WebEye E20 User's Guide

* This manual is for WebEye firmware version 1.2.7. If your WebEye has the later version of firmware, please download the last updated user's guide from WebGate's homepage (www.webgateinc.com)

System Requirements

■ **For WebEye**

- Network: 10 Base-T LAN

(Leased line, xDSL, Cable Modem, ISDN)

■ **For a PC to access WebEye**

- 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

WebGate Inc.

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.

Important Notice

1. WebEye is for indoor use. The built in CCD (charged coupled device) can be damaged permanently if the camera lens is exposed to direct sunlight. When the WebEye is placed under glaring light, an iris lens is recommended. If your application demands prolonged exposure to sunlight, consider using a sun visor.

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

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

4. Be cautious in handling WebEye. Physical shock such as dropping the unit may damage the WebEye and void warranty.

5 The WebEye 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.

6. If WebEye 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.

7. 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 WebEye?**

  The WebEye is a camera server with an integrated Internet server, image compression device, built in CCD, flash memory, and many other features. No other hardware is necessary for use. The WebEye connects directly to a network and provides real time images over networks and the Internet. Simply provide power and connect LAN cable to the WebEye. WebEye utilizes Wavelet image compression and Linux operating system. Wavelet and Linux enable WebEye to transfer high quality images faster and with a greater degree of reliability than standard JPEG systems.

- **Features and Benefits**

  Ease of Use – WebEye 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 WebEye to the Internet and it is ready for use.

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

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

  Wavelet Image Format - Unlike many other products that need to fracture image files prior to broadcast, the WebEye 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 WebEye easily.

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

  Embedded Linux Operating System – WebEye 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

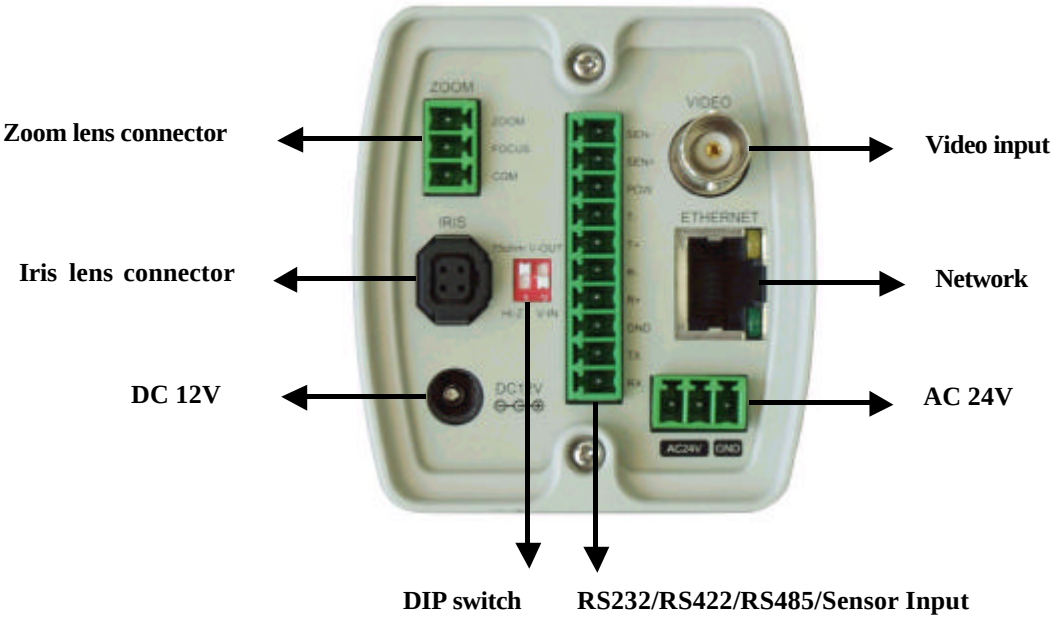
1. WebEye E 20

1) Contents

* Unpack and check all the items as below.

Item	Description	Remarks
WebEye	Web server camera	
AC Adapter & Power cable	DC12V, 1.5A	
Manual	WebEye E 20 User's Guide Quick Reference Guide	Provided on CD Printed material
Crossover Cable	1 meter crossover cable	Red-colored
Direct Cable	2 meter direct cable	White-colored
PSTN Connector	Connector for utilizing PSTN	
CD ROM title	Setup program and manual	

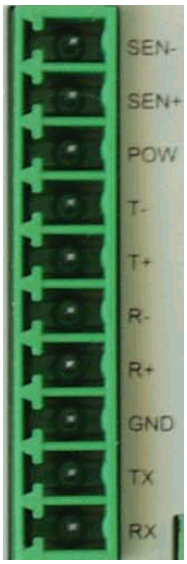
2) Rear Vitew and Descriptions



Connector Name	Description	Remark
Video Input	To input video signal through a coaxial cable.	
Zoom Lens	To control zoom and focus adjustment	
Network	To connect 10 Base-T Ethernet cable.	
Iris Lens	To input Iris lens	
DIP switch	To designate video signal termination of ‘ Video Input’ BNC connector. (Only the left switch is used)	

AC 24V	To connect a power supply unit of 24V AC.	
DC 12V	To connect a power supply unit of 12V DC.	
RS232/RS422/RS485/ Sensor Input	To connect external devices	Arctile3)

3) RS232/RS422/RS485/Sensor Input



Connector	Description
SEN -,SEN +	To connect external sensor
POW	To supply power
RS-232	To communicate between WebEye and external devices such WebEye A10 (An audio transmission kit), or an external modem. These pins are for devices that satisfy RS-232C protocol, and they are consisted in TX, RX, and GND.
RS-422	To communicate between WebEye and external device that satisfies RS-422 protocol. They are half-duflex. It is consisted in R+, R-, T+, and T-.
RS-485	To communicate between WebEye and external device that satisfies RS-485 protocol. They are consisted in 485+ and 485-. Short R+ and R- with a wire to get RS422+ and short T+ and T- to get RS422-.

4) Description on LED of Ethernet Port

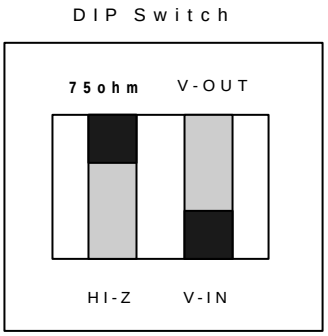
Yellow LED: This LED indicates the status of data transmission. After power is supplied, it is on for the first 4-5 seconds and then it goes off. And it blinks continuously when a user access WebEye and WebEye transmits data.

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.

5) Descriptions on DIP Switches

This is to designate video signal termination of internal and external video signal.

If you connect a external CCTV camera to ‘Video Input’ and want to configure termination, set switches like right drawing.



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 WebEye.

- 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 WebEye.

III. WebEye Installation Summary, Connection & Placing

1. Inst allation Summary

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

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.

3. Placing

- Place WebEye appropriately for your purpose.

IV. Installing WebEye Setup Program

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

V. Assigning IP Address and Configuring Administrator' s Condition

1. Connecting WebEye E 20 to a PC

1) Connecting WebEye E 20 on Internet or LAN.

Use the direct cable (white colored one) to connect WebEye E20 to Internet or LAN. With this connection, remote users will not be able to access WebEye until local user configures WebEye' s network setting.

2) Connecting WebEye E 20 to a PC.

Use the crossover cable (red colored one) to directly connect WebEye E20 to a PC. This connection is to be used to configure WebEye.

IP Address Assigning Methods

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

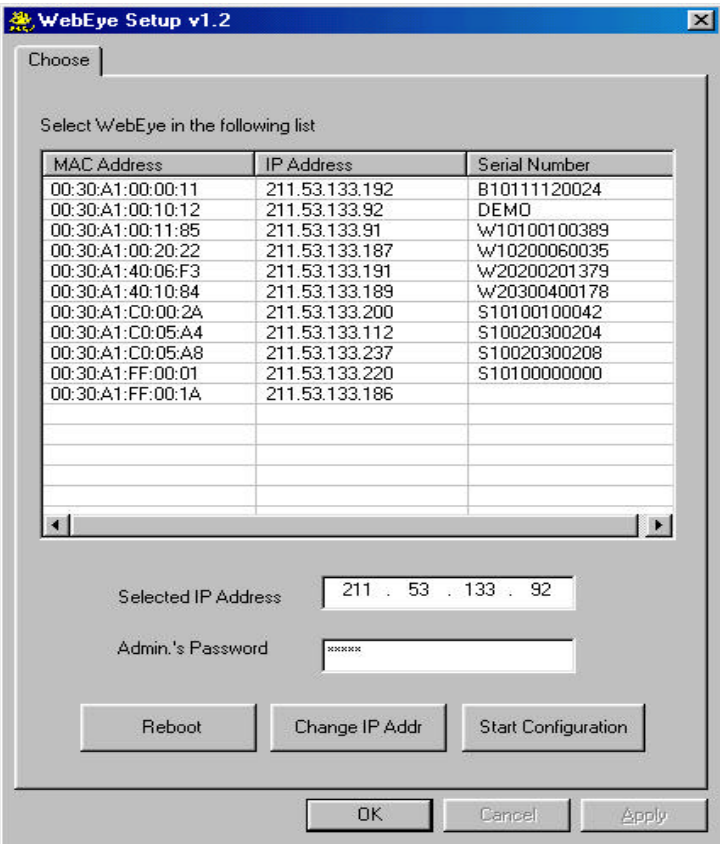
2. Assigning IP address and Configuring administrator's condition with Setup program

1) Starting Setup Program for WebEye

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

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

When a WebEye 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 WebEye, 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 WebEye. This process takes 10-20 seconds.

2) Configuring Administrator' s Conditions

To access the WebEye' 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")

3. Assigning IP Address with ARP command

1) Using ARP in Windows 98 and NT

When using WebEye with Windows 98 and Windows NT, follow the steps below.

- Open a DOS window and type the following commands.

```
Arp   -s   <WebEye IP address>   <WebEye Ethernet address>
Ping  -t   <WebEye IP address>
```

- Example

```
Arp   -s   192.168.1.3   00-40-8c-10-00-86
Ping  -t   192.168.1.3
```

2) Using ARP in Windows 95

When using WebEye with Windows 95, follow the steps below.

- Open a DOS window and type the following commands.

```
Arp   -s   <WebEye IP add.>   <WebEye Ethernet add.>   <my PC IP add.>
Ping   <WebEye IP address>
```

- Example

```
Arp   -s   192.168.1.3   00-40-8c-10-00-86   192.168.1.2
Ping   192.168.1.3
```

3) Verifying Installation

After successfully completing the above procedures, the following message (or similar) will appear on the screen:

```
Request timed out
:
Request timed out
Reply from 200.243.232.178: bytes=32 time=2ms TTL=255
Reply from 200.243.232.178: bytes=32 time=2ms TTL=255

Ping statistics for 200.243.232.178:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms
```

If the above “ping” reply does not appear, press 'F3' and 'Enter' keys. Normally “Request timed out” messages appear 7 times before replying properly.

Once the above “ping” reply appears press <Ctrl>+<C> keys to make it stop.

When the “ping” reply stops, data loss may range from 0% to 99%. This is normal. If the statistic shows ‘100% loss’, check the following criterions: (a) network line and connection status are stable; (b) IP address assigned to WebEye is available; (c) PC and WebEye have the same local network IP address. Same local IP address of C grade network means that first 3 sets of numbers are the same but the fourth set is different. For example 192.168.1.2 and 192.168.1.3 are in the same local network. (If there is a ‘Network Mask’ on the network, this can be an exception. For detailed information on IP, refer to appendix 3)

VI. Accessing WebEye Homepage & Monitoring Real-time Image

After assigning WebEye an IP address, the WebEye 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 WebEye IP address. This will access the WebEye login homepage.

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

2. Login page

1) ID and password

The login page allows only registered WebEye users to view images from WebEye. To connect to WebEye 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 WebEye is blocked. Common video TCP port (A default video TCP port of WebEye is 8080th port.) is blocked under firewall. In this case, real time image may be viewed through WebEye's Server Push Viewer that transmits video through Web TCP port instead of video TCP port. To connect Server Push Viewer directly at WebEye homepage, click on 'Behind Firewall' menu.

3) WebEye Plug-in for Netscape user

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

4) WebEye 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 WebEye. 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 "WebEye Plug-in." If the file is downloaded, but images cannot be seen, delete the file and re-install.

5) WebEye 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

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

There are 6 viewers for real-time monitoring in the WebEye homepage: default viewer, normal viewer, simple viewer, server-push viewer, java applet viewer, and snapshot viewer. An administrator may set 3 different viewers as main viewer out of the 6 viewers. (default viewer, normal viewer, or simple viewer as main viewer) User may monitor real-time images through the viewer that is set as main viewer by administrator.

1) Real-time monitoring through default viewer

At default viewer, user may also choose a viewer among all 6 viewers. Therefore general user may use a certain viewer for one's convenience.

Especially, this default viewer is designed of HTML and server-side script, so administrator may change page easily.

(1) Real-time monitoring.

You can set channel, resolution, expansion, and frame rate.

Channel selection

Select channels to monitor. User may select one specific channel or both of 2 channels.

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.

(2) Changing with other image viewers

User may monitor real-time image through other viewers such as simple viewer, normal viewer, server-push viewer, java applet viewer, and snapshot viewer.

Normal viewer and simple viewer

There are various functions such as pan/tilt/zoom control, gray-scale transmission mode, progressive transmission mode, etc. Simple viewer is recommended for systems using low speed network lines.

Server push viewer

If user's PC is connected on network where a firewall is, the user may view real time image through server push viewer. If user access server push viewer, real time images are transmitted through Web TCP port. So images are to be transmitted at lower frame rate than ones of simple viewer or normal viewer. User may utilize almost the same functions that of normal viewer or simple viewer.

More service

User may see explanation on normal, simple, server-push, java applet, and snap shot viewers. Java applet viewer is for user who accesses WebEye through a computer that does not utilize MS Windows OS such as Macintosh computer, etc. And snapshot viewer is to see still image beforehand accessing WebEye homepage.

(3) Accessing administration page

Click the "Administration" to go to the Administrator's Login Page. Enter the administrator's ID and password to access the settings menu.

(4) Plugin

Click on the "Plug-in" link to download the latest version of the Netscape WebEye Plug-in. This is only necessary for those who use Netscape Navigator.

(5) FAQ

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

(6) Version

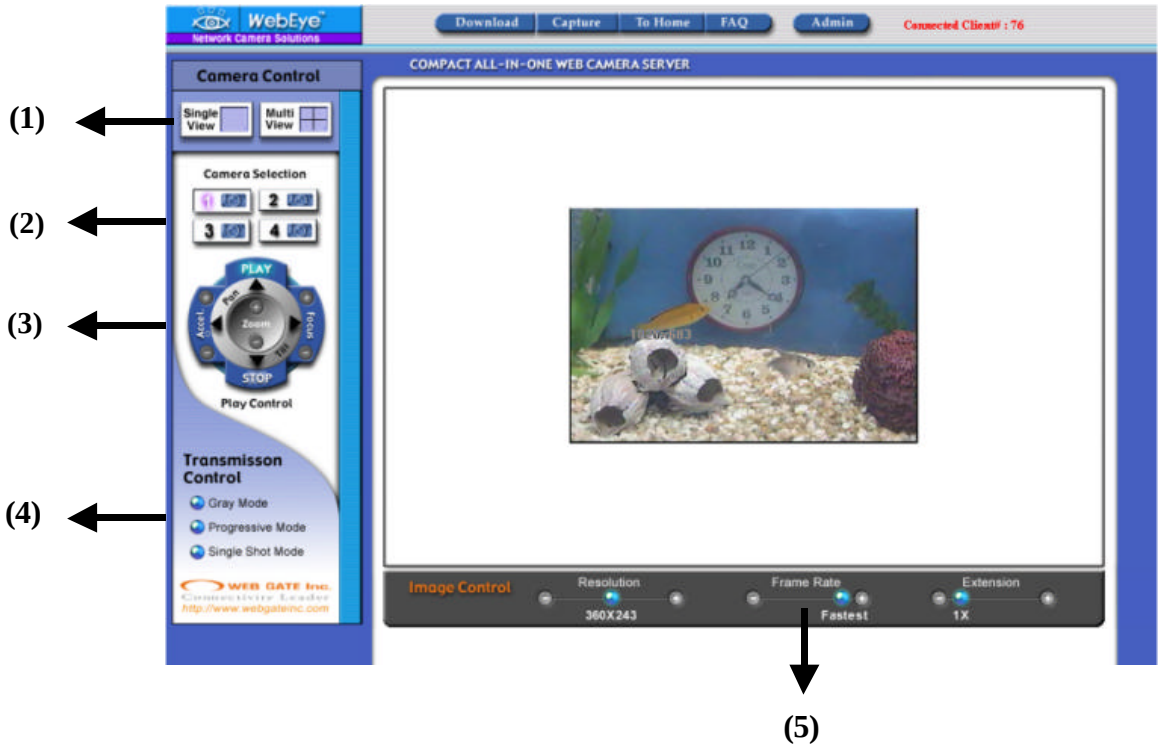
User may look up information about the current firmware and software versions being used by WebEye.

(7) Placing a company logo and hyper-linking

The WebGate company logo, located on the left top 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 normal viewer

After login, the normal viewer provides various options such as pan/tilt/zoom control, gray mode, and progressive mode, to configure monitoring conditions for user' s requirements.



(1) Single View / Multi View

The "Multi View" allows the monitoring of other images from additional cameras connected to the WebEye. The E 20 can view two images simultaneously. Please note that transmission speed cannot exceed 30 fps, and additional images will slow overall transmission speed. "Single View" monitors a single channel. Click on the appropriate button for single view or multi view.

(2) Camera Selection

"Camera Selection" switches the video source for the viewer. Each image will appear in the "Single View" mode.

(3) Play Control

Pan/Tilt

To move the direction of WebEye to where to want to see.

4 direction arrows

To change direction right/left and up/down.

Zoom

To zoom the image in and out.

Focus

To control and optimize the image' s focus.

Accel.

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

WebEye 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.

(4) Transmission Control

Gray Mode

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

Progressive Mode

Every image is regenerated from low to high resolution. In other words, an image is reproduced from vague to clear. This function is useful when using a low speed network such as a dial up phone modem.

Single Shot Mode

When this button is clicked, one frame of image is reproduced. Therefore, no other images may be viewed. To go back to the real-time images, click the button again

(5) Image Control

Resolution

To control the resolution level. Higher resolution levels reduce frame rate.

Extension

To see images in different sizes from 1X to 4X. However, Extension (2X to 4X) does not increase image's resolution. Therefore, the quality of extended image is not as clear as original image.

Frame Rate

To control image transmission speed. The "Fastest" setting will receive images at the fastest speed possible, based on network line capacity and PC capability.

(6) Other function buttons

Download

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

Capture

To save a frame of still image transmitted from WebEye. 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.

To Home

This button returns to the default viewer.

FAQ

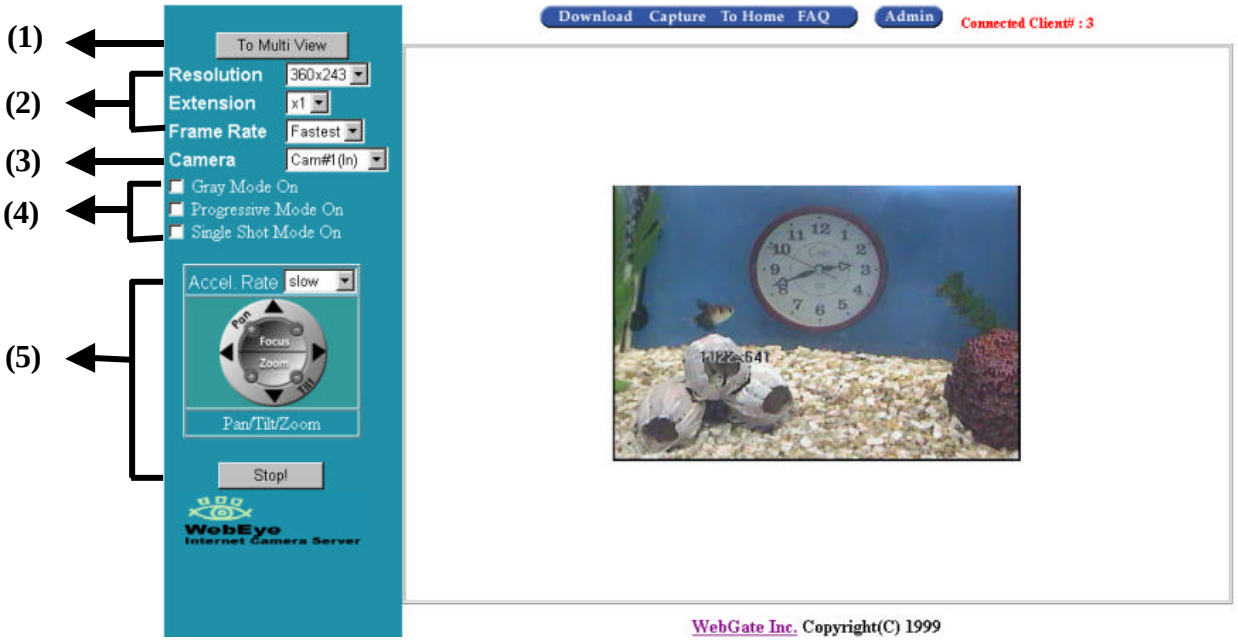
It lists frequently asked questions and answers.

Admin

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

3) Real-time monitoring through simple viewer

Simple viewer has the same functional menus as normal viewer does. However, simple viewer is designed using very simple graphics so that its size is decreased dramatically. Simple viewer is recommended for users with low speed transmission.



(1) Single View / Multi View

User can select a mode between single view and multi view. The button is toggled between the two functions. Usages are same as normal viewer. Please refer to descriptions on normal viewer.

(2) Image Control

Functions are same as normal viewer. Please refer to descriptions on normal viewer.

(3) Camera Selection

Functions are same as normal viewer. Please refer to descriptions on normal viewer.

(4) Transmission Control

Functions are same as normal viewer. Please refer to descriptions on normal viewer.

(5) Play Control

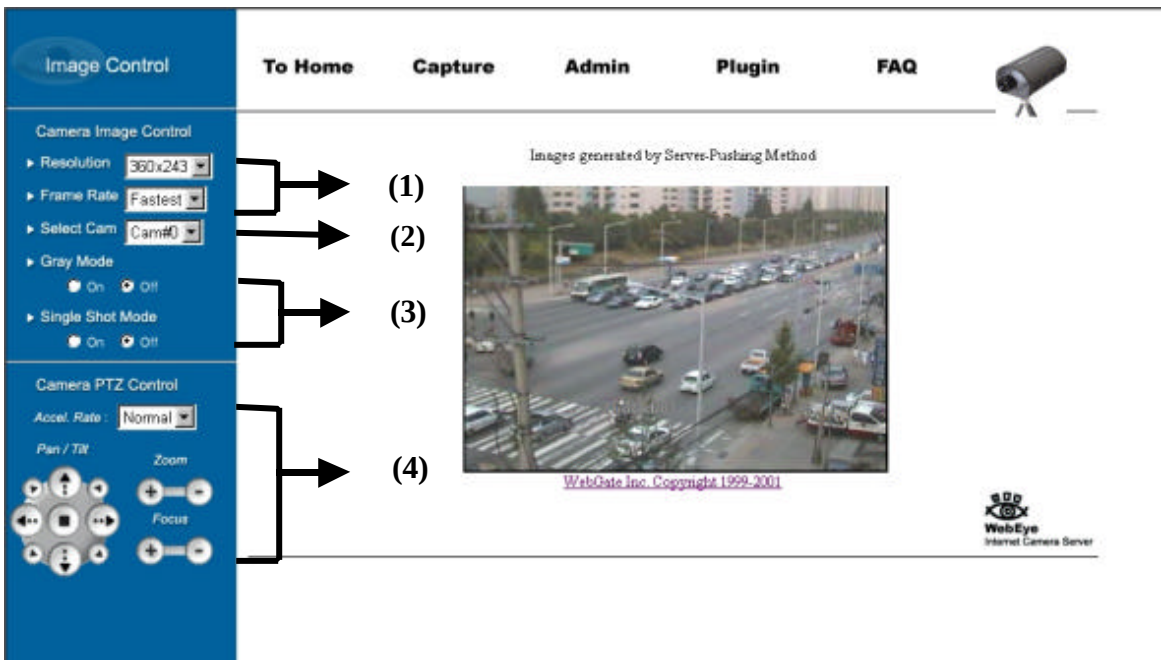
Functions are same as normal viewer. Please refer to descriptions on normal viewer. "Play" and "Stop" functions are toggled on the same button.

(6) Other function buttons

Functions are same as normal viewer. Please refer to descriptions on normal viewer.

4) Real-time monitoring through server-push viewer

If WebEye is installed on a network with a firewall, the server-push viewer will allow remote access to real-time images. Once the server-push viewer is engaged from within the network, images can be viewed over the Internet with the normal, simple, or default viewer. To do this, change either the Web TCP port or the video TCP port. For more information about changing TCP port, please refer to Chapter VII "Configuring Administrator' s Configuration at Homepage."



(1) Image Control

On server-push viewer, there is no "Image extension" menu. Other usages are same as normal viewer. Please refer to descriptions on normal viewer.

(2) Camera Selection

On this viewer, there is no "Multi Viewer" menu. Functions are same as normal viewer. Please refer to descriptions on normal viewer.

(3) Transmission Control

On this viewer, "Progressive Mode" menu is not available. However functions are same as normal viewer. Please refer to descriptions on normal viewer.

(4) Play Control

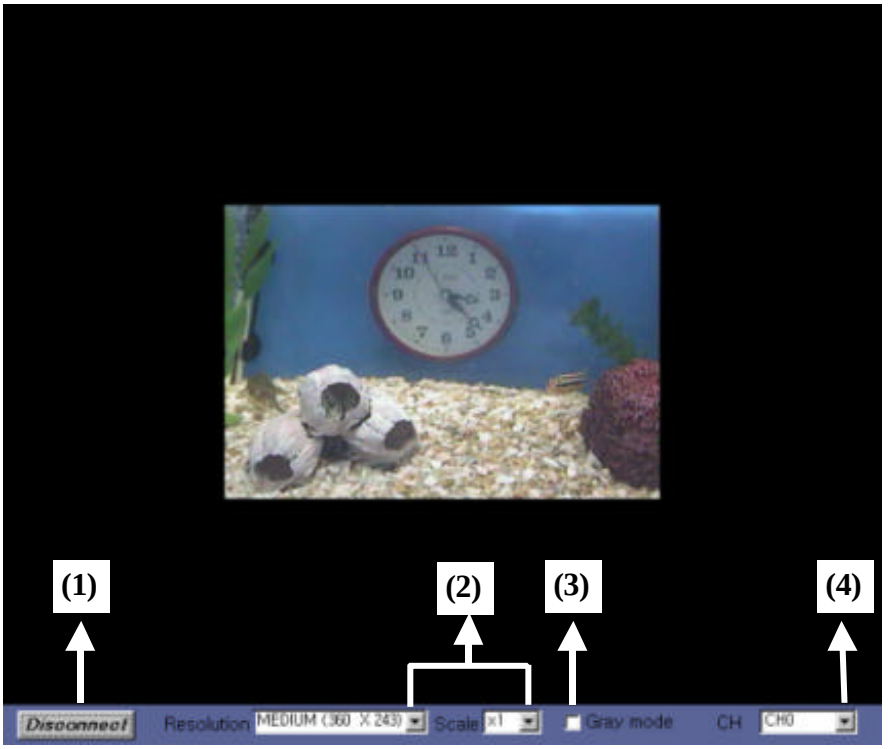
This is to control PTZ mechanism. Usages are same as normal viewer. Please refer to descriptions on normal viewer.

(5) Other function buttons

Usages are same as normal viewer. Please refer to descriptions on normal viewer.

5) Real-time monitoring through java applet viewer

Java applet viewer is for the users who access WebEye through a computer that dose not utilize MS Windows OS such as Macintosh computer, etc.



(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 WebEye.

(2) Image Control

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

(3) Transmission Control

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

(4) Camera Selection

On Java Applet viewer, there is no "Multi Viewer" menu. Other functions are same as normal viewer. Please refer to descriptions on normal viewer. "CH 0" is for internal camera and "CH 1" is for the camera that is connected to video input. Therefore "CH 1" screen can be seen when external camera is connected to WebEye.

6) Real-time monitoring through snapshot viewer

Snapshot viewer can be used to view still images without monitoring real-time motion pictures through other viewers. With default source, a user sees snap shot images from internal CCD (Ch0). To view images from other channels, change the source.

There are two modes for the snapshot viewer. One displays a single fixed image, and the other displays an image that is updated every three seconds. A user may hyper link this menu to another Internet homepage to monitor from the WebEye.

VII. Configuring Administrator's Condition at WebEye 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 WebEye 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 WebEye 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 WebEye 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 WebEye operating conditions. It is very import to configure the conditions properly to utilize WebEye 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 WebEye. Model, serial number and software version appear automatically.

(1) WebEye Name

The name is to be used to register the WebEye 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 WebEye 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 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 "WebEye Current Date & Time" panel, the date and time set in the WebEye appears. In "System (PC) Current Date & Time" panel, the same date and time set in user's PC appears. To synchronize the WebEye 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.

(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 email 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. "Date & Time," "Model," "Serial Number," IP configuration, passwords, and all items in "Video" menu will not be changed.

(7) Rebooting

If WebEye 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 WebEye to everyone, you may not change default user' s ID and password. However you should change administrator' s ID and password with unique ones of yours.

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 forfeit 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 information, 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 dome camera.

(3) Ethernet Interface

Administrator may configure IP address, subnet mask, broadcast address, gateway address, and DNS addresses of WebEye. For broadcast address, administrator may set it automatically by dicking ‘Get From Netmask’ button after assigning IP address and subnet mask. When the addresses are not assigned properly, any user cannot access WebEye 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 WebEye. 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.

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 WebEye on dynamic IP registration list of WRS (WebEye Registration Server). WRS has its domain name of ‘webeye.to’ and the domain name is registered on DNS servers on the world. When your WebEye asks the DNS server on your network, the DNS server resolves the corresponding IP address of ‘Webeye.to’ and informs the IP address to your WebEye. Then your WebEye 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

(4) xDSL Interface

If WebEye 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 WebEye may get IP address when it is connected on xDSL line.

(5) PSTN Interface

If WebEye 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 WebEye to connect to ISP through telephone line for Internet connection. In this case, WebEye is connected to dial-up modem with a serial cable unlike other interfaces such as 'Ethernet' or 'xDSL (PPPoE)'. With these interfaces, WebEye 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 WebEye 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 WebEye through PPP connection. And being seen from WebEye, one is that WebEye dials out and the other is that WebEye is dialed in through dial-up modem.

Dial-out and Dial-in

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

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

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

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

When WebEye dials out?

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

Dial-out 2: While WebEye makes PPP connection to send e-mail or file, administrator may open to common users to access WebEye through Internet. For this purpose administrator should set WebEye to register itself on WRS (WebEye 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 WebEye simultaneously. But the connection-maintain time is for the moment that is set at 'Disconnect Time' menu. The process is as follows.

- WebEye dials up to ISP to connect on Internet.
- ISP asks information for login such as ID, password, etc, and WebEye answers to corresponding questions.
- ISP makes PPP connection to WebEye and assign an IP (official dynamic/fixed IP) to WebEye.
- WebEye connects to WRS (WebEye 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 'WebEye Dynamic IP Registration Server' (www.webeye.to) and find out the WebEye in the list.
- Users access WebEye to monitor real-time image on Internet.

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

- A user dials up to the modem that is connected to WebEye.
- WebEye makes PPP connection to the user's PC and assign an IP (private IP) to the PC. In this case, WebEye assigns an IP address that is in the same local network compared to its own IP address.
- Users access WebEye homepage through web browser by entering WebEye's IP address to monitor real-time image.

IP address of WebEye when it is dialed in

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

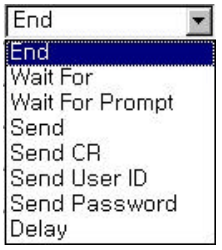
Below items especially user ID, password, and phone number are used for WebEye to connect ISP based on standard PPP. Therefore if your PSTN doesn't need special login script, WebEye dials up to make PPP connection with these items.

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.

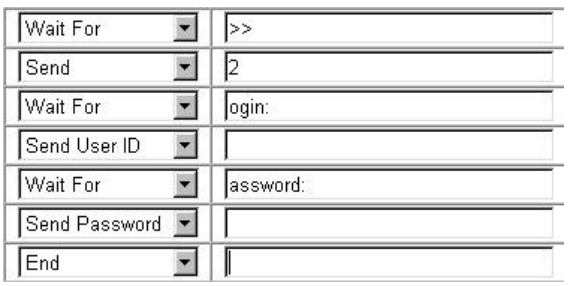
Disconnect Time: WebEye maintains connection for some while there is action such as sending email or files. And when the action is stopped, WebEye disconnects after sometime. This is to configure how long WebEye maintains the connection after any action doesn't occur. It is to be set from 1 to 600 seconds. Different to dial-out connection, a user may disconnect from WebEye 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 WebEye on dynamic IP registration server.

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

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

(1) Auto IP Registration Function

Administrator may register one's WebEye by enabling 'Auto IP Registration Function'. Registration process is that WebEye detects IP addresses from DHCP server and informs the detected IP addresses to dynamic IP registration server. And the server updates already registered informations with new one. Please keep in mind that user have to enable 'DHCP Client Protocol' at 'Network Configuration' page to have WebEye get dynamic IP addresses automatically, when WebEye is installed on a network of dynamic IP address. With 'Auto IP Registration Function' menu, a WebEye 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 WebGate Inc. If you do not run a server for IP registration personally, keep the server's name as default figure (webeye.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 WebEye.

(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 WebEye in WebEye Internet homepage' for more detailed information.)

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

(5) Access Token

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

Private List and Access Token

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

Access token is to be set no more than 4 bytes. 4 bytes are equal to 4 English characters.

5) How to find registered WebEye in WebEye Internet homepage

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

(1) Sign up membership

To search your WebEye 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 WebEye from public list

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

You may search your WebEye 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 WebEye a fixed IP address)

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

(3) Finding WebEye from private list

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

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

Search and Append: This menu is to append a certain WebEye on your own list. You may append WebEye 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 WebEye in the box.

- Click ‘ Append’ menu.
- WRS (WebEye Registration Server) search a corresponding WebEye with the conditions from both the ‘ Public List’ and ‘ Private List’ and registers the WebEye on your own list.

6) Security Configuration

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

(1) IP/Subnet Filtering Mode

You may allow or deny a certain user to access your WebEye 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 WebEye, 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 WebEye, you should select default policy as ‘ deny’ and register a few users as allowed users.

How to register allowed/denied user in the list

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 WebEye.

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 WebEye.

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 WebEye.

- 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 WebEye, while the IP addresses from 192.168.1.128 to 192.168.1.255 and any other IP address are to be denied accessing WebEye.

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 WebEye. And the IP addresses from 192.168.1.0 to 192.168.1.127 and any other IP address are to be denied accessing WebEye.

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 WebEye 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 WebEye, 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 WebEye 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

WebEye E20 has two channel options: 'Ch#0(Internal)' and 'Ch#1(External)'. 'Ch#0(Internal)' is fixed for internal CCD module, and 'Ch#1(External)' is for external CCD camera.

(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 defines 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 WebEye.

(4) Video Signal Type

It is to define whether CCD module of WebEye and external CCD cameras are 'NTSC' or 'PAL'.

(5) Camera Installation Angle

WebEye can always show images in right angle regardless its installation position. If WebEye 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' and 'Vertical Line Shift' are not supported currently. They are 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, 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. The two channels in WebEye E20 are the same as seen in 'Video Configuration' page.

(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, WebEye sends E-mail, but it is no use sending E-mail back to WebEye. 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 WebEye 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, WebEye 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, WebEye 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, and sensor 2. 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 WebEye.) 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, WebEye 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'.

(5) FTP directory configuration

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

(6) FTP event configuration

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

Transmission Performance of E-mail and FTP

- WebEye sends send once in five minutes at most when administrator configures WebEye to send e-mail periodically. If there is no restriction in sending e-mail, WebEye 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), WebEye 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 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. With WebEye E20, internal channel has fixed lens and doesn’ t support zoom function, therefore the menu is not on the page.

(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 serial port between ‘ Serial #1’ and ‘ Serial #2’ with which a pan/tilt/zoom control receiver is connected to WebEye. Serial #1 is RS232C interfaces 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. 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. Since the E20 has two serial ports and two channels, different base addresses are not necessary.

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. WebEye E20 has two serial ports. Serial #1 is a RS232C interface port, and Serial #2 is a RS485/RS422 interface port.

(2) Select Attached Device

PTZ protocols

Administrator selects a communication protocol from a pre-set list of attached external device. WebGate has listed protocols of Philips, Pelco (P and D), Video Technical (VTP 4x), Sony (EVI-D3x), etc. Administrator may utilize any pan/tilt mechanism that satisfies already listed protocols. Among listed protocols, Philips, Pelco, Sensormatic and VT protocols are marked with ‘ M’ and they are to be configured their control parameters such as ‘ Baud Rate’ , ‘ Stop Bits’ , ‘ Data Bits’ , and ‘ Parity Check’ according to connected dome

camera settings.

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. 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	

Audio Device

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

Control Parameters

With listed protocols of Philips, Pelco, Sensormatic and VT, you may also configure its control parameters such as 'Baud Rate', 'Stop Bits', 'Data Bits', and 'Parity Check' according to connected dome camera settings.

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.

1 1) Digital I/O Configuration

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

(1) Device Type for Input Port 1 & 2

Administrator defines active state of 2 digital devices connected to two input ports such as infrared sensors. If normal open type device is connected to input port, select 'NO (Normal Open)'. With normal close type device, select 'NC (Normal Close)'.

(2) Current State for Input Port 1 and 2:

WebEye shows current states of the 2 digital devices connected to 2 input 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, WebEye keeps on receiving status information from the connected device.

(3) Active State for Output Prot 1

Administrator defines active state of a digital device to be connected to the output ports such as an electronic locker or a switch. Active states of digital devices may differ depending on items or models (select between 'Open' or 'Close')

(4) Current State for Output Port 1

According to active state definition, WebEye shows current states of the digital device connected to an output port. Its state is defined at 'Active State for Output Port' menu.

(5) Status Control for Output Port1

Administrator controls an external device that is connected to the output port. After defining active state of the device at 'Active State for Output Port 1', Administrator controls the device to act or not with this menu.

(6) Active Condition and Duration for Output Port1

Administrator defines active conditions for an external device such as an electric light that is connected to the output port. After defining active state and controlling status of the device, administrator defines active conditions among internal S/W motion detection (MD Event) and two external sensors (SID1 & SID2 Event). And 'Active Duration' menu is to set the period of time to activate the external device after detecting event. If the event lasts long, WebEye activate the device for preset time after the last event detection.

Note in connecting external device

When WebEye E104 that needs output 12V is connected to external device, which needs much electric power, WebEye E104 may be operated abnormally. However external sensor does not affect WebEye E104, because it needs just little electric power.

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 WebEye detect events through motion detection function (MD Event) or external devices (SID1 and SID2). WebEye 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. WebEye records the images and send them through e-mail or FTP according to preset conditions on 'Application Configuration' page and 'Alarm Configuration' page.

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 WebEye and data transmission from WebEye. 80th port is assigned as default value.

(2) Video Server TCP Port

Administrator assigns a video server TCP port image transmission from WebEye. 8080th port is assigned as default value.

(3) Select Main Page

Administrator assigns a viewer for the main page of WebEye. Six viewing options are available: "Default Simple Viewer," "Default Multi Viewer," "Simple Single Viewer," "Simple Multi Viewer," "Normal Single Viewer," and "Normal Multi Viewer." Single Viewer displays images from Ch#0(Internal), and Multi Viewer displays images from all channels

(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 a URL of a certain 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.

14) Goto Viewer Page

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

VIII. Convenient Functions of Mouse (Pop-up menu)

A small window of 5 menus appears when you click the right button of the mouse. However only a certain 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 File As' are to be affected in every image that is transmitted to all users. (For detailed information, refer to 'User account management' in Chapter VII).

1. Image Info

You may decide the color (black or white) of the information that is shown on the left top of the image. A user who has 'Video control' right may utilize this menu.

2. Quality Box

This is to set a certain area clear and remained area dull. The Quality Box (QBOX) can help overcome insufficient network bandwidth by reducing the size of a focused image. To initiate a QBOX, right-click on the image and follow the steps below:

- 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.

To use an existing QBOX, select "Enable QBOX." To finish, select "Disable QBOX." The administrator may set the quality of the area outside the QBOX with "Ambient Level." If 'Level 1' is selected, the quality is similar to focused area. And if 'Level 5' is selected, the unfocused area is shown dark. A user who has 'Video control' right may utilize this menu.

3. Focus sensitivity

This is to configure movement degree of zoom mechanism. Sensitivity refers to the change in the focus range caused by one click. "Level 0" is the smallest degree of change and "Level 9" is the largest degree. A user who has 'PTZ control' right may utilize this menu.

4. Image quality

It is to set image quality from Level 0 to Level 9. "Level 9" refers to the highest quality image and "Level 0" refers to the lowest. Higher quality images require more transmission time. A user who has 'Video control' right may utilize this menu.

5. 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, which is shown at the moment when the button is clicked, is saved.

(Appendix 1)

Detailed Specifications of WebEye E 20

1. General

Hardware	
CPU	32bit RISC Embedded processor
Flash memory	8Mbyte
RAM	16Mbyte
OS	Embedded Linux
Video Channel	1Ch. Internal Video Input
Image Resolution	90X60, 180X121, 360X243, 720X243, 720X486
Image Compression	
Algorithm	Wavelet
Rate	10:1 ~200:1
Performance	
Transmission Speed	Max. 30fps
Decoding Rate	Max. 2 ~ 30fps
Compression Speed	Max 30fps(single channel)
Compression Ratio	Min. 1/20 to Max. 1/300
User	100-user support (simultaneous)
Security	Password (Based User Authentification)
	IP-filtering (Secure Mode)
	Image Encryption
Alarms and I/O	Motion detection(Each Channel)
	Sends e-mail automatically
	Sends the image files through FTP automatically
	Software-controlled 2-alarm input
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 Mode
	User customized home page publishing supported by FTP
Power Supply	12V DC 1.5A
Digital input/output	2 digital input (Opto coupler)

2. CCD Module

Horizontal resolution	330 TV lines
Pick-up device	1/4 inch interlined CCD
Scanning System	525 lines interlaced (NTSC)
	625 lines interlaced (PAL)
Synchronization	Internal
Output Signal	Standard composite signal
	1 Vpp composite video into 75 ohms
Light sensitivity	
30 IRE	5 Lux(Scene)
Electronic Iris	1/60~1/96,000(NTSC)
	1/50~1/96,000(PAL)

Signal to Noise Ratio	46dB or more (AGC off)
AGC	ON (0-15dB Max)
Input Voltage	5V DC
Power Consumption	160mA or less
Ambient Temperature	
Operation	-10C (14 F) to +50C (122 F)
In storage	-20C (-4 F) to +65C (149 F)
Relative Humidity	
Operation	Under 90% Non-condensing
In storage	Under 95% Non-condensing
Weight	13 g
Standard Lens	Fixed, F2.0, f=3.8mm, Horizontal view angle 53°

3. Network

Browser	MS Internet Explorer V. 5.0 or higher Netscape V. 4.7 or higher
Transmission I/F	10 Based-T Ethernet, External Modem (RS-232)
Installation	Assign IP address using setup program or ARP, RARP protocol
Protocols supported	TCP/IP, HTTP, ARP, RARP, ICMP, DHCP, FTP, SMTP, PPP and PPPoE
S/W Update	Setup Program through Ethernet Software in Flash memory is updately by Remote PC through Internet
Management	Configuration is achieved by private setup program and Web server built in administration page.

4. Mechanical

Dimension	H x W x L = 63mm x 69mm x 136mm
Weight	400g, without power supply

5. Environmental

(*) This data is a target specification.

Temperature *	
Operating	-5°C (23 F) ~ +40°C (104 F), Gradient 15°C (59 F)/Hr max
Non-Operating -	20°C (-4 F) ~ +60°C (140 F), Gradient 15°C (59 F)/Hr max
Under Shipment	-40°C (-40 F) ~ +70°C (158 F), Gradient 30°C (86 F)/Hr max (Packed in WebGate' s original shipping package)
Humidity *	
Operating	8% ~ 90% R.H. No condensation
Non-Operating	8% ~ 90% R.H. No condensation
Under Shipment	5% ~ 90% R.H. (Packed in WebGate' s original shipping package)
Vibration *	
Acceleration	1.2G
Frequency	10Hz ~ 60Hz
Sweep Time	1 OCT/Min
Shock *	10 G (10msec half sine wave Repeated twice maximum/sec)

6. Compatible external devices and software

PTZ control	1 Ch. RS-232 (Terminal Block)
	1 Ch. RS-422 (Terminal Block) / 1 Ch. RS-485 (Terminal Block)
Sensor input	2 auxiliary inputs are supported, made of ‘ Opto coupler’
	Opto coupler stands with 3-5V and 10-20mA(Appendix 2)
Auto Iris	4 pin Video Iris Connector
Back Focusing	CCD module movable mechanism
Zoom Lens Control	1 zoom lens control port

(Appendix 2)

Upgrading WebEye Firmware

Warning

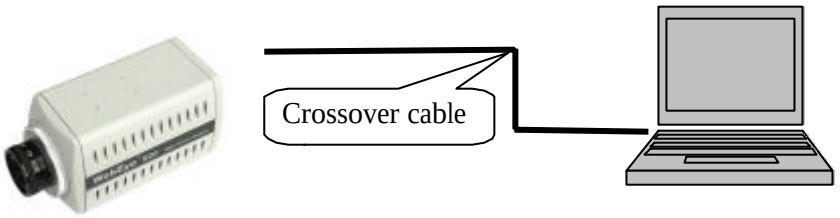
This process is to update WebEye with a new firmware.

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 WebEye can be damaged seriously, which may result inappropriate operation or operation failure.

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

1. Connect WeEye to a PC.

- Directly connect WebEye to a PC with a crossover cable. This connection is recommended.



- Connect WebEye 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.**

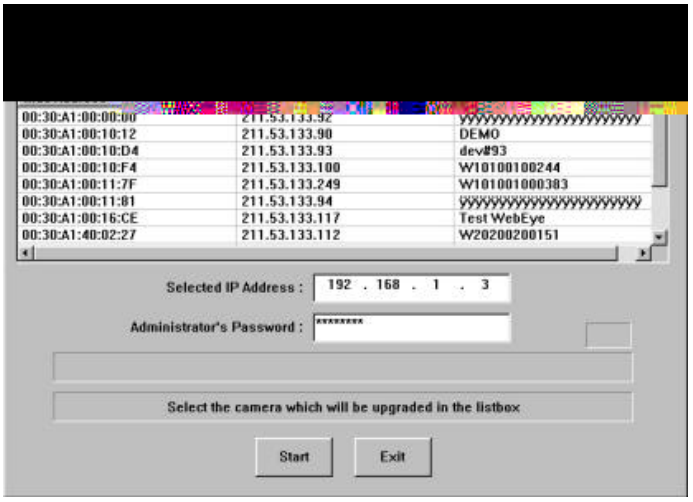
2. Upgrade firmware with upgrading program

(1) Open ‘MS Dos’ window and practice a command <c:\arp –d>.

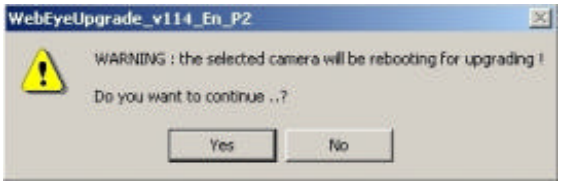
(2) Select WebEye to update by clicking on IP address or MAC address in the list.

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.

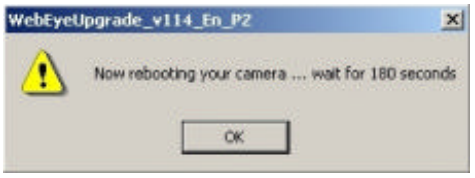
Click “Start” button.



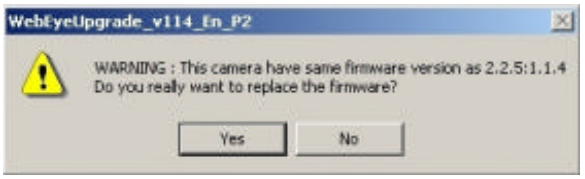
(3) Click “Yes” button to confirm upgrading process.



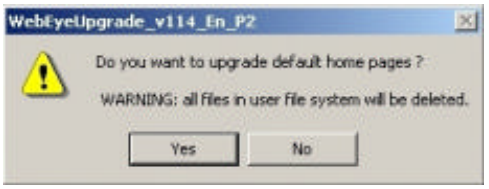
(4) Click ‘OK’ button to start rebooting process.



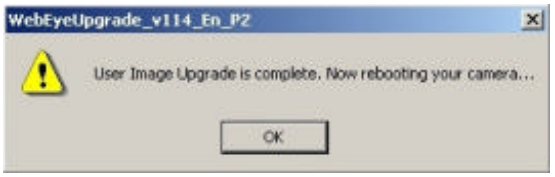
(5) If WebEye has a different firmware version, the program will ask if it should be replaced with a new one. Confirm by clicking “Yes.”



(6) The program will ask to format user file system. To maintain any changes made to WebEye’s homepage, click “No.” To format user file system and reload the default settings, click “Yes.”



(7) When upgrade is complete, reboot WebEye by clicking the “Ok” button.



(8) To upgrade other WebEyes, repeat the above