User Manual
Version 1.0.3 / 2008.3

1. Product Description.

1.1. Outline.

This user manual is intended to help its users to understand the usage and setup of IP DVR SERVER, by listing and explaining appearance, network connectivity, functional capability and etc. The software of this product can be and will be upgraded without any notice, in order to improve its quality. Its users can check the current software version of the product in the administration page.

Linudix Co., Ltd. has intellectual property rights relating to technology embodied in the product described in this document. It is prohibited by law to copy part or all of this user manuals contents without prior consent of Linudix Co., Ltd.

1.2. Main Function.

1.2.1. Definition of IP DVR SERVER.

IP DVR SERVER is capable of transmitting live video on real time basis and record at the same time. Simply by connecting a network cable, its user can have an access to real time streaming and recorded images, regardless of time and place via internet.

1.2.2. Dual Codec & Resolution.

IP DVR SERVER uses MPEG-4 and Motion JPEG, simultaneously. MPEG-4 supports 640x480(VGA) and 320x240(QVGA) for its resolution and Motion JPEG supports 640x480(VGA), 320x240(QVGA) and 160x120(1/8 VGA) for its resolution.

1.2.3. Audio Support.

User can connect an active speaker with built-in amp to its Line-Out (mono) and condenser microphone to its Line-In (mono) or output signal (to audio equipment) to the Line-Level. It supports Simplex, Half-duplex, and Full-duplex, allowing its user to have an access to audio along with video on real time basis.

1.2.4. Recording Capability.

IP DVR SERVER is capable of saving detected events, per event condition preset, to its built-in memory, allowing its user to view and search the saved images or back-up to the hard drive of user's PC, working as a miniature DVR.

1.2.5. External Devices Connectivity.

IP DVR SERVER comes with RS485 for PTZ driver connection and input/output terminal for various alarm connections.

1.3. Product Terms.

1.3.1. Terms.

In

Terminology		Description
Camera Install Hole		To be used when connecting CCD to the server's body and requires a designated screw.
LED	NETWORK	Indicates the status of network connection. If running on 'DHCP' network, LED will be on once IP is obtained successfully.
	LIVE	If there is at least one user connected to the 'IP DVR SERVER', it will indicate by flashing periodically.
	RECORD	When it is saving to its built-in memory, it will flash periodically.
Preset		Returns back to factory default setting. Press and hold it down for 1 second or till all the LED indicators go off.
Audio	In	Connects a condenser microphone or output signal of audio equipment.
	Out	Connects an active speaker (with built-in amp) or headset.
Video		Port for connecting to CCD camera. 'IP DVR SERVER' distinguishes the difference between NTSC/PAL and performs accordingly.
75Ω		If video is connected along with external device concurrently, it allows its user to choose to use 75Ω vertical resistance or not. If it is connected without any external device connected concurrently, it must be 'On'.
ETH 10/100		RJ-45 connector, for connecting network LAN cable. Comes with auto-MDIX function, compatible with every kind of cable used in the market today.
LED	Green	On when power is being supplied to IP DVR SERVER and operating normally.
	Yellow	Indicates the STATUS. If IP DVR SERVER stops to function, it will be on. In other cases, it will use different methods to indicate.
I/O Terminal	RS485(-)	RS485 connector for connecting PTZ equipment.
	RS485(+)	
	DI	Alarm input connector, connecting an external alarm device to the IP DVR SERVER to be used along with GND connector.
	DO	Alarm output connector, to be used along with GND connector.
	GND	To be used along with alarm or power connector.
	DC 12/24	Connector, which provides power to connected camera.
DC 12/24V		Power outlet.

2. Connecting to Network.

Temporary IP address needs to be assigned via using NetSetup Utility or ARP/Ping in the initial stage of using the product, in order to connect to the IP DVR SERVER.

The default network setup is as following;

- IP Address: 192.168.1.200
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1

2.1. IP Address Setup.

There are two methods to assign a temporary IP address, ARP/Ping and using NetSetup.

ARP/Ping is processed in user's computer, executing the commands given in order of inputs and NetSetup is designated software to be used in Microsoft Windows

2.1.1. Using ARP/Ping.

After checking the MAC address from the bottom of IP DVR SERVER run the 'Terminal' screen on your computer (dos if you are using Microsoft Windows).

(1) Connect the computer and IP DVR SERVER in the same network.

(2) After checking the computer's network, choose the temporary IP address for your 'IP DVR SERVER'. (You can simply use the IP address from your computer, by changing the last digit only, as long as that specific IP address is not used by other devices in the same network).

(3) Reboot the IP DVR SERVER and wait for 1 minute or so till it powers back on.

(4) Here is a sample per O/S used in the computer.

O/S	Methods	Example
Windows	arp −s <IP address> <MAC address> ping <IP address>	arp −s 192.168.1.200 00-30-ba-bf-56-10 ping 192.168.1.200

Unix
Linux
Mac
	arp −s <IP address> <MAC address>
	  temp
	ping <IP address>
		arp −s 192.168.1.200 00:30:ba:bf:56:10
		  temp
		ping 192.168.1.200

(5) If you are getting a feedback from the temporary IP address, when ping, go to next step. If not, please check the status of IP DVR SERVER and start from the beginning again.

(6) Try to connect to the IP DVR SERVER by entering the temporary IP address in the web browser's address section.

(7) If you are not getting an answer from the web browser, click on `PRESET' to return to factory default setting and start from the beginning again.

2.1.2．**Temporarily Changing IP DVR SERVER's IP Address, Using NetSetup Utility**.

When executed, NetSetup Utility in shows the IP DVR SERVER's MAC address in the same network. Even if it's not indicated, you can manually input the MAC address and use it.

You must meet the following system requirements for executing NetSetup.

● Compatible O/S : Microsoft Windows 2000 / XP / 2004 Server / Vista

Please make sure to have computer used and the IP DVR SERVER in the same subnet (network group).

（1）Connect the computer and IP DVR SERVER in the same network.

（2）Please check the computer's network setup and choose an IP address for IP DVR SERVER (make sure to have computer used and the IP DVR SERVER in the same network group).

（3）After confirming from its appearance that it is functioning after power is on (check to see if status LED is on or not), run the NetSetup in the computer.
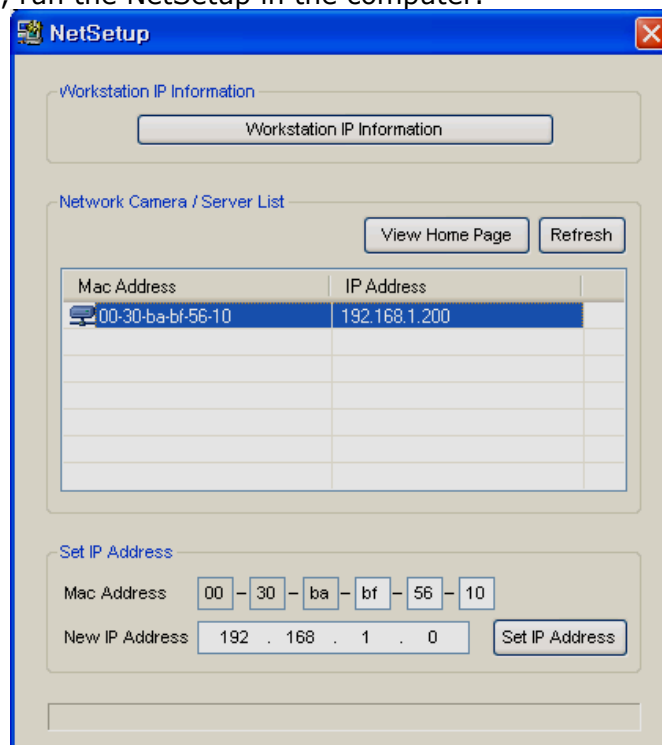
（4）Check the MAC address of IP DVR SERVER, choose the one you'd like to change and input the desired new IP address and click on 'Set IP Address' to request for a change. If MAC address of IP DVR SERVER you wish to change does not show up on the list, you can manually input the MAC address and IP address and do the same.

（5）If a window pop up, stating process was carried out successfully, try to connect to the IP address from web browser.

（6）If you are not getting an answer from the web browser, click on `PRESET' to return to factory default setting and start from the beginning again.

3.IP DVR SERVER Login.

Connect to IP DVR SERVER after running an internet explorer from a PC with internet connection.

3.1. Initial Login Screen.

3.1.1. Initial Login Screen Description.

（1）When connecting to IP DVR SERVER via web browser, it will ask for user ID and password for live page first.

（2）Default user ID and password.
- LIVE: user/user00
- SETUP: admin/admin0
- PLAYBACK: admin/admin0

MPEG4 or Motion JPEG

LIVE: Real Time Image & Sensor Data
PLAYBACK: Record Image & Sensor Data
SETUP: Video, Network, Event, Record,..

Preset Function

Live Control:
Video
Audio
PTZ
I / O

Recording Data Diagram: Hour, Minute, Motion, Event

6

（3）<LIVE> is for viewing the IP DVR SERVER on real time basis only, which can be accessed by a designated user ID and password provided by the administrator.

（4）<SETUP> is for adjusting and managing the current setup of IP DVR SERVER, which requires a special administrator's user ID and password.

（5）<PLAY BACK> s for reviewing the saved images from built-in memory of IP DVR SERVER, which requires a special administrator's user ID and password.

4. **LIVE**.

Users, with assigned user ID and password by administrator of IP DVR SERVER, can watch, listen and speak to the IP DVR SERVER and also controls the digital output and PTZ driver, if available.
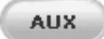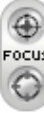
4.1. **LIVE**.

4.1.1. **Contents**.

Can control real time image output, audio input/output, digital output and PIZ driver.

Subject	Function	Description
	Motion JPEG / Motion JPEG / MPEG-4	Choose a desired video format.
Video	Stop	Stops the real time image.
	Play	Starts the real time image.
	Snapshot	Takes a snapshot of the current image.
	View Size	Adjust the image size on display. Have no effect on actual output by the IP DVR SERVER and no effect on network traffic.

|		
	Full	Displays the image on full screen. Press 'ESC' to return to normal screen
Audio	**Speaker On/Off**	Turns on/off the audio output (speaker). Will be used only when Audio Mode is set up as 'Simplex - Microphone only' or 'Full-duplex (headset only)'. Audio Mode can be assessed in Audio menu at SETUP.
	Mic On/Off	Turns on/off the audio input (microphone). 추가부분의 내용 확인 요망.
	Hear/Talk	User can only either talk to or listen to IP DVR SERVER. When it's on 'Hear', user can listen to IP DVR SERVER's microphone via speaker. When it's on 'Talk', user can talk to a speaker connected to IP DVR SERVER, via microphone. For 'Half-duplex' mode in Audio Mode.
	Volume	Controls the volume of PC speaker or microphone.
PTZ	**Aux**	Uses preset functions of 보조기능 of PTZ device. Can adjust the PTZ device's setting in administrator's page.
	Pan/Tilt	PTZ direction control.
	Moving Time	Controls the amount of time of movement per each click of Pan/Tilt, Zoom, Focus or Iris.
	Zoom In/Out	Zoom level adjustment.
	Focus Near/Far	Focus level adjustment.
	Iris Close/Open	Iris level adjustment.
	Preset Position	If a preset is setup at certain value per position, it will move the device to its preset location by clicking on the position. User can set up the preset value at 'Preset Position Setup'.

Output	Pulse Active/Inactive	Controls digital output. Depending on configuration of Layout menu in SETUP, it'll either display Pulse or Active/Inactive button.

4.1.2. Configuring Preset Value for PTZ.

（１）Click on 'Preset Position Setup'.
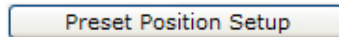
（２）You can set, clear or go to the preset position. Please refer to instruction given below for how to do so.
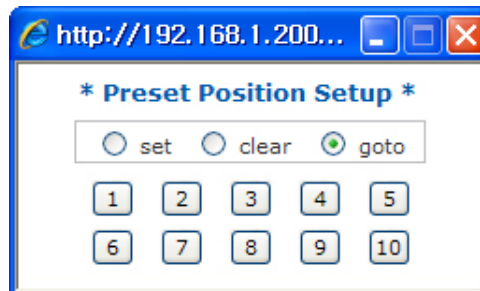
- Set: Please move the PTZ device to desired location first then choose 'set' and click on a desired position button.
- Clear: Choose 'clear' and click on desired position button.
- Go to: Choose 'goto' and click on desired position button.

4.1.3. Event Notification Alarm.

If a digital input, such as door sensor, emergency alarm, or etc. or a motion is detected, it will display a relative alarming icon, alarming the user of the specific event. In order to use this function, user must configure the corresponding event in the EVENT menu in SETUP.

（１） Description on each icon.

Icon	Description
Digital Input	If a digital input is detected, this icon will be displayed for five seconds.
Motion	If a motion is detected, this icon will be displayed for five seconds.

11

5. PLAY BACK.

IP DVR SERVER's administrator can access to review saved images.

5.1. PLAY BACK.

5.1.1. Contents.

Allows user to search saved images based on date/time and capable of backing up to user PC's hard drive.

Function	Description
Stop	Stops replay.
Rewind	Rewind to previous frame. If image was saved with MPEG-4 codec, it will rewind to previous i-frame.
Play	Starts replay.
Fast Forward	Forward to next frame. If image was saved with MPEG-4 codec, it will forward to next available i-frame.
Snapshot	Takes a snapshot of current image on display.

|	
View Size	Adjust the image size on display. Have no effect on actual output by the IP DVR SERVER and no effect on network traffic.
Calendar	By clicking on 'Calendar', it will show a list of dates with saved images. Dates with any saved images will display in bold letter.
BACKUP **Backup**	Back up the images saved in built-in memory to PC's hard drive, as AVI file type.
SLOW ___ FAST **Speed**	Replay speed adjustment.
	This icon indicates that PC is recalling from IP DVR SERVER.

5.1.2. Search through saved images.

(1) Click on the little calendar next to the current date.
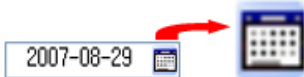
(2) Days with saved images are indicated by bold number. Click on a desired date.

(3) Time span without saved events are indicated by light blue and time span with saved events are indicated by dark blue. Click on the desired time and it will start replaying the images from that time.
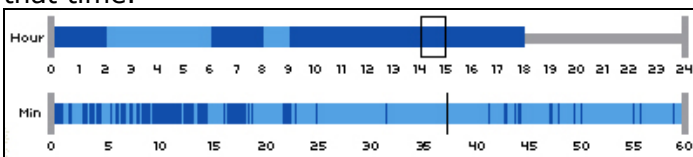
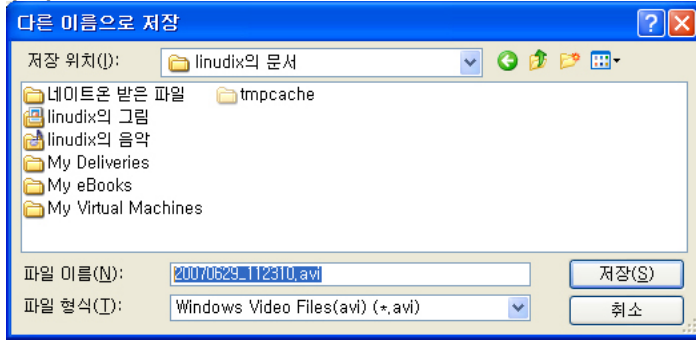(4) If wish to replay, click on 'Play' or double click on the time line.

5.1.3. Back-up Images from Built-in Memory.
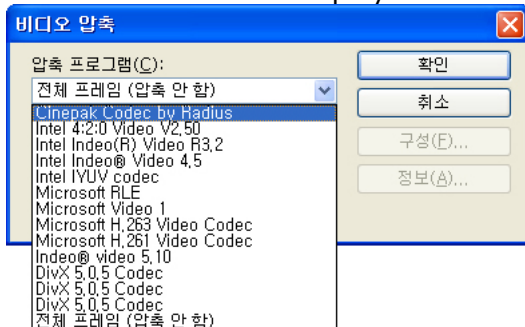
(1) Click on 'Backup'.

(2) Choose desired length of time for backup from 'Saving Period' and click on 'Start'.
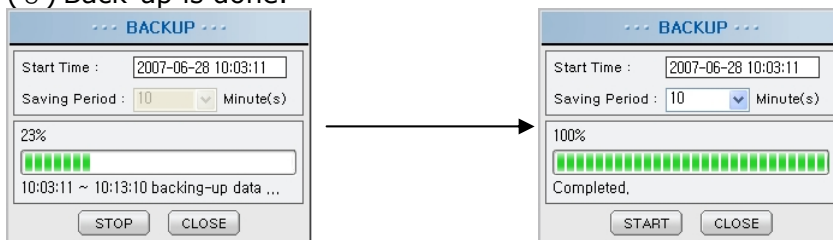
13

(3) Choose a file name.

(4) Choose a compression type. If user's PC does not support the desired compression, the created AVI file won't replay in user's PC.

(5) Back-up is done.

6. SETUP.

User can configure the setting of IP DVR SERVER in SETUP page.

6.1. Video.

6.1.1. Menu Contents.

Adjust quality, resolution, and etc. regarding video image.

Text on image	
Date & Time Display	Displays time and date on image.
Text Display	Displays text on image.
Text	Write down the text you'd like to display on image.

MPEG-4 Stream	
Operation	Either activate or deactivate the specific stream. Primary Stream is always active. If user is not using Secondary Stream, it's always a good idea to deactivate it. For example, if user is running on 320x240 Single Resolution (only Primary Stream is active), IP DVR SERVER will perform at 30fps; however, if running on Dual Resolution (activating both Primary Stream and Secondary Stream), frame rate will be less than 30fps. (Please refer to MPEG-4 Frame Rate on bottom of this chart for further explanation). Operation will also have effects on other functions as well. For example, if you choose to run deactivate stream in "Record" or "Event," that specific function won't perform normally.
Resolution	Choose size of image per stream.
Bit-rate Control	Choose between VBR (Variable Bit Rate) and CBR (Constant Bit Rate). CBR can be set from 10kbit/s to 1800kbit/s.
GOV (Group Of Video) Structure	Decide if image will be solely based on i-frame or mixture of i-frame and p-frame.
GOV Length	Configure the i-frame interval. If set GOV Structure as "IP" and GOV Length at 5, every 5th frame will be an i-frame, meaning, the output will be "I P P P P I P P P P I P P P P …" (If GOV Structure is set as "I," GOV Length can only be 1.)
Frame rate	Configure the maximum frame rate per second. Depending on usage of Secondary Stream and Resolution configuration, maximum frame rate might differ from the set value. In case of Single Resolution, 640x480 is maxed at 15fps and 320x240 is maxed at 30fps. However, if running a Dual Resolution, two different streams are activated concurrently, thus, resulting in lower maximum frame rate. For example, if running 640x480 and 320x240 simultaneously, both 640x480 and 320x240 will run at maximum value of 10fps. This value will also have effect on MPEG-4 image recording. (see table below)

Single Resolution	Dual Resolution	
Primary	Primary	Secondary
640x480: 15fps	640x480: 10fps	320x240: 10fps
320x240: 30fps	320x240: 10fps	320x240: 5fps
	320x240: 10fps	640x480: 10fps

Motion JPEG Stream	
Operation	Either activate or deactivate the specific stream. Primary Stream is always active. If user is not using Secondary Stream, it's always a good idea to deactivate it. For example, if user is running on 320x240 Single Resolution (only Primary Stream is active), IP DVR SERVER will perform at 30fps; however, if running on Dual Resolution (activating both Primary Stream and Secondary Stream), frame rate will be less than 30fps. (Please refer to M-JPEG Frame Rate on bottom of this chart for further explanation). Operation will also have effects on other functions as well. For example, if you choose to run deactivate stream in "Record" or "Event," that specific function won't perform normally.
Resolution	Choose size of image per stream.
Quality	Configure the quality of each stream.
Frame rate	Configure the maximum frame rate per second. Depending on usage of Secondary Stream and Resolution configuration, maximum frame rate might differ from the set value. In case of Single Resolution, 640x480 is maxed at 15fps and 320x240 is maxed at 30fps. However, if running a Dual Resolution, two different streams are activated concurrently, thus, resulting in lower maximum frame rate.

Single Resolution	Dual Resolution	
Primary	Primary	Secondary
640x480: 15fps	640x480: 10fps	320x240: 10fps
320x240: 30fps	320x240: 10fps	640x480: 10fps
160x120: 30fps	640x480: 15fps	160x120: 15fps
	160x120: 15fp	640x480: 15fps
	320x240: 15fps	160x120: 15fp
	160x120: 15fp	320x240: 15fps

* Note

Images of demo site from Linudix's homepage is based on ActiveX and running only on Primary Stream. However, user is able to choose between Primary Stream and Secondary Stream on the integrated application, using our CGI/API.

6.2. Audio.

6.2.1. Contents.

Adjust settings on audio encoding format, input/output size, audio mode and etc.

Function	Description
Enable Audio	Enable/Disable the audio function.
Encoding	Choose audio encoding format.
Audio Mode	Choose between four types of audio mode. ● Full-duplex (headset only): This is similar to talking on the phone, transmitting in and out. However, if your network bandwidth is less than 0.2Mbit/s, we recommend you to use Half-duplex. Since Echo Cancel function is not supported, user needs to use head set. ● Half-duplex: It is bi-directional; however, only one at a time. (Consisted of toggle button.) ● Simplex - speaker only: User can speak into the microphone connected to the PC and it will play via the speaker connected to IP DVR SERVER. Only one user can have an access to this function on first come first serve basis. ● Simplex – microphone only: Install a microphone to the IP DVR SERVER and user can listen to it from the PC with a speaker. (Multi-users can have a simultaneous access to it.)
Input Gain	Line input signal's amplification adjustment.
Output Gain	Line output signal's amplification adjustment.
Microphone Power	Used if a microphone connected to IP DVR SERVER requires power.

6.3. System.

6.3.1. System Contents.

Adjust system time, account management and default option.

Function		Description
Time	Set Manually	User manually inputs date and time as a system time. Ex.) When user would like to input 2004/11/01, 13:00. Date(yyyy-mm-dd): 2004-11-01 Time(hh:mm:ss): 13:00:00
	Set with Computer time	Use user PC's system time as a system time of IP DVR SERVER.
	Sync with NTP Server	Obtain the information from the time server (NTP server) and set as system time. Input the address of time server and reconnection period. Daylight Saving Time: Adjust the time if daylight saving is used in user's resident country.
Admin	Password	Default ID is [admin] and default password is set as [admin0]. Use can change to desired ID and password.
	Confirm Password	Retype to password to confirm the new password.
System	Initialize Factory default	Used when user wishes to return the setting back to factory default. Once executed, IP DVR SERVER must restart; however, network information won't alter, allowing user to carry out the function from remote location.
	Restart	Used when user would like to reboot the system.
User	ID	If user feels the necessity of limiting the user access, user can register more user IDs, up to four different accounts.
	Password	Input a password per extra user ID created.
	Confirm Password	Retype the password to confirm the new password.

6.4. **Security.**

6.4.1. **Security Contents.**

This is for a security setting for controlling the web server access. User can either limit or allow an access from specific network group or IP address.

Function		Description
IP Filtering	Enable	Enable or disable the function.
IP Filtering Setting	Set	Click a condition from list 1-10, which user would like to activate. Filtering conditions will be met from top to bottom if more than one condition was activated.
	IP Address	Input the desired network group or specific IP address.
	Subnet mask	By adding a subnet mask, user can configure the boundary of IP address in the corresponding network group. For example, subnet mask value of 255.255.255.255 would be 32 and subnet mask value of 255.255.255.0 would 24.
	Policy	Choose either to accept or decline an access from the aforementioned information.
Save		Saves the changed values. Must restart the system in order for the new settings to be effective.

- Calculation method for Subnet mask value is based on the binary scale. Based on this, 255.255.255.255 would be 11111111.11111111.11111111.11111111 in binary scale and total number of bit is 32 and 255.255.255.0 would be 11111111.11111111.11111111.0 in binary scale and total number of bit would be 24.

- Access will be controlled only if the configured IP address and Subnet mask value's bit value match the IP address and Subnet mask value's bit value are perfect match. Conditions will be met from top to bottom (starts with 1 and ends with 10), and setting that meets all the conditions will be granted an access or prohibited from access.

- For example, when IP address of IP DVR SERVER is 192.168.1.200 and user would like to deny an access from group of IP address from 192.168.1.1~254, but only allow 192.168.1.254 to granted an access, setting would be like the following example;

- If a user from blocked IP address tries to access the IP DVR SERVER, the following message will be shown.

504 Service Protected.
Sorry, this site is protected. Your IP '192.168.1.21' is denied by filter rule.

6.5. **Network**.

6.5.1. **Common Network Contents**.

We recommend users to use either wired or wireless network, not simultaneously.

If a user chooses to use wired setting, wireless setting won't be working. If a user chooses to use wireless network, the default gateway will be wireless and wired connection will be only used in local network only.

Function		Description
Mode Configuration	Wired Wireless	Once a main network connection method is chosen, the menu will change accordingly. If wireless is chosen, wired connection will be fixed at 정적 IP and make sure that wired network group and wireless network configuration does not have the same setting. For example, if IP address to be used for wireless connection is 192.168.1.200, wired IP address needs to be something like 192.168.10.200 (with different third digit), having different bandwidth.
Common Part	Dynamic DNS Server1 Dynamic DNS Server2	This function is set and used when connecting to IP DVR SERVER from outside, especially useful when given IP address is dynamic (changes every time connection is made). In order to use this function, please input Linudix's own DDNS server address as following; ● Dynamic DNS Server : ns.wisecam.co.kr ● IP DVR SERVER 유선 MAC 주소:00:30:ba:**fe:24:5d** Fixed domain name's address would be http://w**fe245d**.wisecam.co.kr If connected to local network, the address would be http://l**fe245d**.wisecam.co.kr입니다. Even if using a wireless setting, MAC address of wired would still have be used.
	Web Server Port	Sets the value for web server port and default is set at 80 and user only has to input the address in the browser, but if value other than 80 is used, user would have to input the web server port following the standard address. For example, ● Web server port: 8080 Address would be http://wfe245d.wisecam.co.kr:8080.

6.5.2. Network Wired Contents.

This is a menu used for wired connection.

Function		Description
Wired configuration	Network Type	Wired connection supports Static IP and DHCP. If user chooses Static IP, user will need to enter some more network information. If DHCP is chose, there is no need for further information.
Static IP	IP Address	Enter the permanent IP address to be used.
	Subnet Mask	Enter the Subnet Mask per network group used.
	Gateway	Enter the Gateway per network group used.
	DNS Server1	If a domain name is used in IP DVR SERVER setup, these must be entered as well. If Dynamic DNS address or SMTP for e-mail forwarding is entered but DNS is missing, corresponding functions won't work correctly.
	DNS Server2	
DHCP		User can check the IP address obtained from DHCP server. If wired connection is in use, user can refer to eth0 information as well.
Save		Saves the changed values. Must restart the system in order for the new settings to be effective.

* Note

Here are types of wired network connection available;

● Modem using fixed IP address: Static IP.

● Cable modem: DHCP.

● ADSL model with automated connecting program: DHCP.

● ADSL modem: PPPoE (not supported by IP DVR SERVER).

● Router: Depends on the configuration (Static IP, DHCP).

6.5.3．Network Wireless Contents.

This is a menu used for wireless connection.

Function		Description
Wireless configuration	Network Type	Wireless connection supports Static IP and DHCP. If user chooses Static IP, user will need to enter some more network information. If DHCP is chose, there is no need for further information.
ESSID		Enter the ESSID of AP Router to be connected to.
AP SCAN		Search for an AP router with entered ESSID. If there are two or more AP routers with same ESSID, please check the BSSID and choose.
AP'S BSSID		BSSID should be used if there are more than two AP routers with same ESSID BSSID refers to MAC address of AP router. For example, if it's 000E8E0354C9, then you'd enter 00:0E:8E:03:54:C9 as a BSSID. If user clicks on "AP SCAN," it'd automatically be entered.
Security Mode		Choose the security mode to be used for AP router.

Key Type		When WEP-KEY or WPA-PSK is being used, range of characters to be used for encoding. This menu chooses between HEX and ASCII for the encoding character.
WEP	Pass phrase (generator)	Creates a KEY value automatically. User can manually input the KEY value as well. If user inputs the string, used in AP router and clicks 'Generator,' KEY value will be created via HEX. Check if this newly created KEY value matches with the value used in AP router. If it does match, click on 'OK,' and this new KEY value will be automatically registered. Please keep in mind that KEY Generator might differ by each devices, thus always confirm that the new KEY value matches the value from AP router.
	KEY 1 – 4	Either Automatically created KEY value or manually entered value must go here. KEY value must be same as HEX or ASCII encoding character as set in "Key Type" menu.
	Default Key	Choose the KEY value from KEY 1 – 4.
WPA	WPA Algorithms	Choose between TKIP or AES for WPA-PSK.
	Pass phase (generator)	This is used to create KEY value automatically. User can bypass this step and create KEY value manually. Enter the string used in AP router and click on 'Generator' and KEY value will be created in HEX form. Confirm the newly created KEY value to AP router's value. If they do match, click on 'OK' and the newly created KEY value will be entered automatically. Every KEY Generators differ in their processing style, thus must check and match the created KEY values do match or not.
	Key	Either Automatically created KEY value or manually entered value must go here. KEY value must be same as HEX or ASCII encoding character as set in "Key Type" menu.
Keep-alive (with ping)	Enable	There are some AP routers that forcefully disconnect the connection if there isn't any wireless packet available. This function sends a packet via ping voluntarily, making sure IP DVR SERVER stays connected to AP router.
	Target IP	Enter the IP address of the device (computer or network device) to be requested for answer for ping. Make sure that the device to be used does have the function to reply back when ping is received.

Static IP	IP Address	Enter the permanent IP address to be used.
	Subnet Mask	Enter the Subnet Mask per network group used.
	Gateway	Enter the Gateway per network group used.
	DNS Server1	If a domain name is used in IP DVR SERVER setup, these must be entered as well.
	DNS Server2	If Dynamic DNS address or SMTP for e-mail forwarding is entered but DNS is missing, corresponding functions won't work correctly.
DHCP		User can check the IP address obtained from DHCP server. If wireless connection is in use, user can refer to eth1 information as well.
Save		Saves the changed values. Must restart the system in order for the new settings to be effective.

* Note

Description on security method for wireless connection.

● WEP(Wired Equivalent Protection)
    ◇ WEP-Authentication is only supported in Open System Authentication.
    ◇ WEP-KEY value is 5 characters for ASCII 64 bit, 13 characters for ASCII 128 bit, 10 characters for HEX 64 bit and 26 characters for HEX 128 bit.
● WPA-PSK/WPA2-PSK (Wi-Fi Protected Access – Pre-Shared Key)
    ◇ Key value will be 64 characters for HEX and between 8 and 63 characters for ASCII.

6.6. Event Configuration.

6.6.1. Event Configuration Contents.

If a event is detected per Condition, configure the Action to be taken upon detection. There are four main steps in configuring event menu.

- Activate/deactivate event as whole.
- Choose video source and frame rate.
- Configure the Condition.
- Configure the Action to be taken.

If event is activated and certain conditions are preset and a event occurs, the event information will be included in the Header of image. For more information on Header, please refer to technical documentation on MPEG-4, JPEG Header Format.

Event	
Event Enable	Activate or deactivate the function as whole.

Video Source	
Video Source	Choose from Primary Motion JPEG and Secondary Motion JPEG to be used for FTP, E-mail and/or Event Mode Record.
Frame per Second	Configure the frame rate per second.

Condition Configuration	
Digital Input	• Recognize the input signal received via Digital Input port as an event. • Input: If user wishes to recognize an event when Current State differs from Normal State, choose 'Active' and recognize an event when Current State and Normal State are identical, choose 'Inactive.' • Normal State: Configure if the connected sensor device's Normal Stats is Open Circuit or Grounded Circuit. • Current State: Refer to 'Input' and 'Normal State' and indicate the current status of connected sensor device.
Motion	• Digital Motion Setting: Configure the 'Motion' area and Sensitivity. • Continuous motion number for event: If set at '3', event will be recognized if motion occurs three straight times. • After motion event, Interval time for motion checking: If set at '60', device will look for new motion after 60 seconds pass from initial event recognition.
Video Loss	If there is no video incoming signal, 'Video Loss' event will be recognized.
Condition Schedule	All of event conditions will be controlled by condition scheduler. User can configure when to use and when not to use the event function.

● Digital Motion Setting.

Configures the motion area and sensitivity for the motion detection.
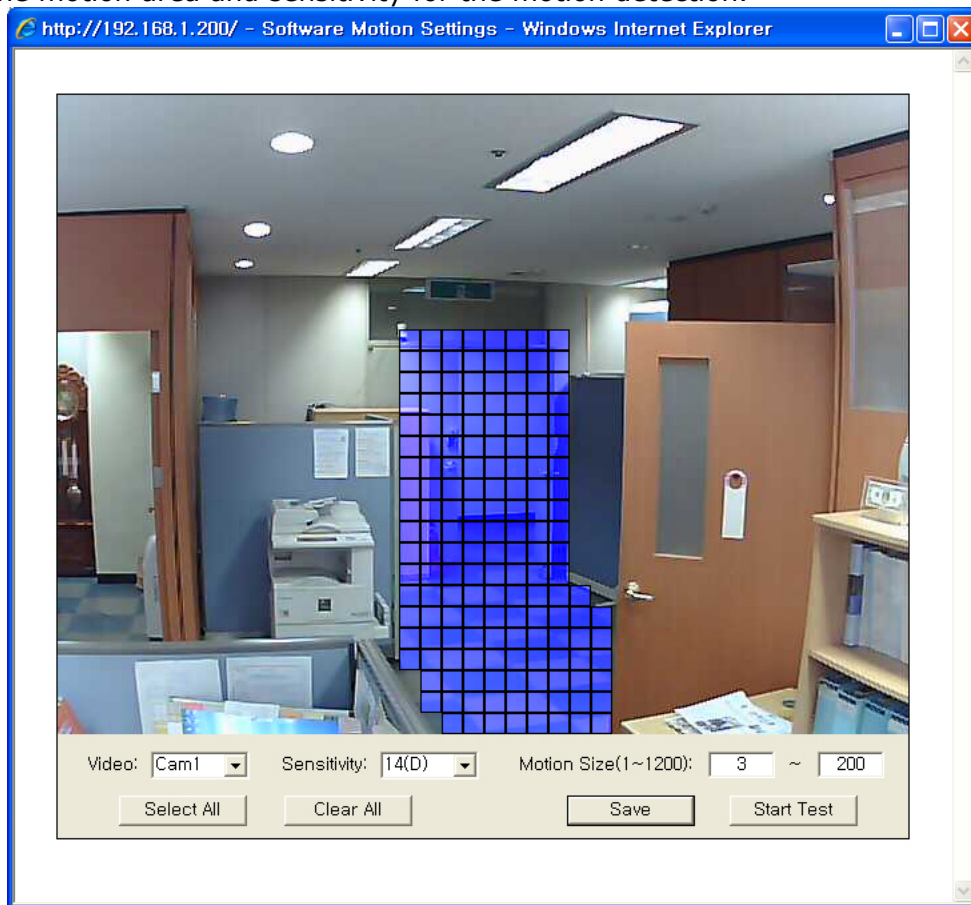
Digital Motion Setting	
Save	Choose the device to be configured.
Sensitivity	Indicates the motion sensitivity. It ranges from 1~20, with higher the number, more sensitive the device is. The default value is set at 14.
Motion Size	Entire screen is divided into 1,200 separate motion areas and motion will be recognized if and only if the motion is within the boundaries set in motion size.
Select All	Selects all 1,200 areas for motion detection. If you wish to choose specific areas, click on left mouse button and drag while holding the button down.
Clear All	Deselects all 1,200 areas for motion detection. If you wish to choose specific areas, click on right mouse button and drag while holding the button down.
Save	Saves the current setting.
Start Test	Tests the current configuration. Must save current setting prior to testing.

● Motion Test.
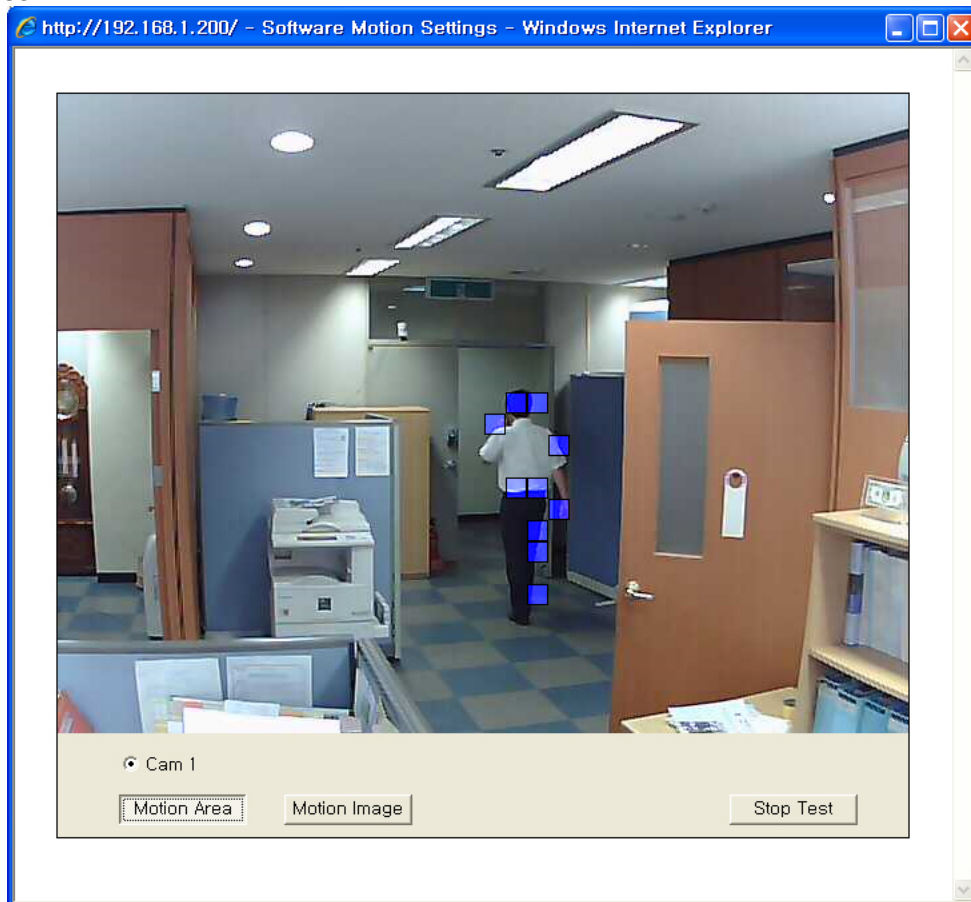
Motion Test	
Motion Area	Displays real time image and the areas where motion is detected, indicated by blue boxes.
Motion Image	Image displays only when motion is detected.
Stop Test	Stops testing and returns to motion setting page.

● Action Configuration.

Configures the Action to be taken upon event detection per Condition.

All Action is activated based on trigger base.

For example, if a digital input signal is activated and event is recognized, Action will be taken only when the signal changes from Inactive to Active, regardless of continuous active signal.
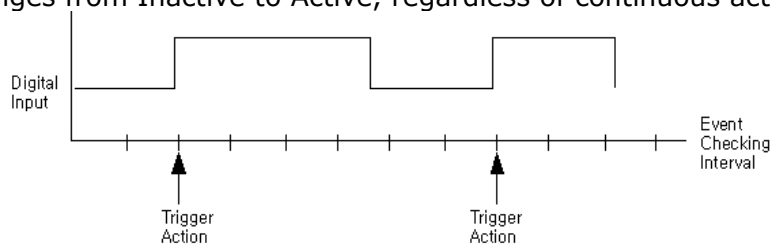
Action based on trigger system

* Note

Event information included in real time image is not based on trigger system, meaning that if an event is detected, the event information will be included in the real time image's Header.

Action	
Digital Output	Configures the length of time for digital output once event is recognized.
Email	Based on the moment event is recognized, gathers the pre, center and post images of event and send via e-mail. ● Attached, before image number: Configures the number of pre-alarm images to be sent. ● Attached, after image number: Configures the number of post-alarm images to be sent. ● Enable SMTP Authentication: If the mail server, user plans to use, requires an authentication, this function must be activated. (Linudix currently supports two type of SMTP authentication: LOGIN, PLAIN)
Call URL	Enter the URL to be called upon once event is detected. Must start with 'http://'. (If no response over 10 seconds, it will disconnect.) Ex) http://mysever.com/cgi/alert.cgi
FTP	Based on the event triggered moment, gathers the images from past(before), present(center) and post(after) and send via FTP. If, due to communication problem, there is a delay of longer than 120 seconds while transmitting data to FTP Server, it will disconnect the communication. ● Before image number: Configures the number of pre-alarm images to be sent. ● After image number: Configures the number of post-alarm images to be sent. ● Saved File name: Enter the file name to be used for saving. In case of no entry, default file name of 'image' will be used. ● For example, if Before Image Number is set at 3, After Image number is set at 3 and Saved File Name is set as 'myimage,' following files will be transmitted to FTP server. (assuming current time to be Sept. 1st, 2007, 10:20:30) myimage20070901102030C1B2.jpg myimage20070901102030C1B1.jpg myimage20070901102030C1B0.jpg myimage20070901102030C1C0.jpg (Center Image) myimage20070901102030C1A0.jpg myimage20070901102030C1A1.jpg myimage20070901102030C1A2.jpg ● Use Passive Mode: Used when can't connect to network from outside due to firewall.

TCP Message Transfer	Used when there is a need for notifying outside source of the event detection. Message Option: Sends the file name of Center image, created by FTP, along with the message sent. (If FTP function is disabled, this option will be bypassed.)

6.7. **Record.**

Saves images and event information to built-in IC memory.

6.7.1. **Record (Normal Mode) Content.**

Record menu can be divided into Normal mode and Event mode. Event mode is based on conditions preset in 'Event' while Normal mode saves constantly, regardless of settings in 'Event' menu.

Record (Normal Mode)	
Video Source	Chose the video source to be used for saving. In case of M-PJEG, frame rate also co be determined. Changing of video source from MPEG-4 to M-JPEG or vice versa would cause the deletion of recorded images from prior source used.
Motion Condition	Normal Mode will basically save constantly; however, user can only save motions detected, by configuring the Record Method. Motion detection configurations can be adjusted by changing the motion condition, such as motion area and sensitivity.
Record Method	Motion Image Only: Save only images with motions. Image Stream: Saves all images, regardless of motions.
Schedule	Configure when to save and when not to save.

6.7.2． Record (Event Mode) Contents.

（1）If Record Mode is set as Event Mode, it will be saved in Motion JPEG.

Record (Event Mode)	
Recording Images	Per values set in Condition of 'Event' menu, it will save, past, present and post image data. Before image number: If set at '3', three pre-alarm images will be saved. After image number: If set at '3', three post-alarm images will be saved.

6.8. PTZ (RS485).

6.8.1. PTZ (RS485) Content.

PTZ drivers can be added via software upgrade.

Function	Description
P/T/Z Enable	Activate or deactivate PTZ control.
Manufacture	Choose the PTZ driver. For more information on Baud Rate, Data Bits, Stop Bits, Parity Bit, please click on '?'.
Baud Rate(bps)	Please click on '?' for more information before choosing a value.
Data Bits(length)	Please click on '?' for more information before choosing a value.
Stop Bits	Please click on '?' for more information before choosing a value.
Parity Bit	Please click on '?' for more information before choosing a value.
Device ID	Enter the Device ID from PTZ driver.

6.9. **Software Upgrade**.

6.9.1. **Software Upgrade Contents**.

This page is for upgrading the software version. Upgrade must be processed with the 'upgrade file' and the instruction given along with the upgrade file.

Software Upgrade

[   ] [찾아보기...]

[Update]

Function	Description
Search	Find the upgrade file.
Update	After the finding the file, click on 'Update' button to start the upgrade process. Depending on the upgrade file size and network bandwidth status, time needed for upgrade might differ. Please wait until upgrade completed message shows.

6.10. System Log.

6.10.1.System Log Contents.

System long is saved in the flash memory, thus unless 'Log Clear' is chosen, it will not be deleted.

Here are the information saved on the system log.

● System booting time.

● AP router's ESSID and MAC address when wireless connection is activated or deactivated.

● Related information when 'Format Recording Memory' function is executed.

● When there is an Action (Digital Output, Email, Call URL, FTP, TCP Message Transfer) recognized in Event menu.
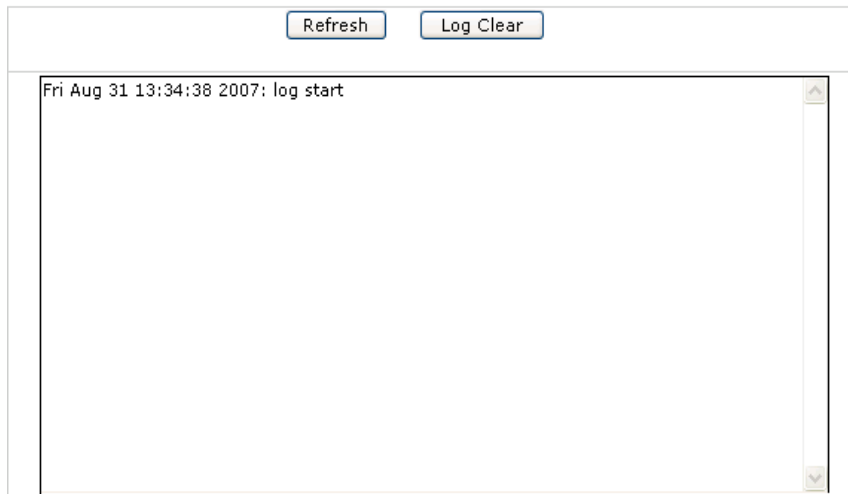
Function	Description
Refresh	To recall the system log information.
Log Clear	To delete the system log information.

6.11. Homepage Layout.

6.11.1.Homepage Layout Contents.

Change the logo, link and title on IP DVR SERVER's homepage.

Homepage Layout

Logo Image (jpg) (default size : 32x32)	[ ] [찾아보기...]
Logo Link	http://
Title	IP DVR SERVER
Default Live View Format	MPEG-4 ▼
Digital Output	○ none ⊙ pulse ○ Active/Inactive time 2000 ms

[Save]

Function	Description
Logo Image (jpg)	Choose the image to be shown on top left corner of the window. (Default size of 32 x 32).
Logo Link	Enter the address of link to be used, when user clicks on logo image. Please start with 'http://'.
Title	Changes the title shown on top middle of the window..
Default Live View Format	Choose the streaming to be used (either MPEG-4 or M-JPEG_ when Live page is initially open.
Digital Output	Configure the digital output method of Live page.

6.12. Version Information.

6.12.1.Version Information Contents.

Check the application version and MAC address.

Function	Description
System	Displays the current firmware version.
Kernel	Displays the version of operating system.
MAC (wired)	Displays the MAC address of wired connection.
MAC (wireless)	Displays the MAC address of wireless connection; however, only if wireless network is used.

7. External Connection.

7.1. External I/O Terminal.

7.1.1. External I/O Terminal Description.

Terminal No.	Title	Description
Pin 1	RS485(-)	RS485 communication terminal, used for PTZ controlling device connection.
Pin 2	RS485(+)	
Pin 3	Alarm Input	If connected to GND(Pin5) due to alarm input, this will be activated. If not, it will be deactivated.
Pin 4	Alarm Output	Has a built-in Open-collector NPN transistor and Emitter is connected to GND. If user wishes to relay to external device, user need to connect the diode in parallel. Maximum electricity current allowed is 100mA, and maximum allowed voltage is 24V.
Pin 5	GND	Used along with alarm input terminal (Pin3) and/or alarm output terminal (Pin4).
Pin 6	Power I/o	User can either use DC power input directly or use IP DVR SERVER as a power output source for other device.

System circuit of external I/O terminal.
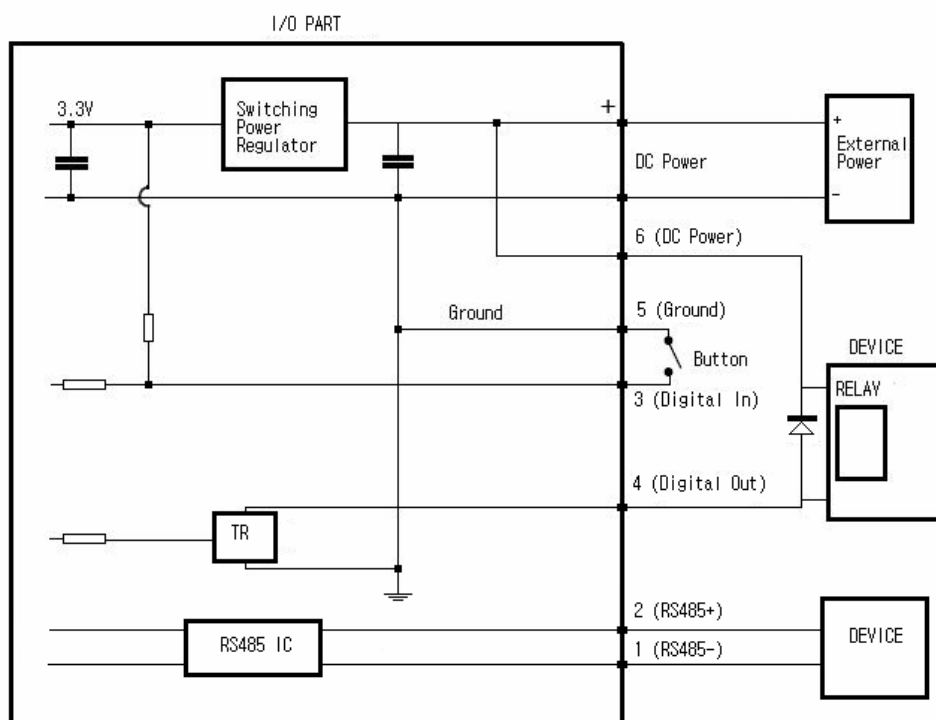
8. Product Information.

8.1. Technical Information.

8.1.1. Technical Specification.

Function	Description
Video compressions	● Motion JPEG ● MPEG-4
Resolutions	● MPEG-4: 640x480, 320x240 ● Motion JPEG: 640x480, 320x240, 160x120
MPEG-4 Frame rate	● Single Resolution: 640x480 (15fps) 320x240(30fps) ● Dual Resolution: 640x480 (10fps), 320x240(10fps) 320x240 (10fps), 320x240(5fps)
Motion JPEG Frame rate	● Single Resolution: 640x480 (15fps) 320x240(30fps) 160x120(30fps) ● Dual Resolution: 640x480 (10fps), 320x240(10fps) 640x480 (15fps), 160x120(15fps) 320x240 (15fps), 160x120(15fps)
Video streaming	● Simultaneous Motion JPEG and MPEG-4 ● Controllable frame rate and bandwidth ● Constant and variable bit rate(MPEG-4)
Image settings	● Compression levels: 5(Motion JPEG) / CBR (MPEG-4) ● Overlay capabilities: time, date, text
Pan/Tilt/Zoom	● 10 presets
Audio	● G.711 PCM 64kbit/s ● Full duplex, Half duplex, Simplex or audio off
Security	● Multiple user access levels with password protection ● IP address filtering
Alarm and event management	● Events triggered by built-in motion detection, external input or according to schedule ● Image upload over FTP, Email ● Notification over TCP, Email and external output

Connectors	● Analog composite video ● NTSC/PAL auto sensing inputs ● Ethernet 10BaseT/100 BaseTX, RJ-45 ● Terminal block: 1 alarm input, 1 alarm output, RS-485, Power connection ● 3.5mm jack for Line in, Line out(active speaker)
Casing	● Metal casing.
Processors and memory	● CPU: 32bit CPU ● RAM: 64MB ● Flash: 32MB for OS ● Battery backed up by real-time clock
Power	● 9 - 24V DC, max 5W
Operating conditions	● 5 - 50 °C (41 – 122 °F) ● Humidity 20 – 80% RH(non-condensing)
Installation, management and maintenance	● Installation tool on CD and web-based configuration ● Firmware upgrade over HTTP
Video access from Web browser	● Camera Live view ● Sequence tour capability for up to 10 PTZ presets
Minimum Web browsing requirements	● Pentium III CPU 500 MHz or higher, or equivalent AMD, 128 MB RAM, AGP graphic card Direct Draw 32MB RAM ● Windows Vista, XP, DirectX 9.0 or later internet Explorer 6.x or later
Supported protocols	● HTTP, TCP, RTSP, RTP, UDP, SMTP, FTP, DHCP, ARP, DNS, DynDNS
Included accessories	● Power supply DC, connector kit, installation Guide, CD with installation and management tools, software and User's Manual
Approvals	● FCC Part 15 Class B, CE, RoHS, MIC
Dimensions (HxWxD) and Weight	● 27(H)x116(W)x85(D) ● 225g (except power supply)

Cautions

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC compliance Information

This device complies with part 15 of FCC Rules.
Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received.
Including interference that may cause undesired operation.

Information to User

This equipment has been tested and found to comply with the limits for a Class B digital device, Pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio Frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
▪ Reorient or relocate the receiving antenna.
▪ Increase the separation between the equipment and receiver
▪ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

FCC Safety Information

 "To maintain compliance with the FCC's RF exposure guidelines, this equipment should be installed and operated with minimum separation distance of 20cm between the radiator and your body. Use only the supplied antenna. Unauthorized antenna, modification , or attachments could damage the transmitter and may violate FCC regulations."