NetServer-6 User's Guide

* This manual is for NetServer-6 firmware version 1.4.0. If your NetServer has the later version of firmware, please download the last updated user's guide from WebGate's homepage (www.webgateinc.com)

System Requirements

■ **For NetServer**

- Network: 10 Base-T LAN
  (Leased line, xDSL, Cable Modem, ISDN) or PSTN

■ **For a PC to access NetServer**

- Processor: Pentium II and above
- RAM: 64MB and more
- OS: Windows 98/NT/2000
- Screen Resolution: 1024 X 768 pixels and above
- Network: 10 Base-T LAN or PSTN
- Web Browser: MS Internet Explorer 5.0 and above
  NS Navigator 4.7 and above

Philips Communications, Security & Imaging

FCC Compliance Statement

Caution : Any changes or modifications in construction of this device which are not expressly approved the party responsible for compliance could void the user's authority to operate the equipment.

NOTE : This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications, However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.
Disposal of used batteries according to the general recommendations against the environmental pollution.

Important Notice

1. NetServer-6 is not weatherproof. Please note the environmental specifications that are included in the manual. For outdoor usage, equip a weatherproof case to protect the NetServer-6 from water, moisture, or extreme temperature changes (higher or lower than the specifications noted below). The NetServer-6 can be cleaned by gently wiping with a clean dry cloth.

2. Be sure to use the DC adapter that is provided by Web Gate Inc. Connecting NetServer B106 directly to an AC current may cause damage to the NetServer.

3. Be cautious in handling NetServer-6 Physical shock such as dropping the unit may damage the NetServer-6 and void warranty.

4 The NetServer-6 is made of aluminum. Be sure that it is fastened tightly during installation to avoid any human injuries. Make sure to place away from the reach of children.

5. If NetServer-6 does not operate properly, please contact your WebGate distributor for after sales service. Unauthorized personnel are prohibited from disassembling the product. Disassembly will automatically result in void of service warranty.

6. Camera surveillance laws may differ for each country and from province to province. Contact the local region representative to avoid any violations and to apply for authorized purposes only.

I. Introduction

- **What is NetServer-6 ?**

  The NetServer-6 is a network CCTV camera server solution with an integrated Internet server, image compression device, flash memory, and many other features. No other hardware is necessary for use. The NetServer-6 relays video source from a CCTV camera to network and provides real time images over networks and the Internet. Simply provide power and connect LAN cable and video cable to the NetServer-6 . NetServer-6 utilizes Wavelet image compression and Linux operating system. Wavelet and Linux enable NetServer-6 to transfer high quality images faster and with a greater degree of reliability than standard JPEG systems.

- **Features and Benefits**

  Ease of Use – NetServer-6 requires either Netscape Navigator 4.7 (or higher) or Microsoft Internet Explorer 5.0 (or higher) for use. Windows 2000 is recommended for best results. Connect NetServer-6 to the Internet and it is ready for use.

  Compatible with most Systems and Protocols – NetServer-6 supports TCP/IP networking, SMTP, HTTP and other Internet-related protocols. In addition, the NetServer-6 can be used in mixed operating system environments, such as Windows, UNIX, Macintosh and OS/2. NetServer-6 also integrates easily into other Internet/Intranet applications and CGI scripts.

  Simple Administration - NetServer-6 can be configured and managed directly from its own web page. Moreover, as new upgrades become available, it is easy to upgrade NetServer-6 remotely over the network.

  Wavelet Image Format - Unlike many other products that need to fracture image files prior to broadcast, the NetServer-6 delivers complete, highly compressed pictures in Wavelet format. Wavelet has image compression rates 30-300% higher than standard JPEG. By utilizing Wavelet, image file sizes are much smaller than conventional camera servers and Wavelet's image quality is superior to other camera servers as well. Wavelet can transmit up to 123 frames per second.

  External Device Connection - External devices such as IR-sensors, switches, alarm relays and external video input can be connected to NetServer-6 via six auxiliary Input ports.

  User's Programmable Space – NetServer-6 contains 4.5MB of configurable Flash Memory for user-programmable and user-configurable space. Because NetServer-6 also acts as a server, this space can be used to create a personal web page.

  Embedded Linux Operating System – NetServer-6 uses an embedded Linux operating system within its 32bit RISC CPU. Linux is based on UNIX and is one of the most stable operating systems available. There is very little chance of the operating system crashing.

II. Product Description

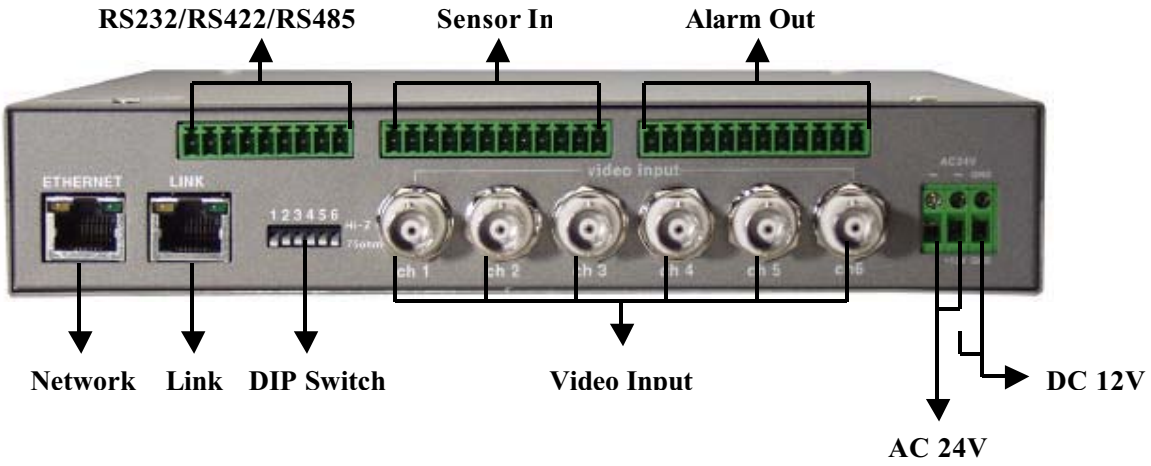
1. NetServer-6

1) Contents

* Unpack and check all the items as below.

Item	Description	Remarks
NetServer-6	Network server for CCTV camera	
Manual	NetServer-6 User's Guide Quick reference guide	Provided on CD Printed material
Crossover Cable	1 m crossover cable	Red-colored
Direct Cable	2 m direct cable	White-colored
DB-9 Connector and wire	DB-9 connector wired with 1 meter communication cable to connect with an external Modem	
Adapter & Power Cable	DC 12V, 1.5A	
CD ROM title	Setup program and manual	

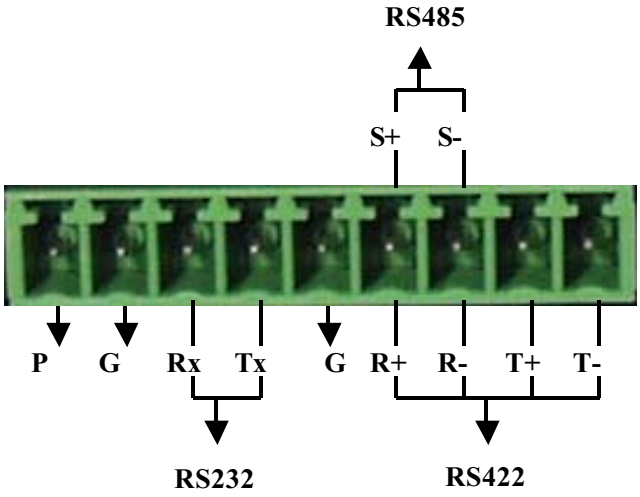
2) NetServer-6 View and Descriptions



Connector Name		Description	Remark
DIP switch		To designate video signal termination of ‘ Video Input’ BNC connector	
BNC connector	CH1, CH2, CH3, CH4, CH5, CH6	To input video signal through a coaxial cable	
AC 24V		To connect a power supply unit of 24V AC	
DC 12V		To connect a power supply unit of 12V DC	
RJ-45 Ethernet port		To connect 10 Base-T Ethernet cable	

Link port	Stackable up to three boxes only with one IP	
RS232/RS422/RS485	To communicate between external devices. These pins are for devices that satisfy RS-232, RS422, or RS485	
Sensor In	To input video signal through 6 coaxial cables	
Alarm Out	To output video signal through 6 coaxial cables	

3) RS232/RS422/RS485 Descriptions



Connector Name	Description	Remark
Power	To supply power to external devices	
Ground	To ground cables of power, communication, etc.	
RS-232	To communicate between NetServer-6 and external devices such a CCTV camera, NetServer A10 (An audio transmission kit), or an external modem. These pins are for devices that satisfy RS-232C protocol, and they are consisted in RX and TX.	
RS-422	To communicate between NetServer-6 and a CCTV camera that satisfies RS-422 protocol. They are half-duflex. It is consisted in R+, R-, T+, and T-.	
RS-485	To communicate between NetServer-6 and a CCTV camera that satisfies RS-485 protocol. They are consisted in S+ and S-.	

4) Description on LED of Ethernet Port

Yellow LED: This LED indicates the status of data transmission. After power is supplied, it is on for the first 45 seconds and then it goes off. And it blinks continuously when a user access NetServer and NetServer transmits data.

Green LED: This LED indicates the status of networking. After power is supplied, it is on for the first 1-2 seconds, and then it blinks once at every one second as long as the network is connected.

Phenomenon of Malfunction

1. Network Malfunction

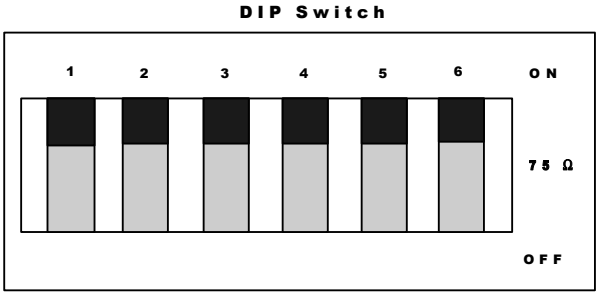
- Green LED blinks once at every 4 seconds
- Check if Ethernet cable is connected properly or the Network works.

2. Software Malfunction

- Green and yellow LEDs are on, and they blink 6 times rapidly at every 10 seconds.
- This problem is to be solved with A/S program. Contact the dealer from who you bought NetServer.

- After being on for a second, Green and yellow LEDs blink 6 times rapidly. Then green LED is on and yellow LED is off.
- This problem is to be solved by re-installing firmware. Visit WebGate's Internet homepage to download the firmware and install it on your NetServer.

5) Descriptions on DIP Switches

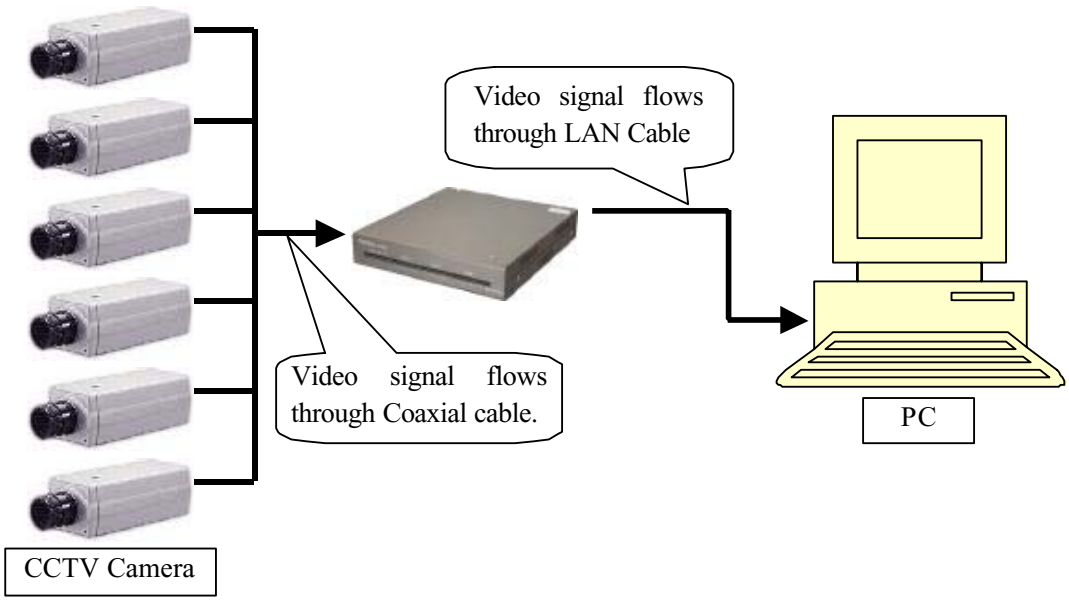


To configure the function of the six coaxial cable ports at the rear of NetServer-6 .

You can configure the relevant channels with each switch.
If you connect two CCTV cameras to Video Inputs and monitor real time video through 1 and 2 channels, place the two DIP switches (marked with No. 1 and 2) at upper position 'ON' and the others at lower position 'OFF'. If you connect six CCTV cameras to Video Inputs and monitor real time video through all channels, place all of six DIP switches at upper position 'ON'.

You can view a real-time image only through PC monitor, because NetServer-6 is not supported

Video output.



Note in connecting cable to terminal block

When you connect cable to terminal block, you should peel off the cover of cable by 1.5Cm and insert the cable by 2Cm into the terminal block.(communication., sensor, alarm and etc) In case of power cable, the white mark of two lines means ‘ +’ .

III. NetServer-6 Installation Summary, Connection & Placing

1. Installation Summary

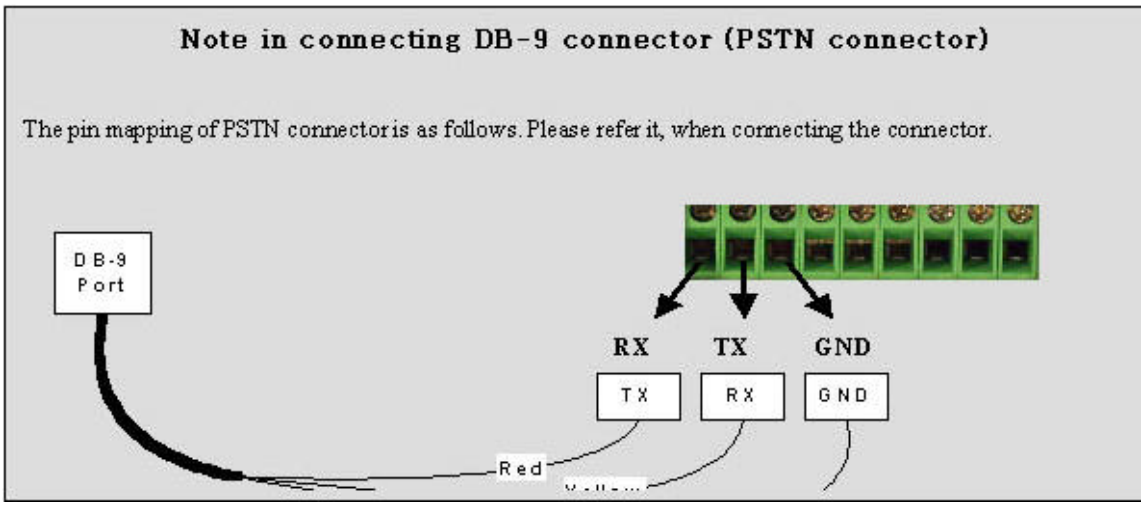
- Connect Ethernet and Power to NetServer on local network for configuration.
- Install NetServer Setup Program into a PC on local network.
- Assign an IP address to NetServer and configure administrator' s condition.
- Configure user' s condition.
- Place NetServer, re-connect power and Ethernet.

2. Connecting

- Connect Ethernet line to the Ethernet port in the rear.
- Connect the power supply.
- Confirm that the LED of the Ethernet port blinks.

IV. Installing NetServer-6 Setup Program

- Insert the NetServer Setup disk.
- Drag the NetServer Setup icon onto the desktop.
- Double-click on the icon.



V. Assigning IP Address and Configuring Administrator' s Condition

Important

To access NetServer, you firstly have to assign an appropriate IP address. When you assign an IP address to NetServer, make sure to use unoccupied IP address, and not to use the default or example IP address.

Terminology

IP Address

IP address is an identification code for computers and devices on a TCP/IP network. Networks using TCP/IP protocol route deliver messages as based on the IP address of the destination. Within a closed network, IP addresses can be assigned at random as long as each one is unique. However, connecting a private network to the Internet requires using registered IP addresses to avoid duplicates. IP address can be acquired from a network administrator or an Internet service provider.

MAC Address (Media Access Control Address)

MAC address is a hardware identification code that uniquely identifies each node of a network. The MAC layer interfaces directly with the network media. Consequently, each type of network media requires a different MAC layer. The MAC address of NetServer is a 12-digit numbers. A unique MAC address can be found on the label at the bottom of each NetServer.

Crossover Cable

The crossover cable (red) provided with the NetServer is used to connect the NetServer with a PC. A HUB is not necessary to connect the NetServer to a PC if a crossover cable is used.

Direct Cable

The direct cable (white) should be used if a HUB is used as an intermediary between the NetServer and PC.

1. Connecting NetServer-6 to a PC

1) Connecting NetServer-6 on Internet or LAN

Use the direct cable (white colored one) to connect NetServer-6 to Internet or LAN. With this connection, remote users will not be able to access NetServer until local user configures NetServer' s network setting.

2) Connecting NetServer-6 to a PC

Use the crossover cable (red colored one) to directly connect NetServer-6 to a PC. This connection is to be used to configure NetServer.

IP Address Assigning Methods

- With setup program
  - Assemble and place NetServer.
  - Assign IP address to NetServer using setup program on local network.
  - Access NetServer through Web browser with the IP address and configure user' s condition and administrator' s condition.
  - If it is impossible to assign IP address with setup program, try it with ARP command.

- With ARP command
  - Assemble and place NetServer.
  - Assign IP address using ARP command on local network.
  - Access NetServer through Web browser with the IP address and configure user' s condition and administrator' s condition.

2. Assigning IP address and Configuring administrator' s condition with Setup program

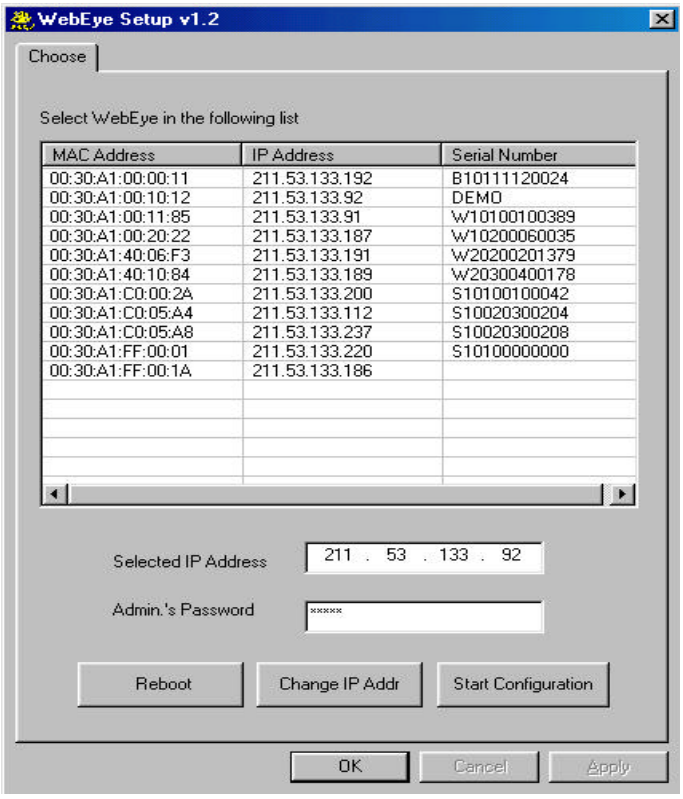
1) Starting Setup Program for NetServer-6

Click the "NetServerSetup.exe" file on your PC. When the Setup Program is executed, the setup program detects and shows every NetServer connected on the local network.

From the NetServers listed, select one to assign a new IP address. (Default is 211.53.133.92) To choose a NetServer, click on its MAC Address or IP addres

When a NetServer is selected, its IP address will appear in the ' Selected IP Address' box. Type a password in the "Admin' s Password" box to change the IP address, reboot NetServer, or start configuration.

The default password is "admin".



To change the IP address, enter the Admin' s password and click "Change IP Addr." Enter the new IP address and click "OK."

The "Reboot" button will reboot the NetServer. This process takes 10-20 seconds.

2) Configuring Administrator' s Conditions

To access the NetServer' s Administrator' s Page from the Setup Menu, enter the admin.' s password and click the "Start Configuration" button. (For more detailed information, refer to Chapter VII "Configuring Administrator' s Condition at Homepage")

VI. Accessing NetServer-6 Homepage & Monitoring Real-time Image

After assigning NetServer an IP address, the NetServer can be configured within its self-contained homepage through any standard Web browser on a local network. However access to its Homepage by a remote network is not possible until gateway address, subnet mask, and broadcast address have been properly assigned.

1. Starting Web browser

Start the web browser and enter the NetServer IP address. This will access the NetServer begin homepage.

- Example

```
http://200.243.232.178/
```

NetServer can support up to 100 users simultaneously. If a person tries to access NetServer as the 101st user, no image will be received, and a counter message in the upper right side of homepage will be read ' Connected Client#: 101' .

2. Login page

1) ID and password

The login page allows only registered NetServer users to view images from NetServer. To connect to NetServer and view real-time images, follow the login procedures.

Type In the user's ID and password to access the image viewing screen. To access the "Admin page" directly and configure administrator's conditions, type in the administrator's ID and password.

The default name and password for the user is "**guest**." The default Admin username and password is "**admin**." Both may be changed at the Admin page, but neither the ID nor password can be more than nine characters long.

2) Behind Firewall

If the PC is connected on a network where firewall is, real time image will not be viewed properly because video TCP port of NetServer is blocked. common video TCP port (A default video TCP port of NetServer is 8080th port.) is blocked under firewall. In this case, real time image may be viewed through NetServer's Server Push Viewer that transmits video through Web TCP port instead of video TCP port.

To connect Server Push Viewer directly at NetServer homepage, click on 'Behind Firewall' menu.

3) NetServer Plug-in for Netscape user

To monitor real-time images using Netscape Navigator, the NetServer Plug-in program is needed. This can be downloaded from the login page by clicking "Download NetServer Plug In Now!". When connecting NetServer for the first time or having Plug-in program of lower version, download it. When accessing NetServer with lower version, user may not monitor properly. In the case, download and install it again.

4) NetServer Active-X for MS Explorer User

Systems using Microsoft Explorer require Active-X Control program. The program will usually be installed automatically when a user accesses a NetServer. A pop-up window will appear for Active-X installation, click "yes." If images still do not appear after installation, check the "c:\windows\download program files" folder (for Windows 2000 NT, the directory is c:\WINNT\download program files). The file name is Web Camera Server Control. If the file is not installed in the directory, return to the login page and click "NetServer Active-X." If the file is downloaded, but images cannot be seen, delete the file and re-install.

Plug-in and Active-X Installation

If the Plug-in or Active-X program fails to be installed automatically, it may be installed manually. The manual installation program is provided at 'Client Support' page at WebGate's Internet homepage. (http://www.webgateinc.com)

The installation will not take more than a minute. Don't click any button until the installation is completed.

5) NetServer Java Applet for Macintosh or Unix system User

Java Applet viewer is for systems that do not use MS Windows. Macintosh OS or Unix can be used with the Java Applet viewer. Java Applet viewer requires java virtual machine that should already be installed on user's computer.

6) FAQ

Frequently asked questions and answers are provided here for troubleshooting. If user has other questions, please contact WebGate Inc. through http://www.webgateinc.com

Macintosh and Unix System

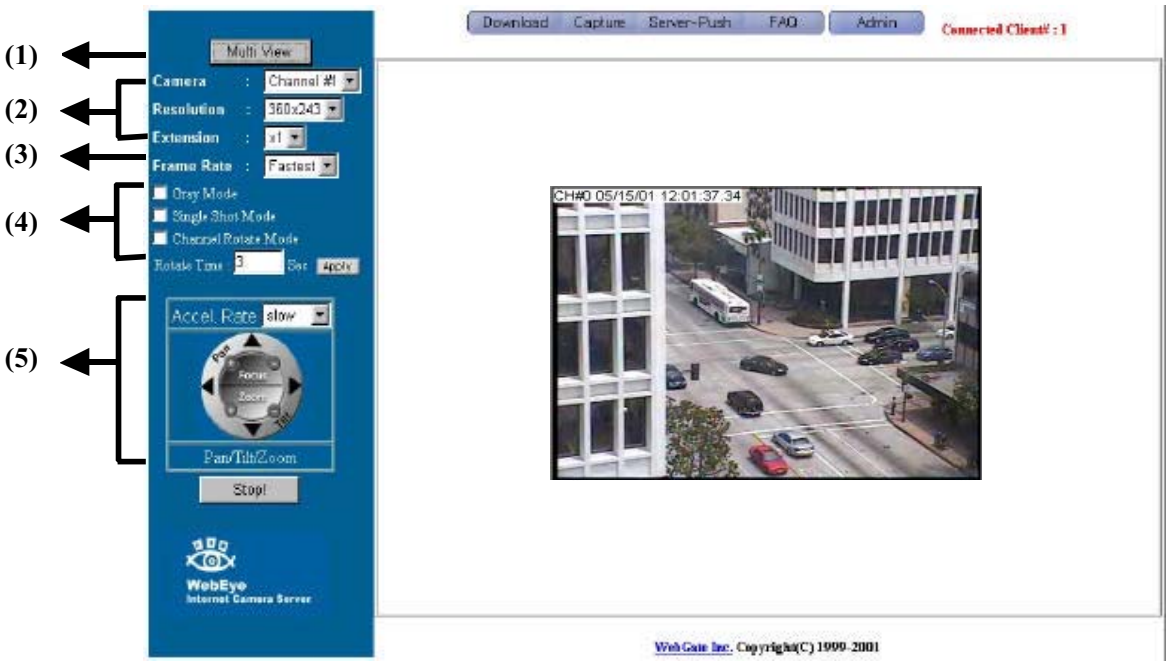
NetServer Active-X and Plug-in program is based on MS Windows OS. Therefore it is impossible to access NetServer and monitor real time image through default viewer. If a user accesses NetServer through Macintosh or Unix systems, NetServer detects that OS is not MS Windows. And it operates java based image viewer to show real time image. The design is same with default viewer, but some functions are not worked here.

If user has any problem in monitoring real time image, please refer to FAQ for troubleshooting. The document is provided at 'Client Support' page in WebGate's Internet homepage. (http://www.webgateinc.com)

3. Various viewers in NetServer homepage

There are 3 viewers for real-time monitoring in the NetServer homepage: Default Viewer, Server-Push Viewer, and Java Applet Viewer. An administrator may set 3 different viewers as main viewer. (Default Simple Viewer, Default Multi Viewer, and Server Push Viewer)

1) Real time monitoring through Default Single Viewer



At default viewer, a user may configure image transmission method and control integrated PTZ mechanism of a CCTV camera. The PTZ control panel is activated in some seconds depending on network speed.

On the upward side panel, there are menus for changing real time image viewer into server-push viewer, accessing administration page, downloading Plug-in program, viewing information on version, and FAQ.

(1) Single View / Multi View

The "Multi View" allows the monitoring of other images from additional cameras connected to the NetServer. If you can press the "Multi View", you can view six images simultaneously. Please note that transmission speed cannot exceed 30 fps, and additional images will make overall transmission speed slow. "Single View" monitors a single channel. Click on the appropriate button for single view or multi view.

(2) Image Control

Resolution

Select the level of resolution from 5 levels (720x486, 720x243, 360x243, 180x121, 90x60). Higher-resolution images are larger file sizes and are transmitted at slower speed.

Expansion
Expansion enlarges the image from 1X to 4X. However, expansion (2X to 4X) does not increase image' s resolution, hence the clarity of an expanded image will not be as good as the original.

Frame rate
To control image transmission speed. "Fastest," will receive images at the fastest speed possible within the network environment. The transmission speed is dependent on the network line' s capacity and user PC' s performance. NetServer can transmit up to 30 frames per second, but total frames transmitted by all 6 channels cannot surpass the maximum rate of 30 fps.

(3) Camera selection
Select cameras to monitor. User may select one specific camera or all 6 cameras.

(4) Transmission Control
Gray Mode On
Images are displayed in black and white. Images can be transmitted at a higher speed under gray mode.

Single Shot Mode On
When this button is clicked, one frame of image is reproduced. Therefore, no other images may be viewed.

Channel Rotate Mode On
Images are viewed one after another as channel number. It may be configured by second.

(5) Play Control
Pan/Tilt
To move the direction of external camera to where to want to see.

Zoom
To zoom the image in and out.

Focus
To control and optimize the image' s focus.

Accel. Rate
To control the moving speed of the Pan / Tilt mechanism. There are three settings, denoted by the small graphic located between the "+" and "—" signs. "Accel." does not control zooming speed. This can be adjusted with the mouse. By clicking the right mouse button on the image, a pop-menu with five options will appear. The "Focus Sensitivity" controls zooming speed from level 1 to 10.

Play/Stop: NetServer generates and transfers the real-time images as soon as it is accessed. To stop transferring images, click the "Stop" button. To resume transfer, click "Play" button.

(6) Other Function Buttons

Download
To download updated versions of Netscape Plug-in program for NetServer.

Capture
To save a frame of still image transmitted from NetServer. A still image can be saved as a format of bitmap (*.bmp) or Wavelet method file (*.eye). Wavelet compression image file can be decompressed and reproduced on Internet browsers such as Netscape or Explorer. Another method to capture a still image is: Place the mouse on the image; Click the right mouse button; Select the "Save As File" option from the pop-up menu.

Server-Push
To go to the server-push viewer.

FAQ
It lists frequently asked questions and answers.

Admin
To access administration page. (Refer to Chapter VII 'Configuring Administrator's Configuration at Homepage')

(7) Convenient pop-up menu
A small window of 5 menus appears when you click the right button of the mouse. However only users who are permitted can utilize the functions such as 'Quality Box', 'Focus Sensitivity', and 'Image Quality'. 'Image Info' and 'Save File As' menus are permitted to any user. And the results of the four functions except 'Save As File' are to be affected in every image that is transmitted to all users. (For detailed information, refer to 'User account management' in Chapter VII). And in server push viewer, only 'Image Info' and 'Save As File' menus are supported.

Image Info
You may decide the color (black or white) of the information that is shown on the left top of the image. And you may leave out the information.

Quality Box

This is to set a certain area clear and remained area dull. You can overcome insufficient network bandwidth with this function, because the file size is reduced with unfocused area. Quality Box is to be set like under written description.

- Choose 'New QBOX' button.
- Place mouse cursor on a certain point of real time image where to start QBOX.
- Click and drag the mouse point.

You can also re-use previous QBOX area to focus again by clicking 'Enable QBOX'. 'Disable QBOX' is to finish. The image activated Focusing Area function is seen in the right. The image quality of outer area of QBOX is to be set with 'Ambient Level' menu. The level is from 1 to 5. If you select 'Level 1', the quality is similar to focused area. And if you select 'Level 5', the unfocused area is shown dark. A user who has 'Video control' right may utilize this menu.

Focus sensitivity

You may configure movement degree of zoom mechanism. The sensitivity is from Level 0 to Level 9. By selecting 'Level 9', user zooms in or out at the largest degree. A user who has 'PTZ control' right may utilize this menu.

Image quality

It is to set image quality. The image quality is from Level 0 to 9. If user chooses the 'Level 9', NetServer sends the finest image. However, transmission frame rate will be reduced because of large sized data. If user chooses 'Level 0', NetServer sends dullest image but fast. A user who has 'Video control' right may utilize this menu.

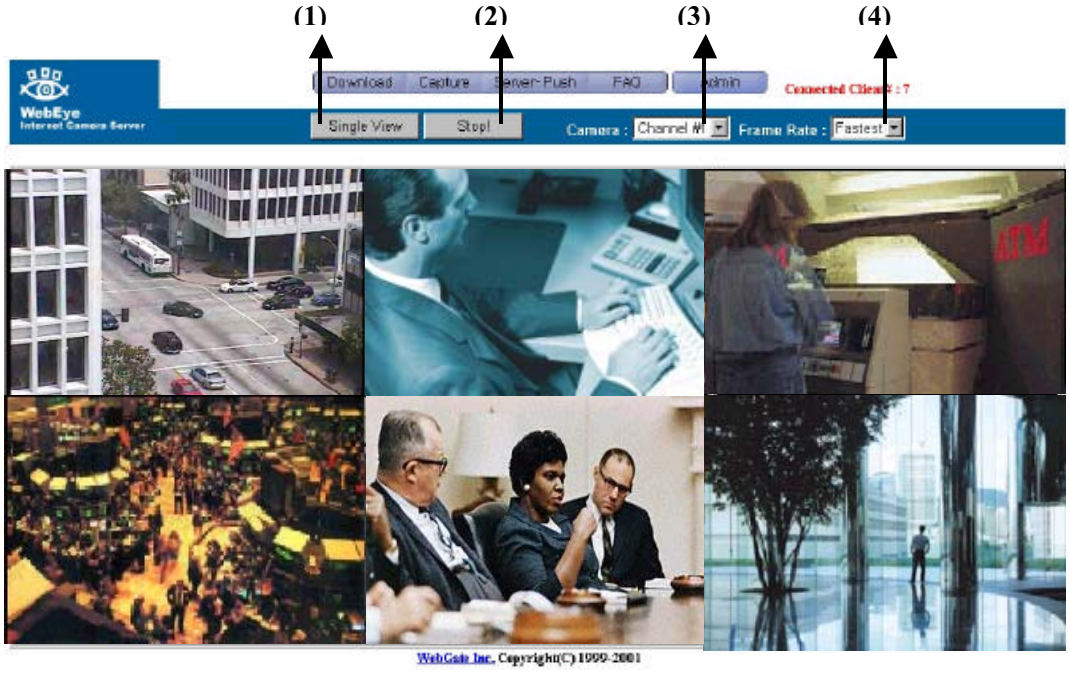
Save File As

It is to save a frame of still image as an electric file. A still image can be saved as bitmap (*.bmp) file or Wavelet format file (*.eye). Wavelet formatted image file is to be reproduced on Internet browsers such as Internet Explorer or Netscape Navigator as long as the PC is installed Active-X or Plug-in program. The very image that is shown at the moment when you click the menu is saved.

(8) Placing a company logo and hyper-linking

The Philips company logo, located on the left bottom of the viewer, can be replaced with a different company logo. This logo can then be used as a hyper-link to a company web page. (Refer to Chapter VII for more detailed information)

2) Real time monitoring through Default Multi Viewer



(1) Single View / Multi View

You can select a mode between single view and multi view. The button is toggled between the two functions.

(2) Play/Stop

NetServer generates and transfers six real-time images as soon as it is accessed. To stop transferring images, click the "Stop" button. To resume transfer, click "Play" button.

(3) Camera selection

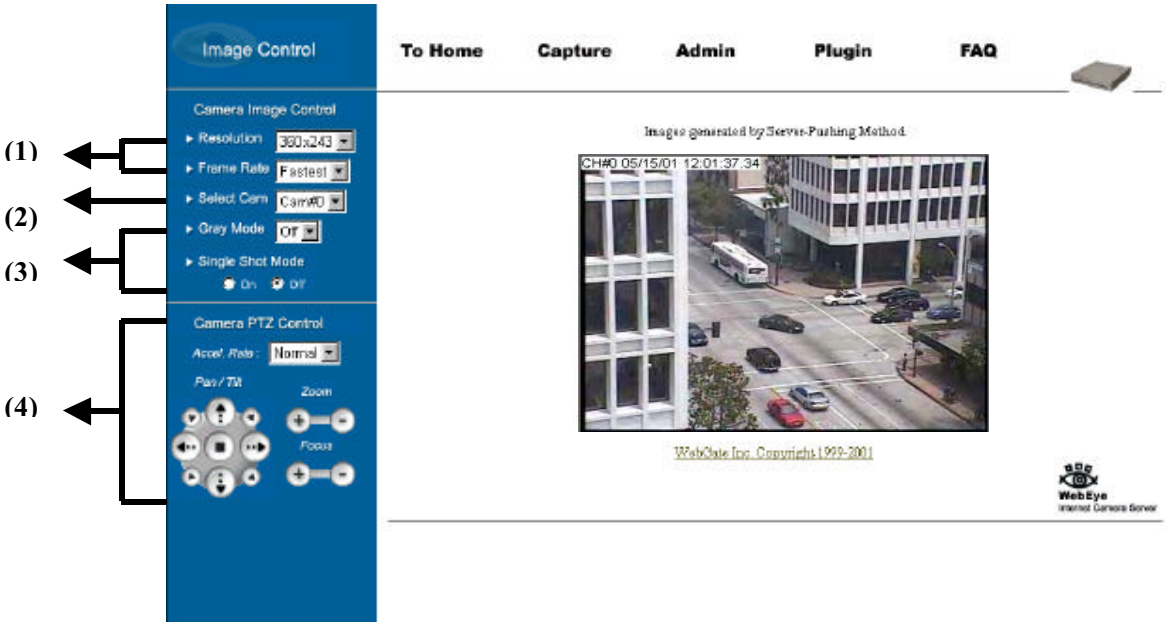
Select the camera to configure a frame rate.

(4) Frame Rate

Control image transmission speed. "Fastest," will receive images at the fastest speed possible within the network environment. The transmission speed is dependent on the network line's capacity and user PC's performance. NetServer can transmit up to 30 frames per second, but total frames transmitted by all 6 channels cannot surpass the maximum rate of 30 fps.

3) Real time monitoring through Server Push Viewer

If NetServer is installed on a network where firewall is, you may access NetServer through server-push viewer to monitor real-time images. If you have information on the network such as which port is block with firewall, you may access with default viewer by changing Web TCP port or video TCP port. For changing TCP port, please refer to Chapter VII 'Configuring Administrator's Configuration at Homepage'.



On server-push viewer, some functions such as 'Progressive Mode' image transmission, 'Image Quality' control, and 'Quality Box' creation menus out of image control and 'Preset', 'Auto Focus', and 'Focus Sensitivity' control out of PTZ control are not supported. Other functions are same as that of default viewer.

(1) Image Control

'Progressive Mode' image transmission menu is not supported.

Resolution

Select the level of resolution from 5 levels (720x486, 720x243, 360x243, 180x121, 90x60). Higher-resolution images are larger file sizes and are transmitted at slower speed.

Frame Rate

Control image transmission speed from 5 levels (fastest, 10fps, 5fps, 3fps, 1fps). "Fastest," will receive images at the fastest speed possible within the network environment. The transmission speed is dependent on the network line's capacity and user PC's performance.

(2) Camera

Select cameras to monitor. User may select one specific camera to monitor real-time image.

(3) Transmission Control
On this viewer, "Progressive Mode" and "Channel Rotate Mode On" menus are not available.

Gray Mode
Images are displayed in black and white. Images can be transmitted at a higher speed under gray mode.

Single Shot Mode
When this button is clicked, one frame of image is reproduced. Therefore, no other images may be viewed.

(4) Play Control
Pan/Tilt: To move the direction of external camera to where to want to see.

Zoom: To zoom the image in and out.

Focus: To control and optimize the image's focus.

Accel. Rate: To control the moving speed of the Pan / Tilt mechanism.

(5) Convenient pop-up menu
'Quality Box', 'Focus Sensitivity', and 'Image Quality' menus are not supported.

Image Info
You may decide the color (black or white) of the information that is shown on the left top of the image. And you may leave out the information.

Save File As
It is to save a frame of still image as an electric file. A still image can be saved as bitmap (*.bmp) file or Wavelet format file (*.eye). Wavelet formatted image file is to be reproduced on Internet browsers such as Netscape Navigator or Internet Explorer as long as the PC is installed Active-X or Plug-in program. The very image that is shown at the moment when you click the menu is saved.

(6) To Home
This button returns to the default viewer.

(7) Capture
This button is to save a frame of still image transmitted from NetServer. This function is the same with 'Save File As' menu.

(8) Admin
It is to access administration page. (Refer to Chapter VII 'Configuring Administrator's Configuration at Homepage')

(9) Plug-in

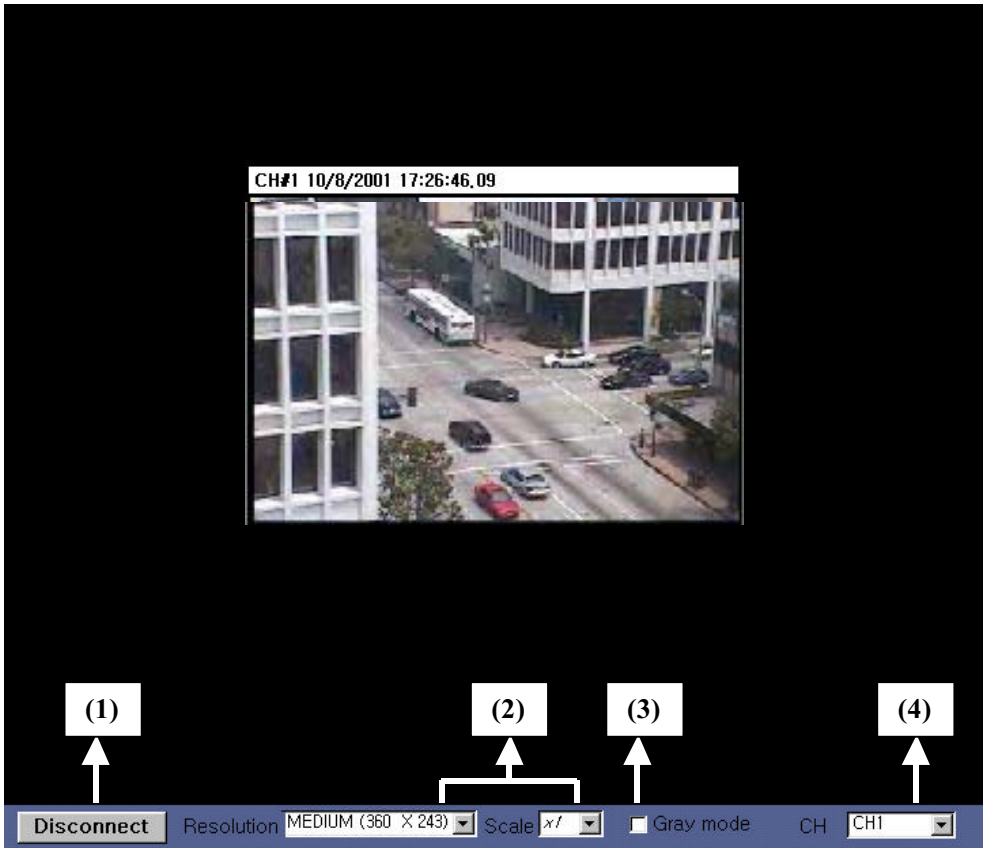
Click on the "Plugin" link to download the latest version of the Netscape NetServer Plug-in. This is only ne cessary for those who use Netscape Navigator.

(10) FAQ

User may refer FAQ for trouble-shooting in installing or running NetServer.

4) Real time monitoring through Java Applet Viewer

Java applet viewer is for the users who access NetServer-6 through a computer that dose not utilize MS Windows OS such as Macintosh computer, etc. Java applet viewer is run with java virtual machine, which needs to be installed on user' s computer.



(1) Connect/Disconnect

After defining other conditions such as image control and transmission control, click the "Connect" button to confirm and enable the settings. This button can also be used to 'Disconnect' from NetServer.

(2) Image Control

"Frame Rate" control menu is not available. The functions are the same as default viewer. Please refer to descriptions on default viewer.

(3) Transmission Control

On this viewer, there is only a "Gray Mode". The functions are the same as default viewer. Please refer to descriptions on default viewer.

(4) Camera Selection

On Java Applet viewer, there is no "Multi Viewer" menu. Other functions are same as default viewer. Please refer to descriptions on default viewer.

VII. Configuring Administrator' s Condition at NetServer-6 Homepage

This page is for administrator. Administrator may control operating status remotely. This page can be accessed through Setup program by clicking 'Start Configuration' button.

1. Administrator Login

1) Accessing through setup program

Select NetServer by clicking on the MAC address or IP address. Then type in the administrator' s ID and password (Default ID and password are 'admin'), and click "Start Configuration" button. The setup program automatically connects to the Admin page of NetServer Homepage. (For more detailed information how to access the page through Setup program, refer to Chapter V 'Assigning IP address and Configuring Administrator' s Condition')

2) Accessing through Web browser

On Web browser, a user may access NetServer login page with its IP address. In the login page, a user may key in administrator' s ID and password or a normal user' s ID and password. With any of ID and password, the user may access real time image viewer page.

However administrator can monitor and control real time image viewer with administrator' s authority. And a normal user may monitor and control the viewer page with assigned authority. If a normal user goes to administration page, one should pass login page again to key in administrator' s ID and password while administrator may access the administration page directly.

Both default administrator' s ID and password are set as 'admin', and administrator and users accounts (ID and password) are to be changed in administration page. But each ID and password must be composed within 9 bytes. (e.g. 9 English letters)

In the administration page, there are 12 sub-pages where to configure NetServer operating conditions. It is very important to configure the conditions properly to utilize NetServer well. The last menu 'Goto Viewer Page' is to go back to real time image viewer.

2. Configuring Administrator's Condition at Homepage

1) System Configuration

This page is to set name, date & time, location, and description of one's NetServer. Model, serial number, and software version appear automatically.

(1) NetServer Name

The name is to be used to register the NetServer on a certain server, if dynamic IP address is used. Therefore it is very important to set a proper name for user to find the NetServer in the dynamic IP registration list. (For detailed information, refer to 'Dynamic IP Registration Service for ISDN, xDSL User')

(2) Model

By clicking 'Detailed H/W Information', administrator may view the detailed hardware information such as maximum numbers of channel, serial port, digital input, digital output, etc. The model name is marked automatically.

(3) Installation Location & Additional Description

The information is to show in the real time image viewer page as well as in a dynamic IP registration list.

(4) Date & Time

There are three date & time menus. In "NetServer Current Date & Time" panel, the date and time that is set in the NetServer appears. In "System (PC) Current Date & Time" panel, the same date and time that is set in user's PC appears. To synchronize the NetServer and PC date and time, an administrator can click the "Time Synchronization" button. The "Manual Date & Time" panel allows the user to set date and time.

*** Notice for Time Setting ***

After setting time and date manually at the System Configuration of Admin Menu, please don't reboot NetServer-6 within one minute. If you reboot it within one minute, your setting would not be applied.

(5) Administrator's E-mail Address

In this panel, administrator records one's e-mail address. If administrator put a 'contact' menu of e-mail communication on real time image viewer page, the linked e-mail address to the 'contact' menu is to be synchronized with this. So administrator can keep up e-mail address easily.

(6) Initialize Flash Info

This will initialize almost all the information saved on Flash Memory. However Date & Time, Model, Serial Number, and IP configuration of "System Configuration", and Video Signal Type of "Video Configuration" menus will not be changed.

(7) Rebooting

If NetServer has any problems, administrator can reboot it without adjusting power supply. This button works as on/off switch.

2) User Configuration

This page is to configure IDs and passwords of an administrator and 5 users.

(1) User Account

There are one administrator's account and 5 users' accounts. Account name can be changed.

(2) Password

If you want to open your NetServer to everyone, you may not change default user's ID and password. However you should change administrator's ID and password as unique ones.

ID and Password Limitation

It is very important to compose any ID or password within 9 bytes' limit. 9 bytes are equal to 9 English characters.

(3) Access Rights

Administrator may give or take users' right of PTZ control and video control. With default setting, administrator has both right of PTZ control and video control and normal user doesn't have any right.

- **Video control**: This is to control pop-up menus such as image quality level and QBOX settings.
- **PTZ control**: This is to control 'Focus Sensitivity' in pop-up menu and to control PTZ mechanism of a CCTV camera.

3) Network Configuration

This page is to define network type and set network addresses of NetServer.

(1) DHCP Client Protocol

DHCP (Dynamic Host Configuration Protocol) is to manage host address on a network. With this protocol, every host on a LAN may share limited official IP address for Internet access. In other words, every host on a LAN may lease official IP address from DHCP server temporarily. Exactly speaking, DHCP server assigns a certain host with an official IP address that is not occupied by other hosts on the LAN.

DHCP server will assign NetServer with an official IP address if the LAN is equipped with DHCP server and 'DHCP Client Protocol' is activated.

'DHCP Client Protocol' is to be used on a LAN where a DHCP server operates. Normally, medium or large sized company runs a DCHP server on their LAN. For the small sized LAN, it would be better to use NAT function of HUB.

(2) Select Network Interface

This is to select proper network interface with which NetServer is connected.

If NetServer is connected with Internet dedicated line, cable modem line or on LAN environment, you should select network interface as 'Ethernet'.

If NetServer is connected on xDSL line that needs PPPoE process to connect on Internet, administrator should select 'xDSL (PPPoE)'. However the xDSL line doesn't need PPPoE process, administrator should select 'Ethernet' though NetServer is connected on xDSL line.

If NetServer is connected on network with PSTN modem, administrator should select 'PSTN (Dial Out)'.

(3) Ethernet Interface

Administrator may configure IP address, subnet mask, broadcast address, gateway address, and DNS addresses of NetServer. For broadcast address, administrator may set it automatically by clicking 'Get From Netmask' button after assigning IP address and subnet mask. When the addresses are not assigned properly, any user cannot access NetServer from local or remote network. Even on the local network, a user is not able to access if administrator does not assign a proper IP address to NetServer. Please refer to appendix 3 'Utilizing IP Address on Local Network' for more detailed information.

This interface is mainly used for Internet dedicated line and LAN, and sometimes for xDSL line as it is explained on 'DHCP Client Protocol' setting.

MTU Size : Depending on network type, administrator may set data packet size with this menu to utilize the network at most effectively.

DNS Server IP Address: This is used when you register your NetServer on dynamic IP registration list of WRS (NetServer Registration Server). WRS has its domain name of 'NetServer.to' and the domain name is registered on DNS servers on the world. When your NetServer asks the DNS server on your network, the DNS server resolves the corresponding IP address of 'NetServer.to' and informs the IP address to your NetServer. Then your NetServer may connect WRS. So it is necessary you get information on DNS server's IP address and enter into the blanks.

DNS (Domain Name System)

DNS (Domain Name System) is to map between IP address and domain name. Every network device on the world has its IP address to be connected on Internet. And the device is to be connected not with its domain name but with its IP address. Common users are not familiar with IP addresses but with domain names.

If a user accesses a certain network device with its domain name, DNS server resolves the domain name into an IP address of the device and replies the result to the user. A lot of DNS servers are run on Internet worldwide.

(4) xDSL Interface

If NetServer is connected on xDSL line and needs PPPoE process, administrator should select network interface as 'xDSL (PPPoE)'. And administrator should configure user ID and password for PPPoE. ID and password may be acquired from the ISP that installed the line. And NetServer may get IP address when it is connected on xDSL line.

(5) PSTN Interface

If NetServer is to be connected on Internet through PSTN (Public Switched Telephone Network) based on PPP, administrator should select network interface as 'PSTN (Dial-out)'. This interface is for NetServer to connect to ISP through telephone line for Internet connection. In this case, NetServer is connected to dial-up modem with a serial cable unlike other interfaces such as 'Ethernet' or 'xDSL (PPPoE)'. With these interfaces, NetServer is connected with LAN cable.

The information to configure in this page is similar to that you configure on your PC to connect to Internet through telephone line. And it is used when NetServer dials up to ISP and make Internet connection based on PPP, while the contents on a PC is used when the PC dials up to its ISP and make Internet connection based on PPP. Normally, ISP set it on your PC the information for connection so that your PC makes progress to the ISP. And the script sometimes differs according to each ISP.

PPP (Point-to-Point Protocol)

PPP is a protocol for communication between two computers using a serial interface, typically a personal computer connected by phone line to a server. For example, your Internet server provider may provide you with a PPP connection so that the provider's server can respond to your requests, pass them on to the Internet, and forward your requested Internet responses back to you. PPP uses the Internet protocol (IP) (and is designed to handle others). It is sometimes considered a member of the TCP/IP suite of protocols. Relative to the Open Systems Interconnection (OSI) reference model, PPP provides layer 2 (data-link layer) services. Essentially, it packages your computer's TCP/IP packets and forwards them to the server where they can actually be put on the Internet.

There are two methods for users to access NetServer through PPP connection. And being seen from NetServer, one is that NetServer dials out and the other is that NetServer is dialed in through dial-up modem.

Dial-out and Dial-in

Dial-out is that NetServer connects to ISP to get Internet connection based on PPP. When ISP makes PPP connection with NetServer, ISP assigns an IP address to NetServer.

Dial-in is that a user's PC connects NetServer and NetServer provides PPP connection to the PC based on PPP. In the case of dial-in, NetServer acts as ISP against to a user's PC. When NetServer makes PPP connection with a PC, NetServer assigns an IP address to the PC.

Dial-out 1: It is for NetServer to make dial-up progress to connect to ISP for PPP connection. NetServer dials up to ISP according to the event that is configured at administration page of 'Application Configuration'. After PPP connection is made, NetServer sends e-mail or file. The process is as follows.

- NetServer dials up to ISP to connect on Internet.
- ISP asks information for login such as ID, password, etc, and NetServer answers to corresponding questions.
- ISP makes PPP connection to NetServer and assigns an IP (official dynamic/fixed IP) to NetServer.
- NetServer access Internet and send e-mail or file to pre-defined person or FTP server.

When NetServer dials out?

When NetServer should send e-mail or file according to the event that is configured on 'Application Configuration' page (external sensor or motion detection), NetServer dials out and make Internet connection.

Dial-out 2: While NetServer makes PPP connection to send e-mail or file, administrator may open to common users to access NetServer through Internet. For this purpose administrator should set NetServer to register itself on WRS (NetServer Registration Server). For detailed information on WRS service, please refer to 'Dynamic IP Registration Service' configuration page in this manual. With this connection, multiple users may access NetServer simultaneously. But the connection-maintain time is for the moment that is set at 'Disconnect Time' menu. The process is as follows.

- NetServer dials up to ISP to connect on Internet.
- ISP asks information for login such as ID, password, etc, and NetServer answers to corresponding questions.
- ISP makes PPP connection to NetServer and assigns an IP (official dynamic/fixed IP) to NetServer.
- NetServer connects to WRS (NetServer Registration Server) and list itself on the list. (More detailed information on WRS, please refer to Dynamic IP Registration Service in this manual.)
- Users access Internet homepage of 'NetServer Dynamic IP Registration Server' (www.NetServer.to) and find out the NetServer in the list.
- Users access NetServer to monitor real-time image on Internet.

Dial-in: It is for a user to make PPP connection to NetServer with his PC that connects on Internet through dial-up modem. Detailed process is as follows. With this connection, only one user can access NetServer at the same time.

- A user dials up to the modem that is connected to NetServer.
- NetServer makes PPP connection to the user's PC and assign an IP (private IP) to the PC. In this case, NetServer assigns an IP address that is in the same local network compared to its own IP address.

- Users access NetServer homepage through web browser by entering NetServer's IP address to monitor real-time image.

IP address of NetServer when it is dialed in

When NetServer is dialed in by a PC and accessed through PSTN, NetServer always has its IP address of **10.0.0.10.** And the IP address is not changed forever.

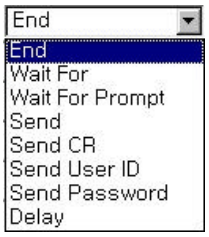
Below items especially user ID, password, and phone number are used for NetServer to connect ISP based on standard PPP. Therefore if your PSTN doesn't need special login script, NetServer dials up to make PPP connection with these items.

ID/Password: It is to put proper user ID and password for connecting to ISP.

Phone: It is to put telephone number of ISP. If a prefix needs in dialing (e.g. 9), you should mark tick on the menu and put the prefix the following square.

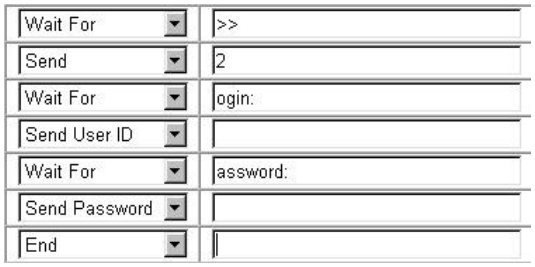
Disconnect Time: NetServer maintains connection for some while there is action such as sending e-mail or files. And when the action is stopped, NetServer disconnects after sometime. This is to configure how long NetServer maintains the connection after any action doesn't occur. It is to be set from 1 to 600 seconds. Different to dial-out connection, a user may disconnect from NetServer by hanging up the phone in dial-in connection.

Login Script: If your telephone line needs special login script to connect ISP, you should enable 'Script Enable' menu and describe the login script. At the section, there are some commands to describe script.



- End: To end the login process.
- Wait for: To wait for a certain signal.
- Wait for Prompt: To wait for prompt.
- Send: To send after described script.
- Send CR (Carriage Return): It has the same effect to press 'Enter' key in the script.
- Send User ID: To send the ID that is described in 'User ID' square.
- Send Password: To send the password that is described in 'Password' square.
- Delay: To delay for a certain seconds that is described the following square.

Administrator should describe a proper script for one's network with provided commands. You may get the script from your PC if you use the same ISP that is connected through PSTN. Here is an example of describing login script.



4) Dynamic IP registration service for ISDN and xDSL users

This page is to register NetServer on dynamic IP registration server.

If NetServer is installed on a network of dynamic IP address (floating IP address), administrator should register the NetServer on dynamic IP registration server to give common users simple connectivity. If not, no one can access the NetServer through Web browser. It is because that no one knows IP address which one can access the NetServer with.

To solve the problem, Philips runs a server making a list of NetServers that have dynamic IP addresses. On the server, NetServer registers its information such as name, location, and description, so that common users may detect a certain NetServer. Name, location and description are assigned at ' System Configuration' page. If administrator does not change them, the NetServer will register default information on the list, and it will be very difficult to point out and access a certain NetServer. The list is on an Internet homepage of NetServer (www.NetServer.to).

Note in registering NetServer on WRS

To register your NetServer on WRS, you should enter "DNS Server IP Address" at "Network Configuration". Though you utilize fixed IP, you should also do it in order to register yours on WRS. For more detailed information, refer to "Network Configuration".

(1) Auto IP Registration Function

Administrator may register one's NetServer by enabling 'Auto IP Registration Function'. Registration process is that NetServer detects IP addresses from DHCP server and informs the detected IP addresses to dynamic IP registration server. And the server updates already registered information with new one. Please keep in mind that user has to enable 'DHCP Client Protocol' at 'Network Configuration' page to have NetServer get dynamic IP addresses automatically, when NetServer is installed on a network of dynamic IP address. With 'Auto IP Registration Function' menu, a NetServer of fixed IP address can also be registered on the list.

(2) Registration Server Address

This is to configure a server address for registration. To manage the registration server(WRS Front-End) for Dynamic IP registration personally, you should install proper S/W, developed by Philips Inc. If you do not run a server for IP registration personally, keep the server's name as default figure (NetServer.to).

(3) Registration Interval

Dynamic IP addresses are commonly used with xDSL, ISDN or Cable Modem lines. In order to maintain continuous connectivity, user should reset the 'Registration Interval' at a shorter time interval than the default value. If the registered IP information on the dynamic IP registration server is to be changed, some user may not access the NetServer.

(4) Add Public List

There are two registration systems. One is to register on a public list and the other is on a private list. (Please refer to Article 5) 'How to find registered NetServer in NetServer Internet homepage' for more detailed information.)

- **Public List**: This list is open to anyone who accesses NetServer Internet homepage (www.NetServer.to).
- **Private List**: This list is not seen to anyone. Even the owner of a NetServer can't get the information on one's NetServer without viewing information on other's NetServer.

(5) Access Token

Access token is a password and it is used when you register your own NetServer on a list 'User's NetServer' out of all NetServers on WRS(NetServer Registration Server). Please refer to Article 5) 'How to find a registered NetServer in NetServer Internet homepage' for more detailed information.

Private List and Access Token

You should set the access token if you configure your NetServer to register its information on a private list at NetServer Internet homepage (www.NetServer.to). Otherwise you cannot access the private list nor find the information on your NetServer.

Access token is to be set 9 bytes. 9 bytes are equal to 9 English characters.

5) How to find a registered NetServer in NetServer Internet homepage

On WebGate Internet homepage (http://www.webgateinc.co.kr), there are menus to find NetServer that is registered on WRS (NetServer Registration Server).

(1) Sign up membership

To search your NetServer out of a public list or a private list, sign up membership first. You may sign up on the server through ‘ Membership’ menu.

(2) Finding NetServer from public list

To access NetServer that is registered on public list, you may find it through ‘ NetServer Service’ or ‘Public NetServer List’ menus. Once click ‘NetServer Service’ or ‘Public NetServer List’ menu, you may find ‘ NetServer list of WRS (NetServer Registration Server)’ .

You may search your NetServer with several conditions such as name, model, location, description, serial number, and IP address. (‘ IP address’ is to be used only when you assigned your NetServer a fixed IP address)

After finding your NetServer, you may access it by clicking on the name. By clicking on ‘ Preview’ , you may monitor real-time image from NetServer without logging in NetServer. However ‘ Preview’ is available only when the NetServer is configured to have its ID and password as default values ‘ guest’ and ‘ guest’ .

(3) Finding NetServer from private list

To access NetServer that is registered on private list, you should make your own NetServer list before. You may make the list through ‘Searching NetServer’ menu of ‘NetServer Service’. In the list, there are to be registered any NetServer from the ‘ Public List’ or ‘ Private List’ .

My NetServer List: You may maintain your own NetServer registering it on this list. When you login this homepage, WRS (NetServer Registration Server) detects and shows all the NetServers that you listed appear on your own list. Therefore you may access any of them without searching it from WRS (NetServer Registration Service) list nor verifying access token again. So it is very convenient to have the list when you run several NetServers having dynamic IP addresses.

Search and Append: This menu is to append a certain NetServer on your own list. You may append NetServer on your own list as follows.

- Key in serial number (W100000000000), MAC address (e.g. 00:00:00:00:00:00), and access token of a certain NetServer in the box.
- Click ‘ Append’ menu.
- WRS (NetServer Registration Server) search a corresponding NetServer with the conditions from both the ‘ Public List’ and ‘ Private List’ and registers the NetServer on your own list.

6) Security Configuration

This is to filter a certain IP addresses from accessing NetServer based on network masking.

(1) IP/Subnet Filtering Mode

You may allow or deny a certain user to access your NetServer with enabling this menu.

Default Policy

This is to decide the principle of ‘ IP/Subnet Filtering Mode’ between allow and deny.

If you allow anyone except a few users to access your NetServer, you should select default policy as ‘allow’ and register a few users as denied users. If you deny all users except a few users to access your NetServer, you should select default policy as ‘ deny’ and register a few users as allowed users.

How to register allowed/denied user in the list

0.0.0.0	/ 0	Allow
IP address	Masking	Allow/Deny

Network masking is to mask network ID for every existing IP address in the world. Therefore the IP addresses that have the same network ID are to be applied with a command of ‘ Allow’ or ‘ Deny’ . The masked bits are considered as network ID.

If a masking number is 4, the 4 bits from the first bit are masked as network ID comparing with the provided IP address before, and any IP address that has the same binary number on the first 4 bits are to be filtered from NetServer.

Note: To explain and understand easily on IP address, the first byte of IP address is marked as X1 in this manual. And X2 is for the second byte, X3 is for the third byte, and X4 is for the fourth byte.

IP address is constructed as follows.

IP address construction in binary number of each bit																															
xxxxxxxx (8 bit): X1								xxxxxxxx (8 bit): X2								xxxxxxxx (8 bit): X3								xxxxxxxx (8 bit): X4							
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
E.g. IP address in binary: 11000000. 10101000. 00000001. 00001101 (It is equal to 192.168.1.13) * Binary number 1 means to take the equivalent decimal number (2^7, 2^5, etc) and 0 means to disregard it.																															

IP address construction in decimal number of each byte																															
xxx (0-255: 1 byte): X1								xxx (0-255: 1 byte): X2								Xxx (0-255: 1 byte): X3								Xxx (0-255: 1 byte): X4							
128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1

E.g. IP address in decimal: 192. 168. 1. 13 (It is equal to 11000000. 10101000. 00000001. 00001101)
* Binary number 1 means to take the equivalent decimal number (2^7, 2^5, etc) and 0 means to disregard it.

Network masking point is to be expressed with decimal number from 0 to 31. IP address is consisted in 4 bytes. 4 bytes are 32 bits. Network is to be masked on every bit from the first bit to the 32nd bit. Masked bit is marked with binary number '1', and the corresponding bits out of provided IP address are defined as network ID for IP filtering.

Network masking point (0 to 31)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0

E.g. Network masking on the 8th bit (8): 11111111. 0000000. 00000000. 00000000 (255.0.0.0)
E.g. Network masking on the 16th bit (16): 11111111. 11111111. 00000000. 00000000 (255.255.0.0)
E.g. Network masking on the 24th bit (24): 11111111. 11111111. 11111111. 00000000 (255.255.255.0)
E.g. Network masking on the 32nd bit (0): 11111111. 11111111. 11111111. 11111111 (255.255.255.255)

According to masking point, masked network ID is to be different out of the same IP address. For example, if IP address is described as 192.168.1.13 (11000000.10101000.00000001.00001101) with masking point 24 (255.255.255.0), the IP addresses whose IP address is consisted with '11000000.10101000.00000001.xxxxxxxx' (2^8 (256) pieces of IP addresses) will be allowed or denied from NetServer.

If you describe an IP address as 192.168.1.13 and put masking point 26 (255.255.255.192), the masked bits are the first 26 digits and network ID masked as '11000000.10101000.00000001.00'. In this case, the IP addresses whose IP address is consisted with '11000000.10101000.00000001.00xxxxxx' (2^6 (64) pieces of IP addresses) will be applied with a command of 'Allow' or 'Deny'.

Applied IP address number according to masking point

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0
2^{31}	2^{30}	2^{29}	2^{28}	2^{27}	2^{26}	2^{25}	2^{24}	2^{23}	2^{22}	2^{21}	2^{20}	2^{19}	2^{18}	2^{17}	2^{16}	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}

E.g. Masking point 8: 2^{24} pieces of IP addresses are applied
E.g. Masking point 16: 2^{16} pieces of IP addresses are applied
E.g. Masking point 24: 2^{8} pieces of IP addresses are applied
E.g. Masking point 0: 2^{0} pieces of IP address (itself) is applied

Though masking point is to be any bit out of 32 bits, it is common to point on the bits of host ID part. If the masking point is placed on network ID part, the range is expanded compared to the provided IP address.

Network class is divided as follows. D and E class networks are not to be used by normal user.

Class	Decimal number of X1 byte	Network ID	Host ID
A	0 to 127	X1	X2, X3, X4
B	128 to 191	X1, X2	X3, X4
C	192 to 223	X1, X2, X3	X4
D	224 to 239	For Multicasting utilization	
E	240 to 255	Reserved for specific utilization	

In C class network, the applied number of IP addresses with network masking is as below when you mask on host ID part (X4: the fourth byte).

Masking on X4 Byte								Remark	Host ID number
25	26	27	28	29	30	31	0	Masking Point	
128 (128)	64 (192)	32 (224)	16 (240)	8 (248)	4 (252)	2 (254)	1 (255)	Decimal Number (Accumulated Value)	
Masked	Free	Free	Free	Free	Free	Free	Free	7 digits are free	$2^7 = 128$
Masked		Free	Free	Free	Free	Free	Free	6 digits are free	$2^6 = 64$
Masked			Free	Free	Free	Free	Free	5 digits are free	$2^5 = 32$
Masked				Free	Free	Free	Free	4 digits are free	$2^4 = 16$
Masked					Free	Free	Free	3 digits are free	$2^3 = 8$
Masked						Free	Free	2 digits are free	$2^2 = 4$
Masked							Free	1 digits are free	$2^1 = 2$
Masked								No free digit	$2^0 = 1$

The most common case is to make subnet through network masking, and it is to divide a network into some smaller network. If provided IP address is 192.168.1.2, you may divide the whole network into 2 sub-networks and allow or deny only the IP addresses that belong to one of sub-networks.
With setting as follows, The IP address of 192.168.1.2 is divided into two sub-networks and allow for the IP address out of the first sub-network to assess NetServer.

- Default Policy: Deny
- IP address: 192.168.1.2
- Masking: 25 (255.255.255.128)
- Then only the IP addresses from 192.168.1.0 to 192.168.1.127 are to access NetServer, while the IP addresses from 192.168.1.128 to 192.168.1.255 and any other IP address are to be denied accessing NetServer.

Changing IP address can reverse the result. If you set IP address as 192.168.1.130, only the IP addresses from 192.168.1.128 to 192.168.1.255 are to access NetServer. And the IP addresses from 192.168.1.0 to 192.168.1.127 and any other IP address are to be denied accessing NetServer.

You may refer below table to figure out masking point from network information that is given from

your ISP or network administrator.

Masking Point	Masked bit (Network ID)	Netmask in decimal number
1	The first bit	128.0.0.0
2	From the first bit to the second bit	192.0.0.0
3	From the first bit to the third bit	224.0.0.0
. 8 9 . 16 17 .	. From the first bit to the 8th bit From the first bit to the 9th bit . From the first bit to the 16th bit From the first bit to the 17th bit .	. 255.0.0.0 255.128.0.0 . 255.255.0.0 255.255.128.0 .
24	From the first bit to the 24th bit	255.255.255.0
25	From the first bit to the 25th bit	255.255.255.128
26	From the first bit to the 26th bit	255.255.255.192
27	From the first bit to the 27th bit	255.255.255.224
28	From the first bit to the 28th bit	255.255.255.240
29	From the first bit to the 29th bit	255.255.255.248
30	From the first bit to the 30th bit	255.255.255.252
31	From the first bit to the 31st bit	255.255.255.254
0	The 32nd bit	255.255.255.255
* Masking on 32nd bit has the same effect as masking none, and in NetServer 0 instead of 32 is used. Masking 32 bits means that all the 32 bits are network ID, and masking none means that all the 32 bits are host ID. Therefore masking all the 32 bits or none means that the provided IP address itself is applied with a command of ‘ Allow’ or ‘ Deny’ .		

If you want to allow only the IP addresses from 192.168.1.61 to 192.168.70, you may set as bellows.

Default Policy	Deny				
IP address	192.168.1.60	Masking	30	Policy	Allow
IP address	192.168.1.60	Masking	0	Policy	Deny
IP address	192.168.1.64	Masking	29	Policy	Allow
IP address	192.168.1.71	Masking	0	Policy	Deny

* The IP addresses in black squares can be any IP address of the sub-networks. In the first square, 192.168.1.60 to 192.168.1.63 is to be assigned. And in the second square 192.168.1.64 to 192.168.1.71 is to be assigned.

Principle in filtering

The sub-network range is smaller; the priority in filtering is earlier. Therefore a single IP address (masking with 0) has the first priority.

(2) Image Encryption Mode

Administrator may restrict people to receive images from one’ s NetServer, even though people accessed it. If ‘ Image Encryption Mode’ is enabled and a pin number is assigned, people have to

key in the assigned pin number to see image after accessing NetServer image viewers. Encryption PIN (number or character) should be consisted in 9 bytes. 9 bytes are equal to 9 English characters.

'Security Configuration' is a double-checking function to control accessibility, utilizing 'User Account Configuration' at the same time.

7) Video Configuration

This page is to configure every channel with various conditions.

(1) Video Channel Selection

To select which video channel to configure. In the list, there are 6 video channels.

(2) Video Channel State Control

It is to determine which channels will be enabled to send image signals to the image viewer. If a channel with an external source is disabled, no image will appear in the image viewer. However, if a channel without an external source is enabled, the overall transmission speed will go down and no image will appear. To view an image from an external source, the channel with the source must be enabled.

(3) Camera Color Type

It is to define whether images from a camera are color or Black/White (B/W). This will not change a camera's original character (color cameras can be viewed in B/W or color, but they are still "color" cameras). Rather, this is to help define external cameras, and provide information to NetServer.

(4) Video Signal Type

It is to define whether the signals of external CCTV cameras are 'NTSC' or 'PAL'.

(5) Camera Installation Angle

NetServer can always show images in right angle regardless of camera's installation position. If camera is located on the wall upside down, user can adjust image angel by selecting '90 deg.' or '270 deg.'

(6) Advanced Configuration

Calibration Parameters

Administrator can manipulate screen settings by adjusting brightness, contrast, hue, saturation, horizontal line shift, and vertical line shift from the menu. With 'Video Gain' menu, the image may be optimized without adjusting each value of other menus. However 'Video Gain' is not supported currently. It is to be supported in near future.

Caption Display Options

Administrator can configure caption on real time image with display options such as color and contents. Caption is to be made of time information, channel information, and additional explanation (user defined string).

Visual Setting Parameters

Administrator can configure QBOX and image quality level with aid of real time image. Place the mouse curse on real time image and click the right button, and pop-up menus will be viewed.

- **QBOX Parameters**: Administrator sets QBOX area with a mouse to 'click and drag'. Selected area shows in 'Left Top Placement' and 'Right Bottom Placement' panels in figures. With 'Ambient Level' menu, Administrator may set quality level of unfocused area in the image (out of the focused range). There are 5 levels. Administrator may set level 5(Darker) to make unfocused area dark and get the transmission speed up.

- **Image Quality Level**: Administrator chooses image quality level from 0 to 9. Level 9 is the best quality. But transmission speed will be reduced because of larger sized data. The image level inside the 'QBOX' is the same level as is selected in this menu.

8) Application Configuration

This page is to configure e-mail and file sending functions.

(1) Select Video Channel

It is to select a video channel for configuration.

(2) Recipient E-mail Address

This is to designate a person to receive E-mail.

(3) Sender's E-mail Address

This is to put a person's e-mail address that is considered as the e-mail sender.

The e-mail sender can be a person who should take care of the situation when events occur. E-mail will be delivered to a person who is defined as a recipient in the blank of 'E-Mail Recipient'. The person who received e-mail can send a message of countermove to a person who is defined as an e-mail sender. Actually, NetServer sends E-mail, but it is no use sending E-mail back to NetServer. So a person can be designated to receive counter e-mail.
Another important function of this menu is to avoid a problem that the e-mail is blocked from e-mail server. Some e-mail servers don't receive an e-mail that does not have its valid domain name such as abc@abcdefg.com. It is because there are a lot of junk e-mails. So NetServer and other devices that do not have their valid domain names or only have their IP addresses can't send e-mails. To avoid this problem, NetServer has the menu to put sender's e-mail address. The default value is invalid, so administrator should change the address with valid one. Administrator may put one's e-mail address.

(4) Check E-Mail Options

Relay Mail Server: With the same problem of e-mail blocking, NetServer has a function to relay its e-mail through an available e-mail server so that e-mail can have the relay server's domain name. After activating 'User Relay Mail Server' menu, key in a server's domain name such as '@abcdefg.com'. To use relay mail server function, don't use the default value. The e-mail server of default value is invalid.

Content-Transfer-Type: It is to define e-mail format. E-mail servers support 'Base64' format in common, but some servers not. In the case, select the format as 'Quoted Printable'.

(5) E-Mail Event Configuration

Event source: Administrator should define the triggering event for E-mail delivery among MD (motion detection), sensor 1, sensor 2, sensor 3, sensor 4, sensor 5, and sensor 6. If administrator clicks on sensor1, e-mail is sent when the sensor1 detects events. (To utilize sensor input detection, a sensor should be connected to NetServer.) If administrator clicks on periodic sending, e-mail is sent periodically every preset time. The interval may be modified.

File name: Administrator can name the image files by one of three methods: date & time (DATETIME; e.g. IMG-CH00-2001030-223031.eye), serial number (SEQNUM; e.g.

IMG-CH00-SN1.eye), or the administrator can name the file (Manually assigned filename). The image file has the extension ".eye" to enable reproduction on an Internet browser. With DATETIME or SEQNUM format, NetServer automatically assigns this extension. When a file is manually named however, the administrator must add the ".eye" extension for the image to be reproduced on an Internet browser.

Image quality: Administrator may set image's resolution that is delivered by e-mail. Resolution is to be set among 90x60, 180x121, 360x243, 720x243, and 720x486. An image of 90 by 60 is of the lowest resolution and the smallest size.

Check Points for E-mail Sending Problem

If you have problem in sending e-mail, check followings;

- If you have set DNS address properly in 'System Configuration' page.
- If you have set sender's e-mail address properly in 'Application Configuration' page.
- If you have set e-mail type properly between 'Base64' and 'Quoted Printable'.

(6) FTP directory configuration

Administrator assigns FTP server address, FTP user account, FTP user password, and FTP user path to receive files when events occur.

(7) FTP event configuration

Administrator may set sending conditions, image resolution, and file name. Image resolution, filename, and sending conditions setting methods for FTP are same as that of e-mail.

Transmission Performance of E-mail and FTP

- NetServer sends once in five minutes at most when administrator configures NetServer to send e-mail periodically. If there is no restriction in sending e-mail, NetServer may cause a serious problem to the recipient's mail server. However there is no limit in sending e-mails under MD or sensor activated situation.
- With FTP function, there is no limit. And if the periodic sending menu is set as zero(0), NetServer transmits files at its best performance.
- With FTP function, if the interval between two events is within 2 seconds, the second event may be neglected. After image transmission, if the second event happens within 3 seconds, the second image file may not be transmitted at all.
- With e-mail function, if the interval between two events is within 3 seconds, the second image file may not be transmitted at all.

9) Pan/Tilt/Zoom Configuration

This page is to decide whether to use pan/tilt/zoom control function or not and select which serial port to use.

(1) Video Channel Selection

Administrator selects a video channel for the pan/tilt/zoom mechanism. The four channels shown in the panel are the same as seen on 'Video Configuration' page.

(2) Pan Tilt Function

Administrator defines whether to utilize pan/tilt control function or not.

(3) Zoom Function

Administrator defines whether to utilize zoom control function or not.

(4) Pan Reverse Mode Function

This is to set command reverse direction against to right and left direction control arrows. This function is useful when PT driver is installed upside down.

(5) Tilt Reverse Mode Function

This is to set command reverse direction against to up and down direction control arrows. This function is useful when PT driver is installed upside down.

(6) Select Serial Port

It is to select a useable serial port as the character of pan/tilt/zoom control receiver.

It is to select a serial port between 'Serial #1' and 'Serial #2' with which a pan/tilt/zoom control receiver is connected to NetServer. Serial #1 is RS232C interface and Serial #2 is RS422/RS485 interface.

(7) Serial Port Base Address

This menu identifies the base address for a video channel and a pan/tilt/zoom (P/T/Z) control receiver. NetServer-6 can support up to six P/T/Z devices for six separate channels when Serial #2 (RS485 Half-Duplex) is enabled. The "Serial Port Base Address" identifies each P/T/Z device to each channel. Select a channel to configure and change the "Serial Port Base Address" to correspond with the channel number. This will allow independent operation for up to six P/T/Z controls. In addition, all channels can be set to the same "Serial Port Base Address" for synchronized movement.

10) Serial Port Configuration

This page is to select a communication protocol among listed ones or to set control parameters manually for each serial port.

(1) Serial Port Selection

Administrator selects a serial port to configure. NetServer-6 has two serial ports. Serial #1 is a RS232C interface port, and Serial #2 is a RS485/RS422 interface port.

(2) Select Attached Device

Administrator selects a communication protocol that an attached external device satisfies among already listed protocols. Philips has listed protocols of Philips, Pelco (P and D), Sensormatic, Video Technical (VTP 4x), LG (GAC-PT2), Sony (EVI-D3x), Surveyor (PT360 and TransitRCM), Sungjin (SJ3728R1), Kukjae (KRS-3200), Serim (SRP-PT1), Mitsubishi (CIT7300), and Samsung (SRX100B). Administrator may utilize any pan/tilt mechanism that satisfies already listed protocols.

Audio Device

This protocol is for NetServer A10, which is an audio transmission device connected to NetServer. For more detailed information on NetServer A10, please refer to NetServer A10 User' s Guide.

Manual Setting

If the mechanism doesn' t use any of already listed protocols, administrator may set the protocol manually by selecting 'Manual Setting' and set parameters through 'Control Parameters' and 'PTZ CMD' menus. And administrator should configure their control parameters such as 'Baud Rate', 'Stop Bits', 'Data Bits', and 'Parity Check' according to connected external camera settings. For detailed information, please refer to following explanation.

Control Parameters	Baud Rate : 19200 bps Stop Bits : 1 bit Data Bits : 8 bits Parity Check : NONE
PTZ Left CMD	
PTZ Top CMD	
PTZ Right CMD	
PTZ Bottom CMD	
PTZ Home CMD	
PTZ Zoom In CMD	
PTZ Zoom Out CMD	
PTZ Focus Far CMD	
PTZ Focus Near CMD	

PTZ Command for Manual Script

1. Escape Characters

#	Special command
@	Hexadecimal character
%	Decimal character
^	Character
,	Break character
;	End of current packet
&	Special operation

2. Special command (Followed by #)

A	Address assigned by PTZ configuration
X	Acceleration rate selected by user
S*x*	Checksum calculation method
x = 0	Sum of entire frame, size = 1byte
x = 1	Sum of entire frame, size = 2byte
x = 2	Sum of entire frame except first byte(sync), size = 1byte
x = 3	Sum of entire frame except first byte(STX) and last byte(ETX), size = 1byte
x = 4	Sum and one's complement of entire frame except first byte(STX) and last byte(ETX), size = 1byte
x = 5	XOR sum of entire frame, size = 1byte
x = 6	XOR sum of entire frame, size = 2byte
x = 7	XOR sum of entire frame except first byte(sync), size = 1byte
x = 8	XOR sum of entire frame except first byte(STX) and last byte(ETX), size = 1byte
x = 9	XOR sum and one's complement of entire frame except first byte(STX) and last byte(ETX), size = 1byte

3. Special Operation (Followed by &)

S*x*	Delay about (([*acceleration rate*] + 1) * (100 * *x*)) ms
x	0 ~ 4

4. Exceptions

Normal character following Escape Sequence, must use break character for identify end of sequence

Some protocols are not to be made command script with above method. It is because they have another method of checksum calculation. If your protocol does not use above checksum calculation method, please inquire WebGate Inc. through its Internet homepage. In the case, it is necessary to send the protocol together.

11) Digital I/O Configuration

This page is to configure digital input state and control script. NetServer sends e-mails or/and files when connected external sensors detect events.

(1) Input Port 1, 2, 3, 4, 5, and 6

Administrator defines active state of 6 digital devices connected to six input ports such as infrared sensors. If normal open type device is connected to input port, select 'NO (Normally Open)'. With normal close type device, select 'NC (Normally Close)'.

(2) Output Port 1, 2, 3, 4, 5, and 6

NetServer shows current states of the 6 digital devices connected to 6 output ports. In the status panel, active state or de-active state message shows. 'De-Active State' means that connected device didn't detect any event when 'Apply' button is clicked. Though this message is not updated until 'Apply' button is clicked again, NetServer keeps on receiving status information from the connected device.

12) Alarm Configuration

This page is to set image- recording conditions during an event situation for e-mail/FTP delivered images.

(1) Motion Detection Threshold

Administrator sets the threshold for motion detection function. Threshold '0' is the most sensitive state and '900' is the least sensitive state.

(2) Alarm Parameters for E-mail / FTP Application

Administrator defines the image-recording conditions for an event, if NetServer detects events through motion detection function (MD Event) or external devices (SID1, SID2, SID3, SID4, SID5 and SID6). NetServer can record 2 frames for 2 seconds before the event and 2 frames for 2 seconds after the event as well as 1 frame at the moment of event. Its maximum recording rate is 1 frame per second and the total fames are maximum 5. NetServer records the images and send them through e-mail or FTP according to preset conditions on 'Application Configuration' page and 'Alarm Configuration' page. If event lasts long, NetServer sends images without duplicating regardless of overlapped time setting. The resolution of the image is fixed as 360x243.

13) User Custom Configuration

This page is to customize TCP ports of data transmission and default viewer composition.

(1) Web Server TCP Port

Administrator assigns a web server TCP port for user access to NetServer and data transmission from NetServer. 80th port is assigned as default value.

(2) Video Server TCP Port

Administrator assigns a video server TCP port image transmission from NetServer. 8080th port is

assigned as default value.

(3) Select Main Page

Administrator assigns a viewer for the main page of NetServer. Three viewing options are available: "Default Simple Viewer", "Default Multi Viewer", and "Server Push Viewer". "Default Multi Viewer" displays images through six-divided screens.

(4) Default Viewer Editing

'Default Viewer' is designed for users to edit easily. Editable parts are as bellows.

- **Main Title**: It is to change the main title displayed at the bottom of the default viewer.
- **Logo Image Source URL**: Administrator may assign the URL of any web site from which default viewer gets a logo. The space to put a log is located on the left top of the viewer.
- **Logo Image Link URL**: Administrator may link the logo with a certain web page, such as a company or personal homepage.
- **Background Color & Foreground Color**: Ground color of default viewer can be changed. Administrator may set the color with RGB value.

When the changed settings are to be affected?

You have to click 'Apply' button at every administration page, if you want to apply changed settings onto your NetServer.

14) Goto Viewer Page

This menu is to return to real time image viewer page from administration page.

(Appendix 1)

Detailed Specifications of NetServer-6

1. General

Hardware

CPU	32bit RISC Embedded processor
Flash memory	8MB
RAM	16MB
ROM	64KB
OS	Embedded Linux
Video Channel	NTSC or PAL video format are supported 6Ch. Internal Video Inputs
Image Resolution	720X486, 720X243, 360X243, 180X121, 90X60

Image Compression

Algorithm	Wavelet
Rate	20:1 ~ 300:1

Performance

Transfer Rate	Max. 120fps (With 3KB image) Max. 30fps(NTSC) / 25 fps(PAL) (on 360X243)
Decoding Rate	2 ~ 30fps
Local Compression rate	Max. 30fps/1Ch, 6fps/6Ch
Security	Password Based User Authentication IP-filtering (Secure Mode) Image Encryption
Alarms and I/O	Motion detection Sends e-mail automatically Sends the image files through FTP automatically Software-controlled 6-alarm input 6 Digital Input (Coupler), 6 Digital Output (Relay)
MISC. function	High quality image area setting Image quality control (10 Levels) Periodic sending of images through E-Mail or FTP Gray/Progressive/Single-Shot/Channel Rotate Mode User customized home page publishing supported by FTP Audio supported through RS232 port
Power Supply	DC 12V, 1.0A via external power supply

2. Network

Browser	MS Internet Explorer V. 5.0 or higher Netscape V. 4.7 or higher JAVA Applet for non PC User (MAC or Unix)

Connector	Two 10 Based-T Ethernet (Network, Loop Stackable upto 3 boxes only with 1 IP)
Installation	Assign IP address using setup program or ARP/RARP protocols
Protocols supported	TCP/IP, HTTP, ARP, RARP, ICMP, DHCP, FTP, SMTP, PPP and PPPoE
S/W Upgrade	Flash memory allows central remote software upgrades over network using FTP or private "WebyeUpgrade" program
Management	Configuration is achieved by private setup program and Web server built in administration page.

4. Mechanical

Dimension	H x W x L = 40mm x 220mm x 240mm
Weight	1.25kg (without power supply)

5. Compatible external devices and software

PTZ control	RS-232, RS485/RS422
Sensor input	6 auxiliary inputs are supported, made of ' Opto coupler' Opto coupler stands with 3-5V and 10-20mA

(Appendix 2)

Upgrading NetServer-6 Firmware

Warning

This process is to upgrade NetServer-6 with a new firmware.

Make sure to complete the whole process, since you begin the process. When the process is completed, 'User Image Upgrade is complete' message appears. During the process, do not give physical shock nor disconnect network and power. Otherwise, your NetServer-6 can be damaged seriously, which may result inappropriate operation or operation failure.

If you failed in upgrading NetServer-6 firmware or NetServer-6 does not operate properly after successful upgrading process, contact WebGate distributor in your area.

1. Connect NetServer-6 to a PC

- Directly connect NetServer to a PC with a crossover cable. This connection is recommended.
- Connect NetServer to a PC through a HUB with a direct cable.

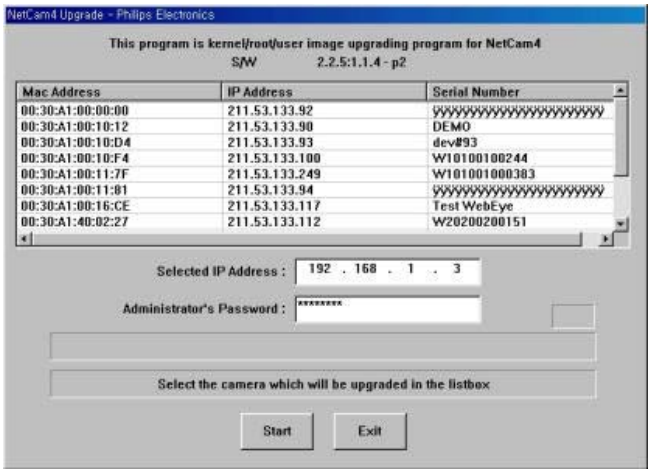
*** This process can also be done on a remote network. However it is not recommended.**

2. Upgrade firmware with upgrading program

(1) Select NetServer to upgrade by clicking on IP address or MAC address in the list.

When an IP address appears in the blanks of "Selected IP address," type in the administrator's password in the "Administ -rator's password" blank.

Click "Start" button.

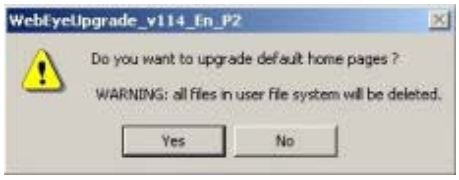


(2) Click "Yes" button to confirm upgrading process.

(3) Click 'OK' button to start rebooting process.

(4) If NetServer has a different firmware version, the program will ask if it should be replaced with a new one. Confirm by clicking "Yes."

(5) T he program will ask to format user file system. To maintain any changes made to NetServer's homepage, click "No." To format user file system and reload the default settings, click "Yes."



(6) When upgrade is complete, reboot NetServer by clicking the "Ok" button.

(7) To upgrade other NetServers, repeat the above process. Otherwise, click "Exit."