Intellisystem
TECHNOLOGIES

Videoserver
IT501

VIDEO   AUDIO

http://www.intellisystem.it

Table of Contents

Before You Use

Surveillance devices may be prohibited by law in your country. Though the IT501 Video Server is not only a high performance surveillance system but also a networked video server, ensure that the operation of such devices are legal before installing this unit for surveillance.

It is important to carefully check the contents with the "Package Contents" section after opening the package. Understanding the physical description can prevent damage caused by abnormal usage and reduce most problems during installation.

Basically the IT501 Video Server is a network device and should be easy to use for those who already have basic network knowledge. If there is a system error and it does not recover easily due to erroneous configuration, check the section "Auxiliary buttons" to restore factory default settings and run installation again.

The IT501 Video Server has been designed for various environments and can be used to build various applications for general security or demonstration purposes. For standard applications, read "System configuration" to understand all functions. To make the best usage of the IT501 Video Server, review "Advanced functions" to get creative ideas. To those professional developers, "URL Commands of the IT501 Video Server" will be a very helpful reference.

Those paragraphs preceding by ⚠ should be fully understood and cautioned. Ignoring the warnings may result in serious hazards.

Package Contents

Video Server IT501
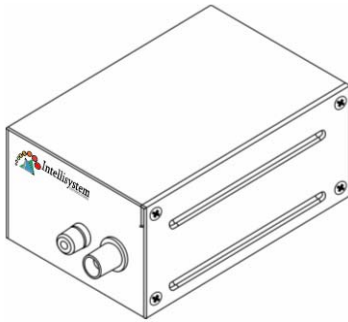
I/O terminal block connector

Wrench
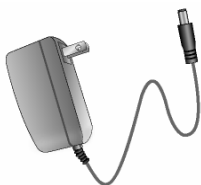
Installation and document CD

Power adapter

Camera control cable
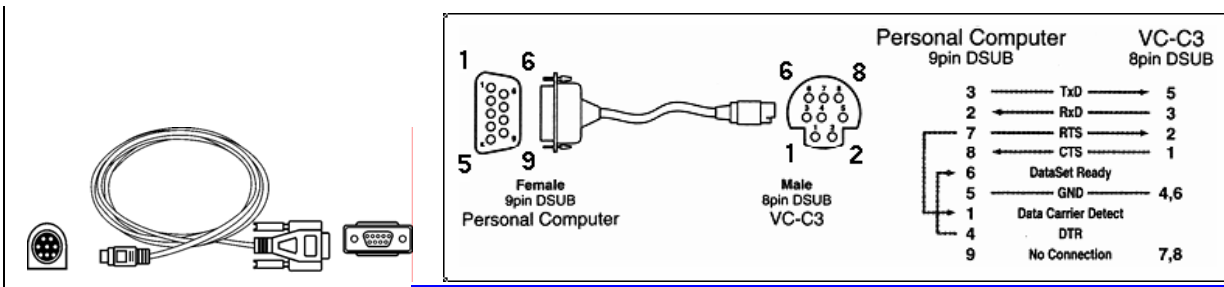
Null modem cable
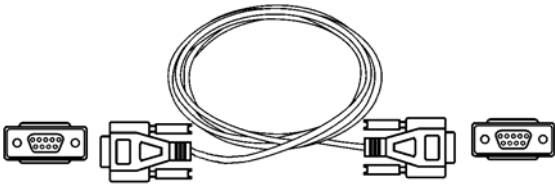
Physical Description

Front Panel

BNC video input

75Ohms resistance video port for connecting an external camera. To ensure video modulation type being correctly detected, cameras should be attached and powered on before the IT501 Video Server is powered on.

RCA audio input

The audio input is connected by RCA connector of mono-audio Line-In signal.

Rear Panel
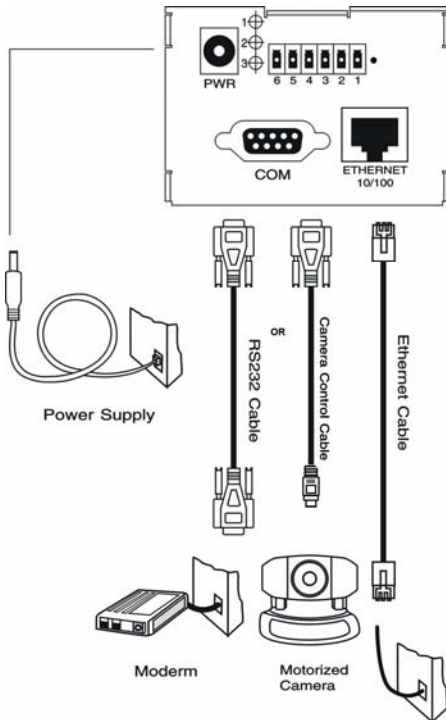
Ethernet 10/100 socket

Connect to Ethernet network with a UTP category 5 cable that cannot exceed 100 meters. Once the Ethernet cable is connected without error, the IT501 Video Server will utilize Ethernet interface regardless of modem connection.

COM port

This RS232 serial port can connect with a modem or included null modem cable to utilize dial-up network when Ethernet is not available. If the IT501 Video Server operates with Ethernet interface, administrators may use this port to control PTZ camera attached to VIDEO.

General I/O terminal block
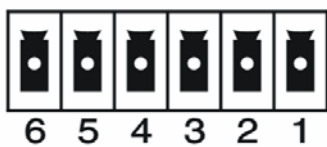
| 1 | ← | DI+ | INPUT | (Max. 50mA, 12VDC) |

2	←	DI-	INPUT	
3	←	SW_COMMON	OUTPUT	(short with NC at initial state)
4	←	SW_NOPEN	OUTPUT	(Max. 1A, 24VDC or 0.5A, 125VAC)
5	←	RS485 B		(inverting)
6	←	RS485 A		(non-inverting)

The IT501 Video Server provides a very flexible general I/O interface to combine with the user's security devices such as sensors, alarms, lighting or door locks. The general I/O terminal block has six pins for device control. These pins can be divided into two categories based on their functions, including RS485 and digital inputs and outputs.

If the device connected to COM has an RS485 interface, wire two control lines to pin 5 and pin 6. After switching to RS485 on the configuration page, the PTZ control commands will be directed through pin 5 and pin 6. If the distance from the controlled device is too far to allow accurate function, an external power source may be used to pull high the RS485 signal.

The IT501 Video Server provides one digital input and one relay switch. Pin 1 and pin 2 can be connected to external sensor and the state of voltage will be monitored according to the programmed scripts in configuration. The relay switch can be used to turn on or off external devices.

Status LEDs
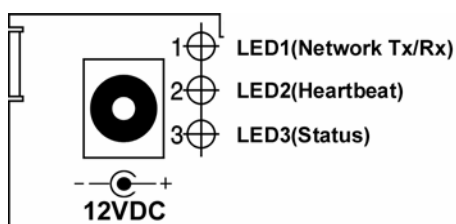
Each time the IT501 Video Server starts, it will perform a Power-On Self Test, abbreviated as POST hereafter, to examine every hardware module. As soon as the administrator plugs in the power adapter, both LEDs under the network LED will flash one by one until the POST is done. If any module fails, both LEDs will indicate to the users the error according to the pattern listed in Appendix A. If the result is good, both LEDs will turn off for a while and then follows the pattern below. Network interface depends on the peripherals including Ethernet UTP cable, modem or null

modem cable. If the Ethernet cable between the IT501 Video Server and Ethernet hub is good, the IT501 Video Server will choose the Ethernet network. If Ethernet is unavailable but a operational modem is connected, the network interface will be PPP with modem. If either of the above is not the case, the IT501 Video Server will try the interface of PPP with null modem.

Network Interface	Condition	LED2 (Heartbeat)	LED3 (Status)
Ethernet	before installed	OFF	OFF
	after installed	flash	OFF
	during camera control	flash	Flash
PPP with modem	after POST	flash	ON
PPP with null modem	before connected	ON	ON
	after connected	flash	ON

Restore button
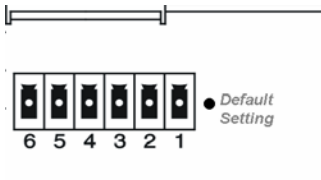
There is a button hidden in the box for restoring the system factory default settings. When the system fails to install or operates abnormally, use the included assistant stick in the package and follow the following procedures to reset the system back to its original status.

Poke the assistant stick into the hole to press down on the restore button. Restart the system by unplugging and re-plugging the power jack. While keeping the button pressed, the system will perform POST twice rather than the usual once, which can be observed from the flashing LEDs. After the system flashes the LEDs for the second time, withdraw the stick to release the button. The system will have restored factory default settings at that moment.

Power adapter

Connect the power jack of the included power adapter. Connecting the power adapter should be the last operation while physically installing the IT501 Video Server.

How to Install

To easily fit into various environments, the IT501 Video Server automatically detects the attached interfaces and configures itself to the best condition. Therefore users need not care whether the connected cameras are either NTSC or PAL, how to select the network between Ethernet and modem, and whether the Ethernet speed is 10Mbps or 100 Mbps. If the connected motorized camera is on the support list, users only need to plug and play without complicated configurations.

The IT501 Video Server supports Ethernet and modem interfaces according to the user's existing network. Ethernet can provide higher bandwidth to achieve the best performance while dial-up network with modem is more common in current Internet applications. Refer to the related installation section for your network environment. If both interfaces are available, Ethernet is recommended and will be chosen as the first priority if Ethernet cable and modem are concurrently attached. Managing to install in the other interface will automatically clear the previous network settings to start new installation.

In the following content, "user" refers to those who can access the IT501 Video Server and "administrator" refers to the supervisor who has the root password to configure the IT501 Video Server in addition to general access. Administrators should carefully read this manual, especially during installation.

Ethernet Environment

Hardware installation

Before installing multiple IT501 Video Servers at the well-chosen locations, the administrator should memorize the serial numbers on the packages respectively for future use.

Cable connection
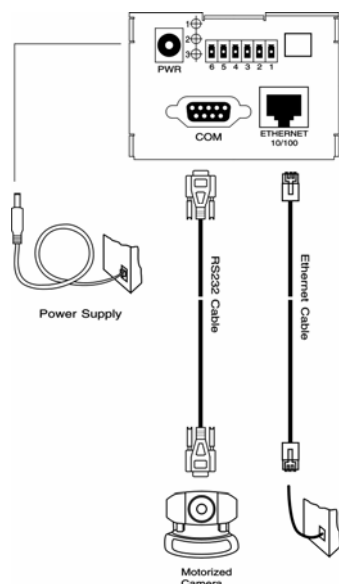
Shut down all the peripheral devices prior to connection. Connect the supplied cables from the IT501 Video Server to related devices according to the following steps. Note that the power adaptor must be kept unplugged until other cables are firmly connected.

Power on

Make sure all cables are correctly and firmly connected before turning on the IT501 Video Server. Turn on cameras, sensors, alarm devices, and then attach the power adaptor of the IT501 Video Server to the electric power socket*. After the POST (power-on self test) is complete and the result is successful, the IT501 Video Server is ready for software configuration as described in this manual. At this stage, network speed and video modulation type are automatically detected. If the detection of video modulation fails, administrators may change the setting on the configuration page. Refer to the configuration section for further information.

⚠ Connect the power jack of the power adapter to the IT501 Video Server prior to plugging the utility end into the utility power socket. It will reduce accidental electric surge shock.

Software configuration

Easy way with installer program

In order to configure IT501 Video Servers remotely, administrators should keep the serial numbers of the new IT501 Video Servers for identification and initial passwords. After successfully mounting IT501 Video Servers in the proper position, run the Installer program on the appropriate PC to locate the newly installed IT501 Video Servers. IT501 Video Servers also support manual setup procedures to non-Windows based environments. The manual procedure is described next.

After the POST is done, the IT501 Video Server will try to configure itself by detecting the network environment. If there is DHCP service over the network, the Installer program will catch the given information and display the serial number and given IP address for each IT501 Video Server as following figure. If no DHCP service is available, a previous IP address will be displayed instead. In that case, it may be 0.0.0.0 for a brand new unit. When multiple units are mounted, there may be several entries shown in the window. Administrators may click on each entry with "Assigned" field labeled "No" to install sequentially.
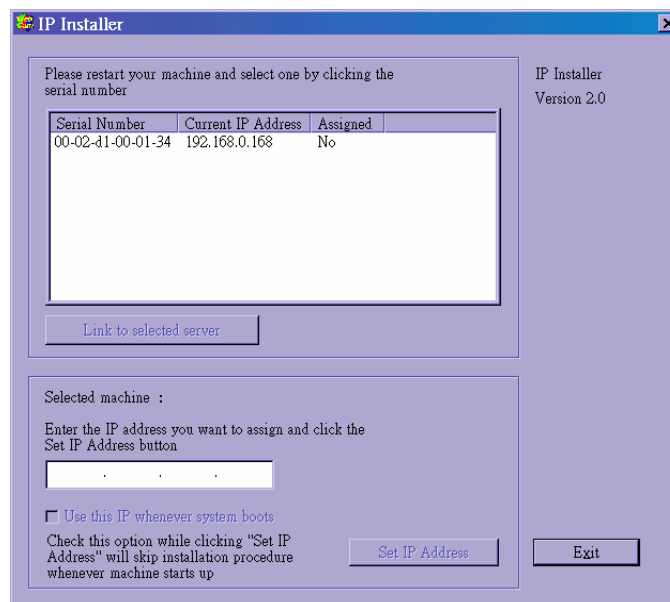
The IP address shown in "Current IP Address" field is for the administrator's reference. If the administrator wants to use another IP address, modify the IP text field below the list window.
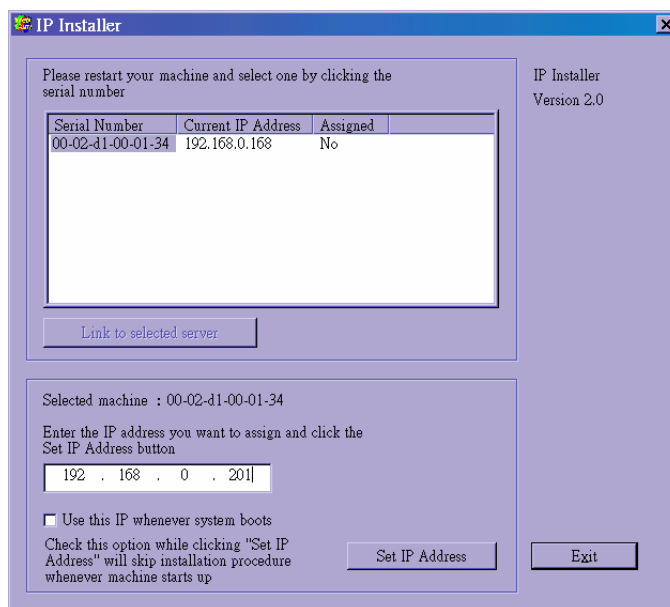
If the administrator wants to fix the IP address of the unit, check the option "Use this IP whenever system boots" to skip future installation procedures. Otherwise the unit will need installation whenever it is restarted.
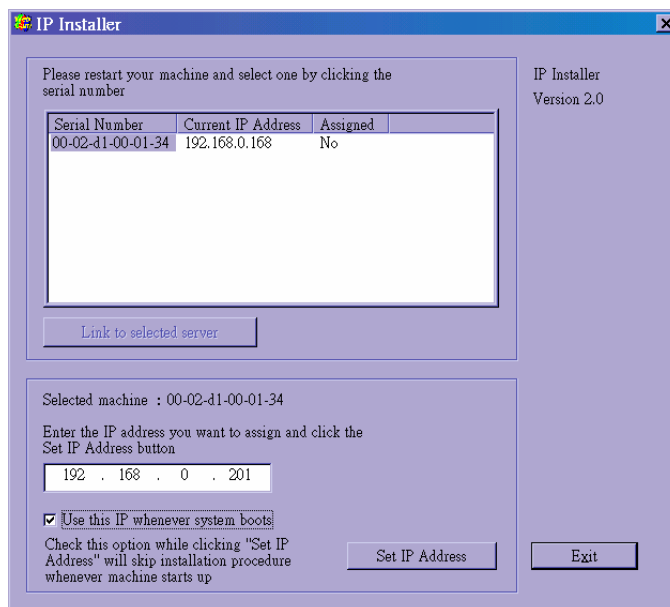
When IP and options are O.K., click on [Set IP Address]. A message window will pop open to inform if the IP address is valid.
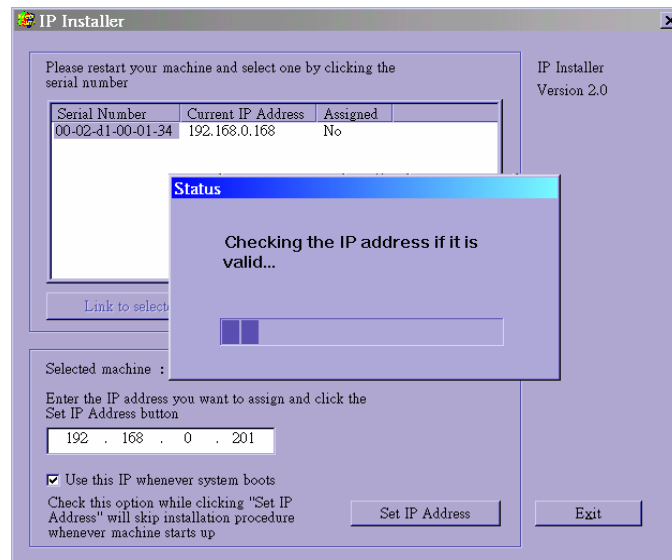
If the IP is not taken by another network device in the network, the Installer program will continue with the setup. Otherwise another message window will warn that the assigned IP conflicts. In this case, administrators should ask the network supervisor for a vacant IP address.
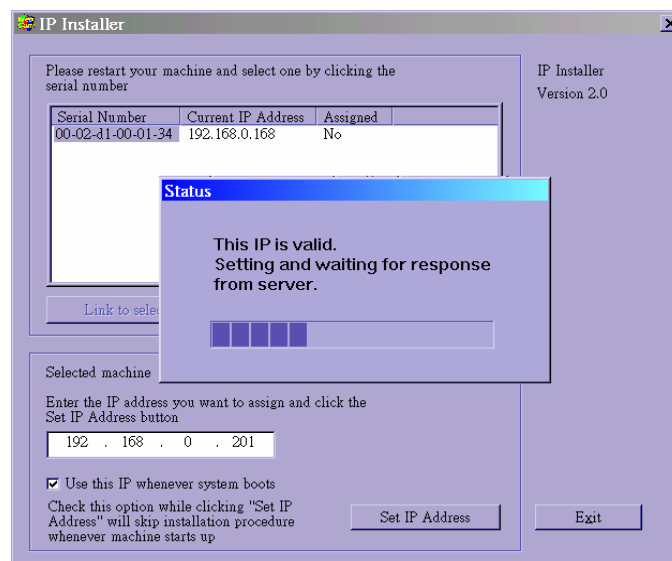
After successful notification, administrators may keep the address information for user's request.
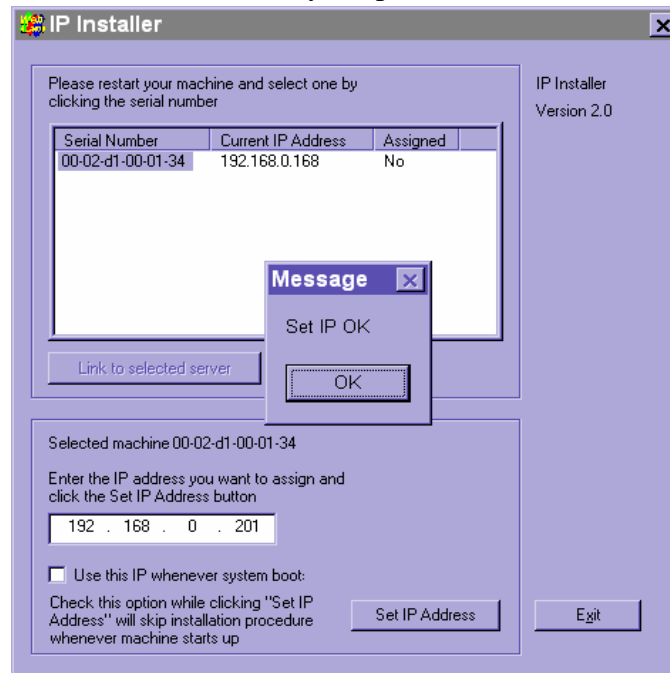
After clicking on [OK], the "Assigned" field will be labeled "Yes". Administrators may click directly on [Link to selected server] to access the newly installed server in the default browser.
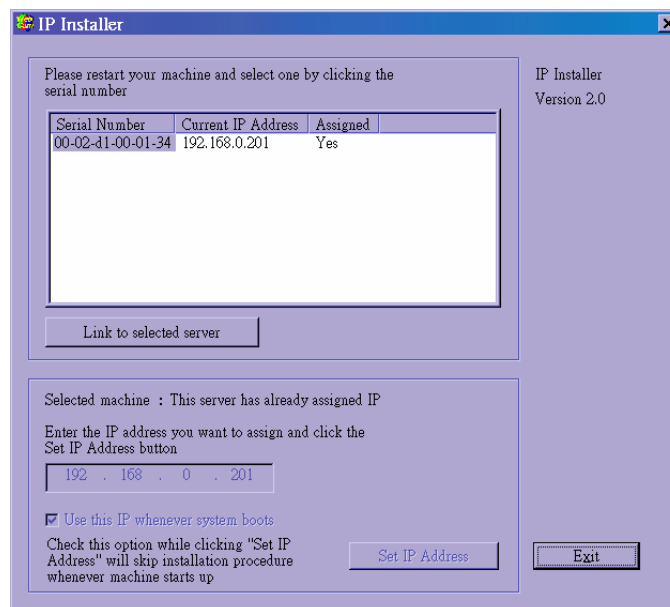
While checking "Use this IP whenever system boots", a dialog window may pop out to ask for "Server FTP Port" and "Root Password" because they are already changed to other than default settings. If the settings are lost, restore default settings and use installer to install again.
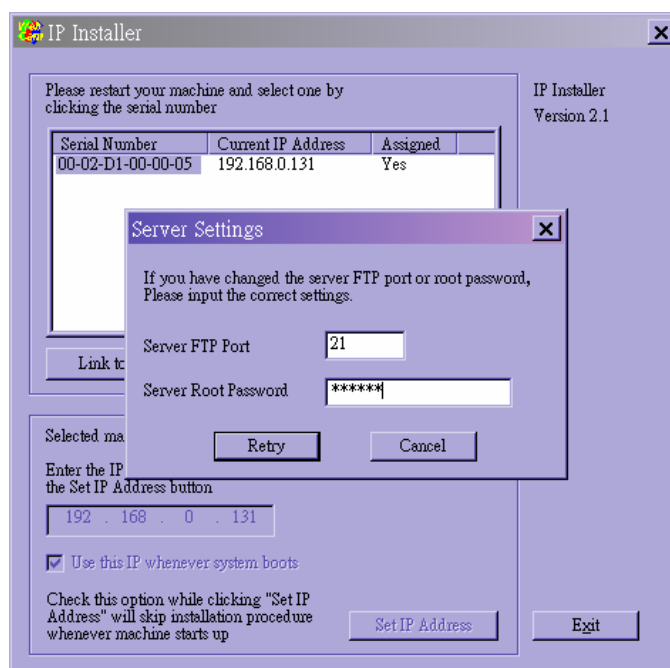
Once installation is complete, administrators should follow the actions in the "First access to the IT501 Video Server" section for necessary checks and configurations. Experienced administrators may use the customized config.ini script file to perform a quick setup via FTP. Detailed procedure can be found on the section "One-shot fast configuration via FTP".

To allow users to connect to the IT501 Video Server through an easily memorized name, the administrators must first configure the name server in his network. Here is an example: When the administrator wants to set up the IT501 Video Server with a fixed IP address and let users connect to the IT501 Video Server by typing a name instead of IP address, the administrator may reserve the IP from DHCP service and assign it with name in the domain name service. During the IT501 Video Server installation, assign the ready IP address. After successful installation, users may access the IT501 Video Server by the given name.

Manual way with existing programs

In addition to the provided installer program, some common network tools including ARP and PING can be used to install the IT501 Video Server. Open a DOS command prompt window to perform the manual installation.

First, type *arp –s "assigned IP address" "Ethernet address"* to add an entity in the system's name table. The Ethernet address is identical to the serial number of the IT501 Video Server and should be typed in the appropriate format, with every two characters separated by a hyphen like "uu-vv-ww-xx-yy-zz".

Once a name entity is added, type *ping "assigned IP address"* to invite the new IT501 Video Server. If it replies, that means the IT501 Video Server has accepted the assigned IP address and is ready for access. The first several ping requests may fail during the self-configuration period of the IT501 Video Server.

First access to the IT501 Video Server

When connecting to the IT501 Video Server for the first time, administrators should check security and network settings on the configuration page. For complete protection from illegal usage, the IT501 Video Server provides two privileges and always needs user name and password before access. The standard level is the USER mode that consists of twenty user profiles. Each user is able to access the IT501 Video Server except for system configuration. The twenty user profiles are also maintained by the administrator. The highest level is ROOT mode that only opens to administrators for initial setup, system configuration, user administration and software upgrade. The user name of the administrator is internally assigned to "root".

When connecting to the IT501 Video Server, users will be requested for user name and password by an authentication message window. A root password, identical to the IT501 Video Server's serial number, is needed for the initial access to a newly installed IT501 Video Server. The administrator must change the root password immediately after the initial installation to ensure security. The new root password should be well memorized since there is no way to retrieve or recover it. After changing the password, the browser will display an authentication window again to ask for the new password.

The other important part is network settings. The software configuration above makes the IT501 Video Server easily accessed through local networks. However administrators should review the network settings on the configuration page according to the existing service. The safe and easy way is to compare the network settings with another PC or workstation in the same network.

The software installation in the previous section only set the host IP address and default subnet mask as 255.255.255.0. Administrators should change the subnet mask if it differs from the one provided by server. Administrators should also fill in the default gateway, primary and secondary domain name servers if necessary.

By default the IT501 Video Server will need administrator's installation every time it reboots. If the network settings are sure to work all the time, disable the install option if this IP address is already reserved for this IT501 Video Server. Clearing this option will skip the installation procedure during the next power-up and use the previous settings. If the install option stays checked, the IT501 Video Server will perform the installation procedure every time the system boots up.

Details about configurations are described in the "How to Use" section. Related figures are attached for easy reference.

Modem Environment

Hardware installation

Before installing the IT501 Video Server, the administrator should memorize the serial numbers on the packages respectively for the initial passwords.

To use a dial-up network, the Ethernet socket should be left disconnected since Ethernet is the first priority among available interfaces. After powering up, the IT501 Video Server will detect if any external modem is connected to the modem port. Once a modem is detected, the heartbeat LED will flash periodically. If no modem responds, the IT501 Video Server will assume the included null modem cable is connected to perform system configuration. Then both lower LEDs will turn on until null modem connection is established.

If users have setup a remote dialup server or subscribed to an ISP service, the IT501 Video Server can be configured to dial to the server upon special events. Otherwise it will wait permanently for the user's call to establish a network connection to provide services.

In the following content, dial-in connection denotes a passive IT501 Video Server waiting for a phone call to establish a point-to-point connection. Dial-out connection denotes an active IT501 Video Server to dial out to the other end of a dial-up server or any Internet service provider, abbreviated as ISP, to request a point-to-point connection.

Cable connection
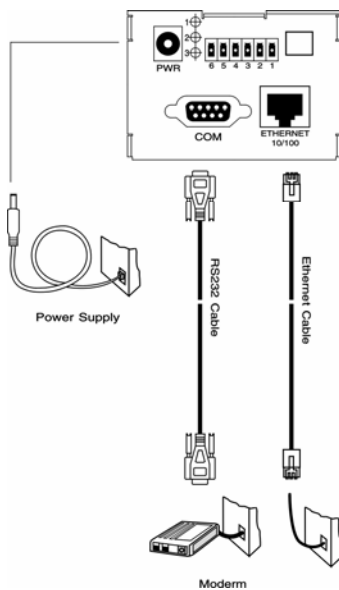
Shut down the peripheral devices prior to connection. Connect the supplied cables from the IT501 Video Server to the related devices according to following steps. Note that power adaptor must be kept unplugged until other cables are firmly connected. For the first access to the IT501 Video Server without Ethernet, administrators may use the included null modem cable to connect to COM for direct connection. It is also convenient for administrators to access the IT501 Video Server through the null modem cable directly without modem or Ethernet card. After necessary information is entered, a modem can be used to dial into the Internet.

Power on

Make sure all cables are correctly and firmly connected. Turn on cameras, sensors, alarm devices, and then finally attach power adaptor of the IT501 Video Server to the electric power outlet*. Since most automatic detections of hardware perform when the system starts, the IT501 Video Server should be turned on after all peripherals are turned on and ready.

⚠️ Connect the power jack of the power adapter to the IT501 Video Server prior to plugging the utility end into a utility power outlet. It will reduce accidental electric surge shock.

Software configuration

For the first time, users should connect the included null modem cable between the COM port of the IT501 Video Server and any COM port of the PC for initial setup.

Install a new modem

Open the control panel and double click the modems icon.

Check "Don't detect my modem......" item and click on [Next >] to install a new modem.
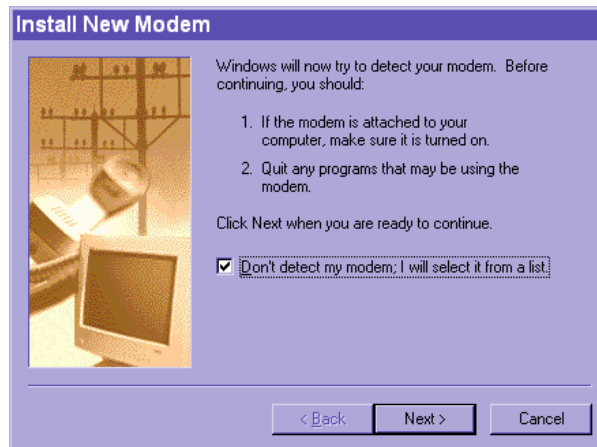
From (Standard Modem Type) choose the Standard 33600 bps Modem and click on Next> .
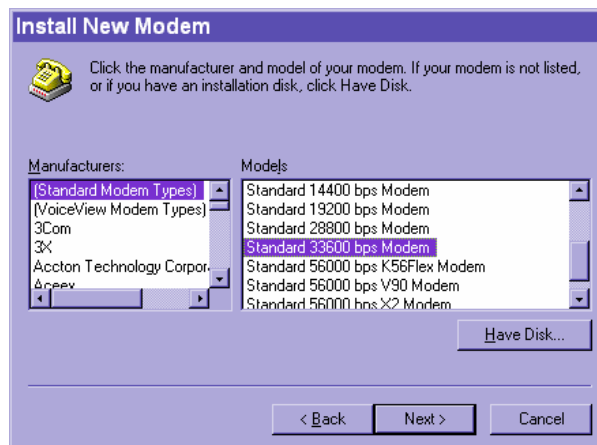
Choose the serial port that the included null modem cable is attached to and click on [Next >]. The null modem is now ready for use.
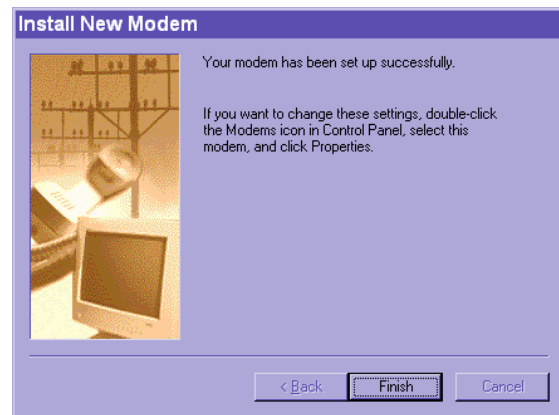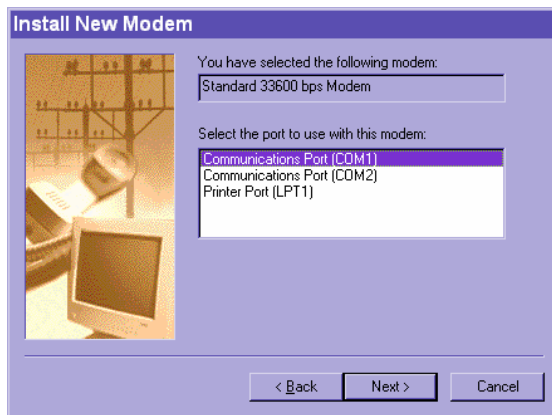
If no Dial-Up adapter exists in the system, Windows will automatically prompt to install. Press [OK] to continue.
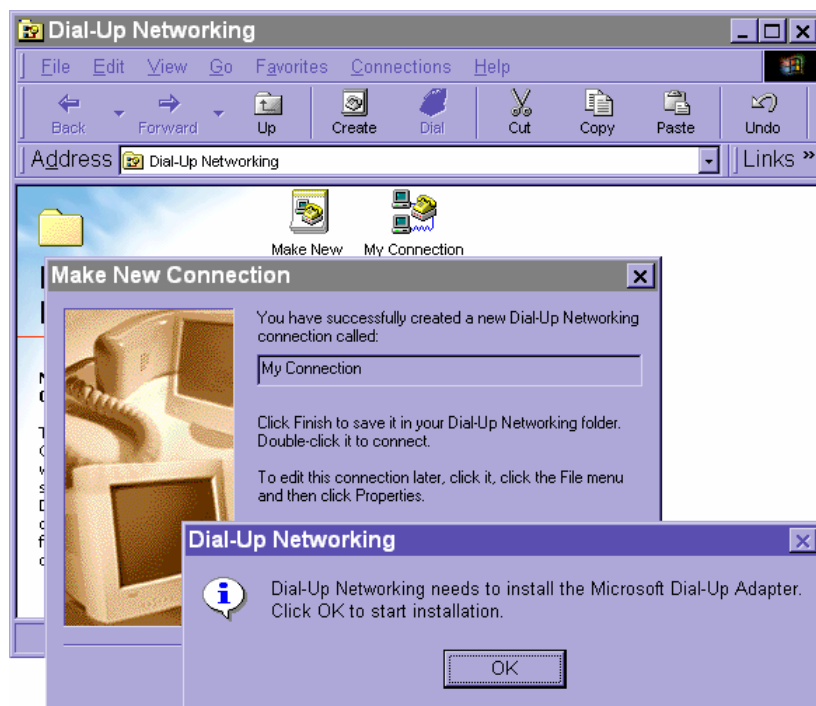
Setup a new connection

After the 33600 bps modem is installed, open the dialup network folder in Windows to build a new connection.
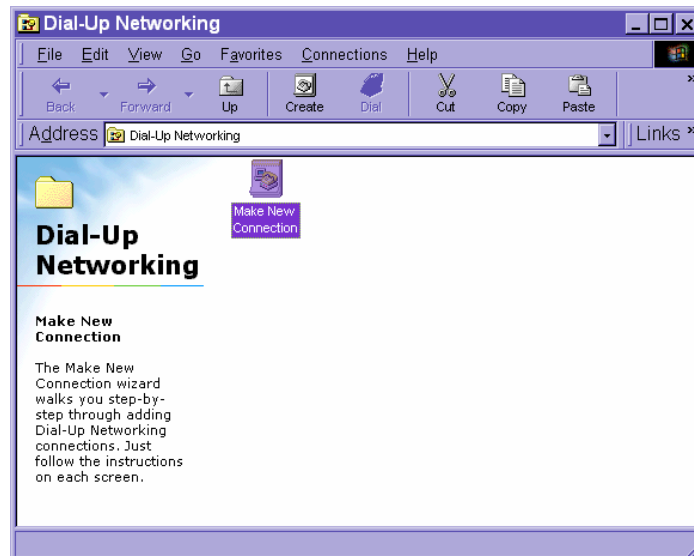
Select the device as the newly installed standard 33600 bps modem and click on Next >.

Just enter arbitrary digits as phone number and click on Next >. The phone number used here is not important.

After clicking on [Finish], this new connection will display in the Dial-up Networking folder and will be used for null modem connections.

Right-click on the newly setup connection icon for properties.
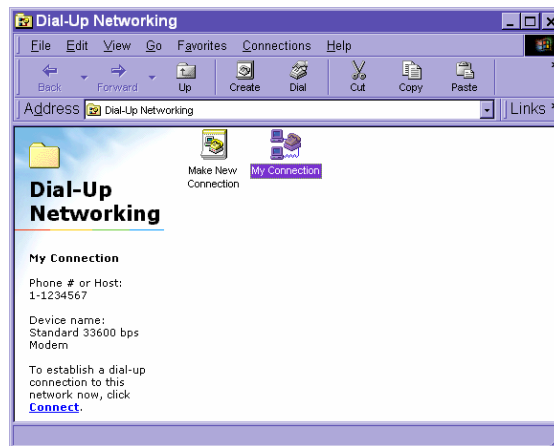
In the first General page, clear "Use area code and Dialing Properties" option and click on Configure... .
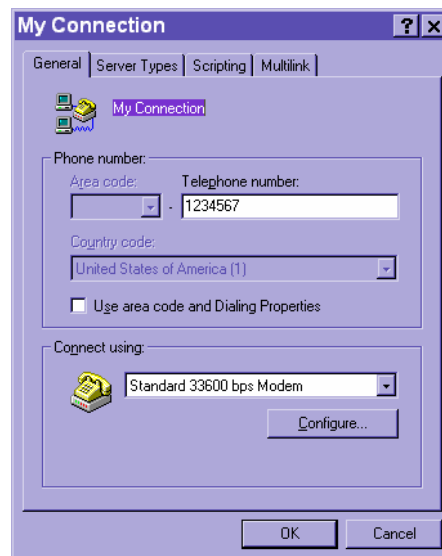
Select 115200 as the speed and click on [OK].
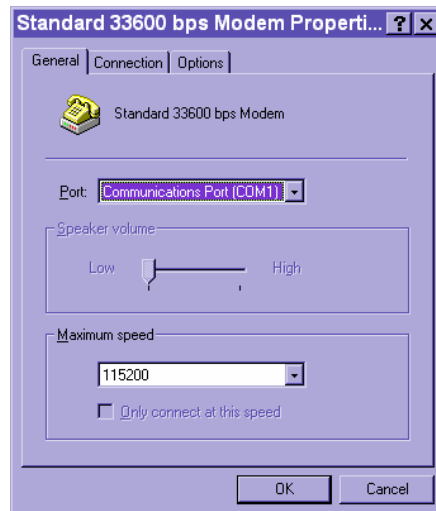
On the second page, only check "Enable software compression" and "TCP/IP" while leaving others blank. Keep other settings as default values and click on [OK]. Now the connection is ready for null modem connection.
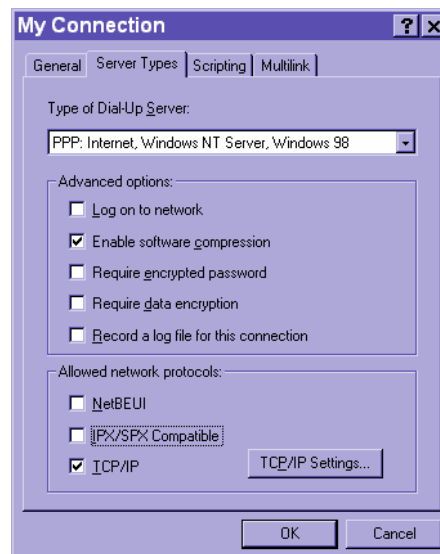
Double click the newly setup connection. A dialing information window will pop up. Enter "root" as user name and the serial number labeled on the bottom side of the box as the password and click on Connect . The user name and password are identical to what is used in web access and may be changed by administrators after successful installation.

Notice that the letters in the serial number should be capital form. For example, type 'A' instead of 'a'. After some negotiation prompts, a connection status window will show the speed is 115200 bps.
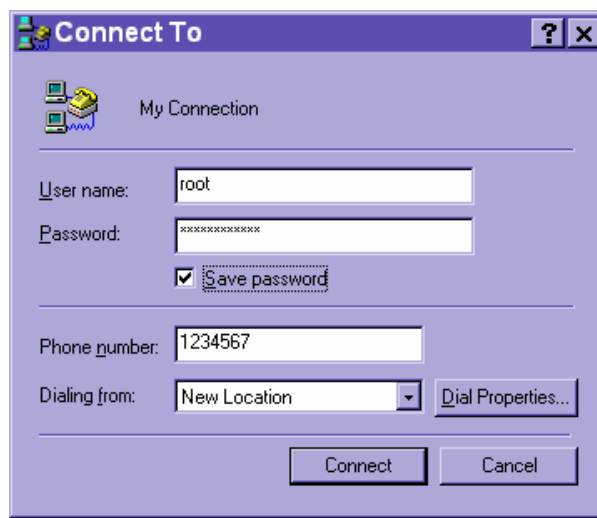
After connection is established successfully, go to the next section, "First access to the IT501 Video Server".

If an error message indicates a hardware error while connecting for the first time, especially in a Windows 2000 environment, try again to recovery the possible detection failure.

First access to the IT501 Video Server

Through direct connection by null modem cable administrators can open the default web browser and type in 200.1.1.1 as the address and press enter. Note that 200.1.1.1 will be the default IP address in a dial-in connection and 200.1.1.100 will be the given IP address for the user's PC by the IT501 Video Server. The user name and password are the same as what was entered during installation.
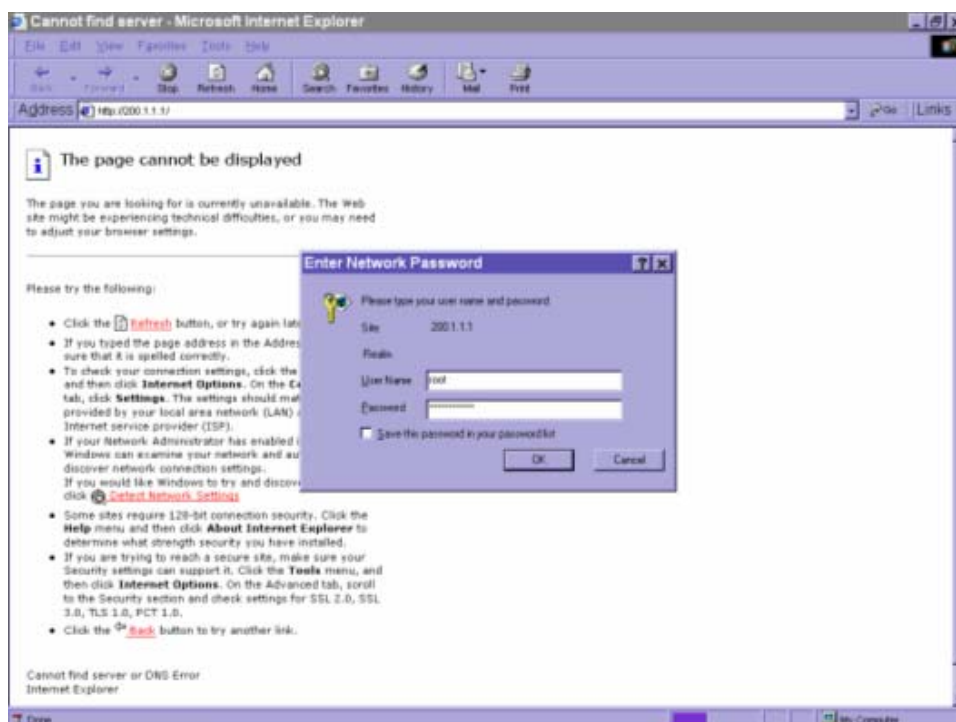
After successful authentication, administrators should see the motion pictures in the main page. When using Microsoft Internet Explorer, administrators should allow a plug-in provided by the IT501 Video Server to install additionally. For best security, administrators must change the password on the system page of configuration immediately. After changing the password, the browser will display the authentication window again to ask for new password. Note that the new password will also be used in the next dialup.

To make the IT501 Video Server successfully work in dial-in and dial-out modes, follow the procedures below for basic configurations. If people other than the administrator will be allowed to use the IT501 Video Server, the administrator should add these user profiles in the Security option. When the IT501 Video Server accepts dial-in connection and acts as a server, the user name and password used in dialing are the same as what was stored in the user database managed for web

access. Any managed user can be authorized during PPP negotiation and access web pages. However only administrators can access the configuration page.

There is more information needed for correct modem operation. Refer to the modem setting section in configuration for further settings. The IT501 Video Server will wait for someone to dial in. If the administrator has setup some conditions in the application, the IT501 Video Server will automatically dial out based on the administrator's configuration. Refer to the application section in configuration for special security applications. After everything is set and saved, turn off the IT501 Video Server and replace the null modem cable with modem for dial-up network. Since the null modem connection is used to configure the IT501 Video Server in advance for modem connection, administrators cannot connect again without restarting the system.

If dial-out configuration is activated, the IT501 Video Server will dial out to send a system startup log to test and drop the call after the pre-configured period.

How to Use

The IT501 Video Server is a well-designed stand-alone video server. With the built-in web server, authorized users may use web browser Internet Explorer to watch the video and hear the audio captured by the IT501 Video Server. The powerful video compression processes up to 30 frames per second and makes the scene in your browser as real-time display. The powerful audio compression processes the real-time audio and makes the synchronization of video and audio correctly. Also benefit from web interface, each function and each configuration has its specific URL that allows advanced users easily integrate them into existing software program.

The preparation of the primary users to utilize the IT501 Video Server is quite simple since administrators have done the majority of the installation. Most administrators find the installation is easy in general environments because most settings are automatically configured. Open your web browser and connect to the IT501 Video Server just like a general web site and the audio and video will present on demand. Make sure the web address of the IT501 Video Server's target is accurate.

Authentication

After opening the Web browser and typing in the URL of the IT501 Video Server, a dialogue window will pop up to request a username and password. For administrator's initial usage of the IT501 Video Server, enter the username as "root" and the password as the serial number in capital letters. The serial number can be found on the labels under the body of the IT501 Video Server and the top side of the carton. The primary users will be allowed to enter as soon as the administrator finishes adding user profiles. Upon successful authentication, the main page will be displayed.

In the figure below, the foreground is the login window and the background shows the message when authentication fails. The user may check the option to save the password for future convenience.
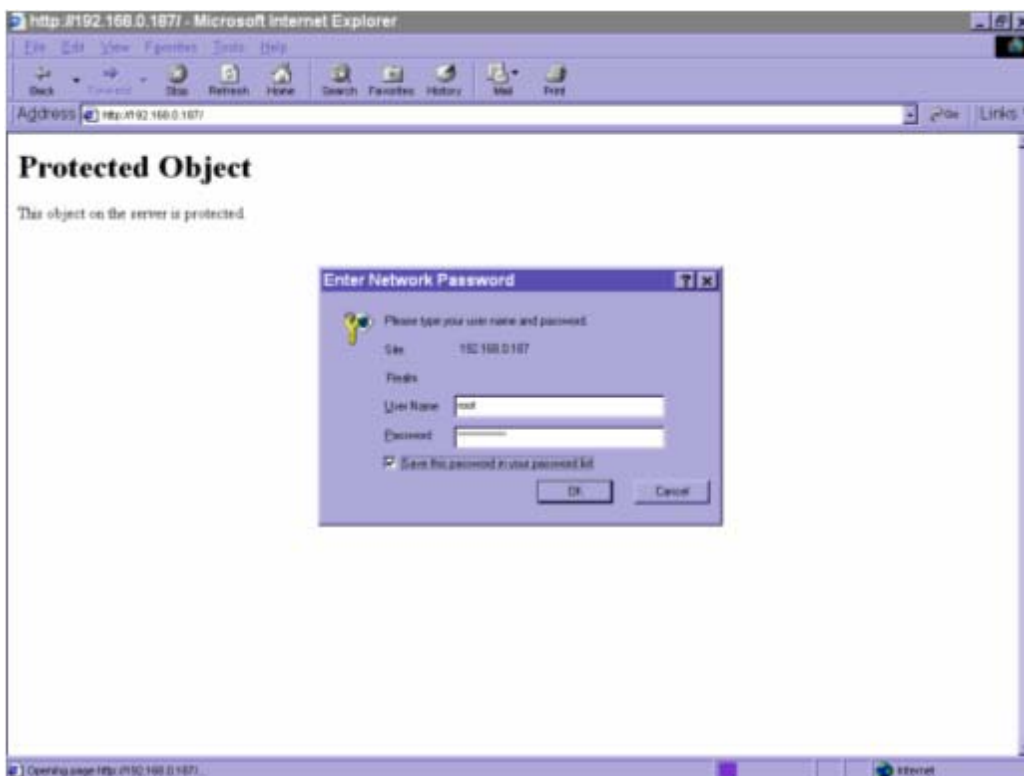
If it is initial access to the IT501 Video Server in Windows, the web browser will ask to install a new plug-in that is provided by the IT501 Video Server. This plug-in has not been registered for certificate and is used to display   motioned pictures in the browser. Users may click on [Yes] to install the plug-in. If the web browser does not allow the user to install, check the Internet security

option to lower security levels or contact network supervisors.
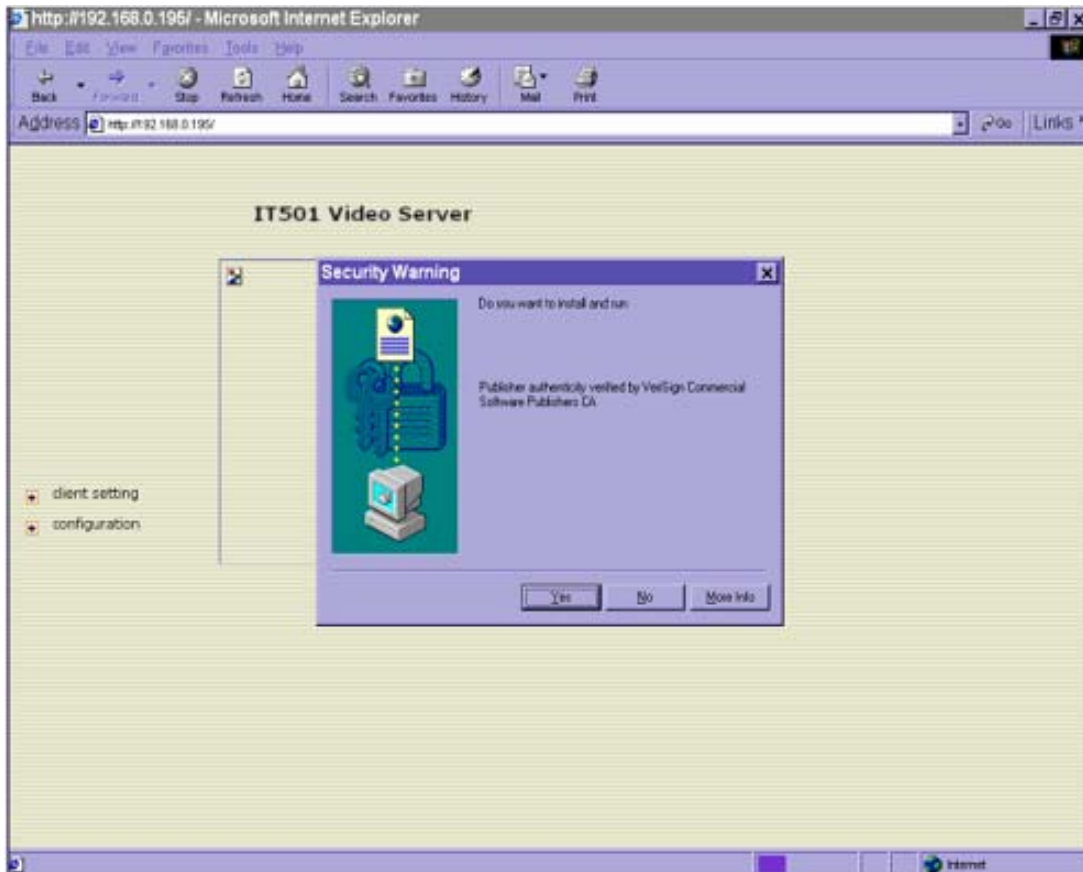
Primary user's capability

Main screen with camera view

There is a logo image shown in the upper left corner. It can link to other web sites or resources depending on the settings in configuration. The assigned caption and system date/time will display in the banner above the image window. There might be some windows enclosed by red lines shown in the image as soon as motion is detected in the related windows. Click on the configuration link to the right of the image window to enter the configuration page.
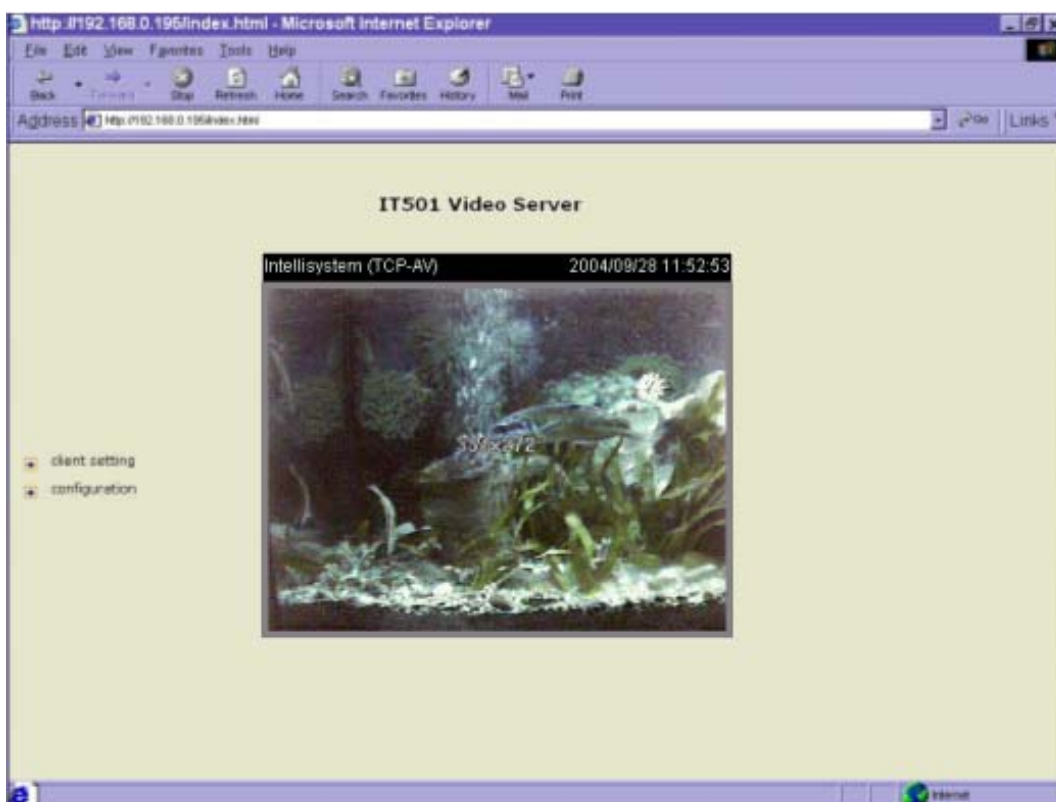
PTZ camera control

A PTZ motorized camera is provided by customers and should be correctly installed in advance. The control button under the video allows users to control the motorized camera attached to the IT501 Video Server with pan/tilt direction and zoom. To access the location set previously, pull down the Preset Position list to select one and click on Go. Only the administrator can preset the camera locations. Primary users are only allowed to browse the preset locations. Five buttons below the image can be used to control cameras in ways other than pan, tilt and zoom. They should be pre-configured by administrators with reference to the instruction manual of the cameras.
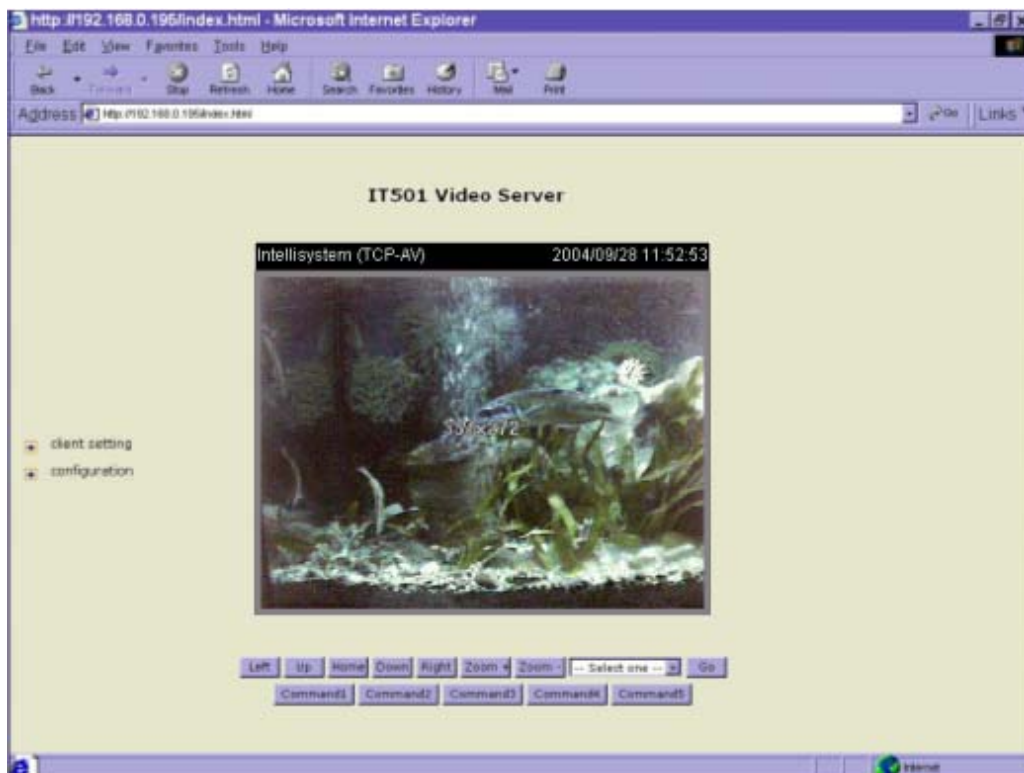
<url> *http://< IT501Video Server>*

<IT501Video Server> is the domain name or pure IP address of the IT501 Video Server.

Client Setting

If it is the first access to "**Client Setting**" page in Windows, the web browser will ask to install a new plug-in that is provided by the IT501 Video Server. This plug-in has not been registered for certificate and is used to setting the client parameters in the browser. Users may click on Yes to install the plug-in. If the web browser does not allow the user to install, check the Internet security option to lower security levels or contact network supervisors.
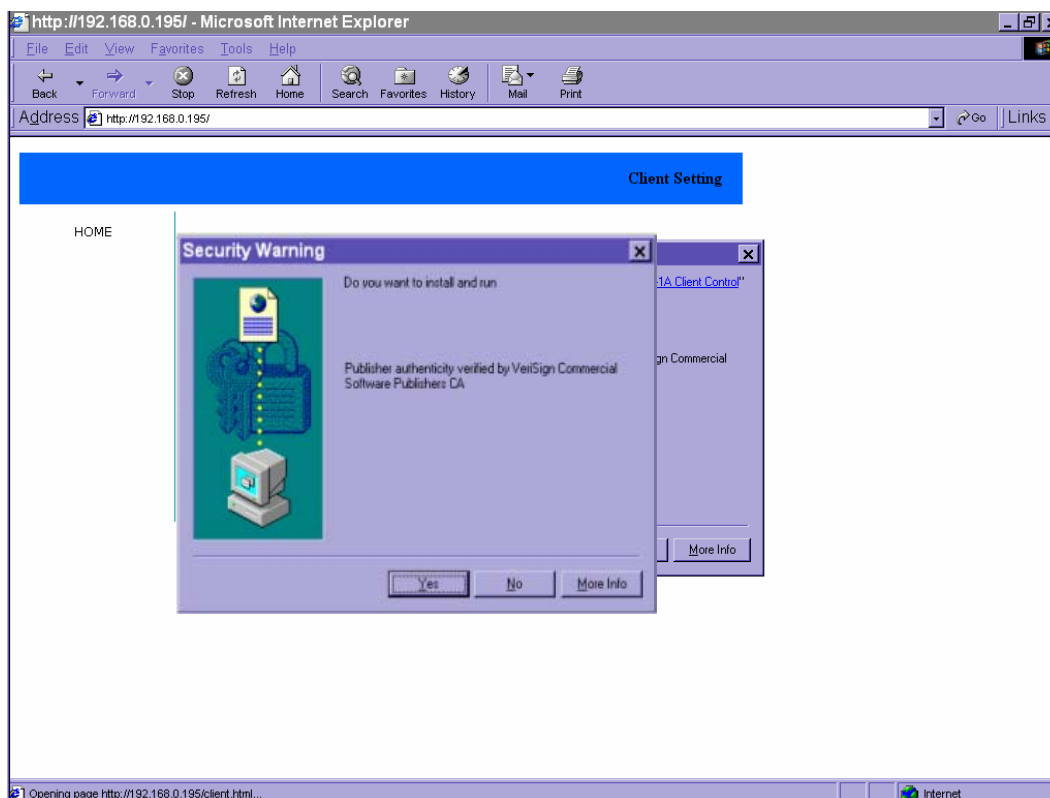
There are two settings for the client side. One is "**Media Option**". You can mute the audio by checking this option. The other is "**Protocol Option**". You can choose the connection protocol between client and server by this option. There are three protocols - **UDP**, **TCP** and **HTTP**. When you choose UDP protocol, audio and video streams can be more real-time. But some packets may be lost and decoding error will happen. If you select TCP protocol, packet loss isn't occurred and decoder will run normally. But the real-time issue is worse than UDP protocol. If your environment is behind the firewall and it opens HTTP port (80) only, you can select HTTP protocol only. In this mode, audio will not be sent and you just can see the video only. If you don't know which protocol you should choose, select the UDP protocol and the client will try these protocols in this order, UDP → TCP → HTTP. After the client connects to the IT501 Video Server successfully, "**Protocol Option**" will be set as the working protocol automatically.
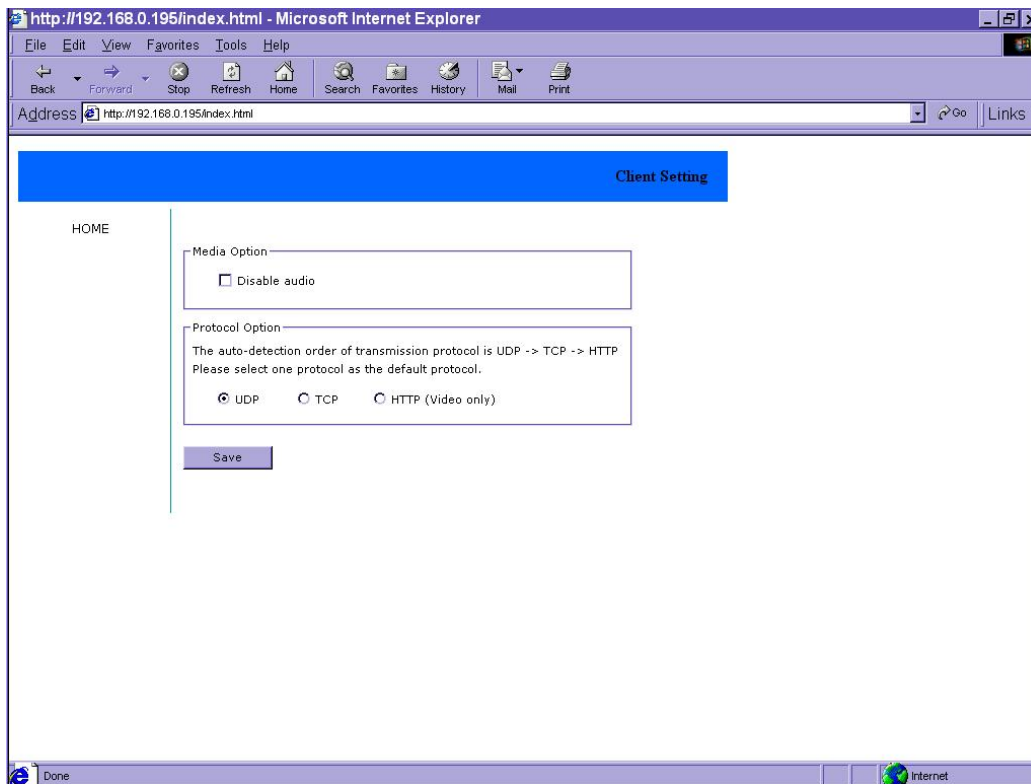
<url> *http://<IT501Video Server>/client.html*

<IT501Video Server> is the domain name or original IP address of the IT501 Video Server.

⚠ When using modem as the network connection, the IT501 Video Server will not send the audio automatically, and send video only because the low bandwidth environment doesn't meet the requirement for both. In the Client setting page, protocol option will be set as Http protocol.

System configuration

There are two methods provided for configuration. Web interface is quite easy and clear to use and FTP with script file is rapid for mass installation. System configuration can be accessed only by administrators. Administrators may type the URL below the figure to directly enter the configuration page. If administrators also want to set certain options through the URL, read the section on advanced usage for reference.
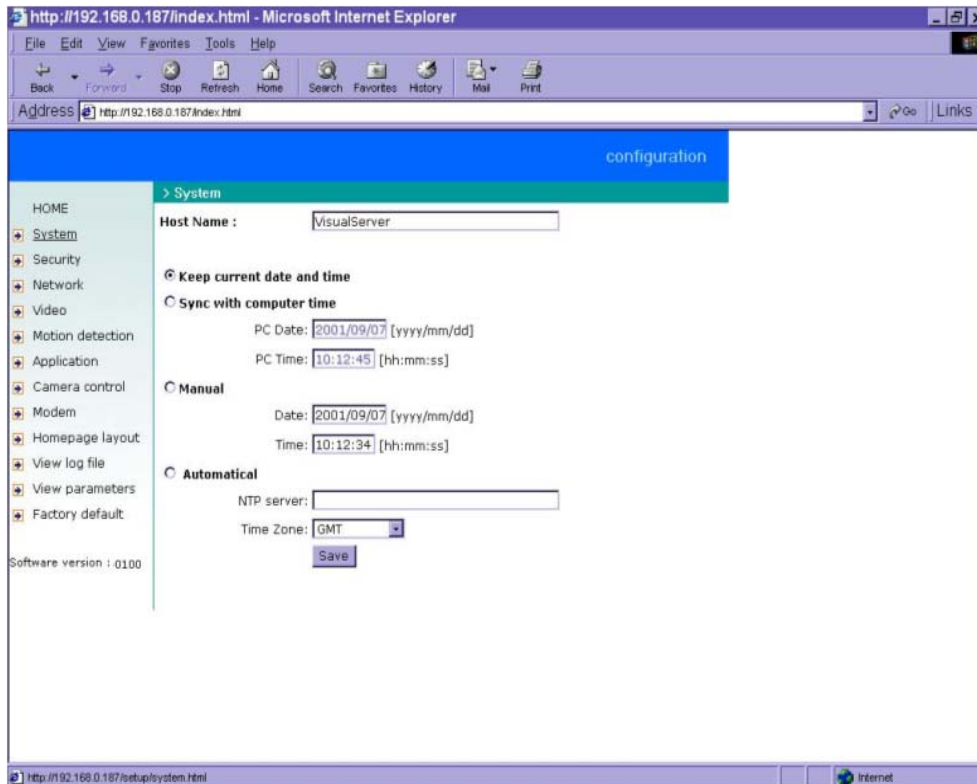
<url> *http://<IT501Video Server>/setup/config.html*

<IT501Video Server> is the domain name or original IP address of the IT501 Video Server.

System parameters
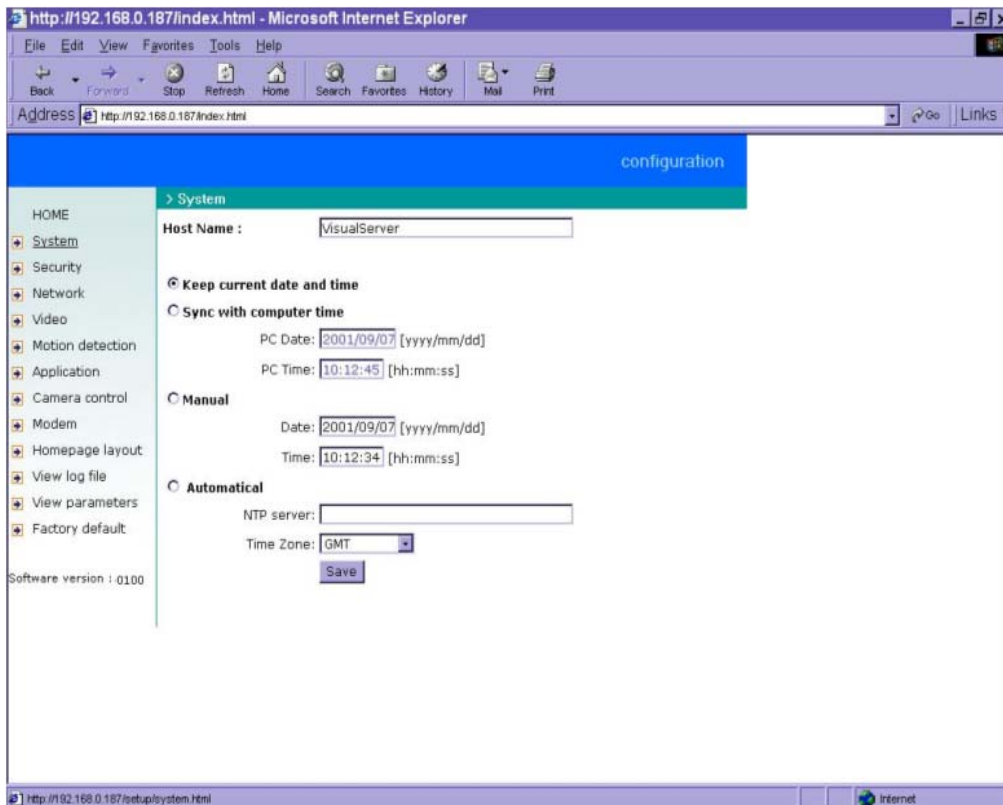
To change the system name, type in the text box after "**Host Name**". This name will be displayed at the top of the main page. In the case that only the host name is changed, without adjusting date and time of the IT501 Video Server, click on "**Keep current date and time**".

There are three ways to adjust system date and time. The easiest is to make the IT501 Video Server "**sync with computer time**". The second is to set the date and time manually. Notice the format in the related field while typing. The third is to make the IT501 Video Server automatically synchronize with timeservers over the Internet whenever the IT501 Video Server starts up. It may fail if the assigned NTP server cannot be reached or it is within a local network. Leaving the NTP server blank will let the IT501 Video Server connect to default timeservers. If some specific timeserver is assigned, type it in the text box. Domain name or IP address format is acceptable as long as DNS server is available. Do not forget to set the "**Time Zone**" offset for local settings. It only affects the hour in NTP method. Click on Save to validate changes.

When user sets the illegal range of Date or Time, server will not accept this new setting and restore to the last setting. The legal range of year is between: 2000~2035.

User group administration
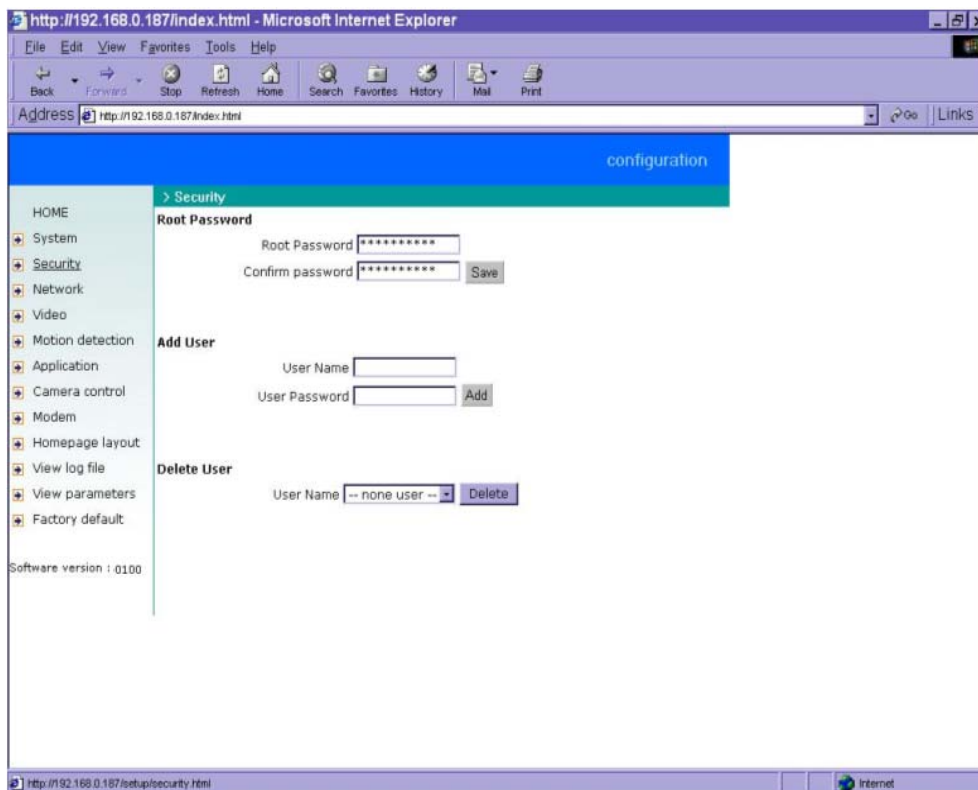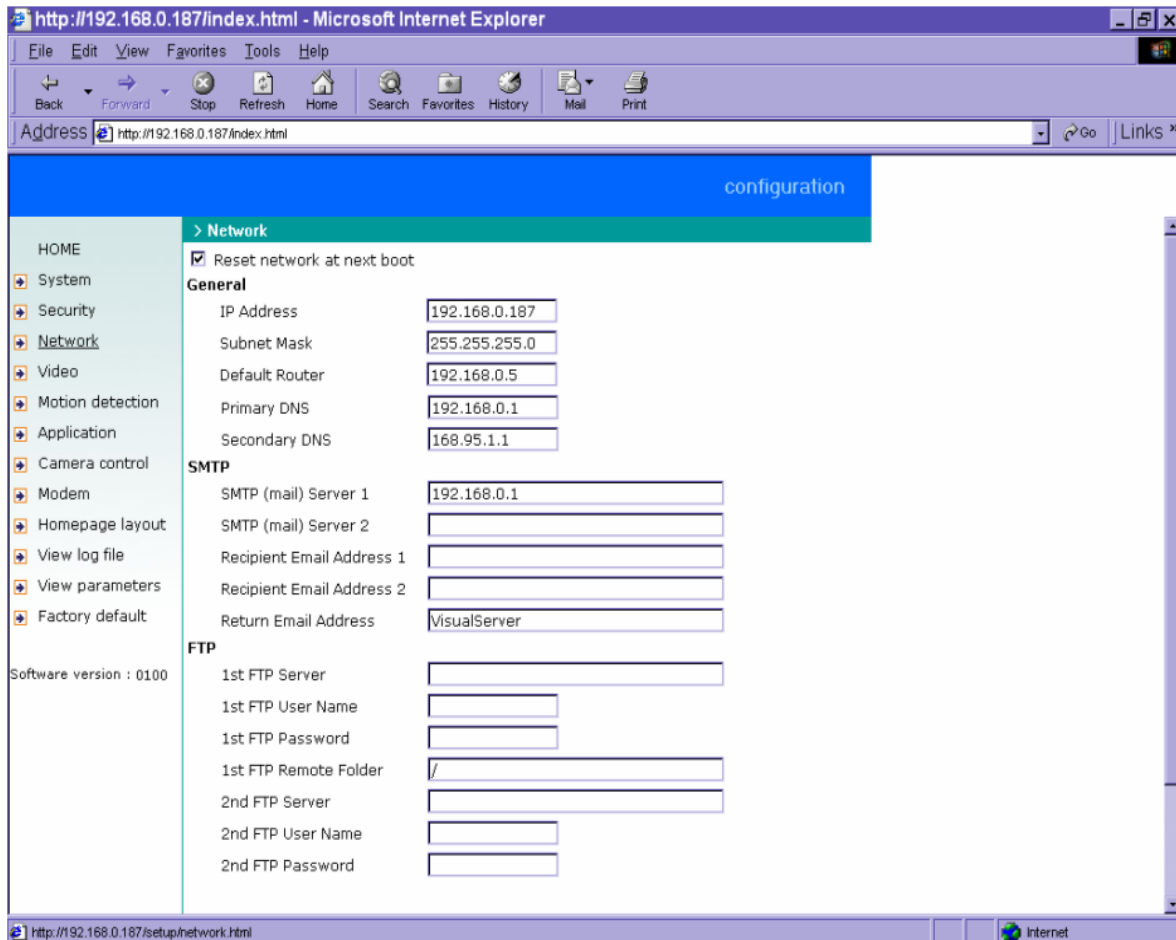
To change the administrator's password, type the new password in both text boxes identically. What is typed will be displayed as asterisks for security purposes. After pressing Save, the web browser will ask administrators for the new password for access.

To add a new user, type the new user's name and password and press Add to insert the entry. There are a total of twenty user accounts. Since only administrators can change a user's password, confirmation for a user's password is not necessary.

To delete a user, pull down the user list to find the user name to be deleted and press Delete.

Network settings

Any change made to this page will make the system restart to validate. Make sure every field is correctly typed before clicking on `Save`.

To eliminate incautious mistakes during installation, the IT501 Video Server will stay in installation mode whenever it starts unless "**Reset network at next boot**" is disabled. This option can also be disabled using the Installer program. Once the option is disabled, the IT501 Video Server will skip installation at the next boot and the Installer program will not find the installed units. That implies that the IT501 Video Server cannot be accessed if no one remembers the IP address, except by restoring factory default settings. However, with this option disabled the IT501 Video Server can automatically operate normally after restarting in case of losing power. This option is ignored in the PPP connection.

Administrators may modify the network settings to fit into existing networks. Some broadband service subnet mask may differ from the default value 255.255.255.0 and service providers may

assign some specific network settings. Administrators should change the configuration according to what is given by the service provider. The configuration may include "**IP address**", "**Subnet Mask**", "**Default Router**", "**Primary DNS**" and "**Secondary DNS**". After changing network settings, be sure to leave "**Reset network at next boot**" blank to skip installation when the system restarts. Otherwise the settings will be erased.

The IT501Video Server not only plays the role of server, it will also actively connect to servers outside to send out messages or snapshots. When the IT501 Video Server starts, it will send out a system log to notify administrators. Even in modem application, the IT501 Video Server will send out a connection log whenever it dials out to an ISP or dialup server outside. If the administrator has setup some applications in either event mode or sequential mode, the IT501 Video Server will send out snapshots once conditions are met. There are two methods to send files, including e-mail and FTP. To ensure the IT501 Video Server sends out files correctly, administrators should set valid "**SMTP (mail) server**" and "**Recipient email address**" as well as "**Primary FTP Server**", "**Primary FTP user name**" and "**Primary FTP password**". "**Return email address**" is whom the mail will return when the SMTP server rejects upon any failure. Some ISP may reject the mail if the address is invalid. "**Primary FTP remote folder**" is the relative sub-folder in the remote FTP server.

In both methods, a "**Secondary**" server can be provided for backup connection. However the primary server information should be entered first. If the primary server is not set, the related FTP or email will be deactivated. Note that it may take time to connect to the secondary server after the first one fails and it may affect some applications when conditions happen too often.

For security or network integration, administrators also can hide the server from the general HTTP port by changing "**HTTP port**" to other than default 80. "**Local FTP server port**" can also be changed to other than default 21. These ports of "**Control Channel Port**", "**Audio Channel Port**" and "**Video Channel Port**" which are used in media transmission can also be changed. Administrators should have enough acknowledge before changing the default port.

If the IT501 Video Server works in variation or low bandwidth (comparing with video bandwidth) environment, the client side will receive the poor quality of media. For improving this situation, you can check the "**Improve audio quality in low bandwidth environment**" item. It can make the audio quality better, but the media delay is longer and real-time issue is bad. If the network performance is worst, please select the "**UDP protocol**" as the communication protocol in "**client setting**"

After everything is set, click on [Save]. A warning message will pop up. Click on [OK] to confirm.

The IT501 Video Server will automatically restart. If "**Reset network at next boot**" is kept checked, run the installer procedure again. Otherwise the IT501 Video Server will restart automatically.
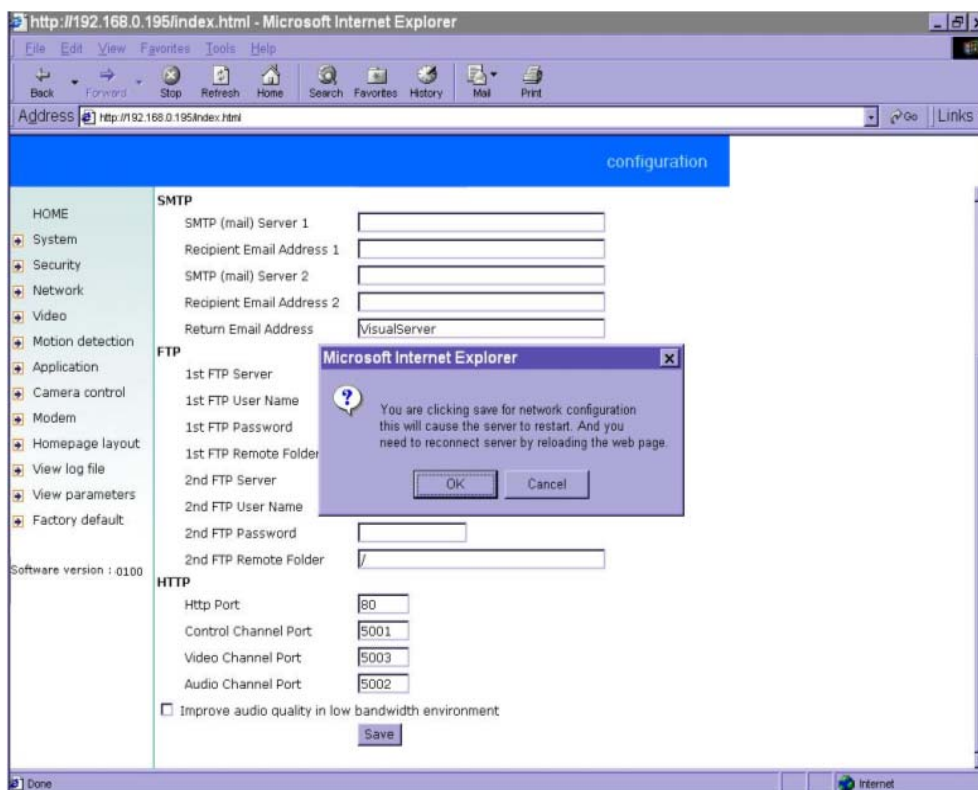
Administrators should notice that the IP address, subnet mask, default router and DNS servers will be cleared when the network interface is switched to the other. Refer to the related section of Ethernet or modem for software installation.

Video codec parameters
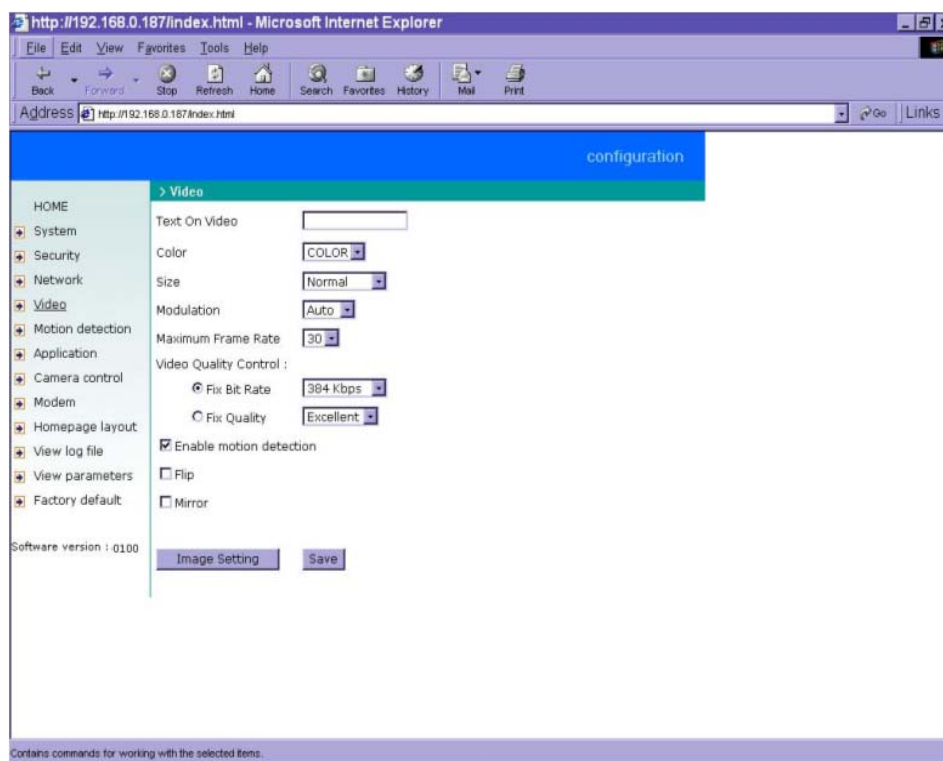
Options on this page will affect the image on the main page seen by users. "**Text on Video**" will be displayed above the video window with a timestamp. The timestamp is captured from date and time of the IT501 Video Server that is maintained by a built-in real-time clock. "**Color**" setting is independent of the connected camera and B/W option might speed up the encoder a little.

"**Size**" option allows users to adjust the image size taking into consideration bandwidth and visual effect. Three options are available including half, half×2 and normal. Half×2 consumes the same bandwidth as half but is the same size as normal. Of course the image is not as good as normal. Half×2 is especially suited to low bandwidth environments like a dial-up network.

The "**Modulation**" type is auto-detected during initialization, but administrators can still set it manually.

VS3102 uses MPEG4 codec compression for best streaming solution. The compressed video data is far less than JPEG in normal cases but it still depends on the level of difference between every two sequential images. There are three dependent parameters provided for adjustment. "**Maximum Frame Rate**" limits the maximal refresh frame rate that can be combined with the "**Video Quality**

Control" to optimize the bandwidth utilization and video quality. If users want to fix the bandwidth utilization regardless of the video quality, choose "Fix Bit Rate" and select the desired bandwidth. The video quality may be poor in order to send maximal frames within the limited bandwidth when images change drastically. Consequently to ensure the video quantization rate regardless of the bandwidth, it will utilize more bandwidth to send the maximal frames when images change drastically.

The option "**Enable Motion Detection**" will control the event of motion detection on the application page. If this option is enabled, the preset windows framed by red lines will appear in the video window even if no option is checked on the application page. If this option is disabled, then any settings related to motion detection will have no effect. Motion detection will increase system load. Enter the motion detection option page for advanced configuration.

To adjust video from external cameras, use "**Flip**" to map the video vertically and "**Mirror**" to map the video horizontally.
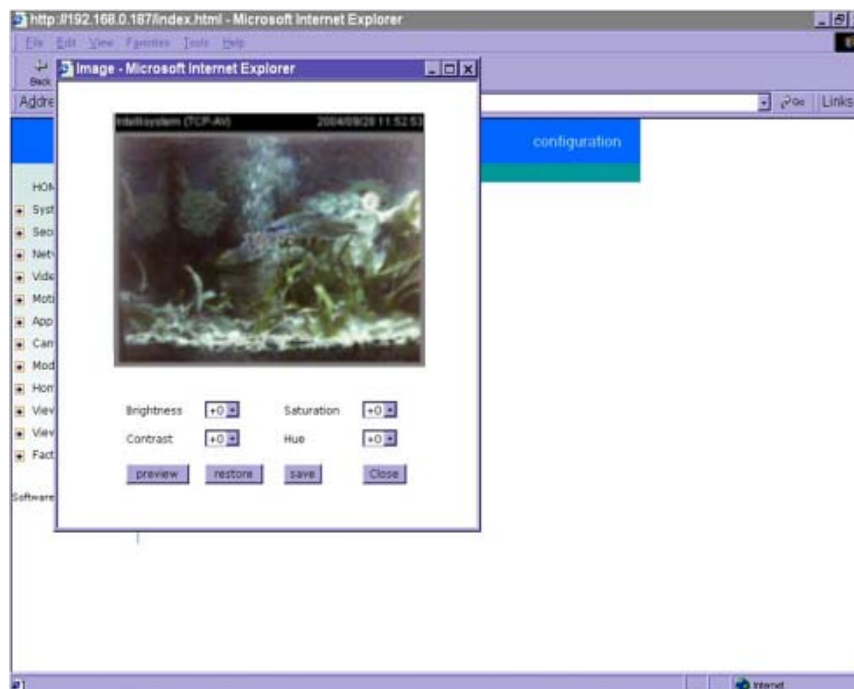
To adjust image settings for best visual quality, press [Image Setting] and a motion picture window will pop up for your reference. There are four fields including "**Brightness**", "**Contrast**", "**Hue**" and "**Saturation**" for video compensation. . Each field has eleven levels ranged from -5 to +5. The user may press [preview] to fine-tune the image. When the image is O.K., press [Save] to memorize the

image settings or [restore] to recall the original settings. If parameters are changed without saving, they will be used until the next system startup.

Motion detection
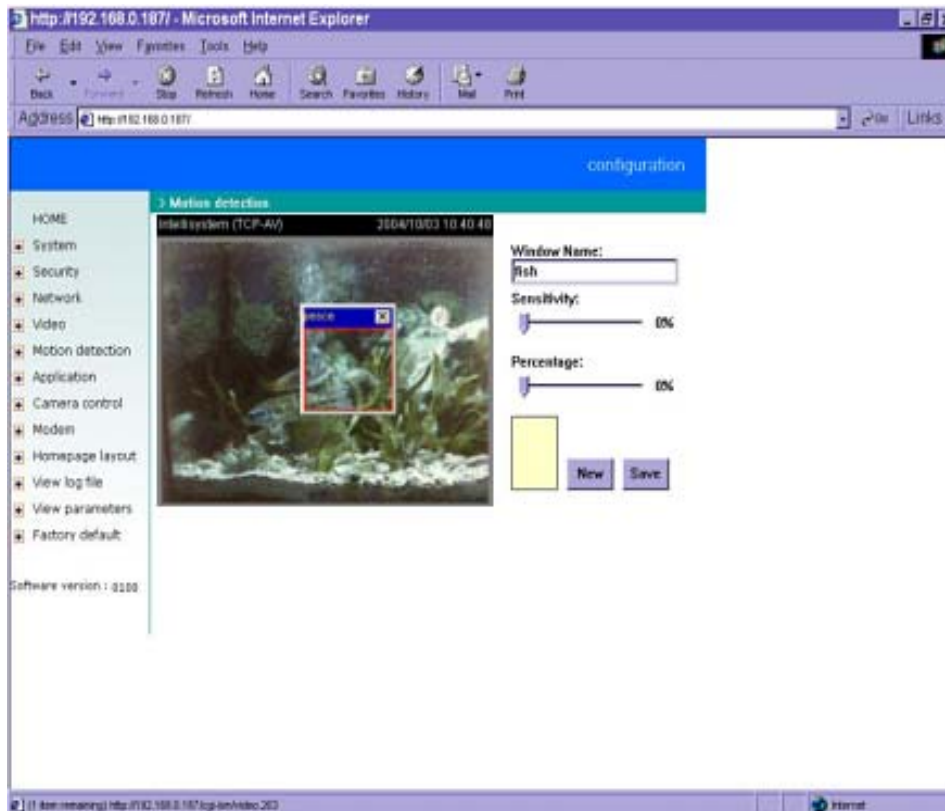
Please note that the option "**Enable Motion Detection**" on the video page must be enabled to make detection effective.

The IT501 Video Server allows administrators to define at most three detection windows to cover different areas. To monitor a specific area, click [New] to add a new window. The typed text in "**Window Name**" will show at the top of the window. Use the mouse to drag the border to the desired size or title bar for location. Higher sensitivity and small percentage will make motion easier detected easier and vice versa. After clicking [Save], a graphic bar will go up or down depending on the image variation. A green bar means the image variation is under monitoring level and a red bar means the image variation is over monitoring level.

The following figure shows the screen when $\boxed{\text{Save}}$ is clicked. The monitoring windows will be marked by red squares.
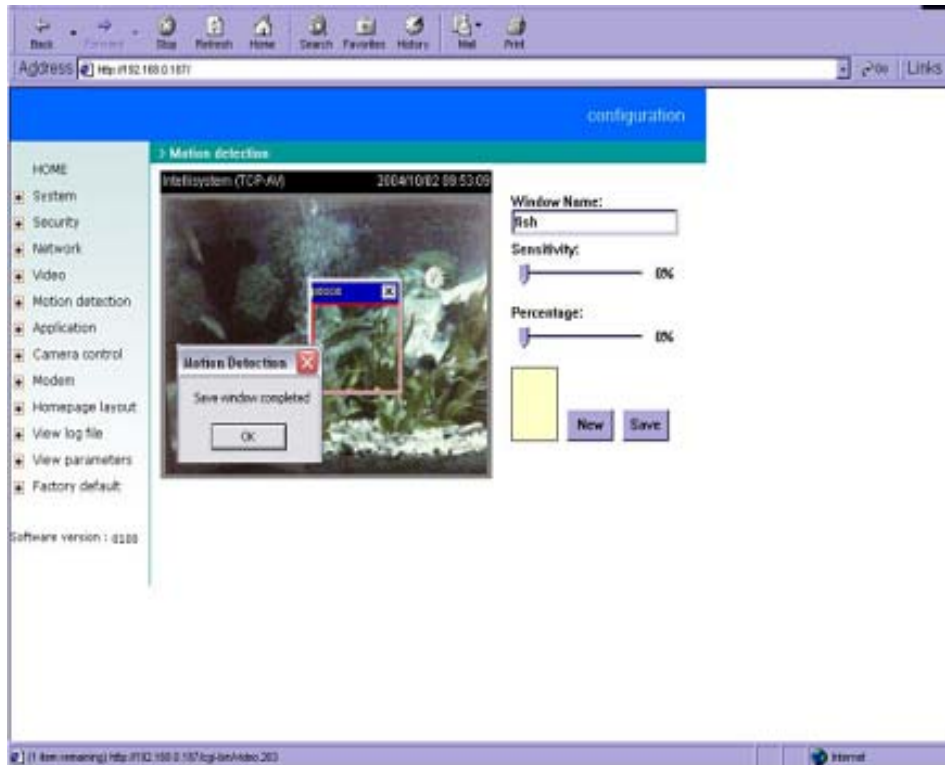
PTZ camera configuration
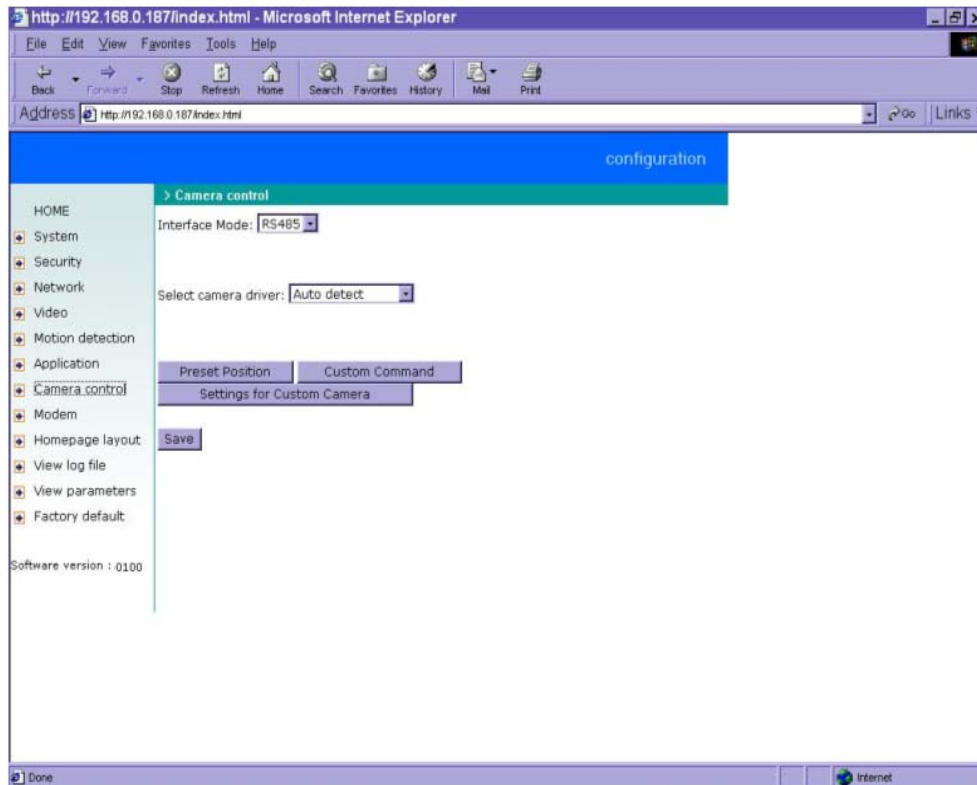
Since the IT501 Video Server can be used in either Ethernet network or PPP network, the single serial port can be used to control either external COM port devices like a PTZ camera or modem. While in PPP interface, go to Modem page for modem configuration. Options on this page will be ignored.

The IT501 Video Server supports RS232 and RS485 interfaces to control external serial port devices. Refer to the hardware description to connect an RS485 device. The included camera control cable can be used for Sony or Canon cameras. The choice "**Auto Detect Driver**" in driver option will let the IT501 Video Server detect the supported camera models sequentially from RS232 to RS485.

Administrators can pull down the list to select UART "**Interface Mode**" according to the connected device and select the camera model directly to save time in detection.

The IT501 Video Server can support any other custom camera by selecting "**Custom Camera**" type. If the attached device is not a PTZ camera, a specific URL can be utilized as an alternative method. See the advanced section for details.
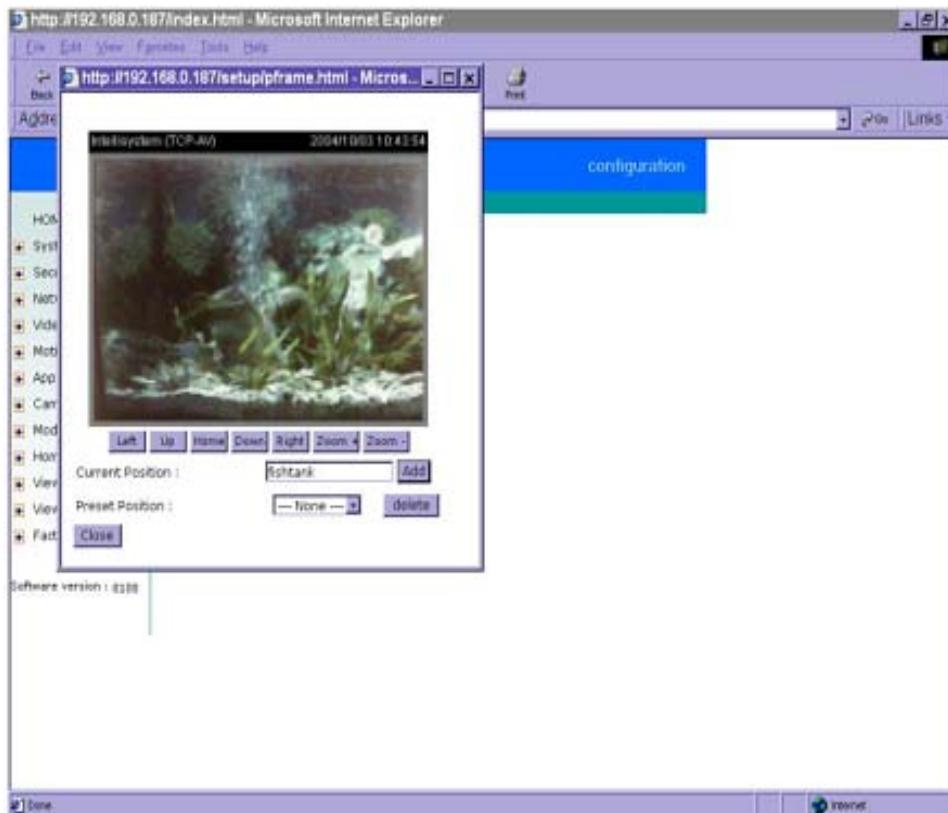
To preset the camera head position, press [Preset Position] and another window will pop up with the camera view and control buttons for preview. After moving it to the desired position, enter the preset position name and click on [Add]. Note that if improper characters are used in the position name, a warning message window will pop up.

To delete the previously preset position, pull down the position list to find the position name and press [delete].
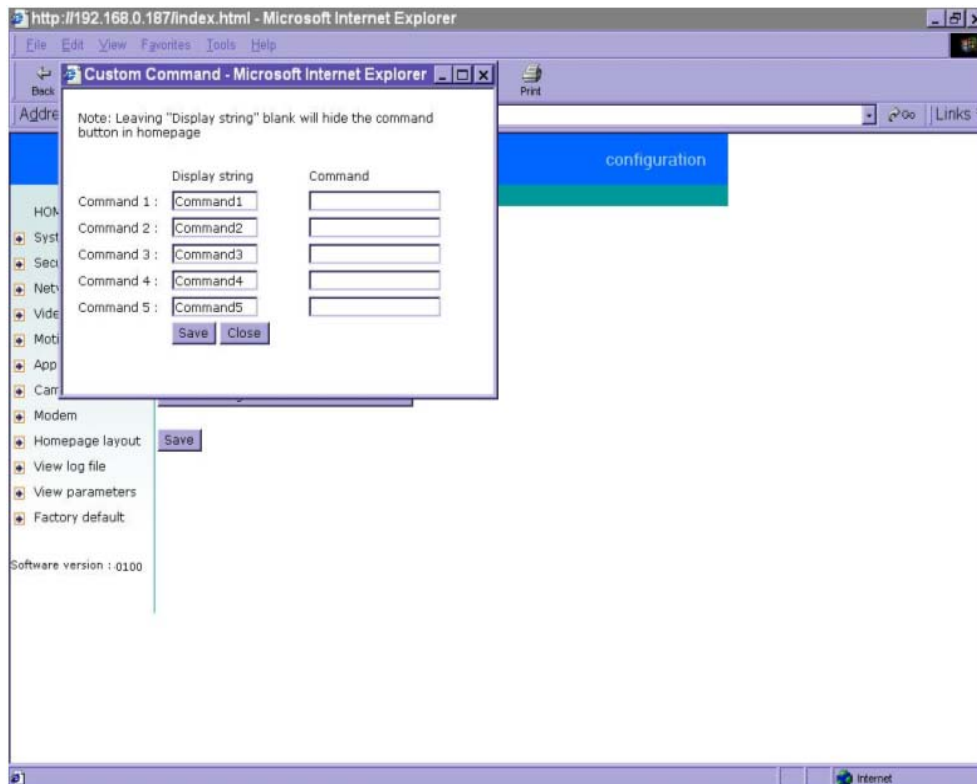
The IT501 Video Server provides five more custom commands other than general pan, tilt, zoom and preset functions. Administrators can click on [Custom Command] and refer to the instruction manual of the attached device to setup frequently used functions. The "**Commands**" should be entered in ASCII format; the IT501 Video Server will translate it into binary code and send it out through the serial port. For instance, a text string of "8101ABCDEF" will be translated into five bytes of hexadecimal 81, 01, AB, CD and EF. The maximal length of a command string is 60 which is equivalent to 30 hexadecimal bytes. "**Display string**" is for text on command buttons and should be less than 8 characters.
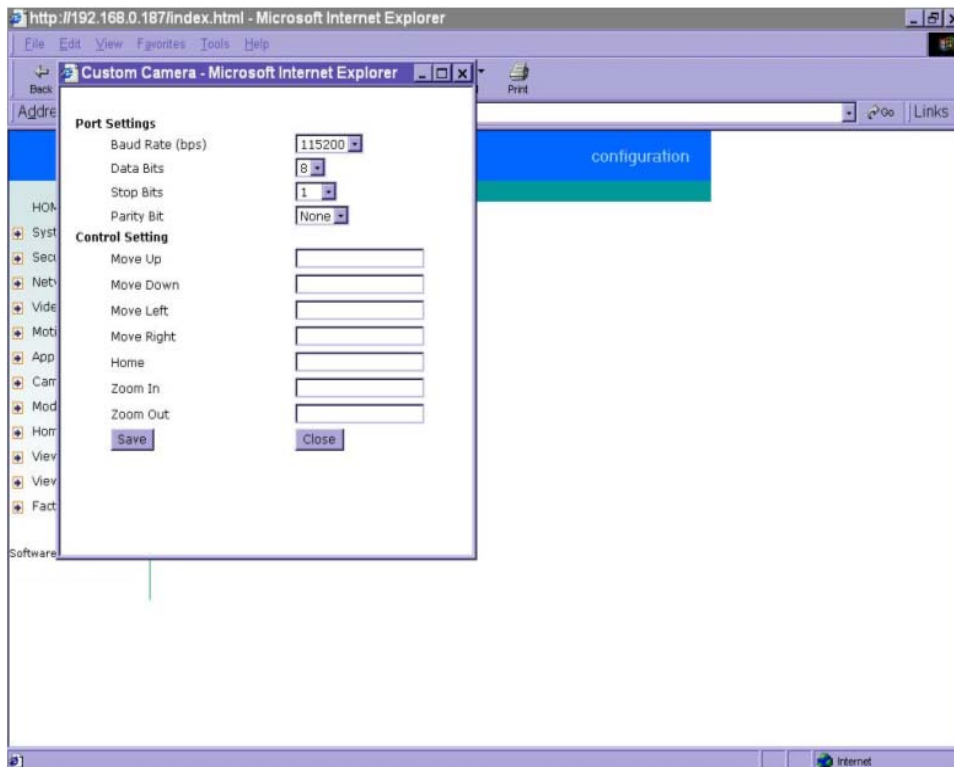
If the attached motorized camera is not on the support driver list, choose the proper UART interface and pull down the driver list to select Custom Camera type and click on [Settings for Custom Camera] for further configuration.

Setup the serial "**Port Settings**" according to the instruction manual of the custom camera. The "**Baud Rate (bps)**" of the serial port is up to 115200 bps. Then enter the specific command related to PTZ in the respective field. The custom command for "**Control Setting**" should be edited in ASCII format. the IT501 Video Server will interpret the ASCII format command to binary string. For instance, "012000ABCD" will be sent out of the COM port as five hexadecimal bytes of 01, 20, 00, AB and CD. If the command string is composed of two or more commands, a comma ',' should be inserted to separate each command. Each comma represents 200 milliseconds. For instance, a command to pan left may be "01000305" and a command to stop panning may be "01000300". The user may edit the applicable command as "01000305,01000300" in the Move Left field. This means the camera will pan left for 200 milliseconds. When everything is set, click on [Save] to save the commands and click on [Close] to close the command setting window.

Double-check the driver settings and then click on [Save] to save the configurations of the custom camera. Since changing drivers will restart the system, a message window like the following figure

will pop up to confirm your actions. The system will restart right after clicking on [OK].
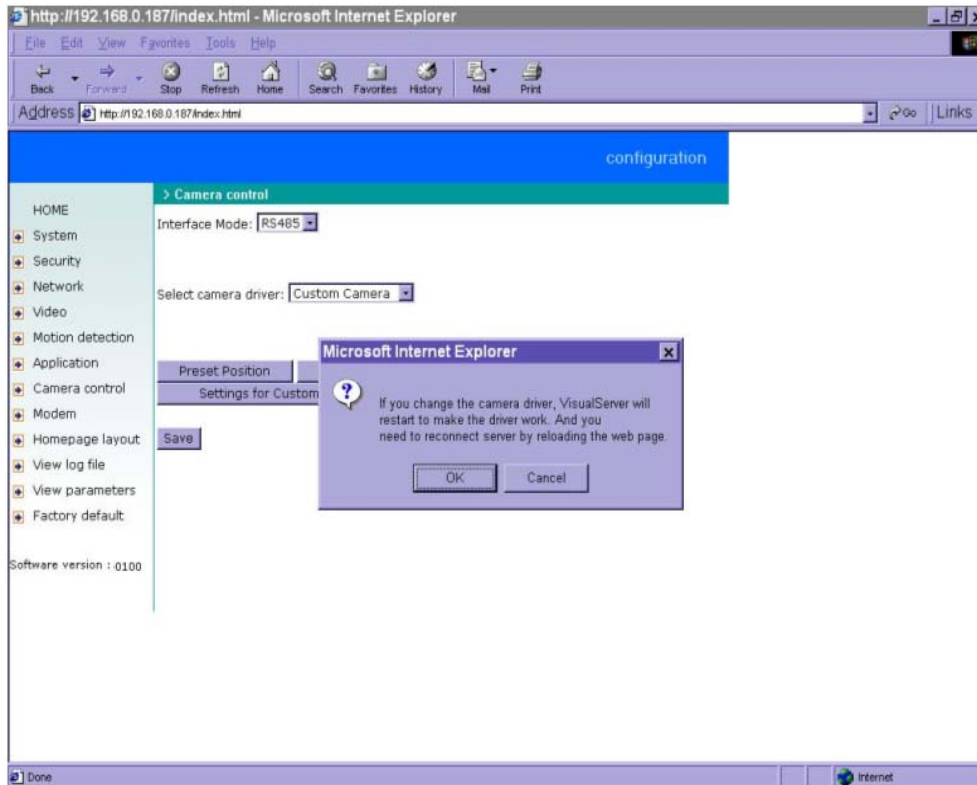
Modem and dialup settings
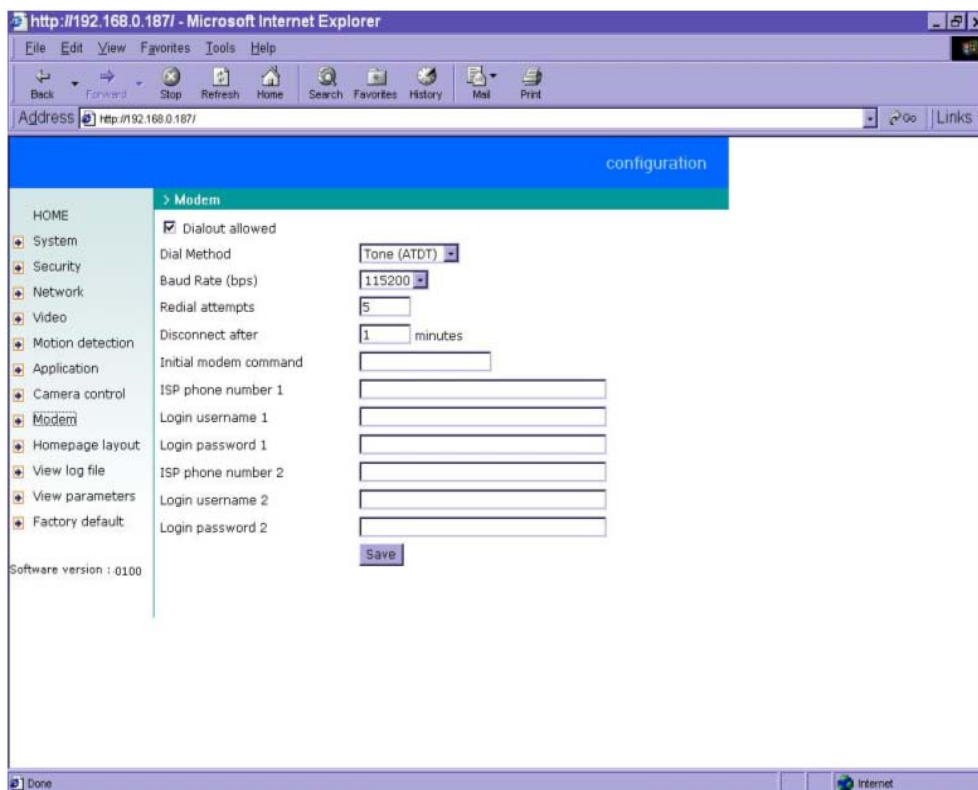
In PPP interface, a modem option will work instead of camera control. Configurations include modem initialization and outside dial-up server. If the users will setup with external sensors and alarms for property security, dial-out is needed to send some snapshot-attached e-mails when the preset conditions are triggered. In such applications, also remember to choose Network option to enter mail server address and recipient's e-mail address. If "**Dialout allowed**" is not checked, the IT501 Video Server will not send out any snapshots when events occur and the settings except for "**Initial modem command**" in this page will have no effect. The system will preset the attached modem to eliminate echo and mute line sound. To initialize the modem with further commands, type into the edit box. The prefix "AT" should be included.

Administrators should choose an appropriate "**Dial Method**" according to the local POTS environment. An incorrect dialing prefix may cause the IT501 Video Server to fail when dialing out. "**Redial attempts**" means how many times the IT501 Video Server should try to connect to each ISP. Setting the value in "**Disconnect after minutes**" will force the IT501 Video Server to drop the connection when there is no activity on the connection for the specific period. The range of this period is from 1 to 240 minutes, with 0 indicating a continuous connection. Administrators may let the IT501 Video Server keep the connection for a while to allow connections from outside. The IP

address given by the ISP can be taken from the connection log that is mailed or uploaded when dial-up connection is successful. Setting the value to zero will make the IT501 Video Server always keep the connection.

Based on the settings of DI/DO in the application, the system will send mail or upload via FTP with image attachment upon the event occurring. In that case the IT501 Video Server will need a network connection and automatically dial out to the pre-configured server outside. When a connection is successfully established, the IT501 Video Server will send out a connection log to notify given network settings. For those installations that may switch the network interface between Ethernet and PPP, administrators should notice that the settings of FTP or SMTP servers might be different from what is in an Ethernet environment. If the network interface is changed, administrators may need to configure them in advance.

The IT501 Video Server will try the second ISP as a backup when the first ISP fails and exceeds the redial attempts. "**ISP phone number**" should be the complete phone number including country code and area code if necessary. "**Login username**" and "**Login password**" are used to pass the PPP negotiation requested by the ISP server. Note that the pair of login name and password is dependent on the ISP and is different from what is used in the authentication process in web access.

⚠ When using modem as the network connection, the IT501 Video Server will mute the audio automatically, and send video only because the low bandwidth environment doesn't meet the requirement for both. In the Client setting page, protocol option will be set as Http protocol.

Application
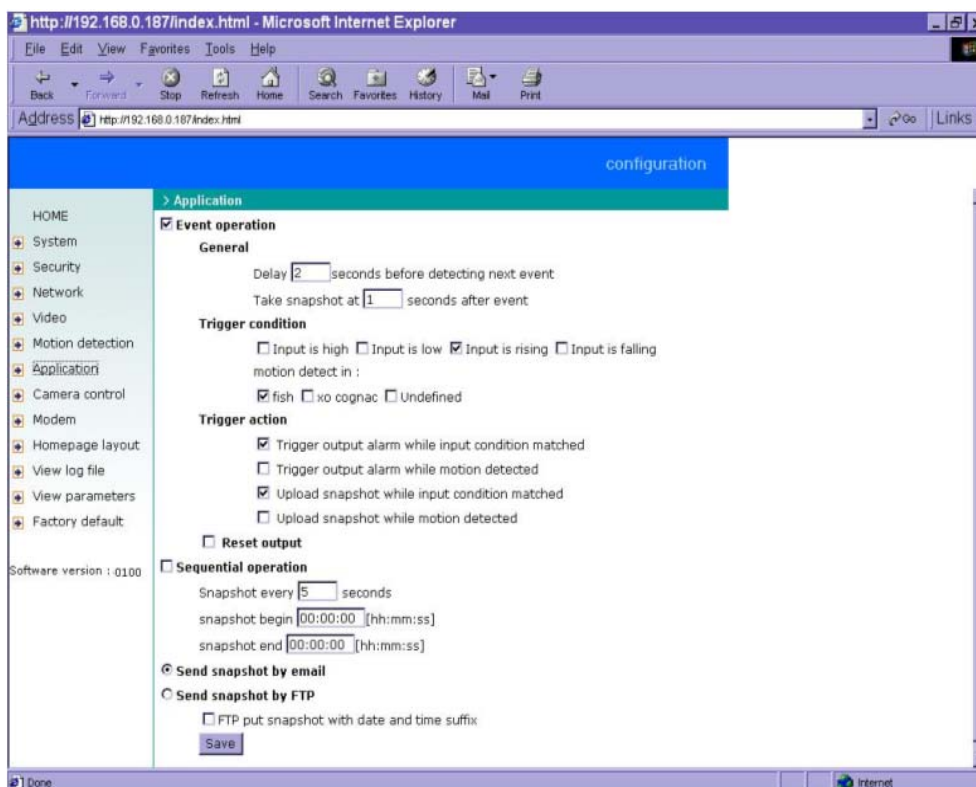
Administrators can use combinations of options on the application page to perform many useful security applications. The sending method is selected at the bottom of the page. Both e-mail and FTP use the network settings on the network page. To use FTP to upload snapshots, a timestamp file name can help administrators identify the event. If "**FTP put snapshot with date and time suffix**" is disabled, the up-to-date snapshot will overwrite the file.

There are two application methods to upload snapshots. "**Sequential operation**" will send out snapshots continuously over a configured period. This mode can be used to integrate with another web server to serve overloaded requests. If the date and time suffix option is disabled, the IT501 Video Server can use FTP to upload and overwrite snapshot files periodically. The remote folder of snapshot files for FTP can be configured on the network page. The snapshot period is between "**Snapshot begin**" and "**Snapshot end**" and it will repeat everyday. The snapshot interval is set in "**Snapshot every seconds**".

The other "**Event operation**" can be used to combine motion detection with devices attached to digital input, to drive devices attached to digital output, or send out snapshots for evidence. It helps users establish an easy security system. Administrators may choose any combination of conditions to

form special applications according to their personal needs. The IT501 Video Server will continuously monitor the channel and digital input every half second. Once the user-defined conditions are matched, IT501 Video Servers will capture three stages of events and react based on the "**Trigger action**" settings. The post-event snapshot can be configured to be delayed after events happen according to the setting in "**Take snapshot at seconds after event**". The three stages of snapshots will be VPRE.JPG, VTRG.JPG and VPOS.JPG. Since the same event may exist for a while, administrators can set delay time in "**Delay seconds before detecting next event**" to reduce multiple triggers by the same event.

There are two kinds of "**Trigger condition**". For digital input there are four options provided to combine with the user's device. Rising and falling will make events happen once. For motion detection, there are window names shown below as choices. Refer to the previous section for configuring motion detection. Note that larger object size and lower sensitivity will make it more difficult for the IT501 Video Server to detect varied images. Once the "**Trigger condition**" is matched, the IT501 Video Server will drive the digital output device and/or upload snapshots based on the "**Trigger action**" settings. The application settings should be carefully examined to operate accurately. If administrators are not sure of the digital output status before configuring applications, "Reset output" can be used to return the digital output to the default "Normal Close" state.

Homepage layout settings
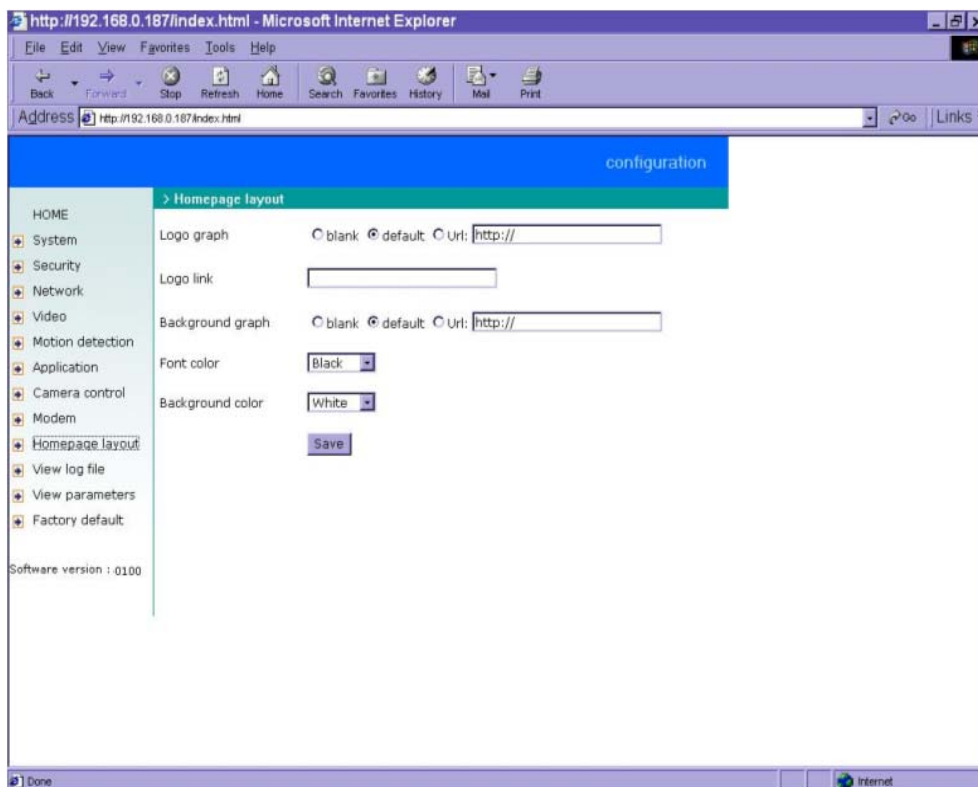
Administrators may give the IT501 Video Server a different presence of homepage. The "**logo graph**" for the system logo in the upper-left corner can be hidden; or the default image from the system memory can be used; or an external resource can be used by assigning a URL. "**background graph**" is similar. Default images from system memory are quick to get but limited by memory size. Images from external resources can be larger and more beautiful but will need more time to load. If the background is skipped, the background color will fill the browser window. Administrators also can give the system logo a "**logo link**" to refer to another web site. The "**font color**" and "**background color**" can be chosen from sixteen colors to achieve the best visual effect.

See "Customizing homepage images" section in "Advanced functions" for how to replace images.

One-shot fast configuration via FTP

For quick setup of the IT501 Video Server, the administrator can utilize the default CONFIG.INI that may be downloaded from the FTP daemon of the IT501 Video Server. To log into the FTP daemon, enter "root" as the user name and the same password used when connecting to the Web server. The serial number of the IT501 Video Server is the password for the initial access.

Then administrators only need to modify necessary fields and then upload the file to the IT501 Video Server with the file name "CONFIG.INI". To reduce error in interpretation, it is recommended that the downloaded template CONFIG.INI be modified using the options following each item in the sample below. The file will include seven categories: [SYSTEM], [NETWORK], [VIDEO], [SERIAL], [ALERT],and [LAYOUT]. The category name in brackets should be in upper case. The item name in angle braces should be in lower case. Some items related to disable/enable should use the keywords "YES"/"NO". The number zero entry in <user name> and <user password> is for the administrator, i.e. "root".

Since the password when logging into FTP is not encrypted, it is recommended to use the Web instead of FTP to configure the system afterwards. If some parameters other than the network or camera drivers are changed, administrators can set <reset system> to NO to avoid resetting the system. It will automatically return to YES during the next downloading of CONFIG.INI.

A sample CONFIG.INI is attached below. *The italic text* following each line describes the format of the field and **the bold italic characters** are the possible values of each field.

******* sample file **********
The IT501 Video Server Initial Configuration File

[SYSTEM]
<reset system>
YES   *or **NO***
<host name>
The IT501 Video Server   *String shorter than 40 characters*
<serial number>
0002D1000001   *Read only string*
<software version>
IT501-0200C   *Read only strin*g
<current date>

2001/08/14	*year/month/date. Read only string*
<current time>	
07:00:00	*hour/minute/second. Read only string*
<time zone>	
0	*From **12** to **-12***
<user name>	
(0) root	*Read only string*
(1)	*String shorter than 15 characters*
(2)	*The followings are as same as above*
(3)	
(4)	
(5)	
(6)	
(7)	
(8)	
(9)	
(10)	
(11)	
(12)	
(13)	
(14)	
(15)	
(16)	
(17)	
(18)	
(19)	
(20)	
<user password>	
(0) 0002D1000001	*Initial value is as same as serial number*
(1)	*String shorter than 15 characters*
(2)	*The followings are as same as above*
(3)	
(4)	
(5)	
(6)	
(7)	

(8)

(9)

(10)

(11)

(12)

(13)

(14)

(15)

(16)

(17)

(18)

(19)

(20)

[LAYOUT]

<font color>

1	*color index: **0** for black, **1** for white, **2** for green,*
<background color>	* **3** for maroon, **4** for olive, **5** for navy, **6** for purple,*
0	***7** for gray, **8** for yellow, **9** for lime, **10** for aqua,*
	***11** for fuchsia, **12** for silver, **13** for red, **14** for blue,*
	***15** for teal*

<logo type>

1	***0** for blank, **1** for default image or **2** for loading from URL*
<background type>	
1	***0** for blank, **1** for default image or **2** for loading from URL*
<logo source>	
http://	*link to external resource when logo type is 2, no longer than 80*
<background source>	
http://	*link when background type is 2, no longer than 80*
<logo link>	
http://www.xxx.com	*providing external link when clicking on logo, no longer than 80*
<com speedlink name>	
(0)AT on/of	*no longer than 8 characters(some language will use double bytes)*
(1)AT bg/ed	*no longer than 8 characters(some language will use double bytes)*
(2)AT mode	*no longer than 8 characters(some language will use double bytes)*

(3)bklt on	*no longer than 8 characters(some language will use double bytes)*
(4)bklt off	*no longer than 8 characters(some language will use double bytes)*

[NETWORK]
<install enabled>

YES	*or NO*

<ppp enabled>

YES	*obsolete*

<ethernet address>

00-02-D1-00-00-01	*Read only string*

<host ip>

192.168.0.201	*Standard IP format*

<subnet mask>

255.255.255.0	*Standard IP format*

<gateway ip>

192.168.0.254	*Standard IP format*

<primary name server>

192.168.0.1	*Standard IP format*

<secondary name server>

168.95.1.1	*Standard IP format*

<ntp enabled>

YES	*or NO*

<network timing server>

ntp-cup.external.hp.com	*Standard IP format or string shorter than 40 characters*

<smtp mail server>

	Standard IP format or string shorter than 40 characters

<mail recipient address>

	String shorter than 80 characters

<mail return address>

	String shorter than 80 characters

<backup smtp mail server>

	Standard IP format or string shorter than 40 characters

<backup mail recipient address>

	String shorter than 80 characters

	Standard IP format or string shorter than 40 characters
<ftp username>	
	String shorter than 15 characters
<ftp password>	
	String shorter than 15 characters
<ftp init path>	
/	*String shorter than 40 characters*
<backup ftp server>	
	Standard IP format or string shorter than 40 characters
<backup ftp username>	
	String shorter than 15 characters
<backup ftp password>	
	String shorter than 15 characters
<backup ftp init path>	
/	*String shorter than 40 characters*
<http server port>	
80	*Integer less than 1024*
<control channel port>	
5001	*Integer less than 65535*
<control channel port>	
5002	*Integer less than 65535*
<control channel port>	
5003	*Integer less than 65535*
<low bandwidth environment>	
NO	*or **YES***

[VIDEO]
<camera modulation>

AUTO	*or **MANUAL**. NTSC or PAL will be ignored when AUTO*
NTSC	*or **PAL**, ignored when AUTO but can be notification*
<caption text>	
	String shorter than 15 characters
<colored video>	
YES	*or **NO***
<video quality>	

8   *12, 10, 8, 6, 4 representing Medium, Standard, Good, Detailed, Excellent*

<brightness>

0   *among 5 and -5*

<contrast>

0   *among 5 and -5*

<hue>

0   *among 5 and -5*

<saturation>

0   *among 5 and -5*

<rate control>

YES   *for fix bit rate, **NO** for fix quality*

<bit rate>

384k   ***1200k**, **1000k**, **768k**, **512k**, **384k**, **256k**, **128k**, **64k***

<frame rate>

30   ***1, 2, 3, 5, 10, 15, 20, 25, 30** (30 for NTSC only)*

<video size>

3   ***1**, **2**, **3** representing half, halfx2, normal*

<motion detect enabled>

NO

<flip>

NO

<mirror>

NO

[SERIAL]

<auto detect camera>

YES   *or **NO***

<data bits>

8

<stop bits>

1

<parity bits>

0

<baud rate>

9600

<ccd model>

0   *0, 1, 2, 3, 4, 6, 7 representing NONE, Custom camera, Sony EVI-D30, Canon VCC1, Canon VCC3, Dynacolor Dome and Pelco Camera*

<uart mode>

RS232   *or **RS485***

<speedlink commands>

(0)   *String shorter than 80 characters*

(1)   *String shorter than 80 characters*

(2)   *String shorter than 80 characters*

(3)   *String shorter than 80 characters*

(4)   *String shorter than 80 characters*

<custom ccd commands>

UP

                       String shorter than 80 characters

DOWN

                       String shorter than 80 characters

LEFT

                       String shorter than 80 characters

RIGHT

                       String shorter than 80 characters

HOME

                       String shorter than 80 characters

TELESCOPE

                       String shorter than 80 characters

WIDE

                       String shorter than 80 characters

NEAR

                       String shorter than 80 characters

FAR

                       String shorter than 80 characters

[ALERT]

<application mode>

0   *for none, **1** for sequential mode, **8** for event mode, **9** for both*

<upload method>

0   ***0** for FTP, **1** for email*

<file with time suffix>

YES   *or **NO***

<seconds to snapshot after event>

0

<seconds to snapshot periodically>

0

<time to start snapshot>

00:00:00   *24 hours format*

<time to stop snapshot>

00:00:00   *24 hours format*

<seconds delay before next event>

3

Advanced functions

Web

Viewing system log
Click the button on the configuration page to view the system log file. The content of the file reveals useful information about configuration and connection after the system boots up.

Viewing system parameters
Click the button on the configuration page to quickly view the whole system parameter set. The content is the same as CONFIG.INI.

Restore factory default settings
Click the button on the configuration page to restore the factory default settings. This means any changes made before will be lost and the system will be reset to the initial status when shipped from the factory. After confirmation, the system will restart and require the installer program to setup the network.

Clear data path for proprietary commands
The IT501 Video Server provides a highly customized control support to third-party serial interface devices aside from PTZ cameras. That means in addition to setting up a custom camera with PTZF commands, users may utilize this mode and introduce a customized homepage to transmit arbitrary user-defined commands from the user-side to the IT501 Video Server. The third-party device connected to the serial port of the IT501 Video Server will receive the same command sent by the originator. The user only needs to attach the command in ASCII format after the special URL. The IT501 Video Server will parse the command and transfer into binary code to send out. See the clear data mode serial port driver in the URL commands of the IT501 Video Server section for detailed description.

FTP

The IT501 Video Server not only has web service for easy access but also has a built-in FTP service to make system integrators easy to use. According to settings on the application page, the IT501 Video Server can sequentially send updated snapshots over a specific period to an external server with choices of overwriting and time suffix. For security staff, the IT501 Video Server can directly

send snapshots to an external server as evidence according to event settings. Through the IT501 Video Server's FTP daemon, administrators can quickly update configurations and maintenance. Those files with GIF extensions which are used for a homepage layout and can be read and overwritten. They also can be downloaded by managed users. Other files will be explained below.

Uploading snapshots periodically to an external FTP server

In sequential mode, the IT501 Video Server will send out snapshots according to interval and period settings. If snapshot files are intended for quick updates, it is better to skip date and time suffix. The file name will then be video.jpg. If the snapshots are used for occasional monitoring, suffix with date and time can help administrators classify them easily.

Customizing homepage images

There is a small icon before each link that can be changed by administrators. Administrators may change the look of the logo, background and image buttons by him or her self. There are three types of logos and backgrounds, blank, default and other URL. The default method will use the image stored in the Flash memory. Administrators may change the default logo, background image and button images by uploading customized ones. The followings are the referenced file names and size limitations.

Object	File name	Maximal size
Logo	logo.gif	Logo and background share 8000 bytes
Background	back.gif	Logo and background share 8000 bytes
Link icon	btn_text.gif	2000 bytes

Viewing system log

Download SYSTEM.LOG and open it with any text viewer. The content of the file reveals useful information about configuration and connections after the system boots up. It helps administrators to easily find out who and how the IT501 Video Server was accessed since all network access to the IT501 Video Server is recorded with timestamp. The system log will scroll to keep the newest messages as eliminate old ones.

Uploading the configuration file

To update each IT501 Video Server's configuration at once, upload the accurately formatted batch file to CONFIG.INI. It is recommended to keep the original format, but changing values. Refer to the section in configuration for details and optional values as well. After successfully receiving and verifying the file, the IT501 Video Server will self-update the configuration and restart automatically. Refer to the previous section for further information.

Software revision upgrade

Customers can frequently check the appropriate product folder on our web site to download the latest firmware. Only administrators can upgrade the system firmware of the IT501 Video Server.

How upgrade firmware:

1. Decompress the compressed file in a local folder. A file named FLASH.BIN should appear.

2. Use the FTP program and change the working directory to the local folder where FLASH.BIN exists.

3. Connect to the IT501 Video Server with user name as "root" and password.

4. Use the PUT command to upload FLASH.BIN to the IT501 Video Server. The file size is near 1.5 mega bytes. It will take approximately 2 seconds in a local network, 2 minutes by null modem connection or 6 minutes by modem, but still subject to user's network.

5. After upload is complete, close the connection.

6. If the received FLASH.BIN is checked without error, the IT501 Video Server will update the software in Flash memory and restart automatically. When the IT501 Video Server starts writing firmware, both status LED indicators will stay on until system restarts. It takes about 30 to 40 seconds. User must keep the power stable during the update process. After the system restarts, the IT501 Video Server may need installation depending on whether the "Reset network at next boot" option is enabled or not. After the IT501 Video Server boots up, reload the web page in the browser.

⚠ If power fails during the software upgrade, the program in the memory of the IT501 Video Server may be destroyed permanently. If the IT501 Video Server cannot restart properly, ask the dealer for technical service.

Telnet

The IT501 Video Server has a Telnet daemon for administrators to access some seldom used functions. Using any general terminal program to connect to the IT501 Video Server will prompt the user for a password. Username is not requested here since only administrators can access the Telnet daemon. The password is as same as that used for web access. After logging in, type "help" for the command list. If "debug" or "dinote" is not executed, Telnet will disconnect automatically after being idle for 1 minute.

System core debugging

General activities are recorded into SYSTEM.LOG continuously, but information about abnormal status is not. To look deep into the core debugging information, administrators may type the "debug" command. This will cause the IT501 Video Server to start dumping the detailed debugging information while the system is running. This is useful to examine if any error has occurred when the system operates abnormally. The stored information will be cleared automatically after the dump. The IT501 Video Server will continue to dump new messages unless the connection is broken. If Telnet is not connected, any messages will be stored until administrators re-login.

Monitor changed status of digital inputs

Typing "dinote" will make the IT501 Video Server send the current status of digital input. After that the IT501 Video Server will continuously monitor DI status and send messages only when the state has changed. For example, after typing "dinote" the terminal will display
DI=L
DI=L
and if DI changes to H, terminal will display only
DI=H

Stop information dumping

Typing "stop" will cease dumping debug information and digital input status.

Query status of digital inputs

Typing "diquery" will display the status of digital input once.

Set digital outputs

To set digital output to connect NO with COMMON, type "DO=L".
To set digital output to connect NC with COMMON, type "DO=H".

Erase snapshots stored in Flash memory

Typing "erase image" will clear all snapshots saved in Flash.memory.

Erase logo and graphic buttons

Typing "erase graph" will clear all images used on the homepage. If no new images are uploaded, the system will switch to text mode and use default images instead.

Skip installation during the next boot

Typing "lock" will inform the IT501 Video Server to fix current network settings. It need not wait for installation during the next boot.

Reset network for new settings

Typing "unlock" will make the IT501 Video Server give up current settings and wait for installation.

Restore factory default settings

Typing "clear" will make the IT501 Video Server restore factory settings but not restart. To validate new settings, type "reset" to make the system restart.

Reset system

Typing "reset" will make the IT501 Video Server perform a software reset.

URL commands of the IT501 Video Server

For some customers who already have their own web site or web control application, the IT501 Video Server can be easily integrated through convenient URLs. This section lists the commands in URL format corresponding to the basic functions of the IT501 Video Server. Some RFC standards related to HTML may be a good reference for implementation of the customized homepages.

Capture update Snapshot of JPEG image

/cgi-bin/video.jpg

Move motorized camera in PTZ direction

<direction>:   up, left, right, down, home

<vision>:   wide, tele

<command>:   1, 2, 3, 4, 5

/cgi-bin/camctrl.cgi?move=<direction>&zoom=<vision>&cust=<command>

Preset/Recall camera position

/cgi-bin/recall.cgi?recall="POSITION"

, where "POSITION" denotes the text string of a location that is preset in system configuration.

Query status of digital inputs

/setup/getdi.cgi

The IT501 Video Server will return status of digital input.

Drive digital outputs

/setup/setdo.cgi?do=<state>

, where state is H, L. H means NC connected with COMMON and L means NO connected with COMMON.

For example, http://192.168.0.201/setup/setdo.cgi?do=h will command the IT501 Video Server, with IP address of   192.168.0.201, to set digital output to connect to NC with COMMON.

Clear data mode serial port driver

This URL applies to the attached serial port device including supported PTZ cameras or non-supported custom cameras. Note the serial port settings of custom cameras must be correctly defined in advance.

Send command to device attached to COM

/cgi-bin/senddata.cgi?data=123456,ABCDEF&flush=yes&wait=1000&read=6

This hyperlink will inform the IT501 Video Server to send out binary format commands to the COM with "0x12, 0x34, 0x56" followed by "0xAB, 0xCD, 0xEF". Each comma separates the commands by 200 milliseconds. "flush=yes" means the receive data buffer of COM port must be cleared before read. Then read 6 bytes after waiting for 1000 milliseconds. The read data can be up to 128 bytes and will return as ASCII coded hexadecimal value, e.g., 0x41, 0x42, 0x43 read from COM port will show in returned homepage as 414243 instead of ABC.

Restore factory default settings

/setup/restore.cgi

The IT501 Video Server will automatically restart after restoring factory default configurations.

Restart system

/setup/reset.cgi

Restart the IT501 Video Server without warning.

Page URL

The configuration page has a frame layout including an option list frame and an option page frame. Referenced URLs, except for the configuration page, direct users to the option page frame only. Some pages, like image quality setting and preset setting, are opened in new windows for preview.

These URLs can be accessed only by administrators.

Homepage name	Referenced URL
Client setting page	/client.html
configuration page	/setup/config.html
system option	/setup/system.html
security option	/setup/security.html
network option	/setup/network.html
video option	/setup/video.html
image quality option	/setup/image.html
camera control	/setup/camera.html
modem	/setup/modem.html
preset PTZ camera	/setup/preset.html
custom command setting	/setup/command.html
custom camera setting	/setup/custom.html
application option	/setup/app.html
homepage layout option	/setup/layout.html
system log	/setup/logfile.html
system parameters	/setup/parafile.html
set factory default	/setup/factory.html

System resource URL

There are some images used on the homepage when the homepage layout is in image mode. Administrators may use the following links to show the images saved in the IT501 Video Server on another page. To change the images referenced by the URL, refer to the homepage layout section in configuration.

Resource name	Referenced URL
system logo image	/pic/logo.gif
background image	/pic/back.gif
icon image for link indicator	/pic/btn_text.gif

General format of command URL

Every configuration can be set through URL with POST method by administrators only.

<general format>

URL[?[name=value][&name=value]……]

<method>

POST

<authorized user>

root

System configuration URL

URL: /setup/system.cgi

NAME	VALUE	DESCRIPTION
host	<text string shorter than 15 characters>	system name
method	keep	keep date and time unchanged
	auto	use NTP server to synchronize
	manu	directly adjust date and time
date	<yyyy/mm/dd>	year, month and date separated by slash
time	<hh:mm:ss>	hour, minute and second separated by colon
ntp	<domain name or IP address>	NTP server
zone	-12 ~ 12	time zone, 8 means GMT +8:00

Security configuration URL

URL: /setup/security.cgi

NAME	VALUE	DESCRIPTION
rootpass	<text string shorter than 15 characters>	change root password
username	<text string shorter than 15 characters>	add new user
userpass	<text string shorter than 15 characters>	new user's password
deluser	<text string shorter than 15 characters>	existing user name

Network configuration URL

URL: /setup/network.cgi

NAME	VALUE	DESCRIPTION
reset	YES	enable installation at next boot
	NO	disable installation at next boot
ip	<IP address>	the IT501 Video Server's IP address
subnet	<IP address>	subnet mask
router	<IP address>	default gateway
domain	<text string shorter than 40 characters>	domain name of the IT501 Video Server
dns1	<IP address>	primary DNS server
dns2	<IP address>	secondary DNS server
smtp1	<domain name or IP address>	primary SMTP server
mailto1	<text string shorter than 80 characters>	mail recipient address
smtp2	<domain name or IP address>	secondary SMTP server
mailto2	<text string shorter than 80 characters>	mail recipient address
return	<text string shorter than 80 characters>	return address
http	<number less than 65535>	HTTP port
controlport	<number less than 65535>	Control Channel port

videoport	<number less than 65535>	Video Channel port
audioport	<number less than 65535>	Audio Channel port
lowband	Yes	enable the low bandwidth environment
	no	disable the low bandwidth environment
ftp1	<domain name or IP address>	primary FTP server
ftpuser1	<text string shorter than 15 characters>	user name for primary FTP server
ftppass1	<text string shorter than 15 characters>	password for primary FTP server
ftpfolder1	<text string shorter than 40 characters>	upload folder in primary FTP server
ftp2	<domain name or IP address>	secondary FTP server
ftpuser2	<text string shorter than 15 characters>	user name for secondary FTP server
ftppass2	<text string shorter than 15 characters>	password for secondary FTP server
ftpfolder2	<text string shorter than 40 characters>	upload folder in secondary FTP server

Video configuration URL

URL: /setup/video.cgi

NAME	VALUE	DESCRIPTION
text	<text string shorter than 15 characters>	enclose caption
color	B/W	set encoder to monochrome
	<other than B/W>	set encoder to color
size	1	half
	2	half x 2
	3	normal
quality	fixb	fix bit rate
	<other than fixb>	fix quantization
quan	1	lowest quality of video
	2	lower quality of video
	3	normal quality of video
	4	higher quality of video

	5	highest quality of video
bitrate	64000	set bit rate to 64K bps
	128000	set bit rate to 128K bps
	256000	set bit rate to 256K bps
	384000	set bit rate to 384K bps
	512000	set bit rate to 512K bps
	768000	set bit rate to 768K bps
	1000000	set bit rate to 1000K bps
	1200000	set bit rate to 1200K bps
mode	Auto	let the IT501 Video Server detect video modulation
	NTSC	set directly to NTSC type
	<other than above>	set directly to PAL type
frame	1	set maximum frame rate to 1 fps
	2	set maximum frame rate to 2 fps
	3	set maximum frame rate to 3 fps
	5	set maximum frame rate to 5 fps
	10	set maximum frame rate to 10 fps
	15	set maximum frame rate to 15 fps
	20	set maximum frame rate to 20 fps
	25	set maximum frame rate to 25 fps
	30	set maximum frame rate to 30 fps
enablemd	yes	enable motion detection
	<other than yes>	disable motion detection
flip	yes	flip image
	<other than yes>	normal image
mirror	yes	mirror image
	<other than yes>	normal image

Image quality configuration URL

URL: /setup/image.cgi

NAME	VALUE	DESCRIPTION
brightness	<-5 ~ 5>	adjust brightness of image
contrast	<-5 ~ 5>	adjust contrast of image
hue	<-5 ~ 5>	adjust hue of image

saturation	<-5 ~ 5>	adjust saturation of image
preview	<not required>	not save the parameters
restore	<not required>	recall the original settings
save	<not required>	save the parameters

Camera configuration URL

URL: /setup/camera.cgi

NAME	VALUE	DESCRIPTION
interface	RS232	switch COM to RS232
	<other than RS232>	switch COM to RS485
driver	auto	let the IT501 Video Server auto detect camera
	1	non-PTZ camera device
	2	Sony EVI-D30/31
	3	Canon VCC1
	4	Canon VCC3
	5	DynaDome/SmartDOME
	6	Pelco D protocol
	7	third party PTZ camera

Camera preset configuration URL

URL: /setup/preset.cgi

NAME	VALUE	DESCRIPTION
addpos	<text string shorter than 40 characters>	add preset position
delpos	<existing position name>	delete preset position

Camera custom command configuration URL

URL: /setup/command.cgi

NAME	VALUE	DESCRIPTION
str1	<text string shorter than 8 characters>	button name of custom command 1 of COM
str2	<text string shorter than 8 characters>	button name of custom command 2 of COM
str3	<text string shorter than 8 characters>	button name of custom command 3 of COM

str4	<text string shorter than 8 characters>	button name of custom command 4 of COM
str5	<text string shorter than 8 characters>	button name of custom command 5 of COM
com1	<text string shorter than 80 characters>	custom command 1 of COM
com2	<text string shorter than 80 characters>	custom command 2 of COM
com3	<text string shorter than 80 characters>	custom command 3 of COM
com4	<text string shorter than 80 characters>	custom command 4 of COM
com5	<text string shorter than 80 characters>	custom command 5 of COM

Custom camera configuration URL

URL: /setup/custom.cgi

NAME	VALUE	DESCRIPTION
baud	<integer>	set baud rate of COM
data	<integer>	set data bits of COM
stop	1	set 1 stop bit of COM
	2 <other than 1>	set 2 stop bits of COM
parity	None	set parity check of COM to none
	Odd	set parity check of COM to odd
	Even	set parity check of COM to even
up	<text string shorter than 80 characters>	tilt up command string of COM
down	<text string shorter than 80 characters>	tilt down command string of COM
left	<text string shorter than 80 characters>	pan left command string of COM
right	<text string shorter than 80 characters>	pan right command string of COM
home	<text string shorter than 80 characters>	home command string of COM

tele	<text string shorter than 80 characters>	zoom in command string of COM
wide	<text string shorter than 80 characters>	zoom out command string of COM

Modem configuration URL

URL: /setup/modem.cgi

NAME	VALUE	DESCRIPTION
dialout	yes	allow the IT501 Video Server dialing out on event
	<other than yes>	no dial-out allowed
method	Tone (ATDT)	make modem dial in tone
	Pulse (ATDP)	make modem dial in pulse
reatt	<integer>	redial attempts
discon	<integer>	minutes delay before disconnection
init	<text string shorter than 40 characters>	command to initialize modem
phone1	<text string shorter than 40 characters>	phone number of primary ISP
user1	<text string shorter than 40 characters>	user name for primary ISP
pass1	<text string shorter than 40 characters>	password for primary ISP
phone2	<text string shorter than 40 characters>	phone number of secondary ISP
user2	<text string shorter than 40 characters>	user name for secondary ISP
pass2	<text string shorter than 40 characters>	password for secondary ISP

Application configuration URL

URL: /setup/app.cgi

NAME	VALUE	DESCRIPTION
emode	<not required>	event mode application
smode	<not required>	sequential mode application
smethod	mail	upload snapshots by email

	ftp	upload snapshots by FTP
suffix	<not required>	FTP file with date and time suffix
delay	<integer>	seconds delay to detect next event
inter	<integer>	seconds delay to capture post-event
dihigh	< not required >	set DI high as trigger condition
dilow	< not required >	set DI low as trigger condition
dirise	< not required >	set DI rising as trigger condition
difall	< not required >	set DI falling as trigger condition
motion1	< not required >	set motion window1 as trigger condition
motion2	< not required >	set motion window2 as trigger condition
motion3	< not required >	set motion window3 as trigger condition
ioalarm	< not required >	trigger DO when DI condition matched
mdalarm	< not required >	trigger DO when motion detected
ioupload	< not required >	upload snapshot when DI condition matched
mdupload	< not required >	upload snapshot when motion detected
sinter	<integer>	seconds interval for sequential mode
sbegin	<hh:mm:ss>	time to start sequential mode
send	<hh:mm:ss>	time to stop sequential mode

Homepage layout configuration URL

URL: /setup/layout.cgi

NAME	VALUE	DESCRIPTION
cuslogo	blank	hide logo
	def	use default logo
	url	use image from URL
logourl	<text string shorter than 80 characters>	URL of image for logo
linkurl	<text string shorter than 80 characters>	URL to link when clicking on logo
cusback	blank	hide background image
	def	use default background
	url	use image from URL
backurl	<text string shorter than 80 characters>	URL of image for background

fcolor	<0 ~ 15>	color index for font
bcolor	<0 ~ 15>	color index for background

Appendix

A. POST procedure

After the power has been turned on, the IT501 Video Server will perform a self-diagnostic to locate any possible hardware defects. If the power indicator is dim at the beginning, the power fails to proceed further. While the POST is proceeding, the status LED indicators will keep blinking interchanged until finished or any fatal error happens. If either status LED indicator is dim at the beginning, the LED may be broken.

Any possible fatal error has a special pattern shown in the following table. LED2 is the one below the network indicator and LED3 is the lowest one. If the POST is successful, status LED indicators will both shut off for a while and then light depending on the chosen network interface. If Ethernet is available, LED2 will flash like a heartbeat after network installation is done. Otherwise if modem is available, LED2 will flash alike to indicate listening for dial-in connection while LED3 is lit. If the included null modem cable is connected, both LEDs will stay on and then LED2 will start flashing after the connection from the PC is opened for configuration and LED3 stays lit.

LED pattern after POST	Possible failed component	Failed function
LED2 and LED3 blink at same time	U32(SAA7113)	Video decoder
LED2 ON and LED3 OFF	U1(TM1300)	PCI bridge of TM1300
LED2 OFF and LED3 ON	U6(RTL8139C)	Ethernet controller
LED2 ON and LED3 ON	U6(RTL8139C), U7, U8	Ethernet interface*
LED2 blink and LED3 ON	U22(M5823)	Real-time clock
LED2 ON and LED3 blink	U19(16C1550CJ), P2	COM interface

⚠ Ethernet interface failure includes not only components on board but also Ethernet cable and the devices of the opposite end.

B. Frequently asked questions

Q. What if I forget my password?

A. Every access to the IT501 Video Server needs authentication. If you are one of the managed users, you have to ask the administrators for the password. If you are the administrators, there is no way to recover the root password. The only way to regain access to the IT501 Video Server is to utilize the default setting button on the rear panel to restore the factory settings and reinstall it.

Q. Why can I not watch video from the IT501 Video Server after it is authenticated?

A. There are many possible scenarios regarding this problem,

1.If you have just installed the IT501 Video Server and are unable to watch the video, check the video modulation on the Configuration page.

2.If the IT501 Video Server is well installed and you are accessing the IT501 Video Server for the first time using Internet Explorer, adjust the security level of Internet Explorer to allow installation of plug-ins.

3.If the problem still exists after adjusting, the current users may be over the system allows.

Q. What is the plug-in for?

A. The plug-in provided by the IT501 Video Server is used to display motion pictures on Internet Explorer. If your system does not allow installation of any plug-in software, the security level of the web browser may need to be lowered. It is recommended that you consult your network supervisors in your office regarding adjustment of the security level.

Q. Why is the timestamp different from the system time of my PC or notebook?

A. The timestamp is based on the system time of the IT501 Video Server. It is maintained by a real-time clock inside and automatically synchronizes with the time server if the IT501 Video Server is connected to the Internet and the function is enabled. Differences of several hours may result from the time zone setting.

Q. Why does the image not refresh regularly?

A. In a modem environment, it is because the bandwidth of PPP connection is far less than Ethernet. If the difference of the timestamp is not stable, adjust the UART FIFO lower in both receiving and transmitting from modem property in the control panel. While in Ethernet, it may be due to time taken in storing snapshots into memory upon events occurring.

Q. How does the IT501 Video Server detect the supported PTZ cameras automatically?

A. If there is no camera detected, the IT501 Video Server will monitor the CTS of the camera control cable continuously. As long as the CTS is detected, the IT501 Video Server will try to handshake with supported cameras until a supported camera is found. There is no more camera detection once a PTZ camera is recognized.

Q. How many users are allowed to watch the IT501 Video Server at the same time?

A. Basically there is no limitation of users. However the video quality also depends on the network bandwidth. To achieve the best effect, the IT501 Video Server will allow several users to be connected. It is recommended to build another web server to host a large quantity of users by retrieving images from the IT501 Video Server periodically.

Q. How fast is the video rate of the IT501 Video Server?

A. The MPEG4 codec can process 30 frames per second internally. However the total performance is subject to many coefficients as follows:

1. network throughput.
2. bandwidth share.
3. number of users.
4. the complicated objects in view results in larger image file.
5. the level of your PC or notebook which is responsible for displaying images.

In general, the transfer rate in a general local network environment can achieve over 200 kilobytes per second and approximately 10 to 20 pictures of a normal environment per second.

Q. How can I keep the IT501 Video Server as private as possible?

A. The IT501 Video Server is designed for surveillance purposes and has many flexible interfaces. The user authentication and special confirmation in installation can keep the IT501 Video Server from unauthorized access. You may also change the HTTP port to non-public number. You can check the system log to examine any abnormal activities and trace the origins.

Q. I have a PTZ camera that is not on the supported list. How can I control it?

A. The IT501 Video Server provides a custom camera command interface to control the cameras that are not supported. The details are described in the manual. Be sure the COM port settings are applied to the camera specification. The camera control cable included is shown in the package content. Prepare your own cable if necessary. The general PTZ command is composed of one start command and one stop command. When editing both commands in the edit box of the configuration page, use comma(s) to separate commands. Each comma represents 200 milliseconds. If the user has some

serial control device other than the PTZ camera, the special URL is provided to send the desired commands. For quick access, integrate the URL to another homepage on your own web server.

Q. How fast will the IT501 Video Server check the status of digital inputs?

A. The IT501 Video Server will check input status in less than half a second. However, to avoid repeatedly checking conditions too often and to allow the devices connected to digital outputs to function properly, the IT501 Video Server will delay 3 seconds by default after each condition matches. Users may change it according to specific applications. During this period, any condition will be ignored.

Q. Why can I not access the IT501 Video Server when I setup some options in the application?

A. When the IT501 Video Server is triggered by events, snapshots will take more time to write them into memory. If the events occur too often, the system will always be busy storing images. It is recommended to use sequential mode or external recorder program to record motion pictures if the event is frequent. If you prefer to retrieve images via FTP, the value could be smaller since FTP responses quicker than the Web does. Once the system is too busy to configure, use the restore factory default and reset button to save the system.

Q. I try to connect my black-and-white and color cameras with the IT501 Video Server but the image is not good.

A. Although the IT501 Video Server allows users to choose color or black-and-white images for each camera, hybrid camera types may increase video processing time and reduce system performance.

C. Technical specifications

Remote Management
Configuration and system log can be accessed
via Web browser and FTP application remotely.

Networking
Protocol
TCP/IP, HTTP, SMTP, FTP, Telnet, NTP, DNS and DHCP
Modem
PPP(dial-up, direct cable connection)
Physical
10baseT Ethernet or 100baseT Fast Ethernet

Audio
Algorithm Supported
24K bps wideband audio coding
Audio Inputs
1 RCA mono audio input

Video
Algorithm Supported
MPEG4(short header mode)
Video Inputs
1 BNC composite video input
NTSC/PAL auto-sensing
Features
Adjustable image size and quality
B/W or color control

Video Resolution
NTSC
Up to 30 frames at 176x120
Up to 30 frames at 352X240

PAL
Up to 25 frames at 176x144
Up to 25 frames at 352X288

Viewing System Requirement
Protocol
Standard internet TCP/IP suite
Operating System
Microsoft Windows,
Browser
Internet Explorer 4.x or above,

General I/O
1 opto-isolated sensor input (max. 12VDC 50mA)
1 output relay (max. 24VDC 1A, 125VAC 0.5A)

Alarm Features
Motion detection with percentage and sensitivity
Daily repeat timing schedule
3 color JPEG images for pre/post alarm image storage
Automatic transfer of stored images via email or FTP with event-triggered actions

RS232/RS485
9 pin D-SUB RS232 or RS485(PTZ camera control) max.115.2Kbps

PAN/TILT/ZOOM
PTZ camera control through RS232 or RS485
Automatic PTZ camera model detection
Supported units and protocol,
Sony VISCA PTZ cameraa
Canon VC-C1, VC-C3
Dynacolor SmartDOME
Pelco D-protocol Dome
Clear-data command driver is supported

Remote Software Upgrade
System firmware upgradeable via FTP

Security
Administrator and user group protected
15 digits password protection

Optional Software
Record and play pictures on PC hard disk
I/O ports monitoring feature

LED Indicator
Status indicators
Network link indicator

Power
12V DC, 1.2A external power supply
6-15V DC, min. 15W

Electromagnetic Compatibility (EMC)

USA - 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 partial 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.
Shielded interface cables must be used in order to comply with emission limits.

Europe - This digital equipment full fills the requirement for radiated emission according to limit B of EN55022/1998, and the requirement for immunity according to EN50082-1/1992.

Liability

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Notes :