 11.40*).



Pic. 11.40

Name: a field which displays the list of motion detection zones. To see one of them on the screen click it with the left mouse button. After selecting you can also change the parameters of this zone.

Display All Range: check it to show the borders of all detection zones.

Name: enter a name to create a new detection zone and press the **[Add]** button to add new zone to the list.

IMPORTANT

When creating a new detection zone, be sure that its name does not correspond to name of the zones that have been already created. The maximum number of zones is ten.

Threshold: you can set a motion detection threshold for each zone by dragging a slider (*Pic. 11.40*) or entering a value in the range from 0 to 100. The more the value the more changes must happen to motion detection triggering.

NOTE:

To save changes press the **[Save]** button, to cancel them press the **[Cancel] button**.

Sensitivity: You can change motion detection sensitivity for each zone by dragging a slider (*Pic. 11.40*) or entering a value from 0 to 100. The more the value is the more sensitive a sensor.

NOTE:

To save changes press the **[Save]** button, to cancel them press the **[Cancel] button**.

To size a detection area drag the low frame border with a mouse and set a size which you need. To replace a detection zone put a mouse cursor in its center, press the left button and drag a zone at the place you need holding the button.

IMPORTANT!

Maximum recording duration will be equal to the sum of **«Pre-event Recording»** and **«Post-event Recording»** time intervals for a certain event server. For details, please, see paragraphs 11.1.1.1, 11.1.1.2 and 11.1.1.5.

[Add]: add a new detection zone.

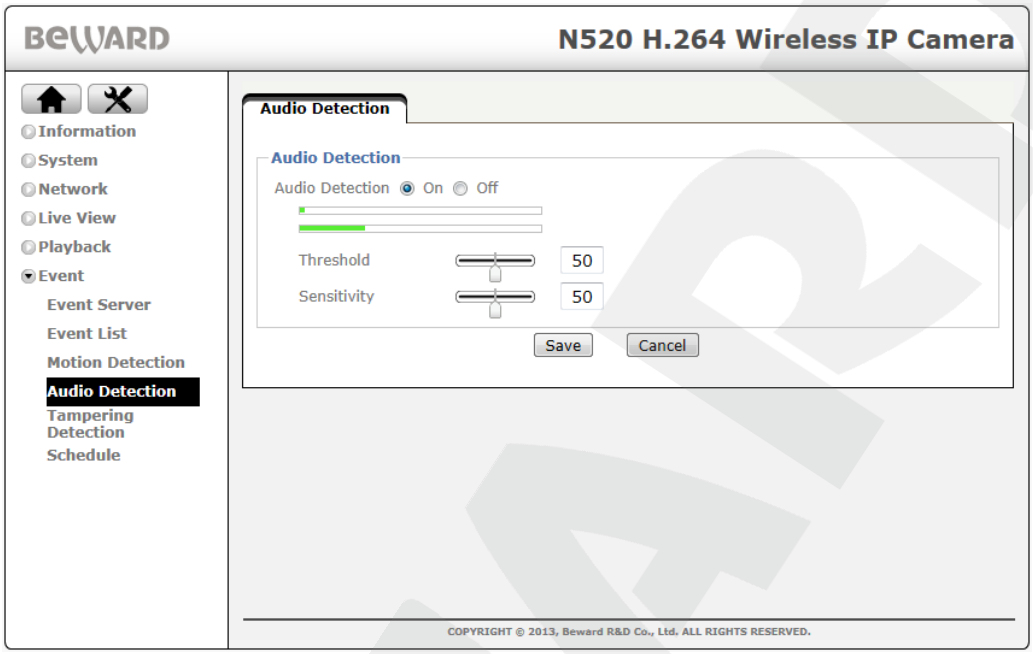
[Remove]: delete a selected detection zone.

IMPORTANT!

When setting this menu item note that this configuration will be applied to several camera functions using motion detection (data recording to NAS, to FTP server etc.).

11.4. Audio detection

Audio detection provides alarm event triggering by exceeding specified sound level in a detection zone. This menu allows you to set audio detection (Pic. *11.41)*.



Puc. 11.41

Threshold: you can set a threshold of audio detection triggering by dragging a slider (*Pic. 11.41*) or entering a value in the range from 0 to 100. The more the value the more changes must happen to audio detection triggering.

Sensitivity: You can change audio detection sensitivity for each zone by dragging a slider (*Pic. 11.41*) or entering a value from 0 to 100. The more the value the more sensitive is a sensor.

NOTE:
To save changes press the **[Save]** button, to cancel them press the **[Cancel] button**.

At the top of **«Audio detection»** window (*Pic. 11.41*) there are two indicators, which show the current audio detection settings. The low line shows the trigger value of a threshold. The upper line shows the current sound level. This indicator depends on detector sensitivity that you can change.

IMPORTANT!
To activate audio detection you should previously turn on a microphone in ***SETTINGS – Live View – Audio***. To do this set **[Audio Input Gain]** in any position different from **[Mute]**.

IMPORTANT!

Maximum recording duration will be equal to the sum of **«Pre-event Recording»** and **«Post-event Recording»** time intervals for a certain event server. For details, please, see paragraphs 11.1.1.1, 11.1.1.2 and 11.1.1.5.

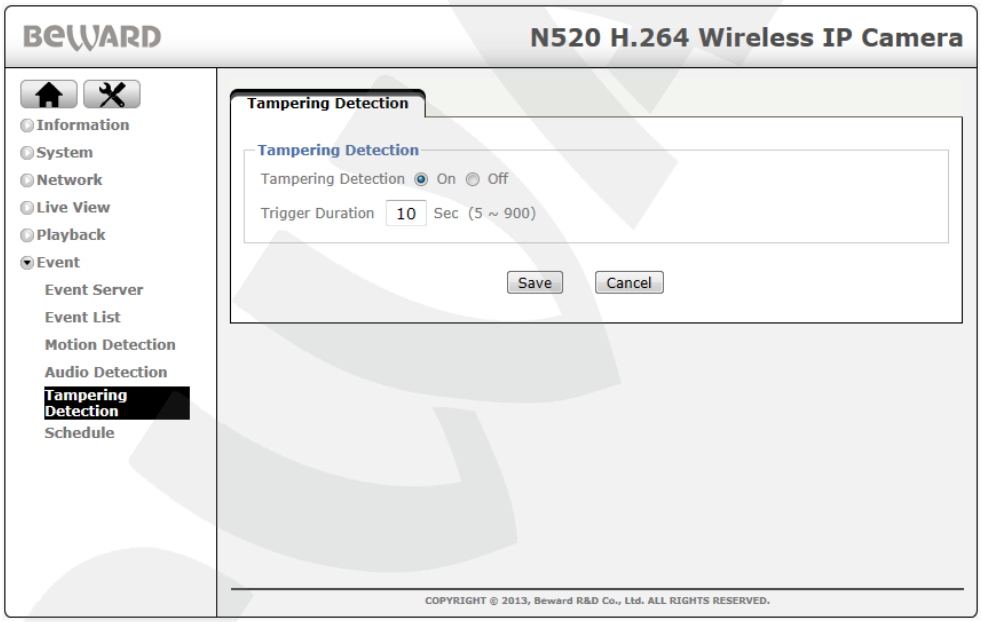
IMPORTANT!

When setting this menu item note that this configuration will be applied to several camera functions using motion detection (data recording to NAS, to FTP server etc.).

11.5 Tampering detection

Tampering detection allows informing surveillance services and operators about the camera status. So if a criminal covers the IP camera lens, then detection will trigger.

To set a tampering detection go to ***SETTINGS – Event – Tampering Detection*** menu and select **[On]** to make settings available (*Pic. 11.42*).



Pic. 11.42

Trigger duration: set the duration of lens covering after which tampering detection will trigger. The values from 5 to 900 sec are available.

NOTE:

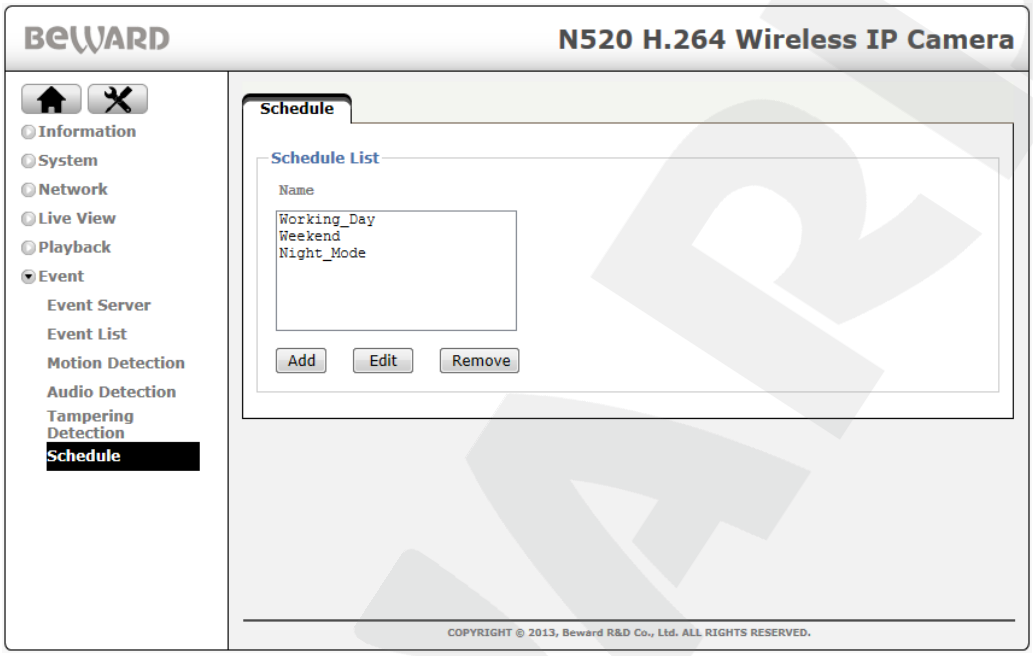
To save changes press the **[Save]** button, to cancel them press the **[Cancel] button**.

IMPORTANT!

Maximum recording duration will be equal to the sum of **«Pre-event Recording»** and **«Post-event Recording»** time intervals for a certain event server. For details, please, see paragraphs 11.1.1.1, 11.1.1.2 and 11.1.1.5.

11.6. Schedule

This menu allows you to set event servers work according to the certain schedule. To set schedule go to ***SETTINGS – Event – Schedule*** menu. By default the following modes are available: **“Working Day”, “Weekend”, “Night_Mode”**.



Pic. 11.43

Working day: a schedule for working week to record video from Monday to Friday from 8 a.m. to 5 p.m.

Weekend: a schedule for weekend to record video from Saturday to Sunday during 24 hours.

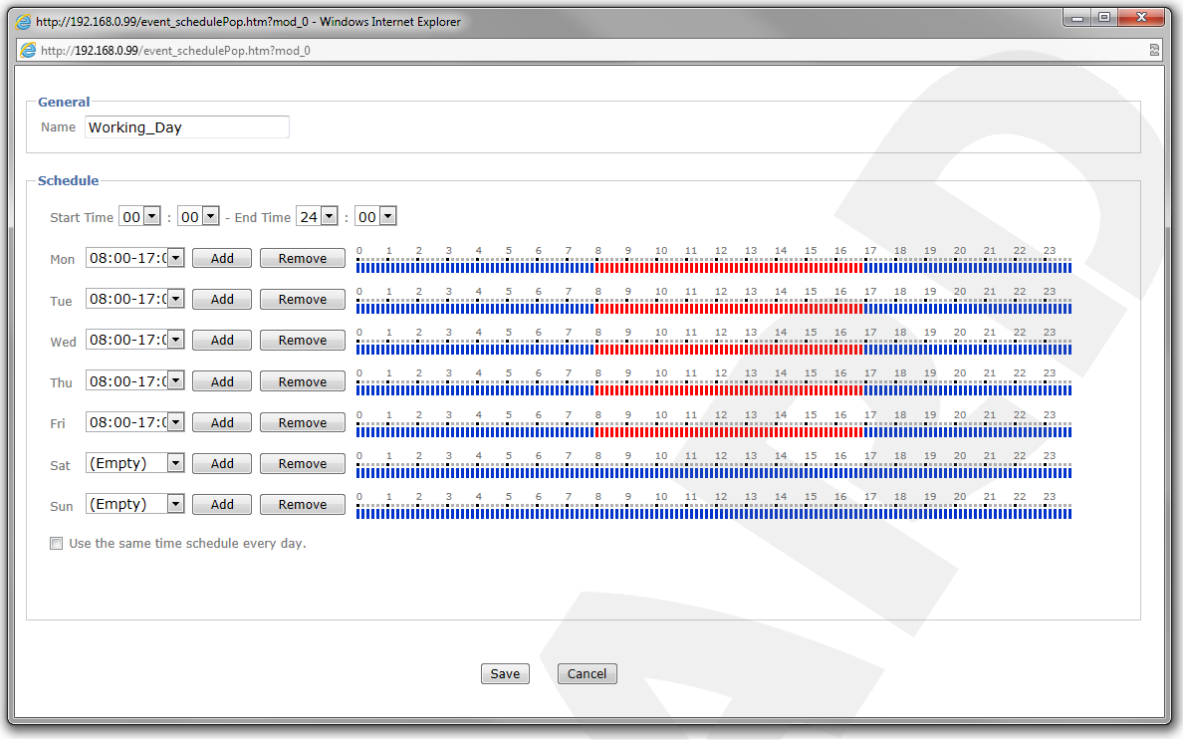
Night_Mode: a schedule to record video during 7 days from 6 p.m to 6 a.m.

[Edit]: press this button to edit a mode.

[Remove]: delete a selected schedule.

[Add]: add a selected schedule.

The menu for **[Edit]** and **[Add]** is the same (*Pic. 11.44*).



Pic. 11.44

Name: enter a schedule name.

Start Time, End Time: set a time period to add to the schedule.

Days of the week: for each day the following fields and buttons are available:

Time period: a field with a list of time interval for the current day.

[Add]: add the time period stated in **[Start]** and **[End]** fields to the schedule.

[Remove]: delete the time period stated in **[Start Time]** and **[End Time]** fields to the schedule.

NOTE:

There are 5 time periods are available for each day in a week.

Use the same time schedule every day: allows apply a schedule which is set to Monday to every day.

NOTE:

To save changes press the **[Save]** button.

Appendix

Appendix A. Bitrate Values

The tables below help you to estimate bitrate, considering the quality level and frames per second. See the information below to choose optimal parameters for your bandwidth.

For example, if you connect to the Internet over ADSL 256 kbps / 2 Mbps, the optimal solution is to select the standard quality, 640x480 resolution and 256 kbps bitrate.

A.1. H.264 15 fps – kbps

Quality	1280*1024	1280*720	640*480	320*240
Excellent	2800	1900	300	90
Detailed	1700	1300	200	75
Good	1300	900	170	60
Standard	800	600	150	55
Medium	600	450	130	45

A.2. H.264 10 fps – kbps

Quality	1280*1024	1280*720	640*480	320*240
Excellent	1900	1400	250	70
Detailed	1200	900	180	60
Good	900	650	160	55
Standard	650	450	130	50
Medium	450	350	120	40

A.3. H.264 fps – kbps

Resolution	Bitrate	Fps	Medium rate	Medium fps
1280*1024	6144	15	6300	15
1280*1024	6144	10	6300	10
1280*1024	2048	15	2200	15
1280*1024	2048	10	2200	10
1280*1024	512	15	550	15
1280*1024	512	10	550	10
1280*720	6144	15	6300	15
1280*720	6144	10	6300	10
1280*720	2048	15	2200	15

1280*720	2048	10	2200	10
1280*720	512	15	550	15
1280*720	512	10	550	10
640*480	6144	15	6300	15
640*480	6144	10	6300	10
640*480	2048	15	2200	15
640*480	2048	10	2200	10
640*480	512	15	550	15
640*480	512	10	550	16
320*240	6144	15	5100	15
320*240	6144	10	3600	10

A.4. MPEG4 15 fps – kbps

Quality	1280*1024	1280*720	640*480	320*240
Excellent	3800	3000	600	130
Detailed	2900	2200	450	110
Good	1800	1400	300	90
Standard	1200	900	250	70
Medium	900	600	200	60

A.5. MPEG4 10 fps – kbps

Quality	1280*1024	1280*720	640*480	320*240
Excellent	3000	2300	500	110
Detailed	2200	1600	400	100
Good	1400	1100	250	80
Standard	950	700	200	65
Medium	700	550	180	50

A.6. MJPEG fps – kbps

Resolution	Bitrate	Fps	Medium rate	Medium fps
1280*1024	6144	15	5200	12
1280*1024	6144	10	6300	10
1280*1024	2048	15	2200	15
1280*1024	2048	10	2200	10

1280*1024	512	15	550	15
1280*1024	512	10	550	10
1280*720	6144	15	6300	15
1280*720	6144	10	6300	10
1280*720	2048	15	2200	15
1280*720	2048	10	2200	10
1280*720	512	15	550	15
1280*720	512	10	550	10
640*480	6144	15	6300	15
640*480	6144	10	6300	10
640*480	2048	15	2200	15
640*480	2048	10	2200	10
640*480	512	15	550	15
640*480	512	10	550	10

A.7. MJPEG 15 fps – kbps

Quality	1280*1024	1280*720	640*480	320*240
Excellent	17500	16000	7800	2600
Detailed	12000	9500	4000	1500
Good	10000	6800	2900	1100
Standard	7000	5100	2200	800
Medium	4300	3200	1400	500

A.8. MJPEG 10 fps – kbps

Quality	1280*1024	1280*720	640*480	320*240
Excellent	16000	14500	5500	1700
Detailed	9000	6500	2700	1000
Good	6500	4700	2000	800
Standard	4700	3500	1500	600
Medium	2800	2200	1000	350

A.9. MJPEG fps – kbps

Resolution	Quality	Fps	Medium rate	Medium fps
1280*1024	Excellent	15	17500	8
1280*1024	Excellent	10	16000	8
1280*1024	Good	15	10000	15
1280*1024	Good	10	6500	10
1280*1024	Medium	15	4300	15
1280*1024	Medium	10	2800	10
1280*720	Excellent	15	16000	12
1280*720	Excellent	10	14500	10
1280*720	Good	15	6800	15
1280*720	Good	10	4700	10
1280*720	Medium	15	3200	15
1280*720	Medium	10	2200	10
640*480	Excellent	15	7800	15
640*480	Excellent	10	5500	10
640*480	Good	15	2900	15
640*480	Good	10	2000	10
640*480	Medium	15	1400	15
640*480	Medium	10	1000	10
320*240	Excellent	15	2600	15
320*240	Excellent	10	1700	10

Appendix B. Required Disk Space

This appendix provides information on required disk space for video records storage, considering its quality, bitrate and frames per second. The numbers listed in these tables are estimates only.

B.1. H.264, 15 fps, 24-hour record – record size (GB).

Quality	1280*1024	1280*720	640*480	320*240
Excellent	232.4	157.7	24.9	7.5
Detailed	141.4	107.9	16.6	6.3
Good	107.9	74.7	14.2	5
Standard	66.4	49.8	12.5	4.6
Medium	49.8	37.4	10.8	3.8

B.2. H.264, 10 fps, 24-hour record – record size (GB).

Quality	1280*1024	1280*720	640*480	320*240
Excellent	157.7	116.2	20.8	5.9
Detailed	99.6	74.7	15	5
Good	74.7	54	13.3	4.7
Standard	54	37.4	10.8	4.2
Medium	37.4	29.1	10	3.4

B.3. H.264, 24-hour record – record size (GB).

Resolution	Bitrate	Fps	Record Size (GB)
1280*1024	6144	15	522.9
1280*1024	6144	10	522.9
1280*1024	2048	15	182.6
1280*1024	2048	10	182.6
1280*1024	512	15	45.7
1280*1024	512	10	45.7
1280*720	6144	15	522.9
1280*720	6144	10	522.9
1280*720	2048	15	182.6
1280*720	2048	10	182.6
1280*720	512	15	45.7

1280*720	512	10	45.7
640*480	6144	15	522.9
640*480	6144	10	522.9
640*480	2048	15	182.6
640*480	2048	10	182.6
640*480	512	15	45.7
640*480	512	10	45.7
320*240	6144	15	423.3
320*240	6144	10	298.8

B.4. MPEG4, 15 fps, 24-hour record – record size (GB).

Quality	1280*1024	1280*720	640*480	320*240
Excellent	315.4	249	49.8	10.8
Detailed	240.7	182.6	37.4	9.2
Good	149.4	116.2	24.9	7.5
Standard	99.6	74.7	20.8	5.9
Medium	74.7	49.8	16.6	5

B.5. MPEG4, 10 fps, 24-hour record – record size (GB).

Quality	1280*1024	1280*720	640*480	320*240
Excellent	249	190.9	41.5	9.2
Detailed	182.6	132.8	33.2	8.3
Good	116.2	91.3	20.8	6.7
Standard	78.9	58.1	16.6	5.4
Medium	58.1	45.7	14.5	4.2

B.6. MPEG4, 24-hour record – record size (GB).

Resolution	Bitrate	Fps	Record Size (GB)
1280*1024	6144	15	431.6
1280*1024	6144	10	522.9
1280*1024	2048	15	182.6
1280*1024	2048	10	182.6
1280*1024	512	15	45.7
1280*1024	512	10	45.7

1280*720	**6144**	**15**	**522.9**
1280*720	**6144**	**10**	**522.9**
1280*720	**2048**	**15**	**182.6**
1280*720	**2048**	**10**	**182.6**
1280*720	**512**	**15**	**45.7**
1280*720	**512**	**10**	**45.7**
640*480	**6144**	**15**	**522.9**
640*480	**6144**	**10**	**522.9**
640*480	**2048**	**15**	**182.6**
640*480	**2048**	**10**	**182.6**
640*480	**512**	**15**	**45.7**
640*480	**512**	**10**	**45.7**

Appendix C. Port Values

Port	Default Value	Range of Values
HTTP	80	1124..65534
HTTP forwarding via UPnP	80	1024..65534
HTTPS forwarding via UPnP	443	1024..65534
RTSP	554	1124..65534
RTSP forwarding via UPnP	554	1024..65534
Initial RTP range port	5000	1124..65435
Final RTP range port	7999	1223..65534
Multicast video port	-	1124..65534
Multicast audio port	-	1124..65534
SMTP	25	1..65535
System log remote server port	514	1024..65534
Event server port	80	1..65535
Proxy server port	-	1..65535
Motion detection	1999	-
MPEG4 streaming (HTTP)	80	1124..65534
MJPEG streaming (HTTP)	80	1124..65534

Appendix D. Factory Defaults

This table provides camera factory defaults

Parameter	Value
IP address	**192.168.0.99**
Subnet mask	**255.255.255.0**
Gateway	**192.168.0.1**
User name (administrator)	**admin**
Password (administrator)	**admin**
HTTP port	**80**
RTSP port	**554**
SMTP port	**25**

Appendix E. Glossary

3GP (3GPP file format) is a multimedia container format defined by the Third Generation Partnership Project (3GPP) for 3G UMTS multimedia services. It is used on 3G mobile phones but can also be played on some 2G and 4G phones.

ActiveX is a standard that enables software components to interact with one another in a networked environment, regardless of the language(s) used to create them. Web browsers may come into contact with ActiveX controls, ActiveX documents, and ActiveX scripts. ActiveX controls are often downloaded and installed automatically as required.

Asymmetric Digital Subscriber Line (ADSL) is an obsolete type of Digital Subscriber Line technology, a data communications technology that enables faster data transmission over copper telephone lines than a conventional voiceband modem can provide.

Angle is the field of view, relative to a standard lens in a 35mm still camera, expressed in degrees, e.g. 30°. For practical purposes, this is the area that a lens can cover, where the angle of view is determined by the focal length of the lens. A wide-angle lens has a short focal length and covers a wider angle of view than standard or telephoto lenses, which have longer focal lengths.

ARP (Address Resolution Protocol) is used to associate an IP address to a hardware MAC address. A request is broadcast on the local network to discover the MAC address for an IP address.

Aspect ratio is a ratio of width to height in images. A common aspect ratio used for television screens and computer monitors is 4:3. High-definition television (HDTV) uses an aspect ratio of 16:9.

Authentication is the process of identifying an individual, usually based on a user name and password. In security systems, authentication is distinct from authorization, which is the process of giving individuals access to system objects based on their identity. Authentication merely ensures that the individual is who he or she claims to be, but says nothing about the access rights of the individual.

Autoiris (or DC-Iris).This special type of iris is electrically controlled by the camera, to automatically regulate the amount of light allowed to enter.

Bit rate: (in kbit/s or Mbit/s) is often referred to as speed, but actually defines the number of bits/time unit and not distance/time unit.

Backlight Compensation compensates for strong backlighting, so that subjects appear clearly instead of as silhouettes.

Bonjour, also known as zero-configuration networking, Bonjour enables automatic discovery of computers, devices, and services on IP networks. Bonjour allows devices to automatically discover each other without the need to enter IP addresses or configure DNS servers. Bonjour is developed by Apple Computer Inc.

CCD (Charged Coupled Device). This light-sensitive image device used in many digital cameras is a large integrated circuit that contains hundreds of thousands of photo-sites (pixels) that convert light energy into electronic signals. Its size is measured diagonally and can be 1/4", 1/3", 1/2" or 2/3".

CGI (Common Gateway Interface) is a specification for communication between a web server and other (CGI) programs. For example, a HTML page that contains a form might use a CGI program to process the form data once it is submitted.

Classless Inter Domain Routing (CIDR) is a method for assigning IP addresses without using the standard IP address classes like Class A, Class B or Class C. In CIDR notation, an IP address is represented as A.B.C.D /n, where "/n" is called the IP prefix or network prefix. The IP prefix identifies the number of significant bits used to identify a network. For example, 192.9.205.22 /18 means, the first 18 bits are used to represent the network and the remaining 14 bits are used to identify hosts. Common prefixes are 8, 16, 24, and 32.

Complementary metal–oxide–semiconductor (CMOS) is a technology for constructing integrated circuits. CMOS technology is used in microprocessors, microcontrollers, static RAM, and other digital logic circuits. CMOS technology is also used for several analog circuits such as image sensors (CMOS sensor), data converters, and highly integrated transceivers for many types of communication.

Dynamic DNS is a method/protocol/network service that provides the capability for a networked device, such as a router or computer system using the Internet Protocol Suite, to notify a Domain Name System (DNS) name server to change, in real time, the active DNS configuration of its configured hostnames, addresses or other information.

DHCP (Dynamic Host Configuration Protocol) is a protocol that lets network administrators automate and centrally manage the assignment of Internet Protocol (IP) addresses to network devices in a network. DHCP uses the concept of a "lease" or amount of time that a given IP address will be valid for a computer. The lease time can vary, depending on how long a user is likely to require the network connection at a particular location. DHCP also supports static addresses for e.g. computers running web servers, which need a permanent IP address.

Digital zoom is a method of decreasing (narrowing) the apparent angle of view of a digital photographic or video image. Digital zoom is accomplished by cropping an image down to a centered area with the same aspect ratio as the original, and usually also interpolating the result back up to the pixel dimensions of the original. It is accomplished electronically, with no adjustment of the camera's optics, and no optical resolution is gained in the process.

Domain server can also be used by organizations that wish to centralize the management of their (Windows) computers. Each user within a domain has an account that usually allows them to log in to and use any computer in the domain, although restrictions may also apply. The domain server is the server that authenticates the users on the network.

Ethernet is the most widely installed local area network technology. An Ethernet LAN typically uses special grades of twisted pair wires. The most commonly installed Ethernet systems are 10BASE-T and 100BASE-T10, which provide transmission speeds up to 10 Mbps and 100 Mbps respectively.

Factory default settings are the settings that originally applied for a device when it was first delivered from the factory. If it should become necessary to reset a device to its factory default settings, this will, for many devices, completely reset any settings that were changed by the user.

Firewall works as a barrier between networks, e.g. between a Local Area Network and the Internet. The firewall ensures that only authorized users are allowed to access the one network from the other. A firewall can be software running on a computer, or it can be a standalone hardware device.

Focal length is measured in millimeters; the focal length of a camera lens determines the width of the horizontal field of view, which in turn is measured in degrees.

FPS (frames per second) a measure of how much information is used to store and display motion video. The term applies equally to film video and digital video. Each frame is a still image; displaying frames in quick succession creates the illusion of motion. The more frames per second (fps), the smoother the motion appears.

Frame is a complete video image. In the 2:1 interlaced scanning format of the RS-170 and CCIR formats, a frame is made up of two separate fields of 262.5 or 312.5 lines interlaced at 60 or 50 Hz to form a complete frame, which appears at 30 or 25 Hz. In video cameras with a progressive scan, each frame is scanned line-by-line and not interlaced; most are also displayed at 30 and 25 Hz.

FTP (File Transfer Protocol) is an application protocol that uses the TCP/IP protocols, used to exchange files between computers/devices on networks.

Full-duplex means transmission of data in two directions simultaneously. In an audio system this would describe e.g. a telephone system. Half-duplex also provides bi-directional communication, but only in one direction at a time, as in a walkie-talkie system.

G.711 is the default pulse code modulation (PCM) standard for Internet Protocol (IP) private branch exchange (PBX) vendors, as well as for the public switched telephone network (PSTN). G.711 digitizes analog voice signals producing output at 64 kilobits per second (Kbps).

Gain is the amplification factor and the extent to which an analog amplifier boosts the strength of a signal. Amplification factors are usually expressed in terms of power. The decibel (dB) is the most common way of quantifying the gain of an amplifier.

Gateway is a point in a network that acts as an entry point to another network. In a corporate network for example, a computer server acting as a gateway often also acts as a proxy server and a firewall server. A gateway is often associated with both a router, which knows where

to direct a given packet of data that arrives at the gateway, and a switch, which furnishes the actual path in and out of the gateway for a given packet.

HTTP (Hypertext Transfer Protocol) is the set of rules for exchanging files (text, graphic images, sound, video, and other multimedia files) on the web. The HTTP protocol runs on top of the TCP/IP suite of protocols.

HTTPS (Hypertext Transfer Protocol over SSL) is a web protocol used by browsers and web servers to encrypt and decrypt user page requests and the pages returned by the server. The encrypted exchange of information is governed by the use of an HTTPS certificate (issued by a Certificate Authority), which guarantees the authenticity of the server.

Hub is used to connect multiple devices to the network. The hub transmits all data to all devices connected to it, whereas a switch will only transmit the data to the device it is specifically intended for.

ICMP is a network protocol useful in Internet Protocol (IP) network management and administration. ICMP is a required element of IP implementations. ICMP is a control protocol, meaning that it does not carry application data, but rather information about the status of the network itself.

IEEE 802.11 is a family of standards for wireless LANs. The 802.11 standard supports 1 or 2 Mbit/s transmission on the 2.4 GHz band. IEEE 802.11b supports data rates up to11 Mbit/s on the 2.4 GHz band, while 802.11g allows up to 54 Mbit/s on the 5 GHz band.

Interlacing. Interlaced video is video captured at 50 pictures (known as fields) per second, of which every 2 consecutive fields (at half height) are then combined into 1 frame. Interlacing was developed many years ago for the analog TV world and is still used widely today. It provides good results when viewing motion in standard TV pictures, although there is always some degree of distortion in the image.

Internet Explorer (formerly Microsoft Internet Explorer, commonly abbreviated IE or MSIE) is a series of graphical web browsers developed by Microsoft and included as part of the Microsoft Windows line of operating systems, starting in 1995.

IP66 is a two digit number developed by the international electrical Commission, and is used to provide Ingress Protection (IP) rating to a piece of electronic equipment or to an enclosure for electronic equipment. The Ingress protection code indicates the level and amount of protection. The first digit means no ingress of dust; complete protection against contact. The second digit means water projected in powerful jets (12.5mm nozzle) against the enclosure from any direction shall have no harmful effects.

IP camera. The terms IP camera, network camera and Internet camera all refer to the same thing - a camera and computer combined in one unit. It operates as stand-alone unit and only requires a connection to the network.

JPEG (Joint Photographic Experts Group).Together with the GIF file format, JPEG is an image file type commonly used on the web. A JPEG image is a bitmap, and usually has the file extension '.jpg' or ".jpeg." When creating a JPEG image, it is possible to configure the level of compression to use. As the lowest compression (i.e. the highest quality) results in the largest file, there is a trade-off between image quality and file size.

kbit/s (kilobits per second) is a measure of the bit rate, i.e. the rate at which bits are passing a given point. See also Bit rate.

LAN (Local Area Network) is a group of computers and associated devices that typically share common resources within a limited geographical area.

Lux is a standard unit of illumination measurement.

MAC address (Media Access Control address) is a unique identifier associated with a piece of networking equipment, or more specifically, its interface with the network. For example, the network card in a computer has its own MAC address.

Mbit/s (Megabits per second) is a measure of the bit rate, i.e. the rate at which bits are passing a given point. Commonly used to give the "speed" of a network. A LAN might run at 10 or 100 Mbit/s.

Motion JPEG is a simple compression/decompression technique for network video. Latency is low and image quality is guaranteed, regardless of movement or complexity of the image. Image quality is controlled by adjusting the compression level, which in turn provides control over the file size, and thereby the bit rate.

MPEG-4 is a group of audio and video coding standards and related technology. The primary uses for the MPEG-4 standard are web (streaming media) and CD distribution, conversational (videophone), and broadcast television. Most of the features included in MPEG-4 are left to individual developers to decide whether to implement them or not. This means that there are probably no complete implementations of the entire MPEG-4 set of standards. To deal with this, the standard includes the concept of "profiles" and "levels", allowing a specific set of capabilities to be defined in a manner appropriate for a subset of applications.

Multicast is a bandwidth-conserving technology that reduces bandwidth usage by simultaneously delivering a single stream of information to multiple network recipients.

Network Time Protocol (NTP) is a protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks. It is designed particularly to resist the effects of variable latency by using a jitter buffer.

NTSC (National Television System Committee) is an analog color encoding system used in television systems in Japan, the United States and other parts of the Americas. NTSC defines the video signal using 525 TV lines per frame, at a refresh rate equal to 30 frames per second. See also PAL.

ONVIF (Open Network Video Interface Forum) is a global and open industry forum with the goal to facilitate the development and use of a global open standard for the interface of physical IP-based security products. Or in other words, to create a standard for how IP products within video surveillance and other physical security areas can communicate with each other. ONVIF is an organization started in 2008 by Axis Communications, Bosch Security Systems and Sony.

PAL (Phase Alternating Line) is an analog color encoding system used in television systems in Europe and in many other parts of the world. PAL defines the video signal using 625 TV lines per frame, at a refresh rate equal to 25 frames per second.

Power over Ethernet or PoE provides power to a network device via the same cable as used for the network connection. This is very useful for IP-Surveillance and remote monitoring applications in places where it may be too impractical or expensive to power the device from a power outlet.

PPP (Point-to-Point Protocol) is a protocol that uses a serial interface for communication between two network devices. For example, a PC connected by a phone line to a server.

Point-to-Point Protocol over Ethernet (PPPoE) is a network protocol for encapsulating Point-to-Point Protocol (PPP) frames inside Ethernet frames. It is used mainly with DSL services where individual users connect to the DSL modem over Ethernet and in plain Metro Ethernet networks.

Progressive scan, as opposed to interlaced video, scans the entire picture, line by line every sixteenth of a second. In other words, captured images are not split into separate fields as in interlaced scanning.

Jack-45 is an eight-wire connector used to connect computers onto a local-area networks (LAN), especially Ethernets. RJ-45 connectors look similar to the RJ-11 connectors used for connecting telephone equipment, but they are a bit wider.

Router is a device that determines the next network point to which a packet should be forwarded on its way to its final destination. A router creates and/or maintains a special routing table that stores information on how best to reach certain destinations. A router is sometimes included as part of a network switch.

RTP is an Internet protocol for the transport of real-time data, e.g. audio and video. It can be used for media-on-demand as well as interactive services such as Internet telephony.

RTSP (Real Time Streaming Protocol) is a control protocol, and a starting point for negotiating transports such as RTP, multicast and Unicast, and for negotiating codecs.

RTSP can be considered a “remote control” for controlling the media stream delivered by a media server. RTSP servers typically use RTP as the protocol for the actual transport of audio/video data.

Shutter is the device on the camera that opens and closes to control how long the focal plane is exposed to light.

SMTP is used for sending and receiving e-mail. However, as it is "simple," it is limited in its ability to queue messages at the receiving end, and is usually used with one of two other protocols, POP3 or IMAP. These other protocols allow the user to save messages in a server mailbox and download them periodically from the server.

SMTP authentication is an extension of SMTP, whereby the client is required to log into the mail server before or during the sending of email. It can be used to allow legitimate users to send email while denying the service to unauthorized users, such as spammers.

SSL/TLS (Secure Socket Layer/Transport Layer Security). These two protocols (SSL is succeeded by TLS) are cryptographic protocols that provide secure communication on a network. SSL is commonly used over HTTP to form HTTPS, as used e.g. on the Internet for electronic financial transactions. SSL uses public key certificates to verify the identity of the server.

Subnet & subnet mask is an identifiably separate part of an organization's network. Typically, a subnet may represent all the machines at one geographic location, in one building, or on the same local area network (LAN). Having an organization's network divided into subnets allows it to be connected to the Internet with a single shared network address. The subnet mask is the part of the IP address that tells a network router how to find the subnet that the data packet should be delivered to. Using a subnet mask saves the router having to handle the entire 32-bit IP address; it simply looks at the bits selected by the mask.

Switch is a network device that connects network segments together, and which selects a path for sending a unit of data to its next destination. In general, a switch is a simpler and faster mechanism than a router, which requires knowledge about the network and how to determine the route. Some switches include the router function.

TCP is used along with the Internet Protocol (IP) to transmit data as packets between computers over the network. While IP takes care of the actual packet delivery, TCP keeps track of the individual packets that the communication (e.g. requested a web page file) is divided into, and, when all packets have arrived at their destination, it reassembles them to re-form the complete file.

TCP is a connection-oriented protocol, which means that a connection is established between the two end-points and is maintained until the data has been successfully exchanged between the communicating applications.

Time to live (TTL) is mechanism that limits the lifespan of data in a computer or network. TTL may be implemented as a counter or timestamp attached to or embedded in the data. Once the prescribed event count or timespan has elapsed, data is discarded. In computer networking, TTL prevents a data packet from circulating indefinitely. In computing applications, TTL is used to improve performance of caching or improve privacy.

UDP is a communications protocol that offers limited service for exchanging data in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol (TCP). The advantage of UDP is that it is not required to deliver all data and may drop network packets when there is e.g. network congestion. This is suitable for live video, as there is no point in re-transmitting old information that will not be displayed anyway.

Universal Plug and Play (UPnP) is a set of networking protocols for primarily residential networks without enterprise class devices that permits networked devices, such as personal computers, printers, Internet gateways, Wi-Fi access points and mobile devices to seamlessly discover each other's presence on the network and establish functional network services for data sharing, communications, and entertainment.

Uniform Resource Locator or Unified Resource Locator (URL) is a character string that specifies where a known resource is available on the Internet and the mechanism for retrieving it.

Wireless Application Protocol (WAP) is a technical standard for accessing information over a mobile wireless network. A WAP browser is a web browser for mobile devices such as mobile phones (called "cellular phones" in some countries) that uses the protocol.

Web server is a program, which allows Web browsers to retrieve files from computers connected to the Internet. The Web server listens for requests from Web browsers and upon receiving a request for a file sends it back to the browser.

The primary function of a Web server is to serve pages to other remote computers; consequently, it needs to be installed on a computer that is permanently connected to the Internet. It also controls access to the server whilst monitoring and logging server access statistics.

Wireless LAN is a wireless local area network that uses radio waves as its carrier: where the network connections for end-users are wireless. The main network structure usually uses cables.