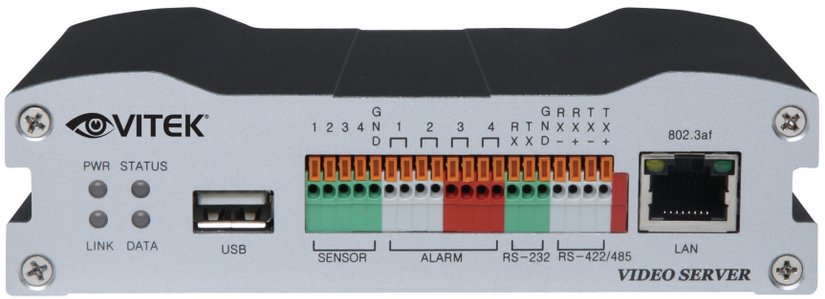
VITEK

VITEK®
INDUSTRIAL VIDEO PRODUCTS, INC.

VT-IPS402H

4Ch D1 Server Dual Stream H.264/MJPEG with PoE



- H.264 + H.264 / H.264 + MJPEG Dual Streaming
- 4 Channels of 30 FPS in Full D1 (720x480) Resolution Transmission
- Real-Time monitoring, recording & playback through CMS
- Multiple PTZ & Controller Support
- Power over Ethernet (802.03af) compliant
- Dynamic IP support with DDNS
- 4 Composite BNC connectors
- 4 Alarm Inputs
- 4 Relay Outputs
- 1 Looping Audio Connection

1 RS-422 Input & 1 RS-485 Input for Controller and PTZ integration

1 RS-232C Input for third party integration

1 USB Port for local recording

CYAN MAGENTA YELLOW BLACK

Safety Precautions

◈ Make sure to turn off the power before installing the VIDEO SERVER.

◈ Do not install under direct sunlight or in dusty areas.

◈ Make sure to use the product within the temperature and humidity that is specified.

◈ Do not operate the product in the presence of vibrations or strong magnetic fields.

◈ Do not put electrically conducting materials in the ventilation hole.

◈ Do not open the top cover of the product. It may cause a failure or electric shock on the components.

◈ To prevent from overheating, make sure to keep the distance at least 10cm from the ventilation hole.

◈ Check for proper voltage before connecting the power.

Table of Contents

1. Introduction

1. About this manual

This user manual provides information on operating and managing the optimal video surveillance system, VT-IPS402H. The manual includes instructions for installation, operation and configuration of VT-IPS402H as well as how to troubleshoot.

2. Feature

VT-IPS402H is a video and audio surveillance transmission system based on IP network through LAN, ADSL/VDSL, and Wireless LAN. The VT-IPS402H operates as A 4 Channel Encoder which compresses and transmits video & audio data through network and provides 4 BNC inputs for connecting analog video devices.

■ Video

- High-quality compression algorithm, H.264 & MJPEG support for each channel
- Compression in various resolution: CIF, Half-D1 and D1
- Wide range of video transmission rate: 32kbps ~ 8Mbps (Up to 2Mbps for each channel)
- Various transmission mode: CBR and VBR
- Motion Detection

■ Audio

- Multi-transmission mode: Uni-direction (Encoder -> Decoder, Decoder -> Encoder), Bi-direction

■ Network

- Fixed IP & Dynamic IP(DHCP) support
- 1:1, 1:N support
- Multicasting
- Automatic transmit rate control according to network condition

■ Serial Data

- Two serial ports
- Various PTZ camera protocols.
- Data pass-through mode: Serial data communication between Encoder – Decoder

■ Sensor and Alarm

- Support direct connections of external sensor and alarm devices.
- Event Alarm

■ **USB**

- Connection to internal or external USB storage for remote access

■ **User Interface**

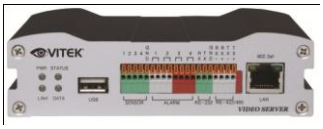
- System status display utilizing OSD (On Screen Display)
- Diagnose and upgrade through a manager program called ENVI VMS
- System configuration using Internet Explorer

■ **High Reliability**

- Reliable embedded system
- System recovery utilizing dual watch-dog functions

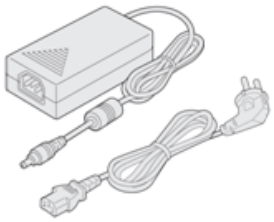
3. Product and Accessories

VT-IPS402H

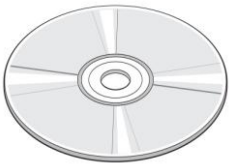


Quick Guide

Power adaptor and cable

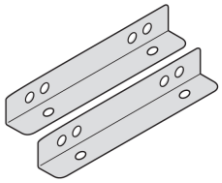


S/W & User manual CD



Screws

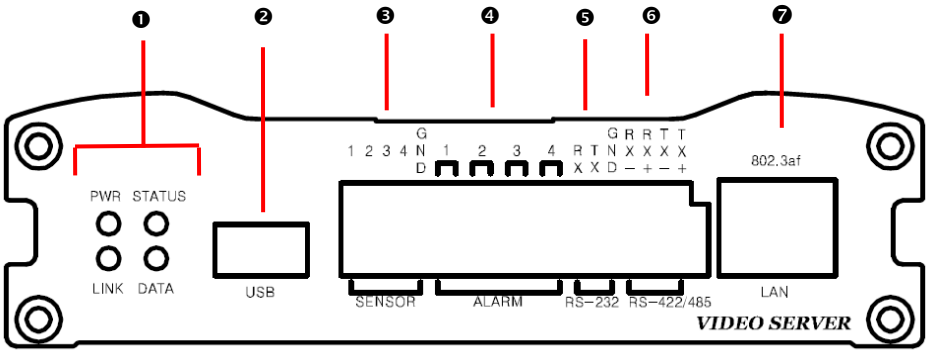
Brackets



<Picture 1> Product and Accessories

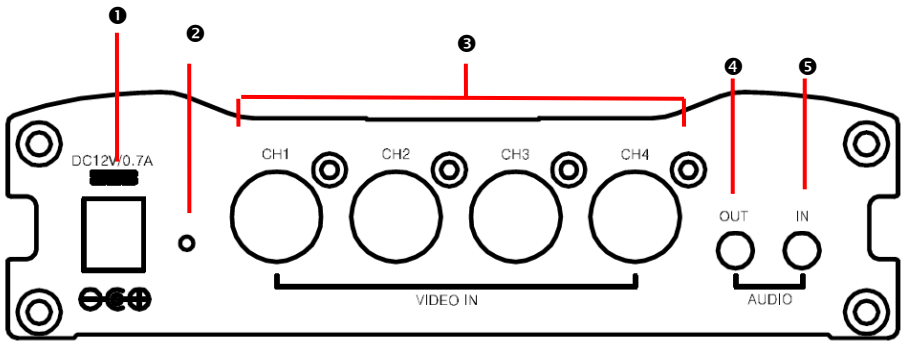
4. Part Names and Description

■ Front View



Parts	Function
❶ LEDs	Display power On/Off condition, Link, Status and data
❷ USB	USB port for any USB device
❸ SENSOR	Sensor input
❹ ALARM	Relay output
❺ RS-232	Serial communication port 1 (COM1) for PTZ control or bi-directional command pass-through
❻RS-422/485	Serial port 2 (COM2) for PTZ control and etc. Support RS-422 and RS-485 protocol
❼ LAN(Ethernet)	100/10-base-T Ethernet interface

■ **Rear View**



Terminal	Function
❶ POWER IN	DC 12V power input
❷ RESET	Reset button for network reset
❸ VIDEO IN	Video Input
❹ AUDIO IN	Audio Input
❺AUDIO OUT	Audio Output

5. System Modes and Connections

The VT-IPS402H system operates as an Encoder and can be connected in either '1-to-1' fashion where the VT-IPS402H is connected one decoder or in a '1-to-many' fashion where the VT-IPS402H is connected to many decoders.

The following chart shows possible combinations of video, audio and serial data transmission.

System Mode	Video	Audio	Serial Data
Encoder	Transmit	Transmission/Receive	Transmit/Receive

Therefore, VT-IPS402H is capable of bi-directional transmission of audio or serial data.

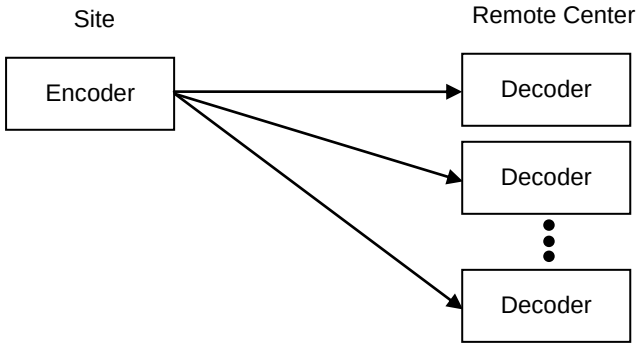
■ **Topology**

Generally, the encoder and the decoder are connected in 1-to-1 mode. To support specific situations, the 1-to-many connection option is also supported.

◈ 1:1 Connection (Unidirection)

The commonly used configuration is the 1 to 1 connection. An encoder is installed at a site where video images can be transmitted and a decoder is installed at a center location to receive and view the video images on an analog monitor. Audio and serial data are transferred in either direction.

◈ 1:N Connection (Unidirection)



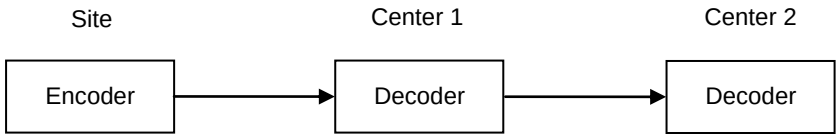
In this configuration, a site can be monitored from many remote center locations. Although up to 64 decoders can be connected to one encoder, in the real network environment, network bandwidth can limit the maximum connections.

Functionally, the CMS (Central Monitoring System) software can replace the decoder.

◈ Multicast Mode

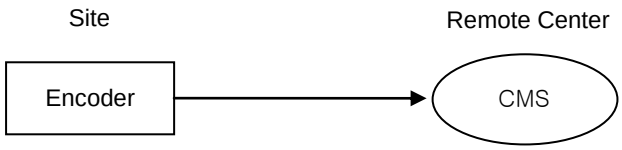
In 1:N Connection, the network that supports multicasting, a large number of decoders, can efficiently receive video from an encoder that transmit a single streaming of video and audio.

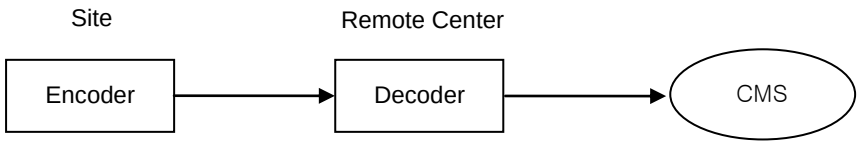
◈ Relaying



In this arrangement, video and audio can be retransmitted from a center to another center. This arrangement is useful when the network bandwidth to the site is limited and there is more than one center that wants to monitor the site.

◈ CMS (Central Monitoring System)





CMS (Central Monitoring System) is a Windows based remote monitoring program to access multiple encoders for real-time monitoring or control of the encoders and connected cameras. Please refer to CMS User Manual for more information on CMS.

2. Installation

1. Connecting Video

◈ Encoder System

- Connect the video output line to the encoder (VT-IPS402H) video input port.

2. Connecting Audio

Audio is bi-directional in any configuration regardless of the system mode. If necessary, it can be configured to be in transmit-only, receive -only or bi-directional mode.

- Connect audio input and output ports to audio devices accordingly.
- Audio signal is in line level, therefore, a microphone or speaker with an amplification function should be used.

3. Connecting Serial Ports

For camera control, PTZ controller (keyboard) and receiver can be connected to serial ports. Two corresponding serial ports in encoder and decoder which are connected in 1-to-1 fashion works in pass-through mode. This means that commands at a local system's COM1 port will be transparently passed to the remote system's COM1 port. Also, a command at a local system COM2 port will pass to the remote system's COM2 port.

4. Connecting Sensor and Alarm

Connect sensor and alarm devices to corresponding terminals accordingly.

5. Connecting Power

After confirming the power source, connect power adaptor and connect the 12VDC connector to the system.

6. Check Operating

Once the power is supplied to the camera, it will start booting. The system will boot up to an operating mode after approximately 40-60 seconds. The green LED on the Ethernet port will flash indicating the system is ready.

Software provided on the disc called ENVI VMS allows you to check the IP address and other network details of the camera.

◈ Encoder LED Display

PWR	STATUS	LINK	DATA
Red	Green Blinking	OFF	OFF

The above LED status display shows that neither camera is connected nor a decoder is connected. Once the encoder is connected to a decoder, the color of link LED will be green and the LED will blink as video or audio transmissions occur.

◈ Decoder LED Display

PWR	STATUS	LINK	DATA
Red	Green Blinking	Red Blinking	OFF

The above LED status display shows that the encoder has started without connecting to an encoder. Once an encoder is connected, the color of link LED will be changed to green and the LED will blink as video or audio data transmissions occur.

3. System Operation

1. LED Display

■ Description of LEDs

System status can be monitored with LEDs.

LED	State	Description
PWR	Off	No power
	Red	Power on
STATUS	Green blinking	Operating Normally
	Red	System failure: Needs diagnostics
	Constant change of colors between Red and Green	NTSC/PAL setting does not match with input video signal
	Red Blinking	Failed to obtain IP address in DHCP mode
	Constant change of colors between Green blinking 2 times and Red blinking once	Failed to register on DDNS server
	Green blinking, Red blinks once every 5 seconds	Video loss in Encoder system
	Orange blinking	Improper resolution setting in duplex mode
LINK	Off	No connection to remote system
	Green	Connected to a remote system
	Red blinking	Decoder only: trying to connect to an Encoder
	Orange	Illegal connection (unsupported combination of system modes)
DATA	Green	Data transmission in progress
	Red	Data loss
	Off	No data transmission

2. Remote Video Monitoring

There are two ways to remotely view video when the connections are completed between a site and center system. In order for a proper operation, an IP address must be set accordingly. Please refer to **True Manager** or **Remote Setting in Chapter 4 and 5** for further details.

■ Video Monitoring with Decoder System

Once the encoder IP address is set in the remote IP address section of the decoder, the decoder system will connect to the encoder system and start receiving the video images. Normally, a monitor connected to the decoder will display video images.

■ Video Monitoring using Internet Explorer

If the VT-IPS402H's IP address is entered on Internet Explorer, the system will ask for confirmation to install Active-X control. Once authorized, Internet Explorer will start to display video images from the encoder as shown below.

http://192.168.10.100

■ Video Selection

If Primary is selected, Max. 720 x 480 (NTSC) or 704 x 756 (PAL) via H.264 compression algorithm video can be displayed. And once activated Dual Video compression and Secondary may be selected, H.264 or MJPEG compression algorithm video can be displayed in this case.

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■ Screen Size:

Adjustable Screen Size

■ Digital Zoom:

Max 5x Digital Zoom is available.

■ Focus Near, Focus Far, Auto Focus

Adjust the focus

■ Sensor Input

When the sensor on the VT-IPS402H is connected and working, the light turns red.

■ Alarm Output

Alarm Output button can trigger an event directly from the Live View page.

■ Snapshot

Snapshot button saves a snapshot of the video image currently on display. Captured picture can be stored as BMP or a JPEG file.

■ Talk

Transfer audio to audio device connected to the VT-IPS402H.

3. Initialization of IP Address

If a system IP address is lost, the system can be reset to a known IP address using the reset button in the back side of the system:

① While system is in operation, press the reset button for 5+ seconds.

② The system will reboot automatically

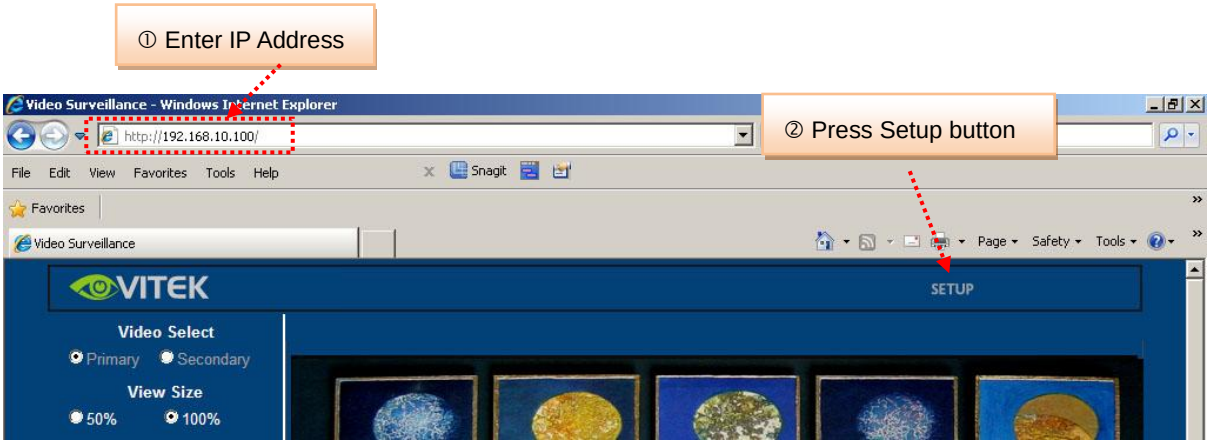
③ Once the system has been rebooted, IP address will be set to the following.

- IP mode: Fixed IP
- IP address: 192.168.10.100
- Subnet mask: 255.255.255.0
- Gateway : 192.168.10.1
- Base port : 2222
- Http port : 80

4. Remote Configuration

1. Remote Configuration

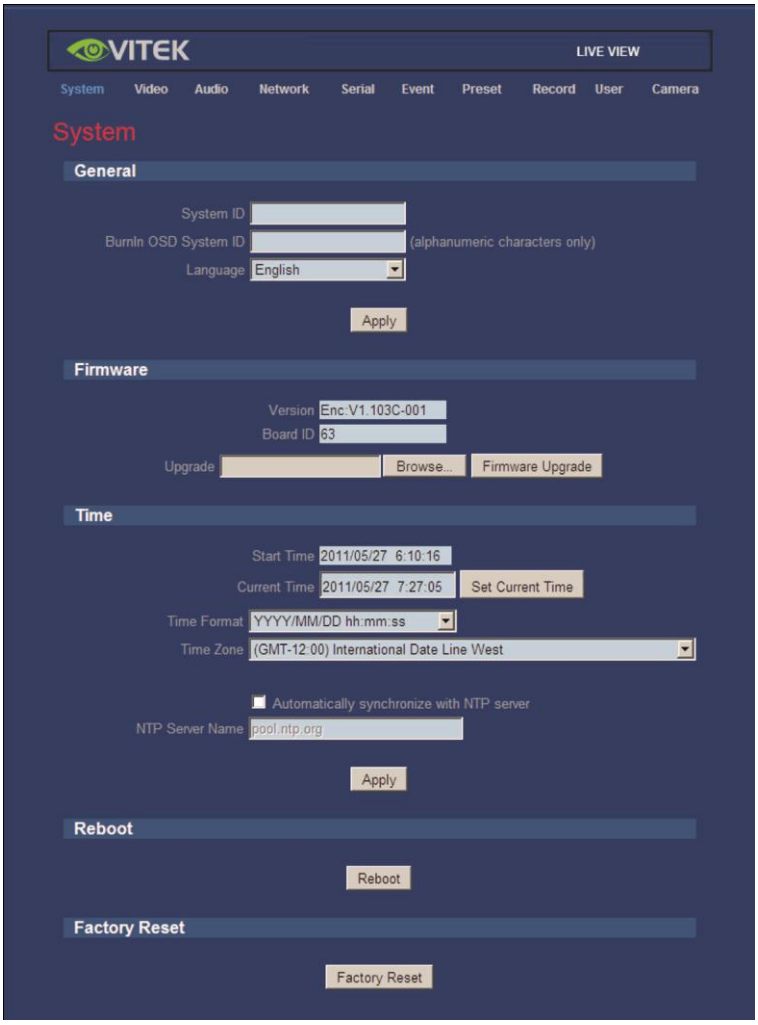
The server can be configured using web browser. Type the IP address of the VT-IPS402H in the address input area of Internet Explorer, then a live viewing screen will be displayed. Press **Setup** button located in the upper right area of the monitoring screen, then this page for server setup will be displayed.



The remote configuration window may be slightly different depending on the system modes (Encoder, Decoder). The general explanation of the configuration in this manual is based on the Encoder system, and differences according to the modes will be clarified when needed.

The configurations are grouped into 8 categories: **System**, **Video**, **Audio**, **Network**, **Serial**, **Event,** **Preset** and **User**. No configuration changes are applied until **Apply** is pressed. Leaving the page without pressing the **Apply** button will discard any changes.

2.1 System Configuration



■ System ID

System ID: Alphanumeric System ID to be transferred to remote software

■ Language

Language to be used for web-based configuration

■ Firmware version

Current firmware version

■ Board ID

Network board ID of VT-IPS402H is recognized by system

■ Start Time

Latest system boot date and time

■ Current Time

Current date & time: Enter a new date and time and press **Set Current Time** button to update date & time.

■ Time Zone

Time zone: Select the time zone of where the system is installed. Depending on the time zone, Daylight Saving Time will work automatically.

■ Automatically synchronize with NTP server

Synchronize system time with an NTP server using NTP (network time protocol). Name of the NTP server should be registered on NTP server Name.

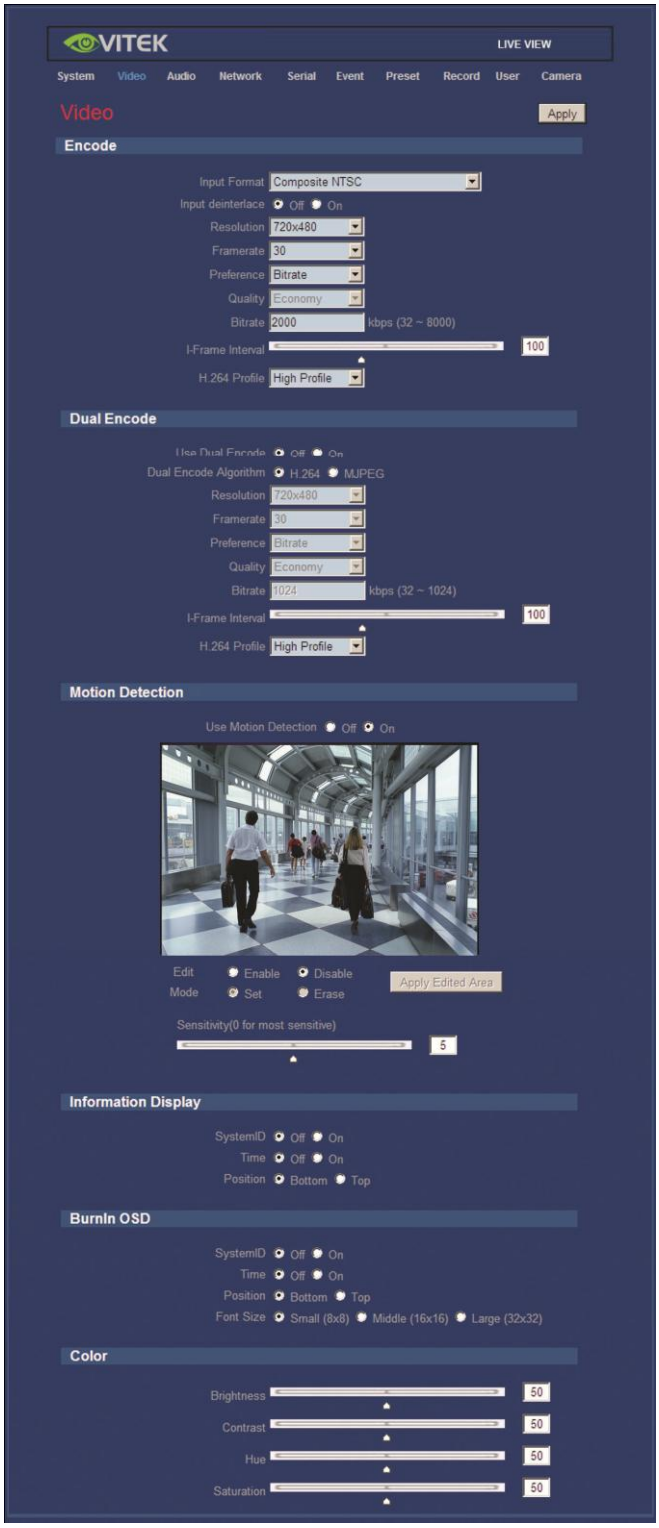
■ Reboot Server

Pressing **Reboot Server** button will cause the system to reboot. Do not press the Reboot button unless the server needs a reboot.

■ Factory Reset

Set all settings to the factory default values. System log and user registrations are also cleared.

2.2 Video Configuration



■ Input Format

Select channel and video input format.

- **ENCODE**

■ Resolution

Selectable video compression resolution as below:

NTSC: 720 x 480, 720x 240, 352 x 480, 352 x 240

PAL: 720 x 576, 720 x 288, 352 x 576, 352 x 288

■ Frame Rate

Select video frame rate (the maximum number of frames of video images to compress). The frame rate actually transmitted can be affected by the network bandwidth limitations.

■ Preference

Preference in video compression and transmission: With ‘Bitrate’ selected, the video compression will be effected by the ‘Bitrate’ value entered. With ‘Quality’ selected, the video compression will be effected by the quality of image selected. Therefore, ‘Bitrate’ and ‘Quality’ corresponds to CBR (Constant Bitrate) and VBR (Variable Bitrate) respectively.

■ Quality

VBR (Variable Bit Rate) adjusts the bit rate according to the image complexity, using up bandwidth for increased activity in the image and less for lower activity in the monitored area.

■ Bitrate

CBR (Constant Bit Rate) allows you to set a fixed target bit rate that consumes a predictable amount of bandwidth. As the bit rate would usually need to be increased for increased image activity, but in this case it is constrained, the frame rate and image quality are affected negatively.

■ I-Frame Interval

Setting numbers of P frames to each I frame between 0 and 255.

There will be no P-frame if 0 is set.

- **DUAL ENCODE**

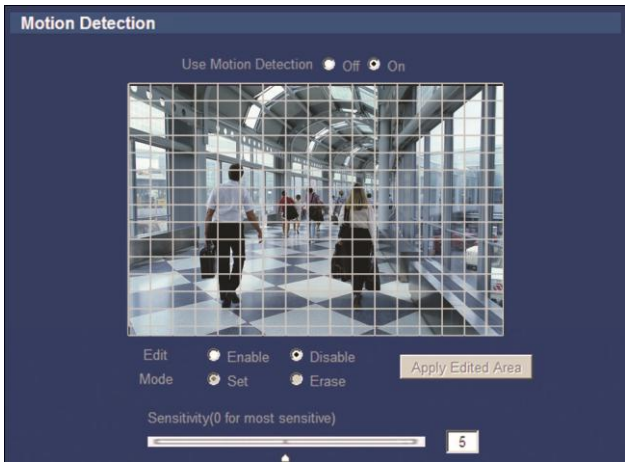
■ Use Dual Encode

Select On to use dual encode

■ Dual Encode Algorithm

H.264 and MJPEG can be selected for secondary streaming. Maximum resolution is 720 x 480 and there are 8 steps of resolution. If MJPEG is selected, Preference supports only Quality mode. Bitrate can be set from 32~1024kbps for Dual Encode.

- **MOTION DETECTION**



■ Use Motion Detection

Select Motion Detection function

■ Motion Detection Area Editing

Configure regions for motion detection. Regions of arbitrary shape can be configured by the following steps.

① Enable **Edit** item.

② Select editing Mode. **Set** is for including cells to motion detection region and **Erase** is for excluding.

③ Select cells using the left button of the mouse. Multiple cells can be selected conveniently by press and dragging.

④ Press **Apply Edited Area** button to save the editing.

■ Sensitivity

Sensitivity is a condition to trigger an event of motion detection. The value determines the sensitivity of the motion detection within a block: the smaller, the more sensitive.
It is selectable from from 0 to 10.

■ Information Display

System ID and/or server time can be displayed over the video window in Web View. Each item can be turned on or off and the position can be configured as well. This information is displayed after the video is decompressed.

■ Burn-in OSD

Insert system ID and date/time in the compressed video. System ID and time respectively can be turned on or off in the video. And position and Font size can be selected.

■ Brightness

Controls input video brightness by selecting values between 0 and 100.

■ Contrast

Controls input video contrast by selecting values between 0 and 100.

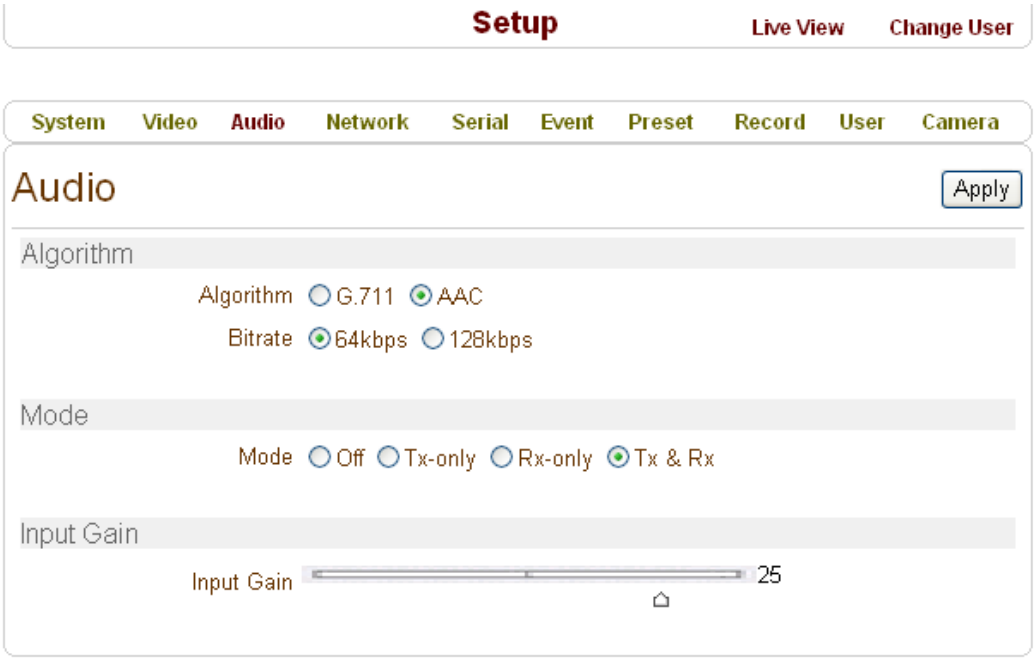
■ Hue

Controls input video Hue by selecting values between 0 and 100.

■ Saturation

Controls input video saturation by selecting values between 0 and 100.

2.3 Audio Configuration



■ Algorithm

Algorithm: Select the audio algorithm: G.711 or AAC

Bit rate: Select the Bit rate between 64kbps and 128kbps when AAC is selected.

The sampling rate is fixed to 32KHz when AAC is selected.

Note that when VT-IPS402H is connected to a decoder, the decoder's audio algorithm should be set identical to transmit audio properly.

■Mode

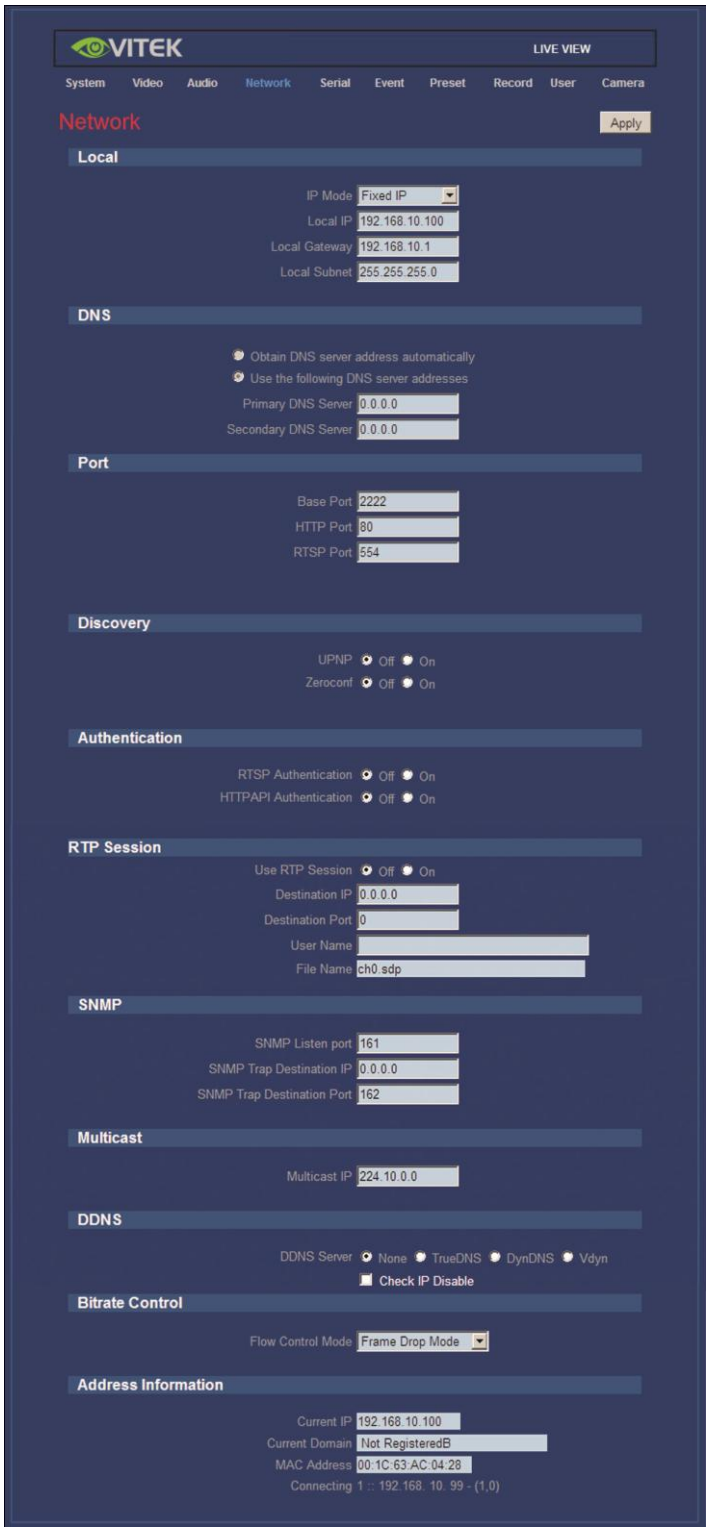
Select audio operation mode.

Mode	Status
Off	No operation
TX-Only	Transmit only
RX-Only	Receive only
TX & RX	Transmit and Receive

■ Input Gain

Set audio input gain.

2.4 Network Configuration



■ IP Mode

Two IP modes are supported. Depending on the selected mode, further configuration items come as follows.

IP Mode	Selection	Description
Fixed IP	Local IP	Fixed IP address
	Local Gateway	Gateway IP address
	Local Subnet	Subnet mask
DHCP IP	N/A	

☞ Please, get IP address information from your ISP provider or network manager.

■ DNS

Set DNS server IP address.

■ Base Port

Network base port is used for communication between systems. In order for the VT-IPS402H and remote systems to be connected together, each port number must be identically set.

■ HTTP Port

HTTP port used for web-based connection

■ RTSP Port

RTSP port used for RTSP-based connection

■ SNMP

VT-IPS402H can be used as an SNMP agent. It is compatible to both SNMPv1 and SNMPv2c. Vender specific MIBs for IP camera/server are defined. SNMP listen port can be set and disabled when it is 0. SNMP trap is also supported. Destination IP and port can be set. If one of these values is 0, SNMP trap will be disabled.

■ Multicast IP

The multicast IP address selection range is between 224.0.1.0 and 238.255.255.255. The selection can be used only when media protocol is set to Multicast. The multicast address must be the same for the system to be connected using multicast protocol.

■ Address Information

The addresses can be accessed through 3 ways. (Read-only)

IP Address

The servers own IP address. This information is useful when the server's IP mode is set to DHCP.

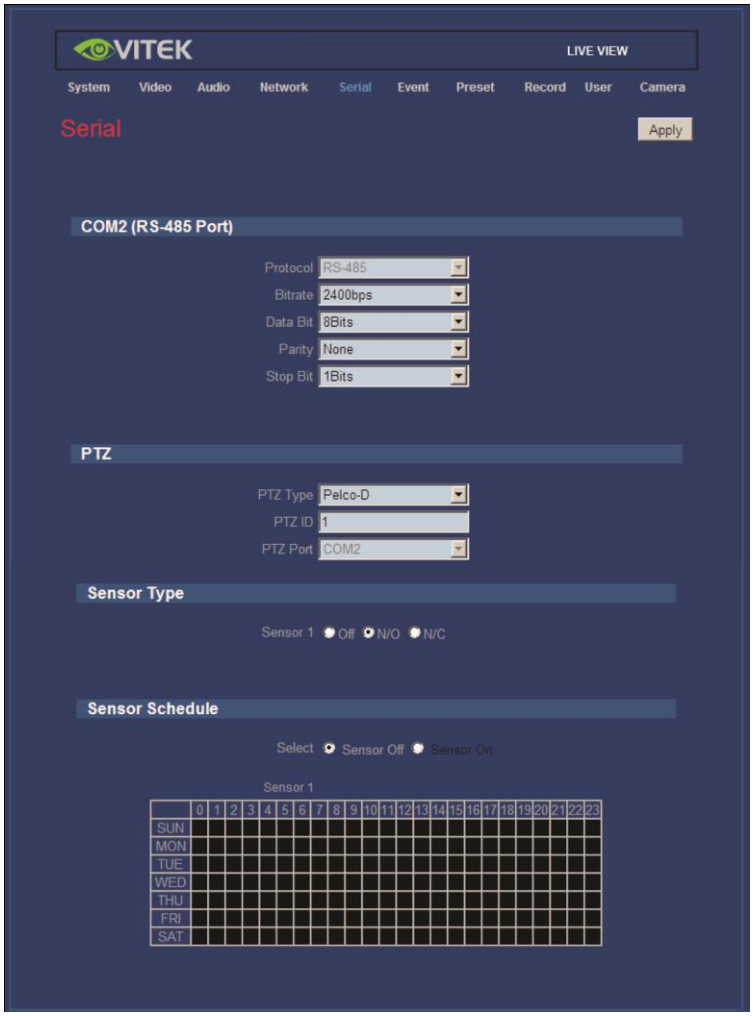
Domain Name

In case the server is registered with DDNS server, the registered domain name is displayed.

MAC Address

Display the MAC address of the server. In case the server is registered with DDNS server, the MAC address is used in DDNS registration.

2.5 Serial Port Configuration



■ Serial Port Configuration

There are two serial ports, (COM1 and COM2) in VT-IPS402H. While COM1 port is fixed to RS-232C, COM2 port can be set to RS-422 or RS-485 protocol.

The serial ports can be configured as follows.

Mode	Selection
Bitrate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Data Bits	5, 6, 7, 8 bits
Parity	NONE, EVEN, ODD bit
Stop Bit	1, 2 bit

Each of the serial ports configurations must be same as connecting device.

■ PTZ Configuration

Each channel can be set independently.

PTZ Type

Select the type of PTZ camera or receiver.

PTZ ID

Since it is possible to control multiple PTZ cameras or receivers over a single control line, each camera or receiver will be assigned with a unique ID. Enter the PTZ ID of a camera or receiver for control. The ID value range can be between 0 and 255.

PTZ Port

Select the serial port used for the PTZ camera control.

■ **Sensor Type**

There are two sensor input ports on VT-IPS402H. Each of the sensor ports can be configured to the following.

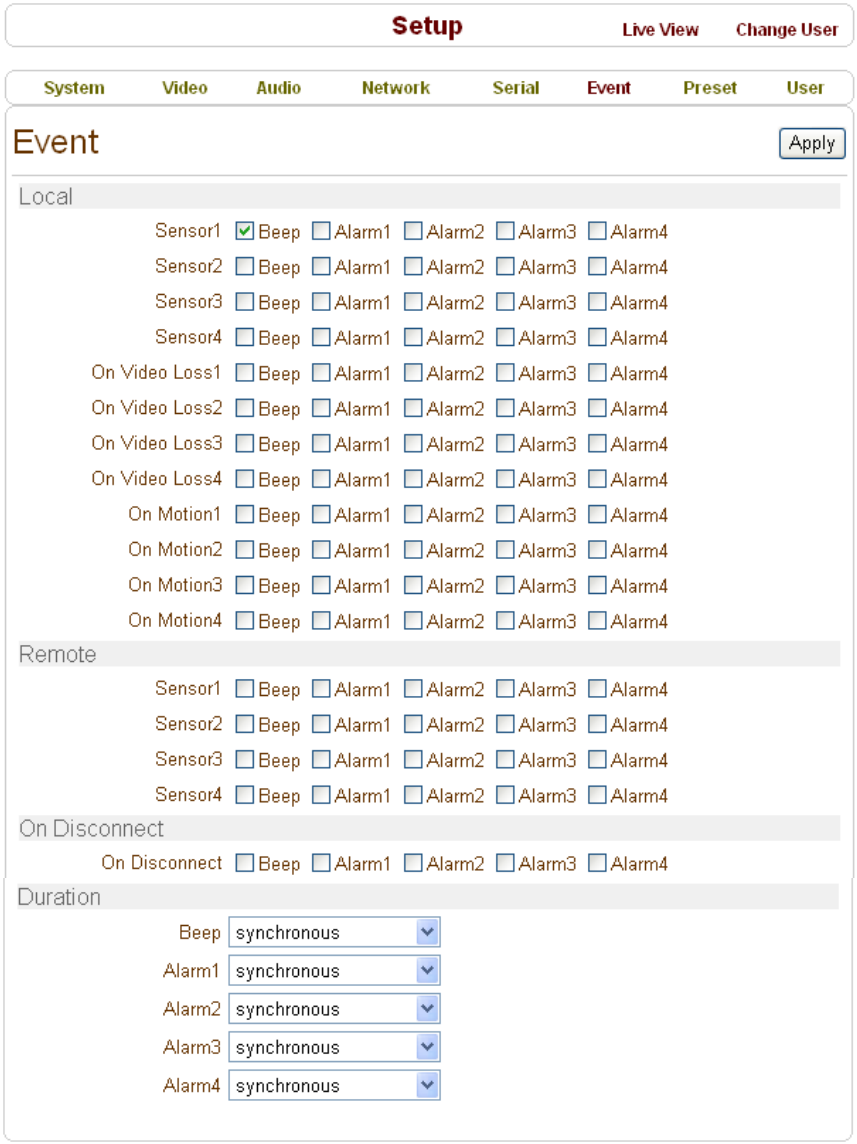
Function	Operation
OFF	Not used
NO (Normally Open)	The port is normally open and activated when closed.
NC (Normally Closed)	The port is normally closed and activated when opened.

The function of the sensor port is set based on the type of the sensor connected.

■ **Sensor Schedule**

Each sensor port can be enabled or disabled in day (of a week) and hour unit. Sensor is disabled for grey-colored duration.

2.6 Event Configuration



The event configuration configures the actions for each event type. The **Local** section configures the actions for events from local (self) system, and configuration activates local devices and **Remote** sections configure the actions for events from remote (peer) system.

The following table lists the possible actions for events.

Action	Description
Beep	Outputs beep sound using the buzzer in the system
Alarm	Triggers alarm (relay) port.

■ Sensor1/Sensor2/Sensor3/Sensor4

Configure the actions when the sensor 1 ~ 4 are activated. Multiple actions can be set for a single event.

■ On Video Loss

Configure the actions when video input signal is lost. Multiple actions can be set for a single event.

■ On Motion

Configure the actions when motion is detected. Multiple actions can be set for a single event.

■ On Disconnect

Configure the actions when the link (connection) with the peer system is disconnected. Multiple actions can be set for a single event.

■ Alarm and Beep activation duration

Set the duration of alarm or beep activation in case of an event. If it is set to continuous, it will be in an active state until an operator resets it manually.

By setting **Continuous Upload** to on, it is possible to upload video clips periodically regardless of events. **Upload Duration** specifies the duration of one upload file, and **Upload Interval** specifies how often it should happen. Upload Interval doesn't include the duration. If Upload Interval is 60 and Upload Duration is 20, it uploads a file for 20 seconds duration every 80 seconds.

2.7 Preset Configuration

Configure up to 15 preset positions. Preset function is not available on some PTZ receivers. Make sure to check if a PTZ receiver supports preset.

■ Preset Configuration

Set the PTZ Presets by following the next steps.

① Move cameras to desired view using PTZ control buttons.

② Enter Preset name.

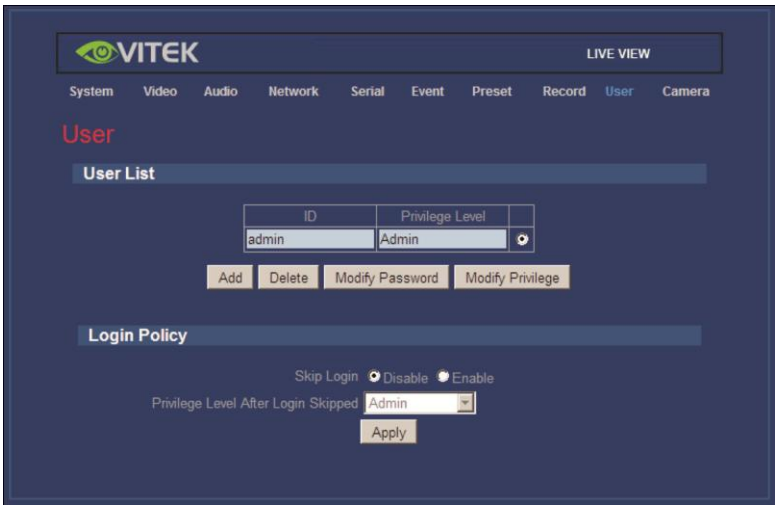
③ Press **Set** button.

④ Once all the presets are set, press **Save List** button.

■ Move to Preset Position

Select a preset from the Preset and press **Go To** button, then, the camera will move to the selected preset position.

2.8 User Configuration

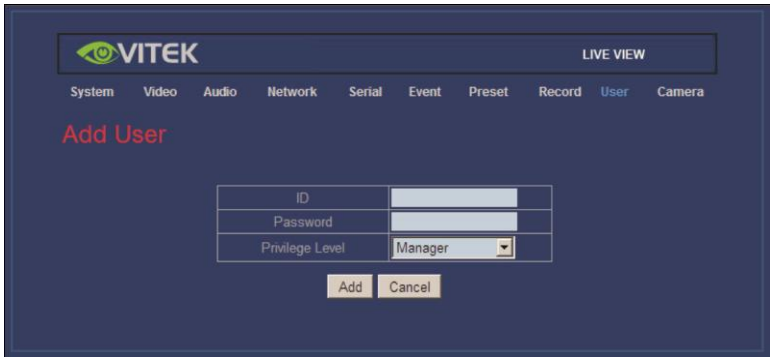


User can be registered and privilege level of a user can be specified. User configuration is allowed only to admin user. Max 16 users can be registered and each user can have one of four privileges.

Privilege	Allowed Operations	Remarks
Admin	All operations	User id = admin
Manager	All operations except for user configuration	
User	Live viewing and PTZ control	
Guest	Live viewing only	

■ Add User

Page for adding a user comes on pressing **Add** button.



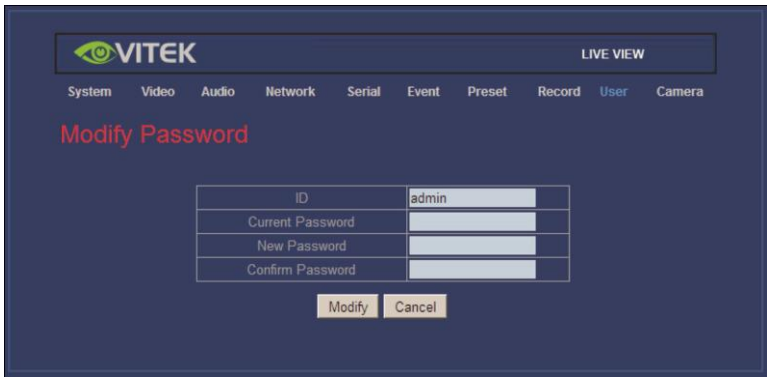
User ID and password need to be entered and privilege level needs to be selected. User ID and password consist of alphanumeric string of max 15 characters.

■ Delete User

A user is deleted by pressing **Delete** button.

■ Change Password

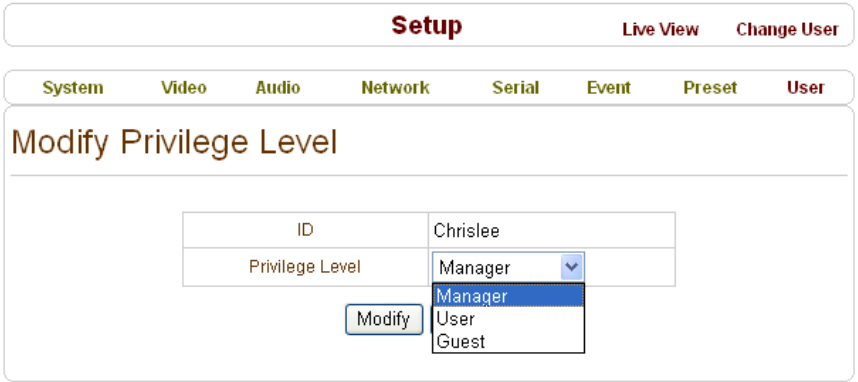
Pressing **Modify Password** button after selecting a user shows a page for changing password.



If trying to change the admin password, the old password is checked first.

■ Modify Privilege Level

Pressing **Modify Privilege** button after selecting a user shows a page for changing the privilege. It is not allowed to change the privilege level of admin user.



■ Login Policy

Skip Login is provided for convenient access to the server when authentication is not required. When **Skip Login** is set to Enable, login step is skipped. The privilege level after logging in this way is determined by the setting of **Privilege Level After Login Skipped**.

6. Trouble Shooting

1. Illegal Connect Error

If an unauthorized connection has been established, the system will not function properly. Maintaining the connection, error condition will be displayed for correction.

Illegal connect sign will appear in such conditions as:

1) Incompatible Media protocol between two systems
2) Other unauthorized connections

Even if illegal connect condition occurs, normal operation between systems with authorized connections will not be effected. The color of link LED will change to orange and it blinks

Appendix A: Sensor and Alarm Port

1. Sensor Port

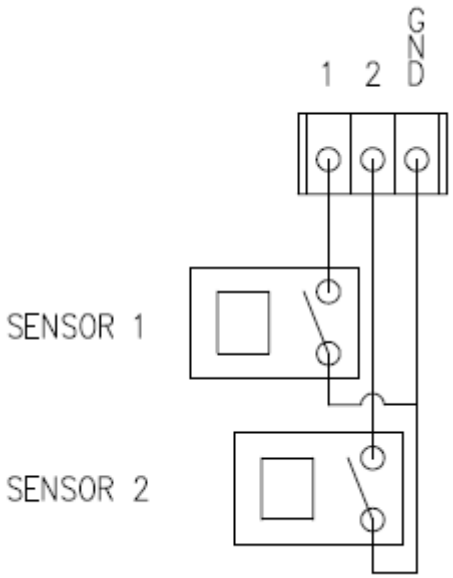
■ **Terminal Type**

* Voltage Rating: 150VAC
* Current Rating : 2A
* Color : Red

■ **Sensor Signal Input Type**

* NO Contact Signals

■ **Connection to External Device**



2. Alarm Port

■ **Terminal Type**

* Voltage Rating: 150VAC
* Current Rating : 2A

■ **Relay Type**

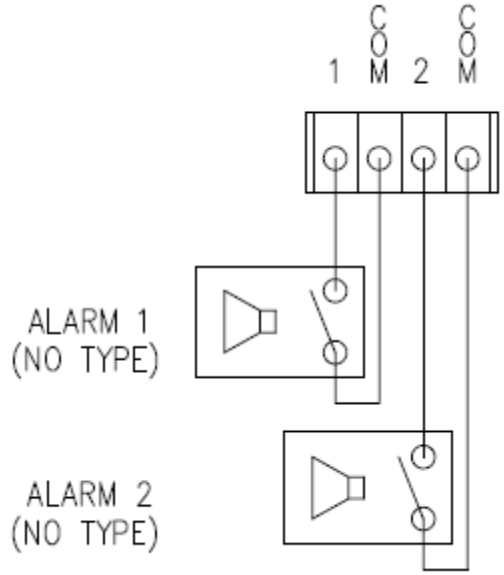
* Contact Rating : 1A 30VDC
* Switching Power : Max 30W 62.5VA
* Switching Voltage : Max 60VDC

■ **Alarm Signal Output Type**

* NO/NC Contact Signals

■ **Connection to External Device**

Appendix B: Serial Port

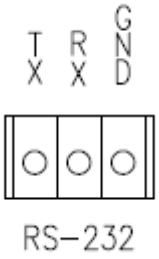


1. RS-232 Port

■ **Port Type**

* 3 PIN

* Pin Arrangement



* Pin Description

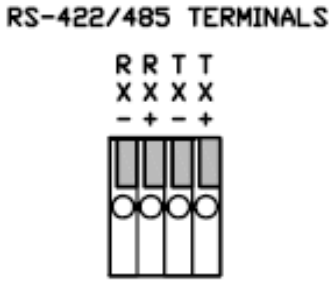
Pin NO	Pin Name	Description
1	TX	RS232 TX(Transmit)
2	RX	RS232 RX(Receive)
3	GND	Ground

2. RS-422/485 Port

■ **Port Type**

* 4 PIN

* Pin Diagram



* Pin Description

Pin No.	Pin Name	설명
1	RX-	RS422 RX-
2	RX+	RS422 RX+
3	TX-	RS422 TX- or RS485 TRX- It is selectable by S/W Setup
4	TX+	RS422 TX+ or RS485 TRX+ It is selectable by S/W Setup

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VITEK products carry a three (3) year limited warranty. VITEK warrants to the purchaser that products manufactured by VITEK are free of any rightful claim of infringement or the like, and when used in the manner intended, will be free of defects in materials and workmanship for a period of three (3) years, or as otherwise stated above, from the date of purchase by the end user. This warranty is non-transferable and extends only to the original buyer or end user customer of a VITEK Authorized Reseller.

The product must have been used only for its intended purpose, and not been subjected to damage by misuse, willful or accidental damage, caused by excessive voltage or lightning.

The product must not have been tampered with in any way or the guarantee will be considered null and void.

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