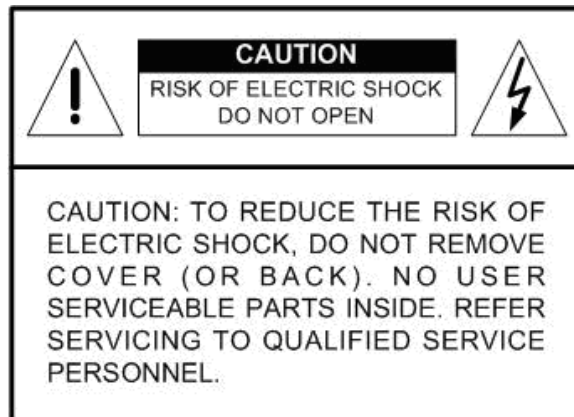


USER MANUAL



Caution and Preventive Tips

- Handle with care, do not drop the unit
- Mount the unit in an equipment rack or place it on a solid, stable surface
- Indoor use only. Do not place the unit in a humid, dusty, oily, or smoky site
- Do not place it in an area with poor ventilation or in an area close to fire or other sources of heat. Doing so may damage the unit as well as cause fire or an electric shock
- When cleaning is necessary, shutdown the system and unplug the unit from the outlet before uncovering the top cover. Do not use liquid cleaners or aerosol cleaners. Use only a damp cloth for cleaning
- Always shutdown the system prior connecting or disconnecting accessories, with the exception of USB devices



This symbol intends to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



This symbol intends to alert the user to the presence of unprotected "Dangerous Voltage" within the product's enclosure that may be strong enough to cause a risk of electric shock.

Important Information

Before proceeding, please read and observe all instructions and warnings in this manual. Retain this manual with the original bill of sale for future reference and, if necessary, warranty service. When unpacking your unit, check for missing or damaged items. If any item is missing, or if damage is evident, **DO NOT INSTALL OR OPERATE THIS PRODUCT**. Contact your dealer for assistance.

Rack Mounting

Consult with the supplier or manufacturer of your equipment rack for the proper hardware and procedure of mounting this product in a safe fashion. Avoid uneven loading or mechanical instability when rack-mounting units. Make sure that units are installed to get enough airflow for safe operation. The maximum temperature for rack-mounted units is 40 °C. Check product label for power supply requirements to assure that no overloading of supply circuits or over current protection occurs. Mains grounding must be reliable and uncompromised by any connections.

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1. Overview

DVRN960 H.264 WD1 DVR is an integrated digital video recorder that combines the features of a time-lapse audio / video recorder, a multiplexer, and a video server to create a single security solution.

Its quadplex operation enables users to view live video, search and playback any recorded video by date / time or event, and remotely monitor the unit via internet on PC, all while the DVRN is recording simultaneously.

DVRN960 H.264 WD1 DVR provides the latest H.264 compression mode. Moreover, the implementation of the Graphical User Interface (GUI) optimizes the monitoring controls of the unit. **The DVRN960 H.264 WD1 DVR** is enhanced to support Full HD 1080p output.

DVRN960 H.264 WD1 DVR is pre-installed with remote viewing and configuration software which is a Web-browser plug-in allowing users to view live or recorded video images and enables remote configuration. The remote software is stored in the **DVR** and deployed over a LAN, WAN or Internet connection to remote Windows-based computers. This simplifies the installation and maintenance of the software components so all remote users are using the same software coming from the unit.

2. System Setup

The notices and introduction on system installation will be described in this chapter. Please follow these descriptions to operate the unit.

In order to prevent the unit from data loss and system damage that caused by a sudden power fluctuation, use of an Uninterruptible Power Supply (UPS) is highly recommended.

2.1 Position the Unit

First, note to position / mount the DVR in a proper place and be sure to power off the unit before making any connections. The placed location should avoid hindering or blocking the unit from airflow. Enough airflow is needed to protect the unit from overheating. The maximum allowable temperature of operating environment is 40°C.

The unit utilizes heat-conducting techniques to transfer internal heat to the case, especially to the bottom side of the unit.



NOTE: Be sure the rubber feet are not removed, and always leave a space for air ventilation on the bottom side of the unit.

2.2 Connect Devices to the Unit

This section lists some important notices that should be read before making any connection to the DVR.

Connecting Required Devices

Before powering up the unit, a USB mouse, cameras, and a main monitor should be connected to the unit for basic operation. If needed, connect a call monitor for displaying full-screen video of all installed cameras in sequence.

Connecting Short-term Device

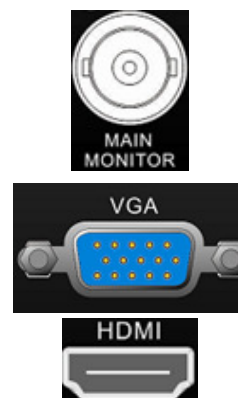
If any short-term devices shall be installed to the DVR as parts of the unit system, such as USB ThumbDrive® or any USB devices, etc, make sure those devices are connected only after the DVR is powered up. The reason is the DVR can recognize the external devices only after the power-up process is done completely.

2.3 Rear Panel Connections

There are various connectors on the rear panel for the DVR installations. The following shows the detailed description of each connector.

Main Monitor (BNC / VGA / HDMI)

The DVR supports three different types of main monitor: BNC, VGA, and HDMI. The main monitor displays Live image and playback recorded videos in full-screen or multiple-window mode.



Call Monitor

The BNC call monitor connector allows users to connect the DVR with a call monitor. The call monitor is to display full-screen video of all installed cameras in sequence.



Video Input

A group of BNC connectors is provided for video input from the installed cameras. The number of connectors equals the number of channels.

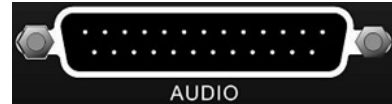


Video Output

The same amount of BNC connectors beneath Video In (BNC) are provided for looping out the specific video input.

Audio In/Out (16CH Models Only)

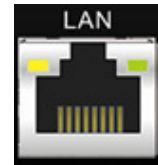
16CH models provide audio in/out connection via a D-Sub connector. Users can connect audio source devices for each channel and an audio output device for Main monitor. Refer to **Setup Guide** for detailed pin definitions for different models.

**Alarm I/O & RS-485**

A D-Sub connector offers users the flexibility to connect the DVR to Alarm I/O and RS-485 devices. Refer to **Setup Guide** for detailed pin definitions for different models.

**LAN 10/100/1000M (RJ-45)**

The DVR is capable of networking, and it allows the recorded videos to be viewed over the LAN network or the Internet via the Internet Explorer.

**Power Jack**

Connect the power supply cord and the power adaptor shipped with the DVR.



NOTE: Use of other power supply cords or power adaptors may cause overloading.

3. General System Setup

Before operating the DVR, some general configurations should be setup first. The following subsections will introduce general configurations of the DVR.

The regular displayed OSD information and its displayed position are shown in the following figure. The title of the channel is displayed on the top-center of the grid, either in full-screen mode or in multiple-window mode. The current operation status and date / time information will be displayed in the status bar at the bottom-left corner of the screen. Move the mouse cursor to any status icon and its description will be displayed. Refer to **Setup Guide** for a list of status bar icons and their descriptions.

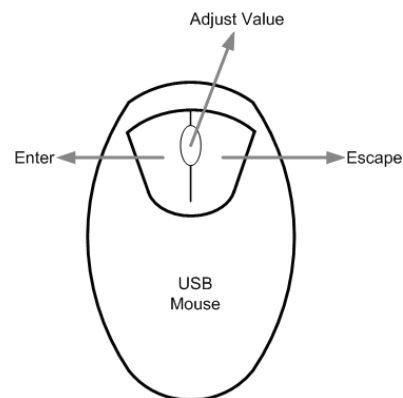
CH1	CH2	CH3	CH4
CH5	CH6	CH7	CH8
CH9	CH10	CH11	CH12
CH13	CH14	CH15	CH16
2014/02/09 04:31:22 PM			

3.1 USB Mouse Operation

A USB mouse must be connected in order to operate the DVR. As shown in the figure on the right, click the left button to select or “ENTER”. Conversely, click the right button to exit or “ESC”. The scroll wheel is for adjusting values.



NOTE: Users can setup preferred mouse sensitivity level by accessing the OSD menu <Monitor> → <Mouse Sensitivity>.



In addition, users can also connect a USB keyboard to help operating the DVR. Refer to the appendix for key definition of the USB keyboard.

3.1.1 Functional Icons

Move the cursor to the right side of the screen and a Live Panel will be displayed. This section describes the functional icons in the Live Panel. Please refer to **Setup Guide** for the graphical illustration of the functional icons.

Enter/Zoom

In Live and Playback full-screen mode, click on this icon to view a 2x zoom image. Click on this icon again to return to the Live or Playback full-screen mode.

Esc

Click on this icon to logout.

Mode

Click on this icon repeatedly to change the display mode among full-screen, 4-window, 9-window, and 16-window. Refer to section **Viewing Modes** for more information.

Freeze

Click on this icon while viewing Live images, the Live video will be frozen. The date / time information shown on the monitor will continue updating, as well as the recording of video. Click on this icon again to return to Live video of the current moment.

Search

In Live mode, click on this icon to enter the Search menu to search and playback the recorded video by date / time or event.

Play

Click on this icon to playback recorded video from the last suspended time.



NOTE: The video of the latest 5 to 10 minutes of recording cannot be played back because the video is still saved in the buffer.

Seq (Sequence)

This icon is for automatic sequence display of predetermined camera orders.

Menu

Click on this icon to enter the OSD setup menu.

Dome

Click on this icon to enter Dome Camera Control mode. Please refer to section **Dome Control** for detailed control operation.

Channel

In Live mode, click on any Channel icon to view the corresponding video in full-screen.



NOTE: Users can also right click the mouse, and the pop-up list provides some similar functions, such as Mode List, Mode, Freeze, Search, Fast PB, Sequence, Menu, Call, and Dome.

3.2 Enter OSD Setup Menu

The configuration of the DVR can be customized by entering the intuitive Graphical User Interface (GUI) OSD setup menu. When a USB mouse is used for control, setting up the DVR can be easy as operating a PC. Click on the Menu icon in the Live Panel and select an account to login.

The next step is to enter a corresponding password. The preset password for the administrator account “admin” is “1234”.



NOTE: It is strongly suggested you change the preset password to prevent unauthorized access to the unit.

An icon displayed at the status bar will show the authority level of the account. Under logout condition, the “Guest” icon will be displayed. When an account is logged in, its authority level number (1~8) will be shown.

Before an account is logged out, other functions can also be accessed without having to login again. There are two ways to logout: manually logout by clicking on the Esc icon in the Live Panel, or auto logout when users are not using the DVR for a preset period of time (default 5 minutes) at Live / Menu mode.

3.2.1 User Management

The DVR provides the option to create up to seven sets of usernames and passwords with customized authority, excluding the preset “admin” account. From the OSD setup menu, select <System> → <User Management>. The menu is as the following.

User Management	
Password Protection	On
Auto Logout	300 Sec
Account Setup	
Permissions Setup	
Load Default Setting	No

Password Protection

Select <On> to request for username and password for accessing functions listed in Permissions Setup menu, or select <Off> to allow free access.

Auto Logout

Select the duration of time to auto logout after no operation is performed.

Account Setup

Setup the customized account, password, and privilege level in this menu. The account is case sensitive. The privilege level ranks from levels 1~8. Level 8 is the highest authority. Alternatively, select <Disable> to stop using the account.



NOTE: The username and authority level of the preset “admin” account cannot be changed.

Permissions Setup

Setup the allowed authority level for accessing the functions listed in this menu. In accordance with users’ privilege level defined in <Account Setup>, the authority level here also ranks from level 1~8, and level 8 is the highest level. Users can access any function that is equivalent to or lower than their privilege level. Alternatively, select <DISABLE> to allow free access.



NOTE: The “Menu Access” item cannot be set to <DISABLE>.

When the account does not have authority to access certain functions, an error message will be displayed on the screen.

Load Default Setting

Select <Yes> to load the default setting.

3.3 **Power On / Shutdown / Reboot**

If the DVR must be rebooted or shutdown for any reason, please follow the proper shutdown procedures to avoid damaging the DVR.

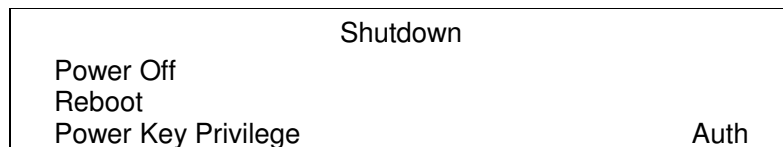
Power On the Unit

After all required devices are connected, plug the power adaptor with the power supply cord in the DVR. Make sure the power source is between AC 110V to AC 240V. After the power key on the front panel starts blinking, press it to power on the DVR.

The power LED will be fully lit, and the color bar and booting logo will be shown on the monitor, and then disappear when the unit is completely powered on.

Shutdown / Reboot the Unit

Click on the Menu icon. Select <Shutdown> in the OSD setup menu to enter the Shutdown menu, which displays as follows.

**<Power Off>**

Select this item to shutdown the unit. Do not remove the power during the shutdown procedure until the monitor turns black.

<Reboot>

Select this item to reboot the unit. The message "System rebooting..." will be displayed on the monitor which indicates the DVR is rebooting.

<Power Key Privilege>

According to the setting of this item, users are able to quick shutdown the DVR by long pressing the Power Key. This item defines the action of the Power Key. The options are <Auth>, <Confirm>, <Direct>, and <Disable>. The following explains each option.

- **Auth:** This will ask users to login with an authorized account, when Password Protection function is enabled. If Password Protection function is disabled, the action will be the same as the next option <Confirm>.
- **Confirm:** When this option is selected, a confirmation message will be shown after the Power Key is long pressed. Users can confirm or cancel the quick shutdown function.
- **Direct:** For users who wish to enable the quick shutdown function without any confirmation or login process, select this option and the DVR will automatically shutdown after the Power Key is long pressed.
- **Disable:** Select this option to disable the quick shutdown function.

3.3.1 HDD Auto Scan

When the DVR is powering on, HDD auto scan will be initiated if there was previously an unusual power loss or file system error. If by any chance auto scan failed, the HDD will need to be formatted.



NOTE: If users wish to disable the auto scan function, enter the OSD setup menu via an authorized account and access <Database> to set <Repair On Power Loss> to <Off>.

Read the following troubleshooting to finish the auto scanning process.

- **Skip Auto Scan:** During the scanning process, users can click on <Esc> to skip the process.
- **Time Expired:** When the scanning process takes more than predetermined time (3hrs for 1TB HDD, 6hrs for 2TB HDD, etc), the scanning process is treated as failed and will be automatically terminated. The DVR will reboot.
- **Format HDD:** If the scanning process fails, users will be prompted to confirm format of the HDD with error. When users confirm to format the HDD with error, login of an authorized account is required if password protection is enabled. If users select Cancel or do not respond within 5 minutes, the HDD with error will be marked as a NG HDD. A NG HDD will not be counted as a part of the DVR's database. It will just stay there doing nothing.
- **Recover NG HDD:** Enter the OSD setup menu via an authorized account and access <Database>. Then select <Internal Disks> and find the NG HDD from the list. Under <Action> column, first select <Format> to format the NG HDD. Then select <Add> to add the formatted HDD to the DVR's database.



NOTE: The above actions will be recorded in the system log data.

3.4 System Date / Time Setting

Users can set the current date, time and other OSD parameters in Date/Time menu (under System menu). The login account should have authority to access the System menu. In the OSD setup menu, select <System>, and then select <Date/Time> to access the Date/Time menu; the menu displays as follows.

Date/Time	
Date	2014/02/17
Time	PM 03:39:26
Time Zone	OFF
Date/Time Display	1 Row
Date Display Mode	Y/M/D
Time Display Mode	12 HR
Daylight Saving Time Setup	
Network Time Protocol Setup	

3.4.1 Set Date / Time

Set Date / Time

Select <Date> / <Time> to adjust the settings. Click at the target position and click on the UP / DOWN buttons to change the value in the selected field.



NOTE: The new date / time setting applies to videos recorded after the change. The date and time of previously recorded videos will not be altered.



NOTE: If time settings have to be changed in any case, it is strongly recommended to format the HDDs to avoid database corruption.

Date / Time Display

Users are allowed to set the time in the status bar to display in <1 Row>, <2 Rows>, or <OFF>.

Date Display Mode

This function allows users to set the OSD display type of the date. There are three options to select: <Y/M/D>, <M/D/Y> or <D/M/Y>. “Y” represents “Year”, “M” represents “Month” and “D” represents “Day”.

Time Display Mode

Users can set the time format to <12 HR> or <24 HR>.

3.4.2 Daylight Saving Time

Daylight Saving Time

The item is for people who live in certain regions to observe Daylight Saving Time. Select <On> to enable, or <Off> to disable the function. If the function is disabled, the DST Start / End time and DST Bias will be grayed out and cannot be accessed.



NOTE: If this function is enabled, the date / time information will be shown on the screen with a DST icon when playing back recorded video or searching video in the event list. “S” indicates summer time and “W” indicates wintertime.

DST Start / End

These items are used to program the daylight saving duration. Click at the target position and click on the UP / DOWN buttons to change the value.

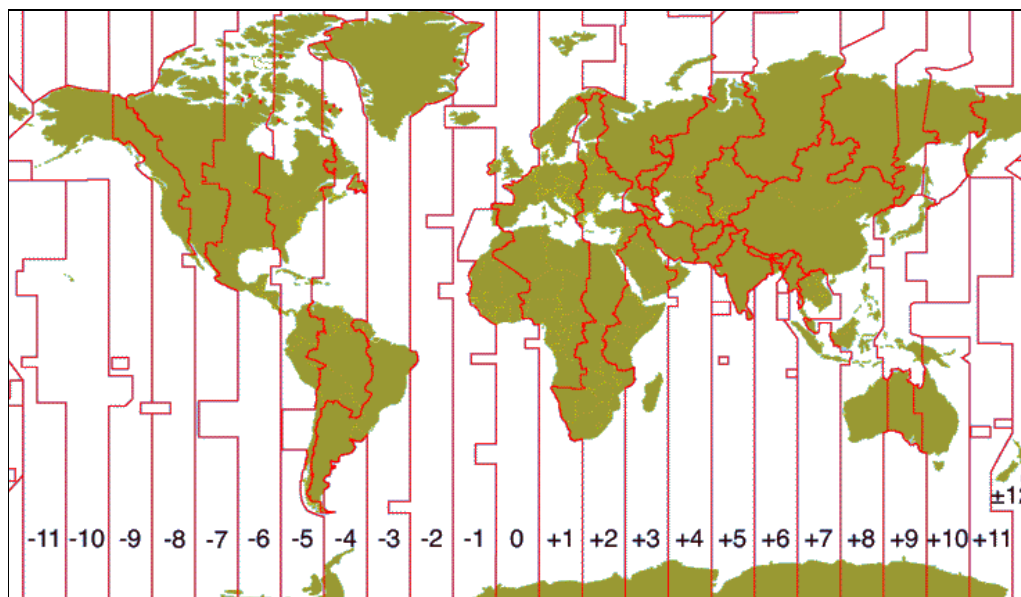
DST Bias

The item allows users to set the amount of time to move forward from the standard time for daylight saving time. The available options are in minutes.

3.4.3 Network Time Protocol Setup

Time Zone

Select <Time Zone> to setup the time zone. To find out the correct local time zone, please visit www.greenwichmeantime.com or refer to the figure below.





NOTE: The <Time Zone> must be set to the correct local time zone or the <Network Time Protocol Setup> will not be accessible.

Network Time Protocol Setup

After the time zone is setup, <Network Time Protocol Setup> will be accessible. Select <NTP Server> to setup the time server. The default time server is time.nist.gov, but the users can change to any other time server if preferred. A list of IP addresses of the time servers is listed below.

129.6.15.28	129.6.15.29	132.163.4.101
132.163.4.102	132.163.4.103	128.138.140.44
192.43.244.18	131.107.1.10	69.25.96.13
206.246.118.250	208.184.49.9	64.125.78.85
207.200.81.113	64.236.96.53	68.216.79.113

After the time server is set, set <Manually Time Sync> to <Yes> to sync the time. The time sync can also be updated periodically. Set <Automatically Time Sync> to <On>, and the time will be automatically synced once an hour.

3.5 Record Schedule / Quality Setting

The Record menu allows users to set recording quality, recording schedules, and other recording parameters. Login with a proper account to access the Record menu. In the OSD setup menu, select <Record>; the following menu is displayed.

Record	
Record Mode Setup	
Schedule Setup	
Preset Config	Best Quality
ezRecord Setup	
Advance Schedule Setup	
Data Lifetime Setup	
Circular Recording	On
Audio Recording	On
Purge Data	

3.5.1 Record Mode Setup

The Record Mode Setup menu allows users to setup record resolution, etc. The related record settings, such as preset configuration, will follow the record mode setting. The menu is displayed as the following.

Record Mode Setup	
Record Resolution	WD1
Record Format	H264
Max Rec. PPS	480
CBR/VBR	CBR

- Select record resolution of the video from WD1, D1, and HD1.
- Record Format of the video is H.264. This item is “read-only”.
- Set the recording bit rate as CBR (Constant Bit Rate) or VBR (Variable Bit Rate).

It is strongly suggested to use CBR encoding when reliable video quality is the top priority.



NOTE: Since a VBR file does not have a fixed size, the HDD space usage cannot be calculated; thus, ezRecord function is not supported for VBR mode. Therefore, if ezRecord is selected as the preset record configuration, the option of this item will be automatically set as <CBR>.

3.5.2 Schedule Setup

The Schedule Setup is used to set the day and night time, or weekend recording schedule. Select <Schedule Setup> from the Record menu; the following menu is displayed.

Schedule Setup		
Day Time Start		AM 06:00
Day Time End		PM 06:00
Night Time Start		PM 06:00
Night Time End		AM 06:00
Weekend Schedule		On
Weekend Start	Fri	PM 06:00
Weekend End	Mon	AM 06:00

- Make appropriate changes of the start time of Day and Night Time.
- If a weekend record is required, select <On> to enable the Weekend Schedule in advance, and then configure the Weekend Start / End time.
- Right click the mouse to return to previous page.

3.5.3 Preset Record Configuration

<Preset Config> is for users to select the preset recording quality. Different preset recording quality levels are provided for users to choose: <Best Quality>, <Standard>, <Extended Record>, <Event Only>, <ezRecord>, <512Kbps DSL>, <256Kbps DSL>, <128Kbps DSL>, and <Adv. Schedule>. The default setting is <Best Quality>. Please refer to ***OSD Setup Manual***, section **Preset Record Configuration** for more details about recording picture sizes of each recording quality.



NOTE: If <ezRecord> or <Adv. Schedule> is selected, users need to further setup its related configurations.

3.5.4 ezRecord Setup

This item aims to ease the complicated record settings, and to make the setup much easier. Note that this item is only accessible when <ezRecord> is selected as the option for <Preset Config>.

Select <ezRecord Setup> from <Record>, the sub-menu appears as below.

ezRecord Setup	
How Many Days To Record	7 Days
Daytime Record	Yes
Night Record	Yes
Weekend Record	Yes
Average Normal PPS	30
Average Normal Quality	Best

Follow these steps to Setup ezRecord:

- Click on the box next to <How Many Days To Record>, and then click on the UP / DOWN buttons or scroll the mouse wheel to choose an option. The average normal PPS and Quality will be adjusted automatically. The maximum of days depends on the size of the installed HDD. In other words, the larger the size of the HDD installed, the more days the unit can record.
- Click the box next to <Daytime Record>, which determines whether the DVR will record during daytime. Select <Yes> to enable daytime recording, or <No> to disable.
- Repeat the same procedures through the 3rd and 4th item, respectively. Note that <Weekend Record> will be inaccessible if <Weekend Schedule> in <Schedule Setup> is set to <No>.
- Click the box next to <Average Normal PPS>, and select a value from the pull-down list. The <How Many Days To Record> will be computed automatically.
- Select a preferred quality under <Average Normal Quality>. <How Many Days To Record> will be computed automatically.



NOTE: The current number of the connected cameras will affect the recording quality automatically calculated through <ezRecord Setup>. Therefore, once the number of the connected cameras is changed, users should re-access the <ezRecord Setup> menu for the DVR to reset the values.

3.5.5 Advance Schedule Setup

When <Adv. Schedule> is selected as the option for <Preset Config>, users need to further configure the schedule and recording setting under this menu. The Advance Schedule setup menu is shown as below.

Advance Schedule Setup
Schedule Table
Recording Profile Setup
Holiday Setup



NOTE: The <Advance Schedule Setup> menu can only be accessed when <Preset Config> is set to <Adv. Schedule>.

3.5.5.1 Schedule Table

In this menu, users can assign recording type for days in a week by hour. Moreover, the recording type for pre-defined holidays can also be specified here. Refer to the steps below to setup the schedule table.

Schedule Table																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sun																								
Mon																								
Tue																								
Wed																								
Thu																								
Fri																								
Sat																								
Hol																								

Recording Type

Best Qty

Standard

Extended

Profile 1

Profile 2

Profile 3

Evt Only

Best Quality ▾

Confirm

Cancel

- Click on a preferred recording type at the bottom.
- Click at any grid of time to assign the selected recording type.
- Click on any hour on the top to fill up the column.
- Click on any day on the left to fill up the roll.
- Click on the top left grid to always record with the selected recording type.
- Click on the <Confirm> button to save the setting.

3.5.5.2 Recording Profile Setup

Enter this menu to setup normal and event recording options for Profile 1, Profile 2 and Profile 3 for each channel. Follow the steps below to complete the setting.

Recording Profile Setup			
Cameral Select	Profile 1	Profile 2	CH01 Profile 3
Normal PPS	30	30	30
Normal Qlty	Best	Best	Best
Normal Resolution	D1	D1	D1
Event Max PPS	30	30	30
Event Qlty	Best	Best	Best
Copy Settings			

- Setup PPS (Picture per Second), quality and resolution for normal videos.
- Setup maximum PPS and quality for event videos.
- The <Copy Settings> item is for users to copy the settings of the currently selected camera to any other connected cameras. After the selection, click <Confirm> to apply the settings

3.5.5.3 Holiday Setup

The DVR also allows users to define holidays that require special monitoring and recording settings. The Holiday Setup menu is as below.

Holiday Setup	
Holiday List	
Add Holiday	01/01

- Select a date for <Add Holiday> and the date will be added to the holiday list.
- Select <Holiday List> to see all added holidays.
- Users can also remove holidays in the <Holiday List> menu.

3.5.6 Data Lifetime Setup

Data Lifetime indicates the duration that a video is saved and recallable in the HDD. Only those video recorded within Data Lifetime can be searched for playback. The video exceeds Data Lifetime will be hidden and cannot be retrieved for playback.

Data Lifetime Setup	
Data Lifetime Mode	General
Data Lifetime	0 Days
Data Lifetime By Day	
Data Lifetime By Channel	



NOTE: To playback a video exceeding the data lifetime, please extend the duration until the recording data / time of the video is included.

Data Lifetime Mode

This item allows the user to choose preferred data lifetime mode. There are three types of data lifetime mode: General, By Day, and By Channel. When a specific mode is selected, further settings of the other two items below will be grayed out and cannot be accessed.

Data Lifetime

When data lifetime mode is set as <General>, this item will be accessible. Click on the UP / DOWN buttons to set the data lifetime. The value ranges from <1> to <365> days. Alternatively, select <0> to disable this function.

Data Lifetime by Day

When data lifetime mode is set as <By Day>, this item will be accessible. Enter this menu and users can setup data lifetime of each weekday independently. The value ranges from <1> to <365> days. Alternatively, select <0> to disable this function.

Data Lifetime by Channel

When data lifetime mode is set as <By Channel>, this item will be accessible. Enter this menu and users can setup data lifetime of each channel independently. The value ranges from <1> to <365> days. Alternatively, select <0> to disable this function.

3.5.7 Circular Recording

Users can choose to record video in circular mode or in linear mode. If circular mode is selected, the DVR will store new videos into the HDD spaces while overwriting the oldest recorded videos. Alternatively, if linear mode is selected, the DVR will stop recording when the HDD is full. The percentage of HDD usage will be displayed as an icon in the status bar. Moreover, an alert icon will be displayed in the status bar when HDD usage reaches 98%. In the mean time, an internal buzzer will start beeping.

From the Record menu, set <Circular Recording> to <On> or <Off> to enable or disable the circular recording mode.

3.5.8 Audio Recording

This item allows user to enable / disable audio recording function of the unit. When it is set to <On>, audio input is recorded and saved with the video. When it is set to <Off>, audio is ignored.

3.5.9 Purge Data

This item is used to delete the Normal or Event recording video. In Record menu, select <Purge Data>; the Purge Data menu is displayed.

Purge Data		
Purge All Data		No
Purge All Event Data		No
Purge Event Before	2000/01/01	
Start To Purge		No

Purge All Data

The item is used to delete all recorded video from the database. Set this item to <Yes>, and start the deletion by setting <Start to Purge> to <Yes>.

Purge All Event Data

The item is used to delete all event video from database(s). Select <Yes> and start the deletion by setting <Start to Purge> to <Yes>.

Purge Event Before

The item is used to delete event video before a specific date. Select a preferred date and start the deletion by setting <Start to Purge> to <Yes>.

Start to Purge

After the video or data to be deleted are selected, set this item to <Yes> to start the deletion or choose <No> to cancel.

3.6 Event Setting

This menu allows users to determine the behaviors of the DVR in response to alarm events. In the OSD setup menu, select <Event>, and the following menu is displayed. Items in the Event menu are described in the following subsections.

Event	
Internal Buzzer	On
Event Icon	On
Alert Notification Setup	
Event Full Screen	None
Event Duration	20 Sec
Per Channel Config	
E-mail Management	

3.6.1 Internal Buzzer

This item allows users to enable / disable internal buzzer of the DVR. If <On> is selected, the buzzer is activated in response to alarm events. If <Off> is selected, the buzzer is not activated.

3.6.2 Event Icon

This item enables (On) / disables (Off) the display of event icons on the monitor when alarm events occur. The event icons are represented by a character according to the event types respectively. Refer to the following table for association of event icons and event types.

Event Icon	Event Type
A	Alarm in event
M	Motion detection event
L	Video loss event

3.6.3 Alert Notification Setup

This function allows users to send alert notifications to the CMS software which had been installed to users' computer. For further setup instruction at the CMS side, please refer to the CMS user's manual.

Alert Notification Setup	
Alert Configuration Set	1
Alert Notification	OFF
Alert IP	0.0.0.0
Alert Port	9999
Alive Interval	120 Sec

3.6.3.1 Alert Configuration Set

<Alert Configuration Set> provides 3 combinations of Alert Notification, IP, Port, and Interval.

3.6.3.2 Alert Notification

4 options are included in this item: <OFF>, <Event>, <Alive>, and <Both>.

<OFF>: The Alert Notification is turned off.

<Event>: When the alarm is triggered, the DVR will send an alert message to the CMS.

<Alive>: The DVR will send an alive message to the CMS every *N* second just to show that the connection between the DVR and CMS is active. The time interval *N* can be adjusted in <Alive Interval>.

<Both>: This enables the DVR to send both Event and Alive alert messages to the CMS.

3.6.3.3 Alert IP

The Alert IP must match the IP address of the computer installed the CMS.

3.6.3.4 Alert Port

The ports for DVR and the CMS Alert **MUST** be the same.

3.6.3.5 Alert Interval

Users can define the time interval (1 to 255 seconds) between each alive message. This item will not be available if <Alert Notification> is set to <OFF> or <Event>.

3.6.4 Event Full Screen

This function allows the DVR to display the alarm channel in full-screen size when an alarm is triggered. Select <None> to disable this function; select <Main> to display the alarm channel on Main Monitor when an alarm is triggered; select <Call> to display the alarm channel on Call Monitor; and select <Both> to display the alarm channel on both Main Monitor and Call Monitor.

3.6.5 Event Duration

This item determines the duration of the buzzer and Alarm Out relay function after an alarm is triggered. The available event duration range is from 5 seconds to 999 seconds.

3.6.6 Per Channel Config

This menu is used to configure the <Video Loss Detect>, <Motion Detect>, <Alarm In> and <Alarm Out> settings for each channel. The menu is displayed as below.

Per Channel Config	
Channel Select	CH01
Video Loss Detect	Off
Motion Detect	Off
Detection Config	
Alarm In	OFF
Alarm Out	OFF
Copy Event Setting	

3.6.6.1 Channel Select

The item is used to select a desired channel for setting the parameters. Click on the box next to <Channel Select> to select a channel.

3.6.6.2 Video Loss Detect

This item allows users to enable or disable Video Loss as an alarm event. Select <On> to enable Video Loss alarm events, or <Off> to disable.

3.6.6.3 Motion Detect

This item allows users to enable / disable the motion detection function of the DVR. Select <On> to enable Motion Detect alarm events, or <Off> to disable. If motion detection function is enabled, it is required to define motion detection parameters, such as detection area and sensitivity settings in <Detection Config>.

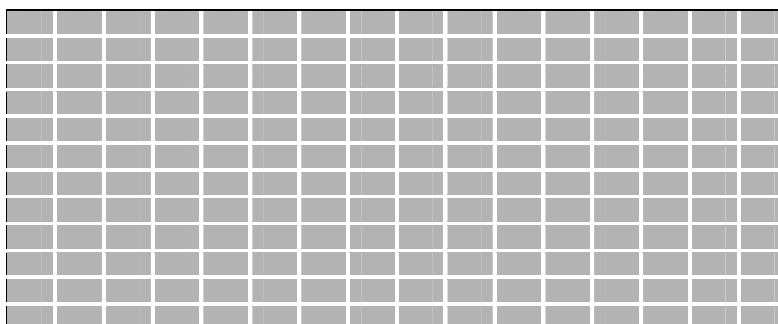
3.6.6.4 Detection Configuration

If motion detection function is enabled, the motion detection parameters should be setup. Select a channel in <Channel Select>, and then click <Detection Config>. The Detection Configuration menu displays as follows.

Detection Config	
Detected Area Setup	
Sensitivity	88%
Area Threshold	4

Detected Area Setup

The Detected Area is displayed as follows. The detection area consists of 192 (16×12) detection grids.



Click and drag the mouse to select or de-select a detection area. A pull-down list will be displayed after the mouse is released. Select <Block Select> to set the grid(s) as a motion detection area, or select <Cancel> to abort. After the setting is completed, right click and select <Confirm> to save the setting.

Sensitivity

This item is used to set the sensitivity of detection grids. A greater value indicates more sensitive motion detection. A motion alarm will be triggered once the amount of motion detected exceeds the Threshold value.

Adjust the value by clicking UP / DOWN buttons next to <Sensitivity>. The value is increased by 4% increment.

Area Threshold

<Area Threshold> indicates the motion trigger level. If the percentage of the triggered grids from the total detection area is greater than the set value, the motion alarm will be triggered.

For example, if 10 grids are selected and the <Area Threshold> value is 70%, the motion alarm will be triggered when 7 grids are motion-detected.

Adjust the percentage by clicking UP / DOWN buttons next to <Area Threshold>. The value is increased by 1% increment.

3.6.6.5 Alarm In

This item allows users to enable / disable alarm input detection. According to users' application, select <N/O> (Normal Open) or <N/C> (Normal Close) to enable the alarm input detection, or select <OFF> to disable the detection.

If <Alarm In> is set to <N/C>, but no device is installed, an alarm will be triggered and the Event Icon <A> will always be displayed on the screen until this item is changed to <N/O>, <OFF>, or when a device is installed to the unit.

3.6.6.6 Alarm Out

This item allows users to enable / disable the alarm output on the selected channel to activate the relay. The signal can be a light or siren to caution an alarm event. Select <ON> to enable the alarm output, or <OFF> to disable.

3.6.6.7 Copy Event Settings

This item allows users to copy the event settings of the currently-selected camera to any other connected cameras. Enter this menu and select one or more target cameras. Then select <Confirm> to apply the settings.

Copy Event Settings							
Copy To:							
01	02	03	04	05	06	07	08
09	10	11	12	13	14	15	16
Select All		Deselect All		Confirm		Cancel	

3.6.7 E-mail Management

Users can setup three sets of e-mails for receiving event/alarm notices. Follow the brief steps below to setup the e-mail management setting.



NOTE: In order to successfully send a notification e-mail, be sure that the DVR is connecting to the internet.

E-mail Management	
E-mail Select	1
E-mail Activate	Off
E-mail Address	
E-mail Video Attachment	Off
E-mail Video Attachment Size	100 KB
Event/Alarm Selection	
SMTP Server Setup	

- First, select a number next to <E-mail Select>.
- Set <E-mail Activate> to <On>.
- Input the target e-mail address.
- Select whether or not to attach video clips with the e-mail.
- If <E-mail Video Attachment> is <On>, set <E-mail Video Attachment Size> according to users' needs. The maximum size is 500 KB.
- Enter the <Event/Alarm Selection> menu to select if the DVR should send e-mails regarding the listed events and alarms.
- If users are going to send e-mails via an SMTP server, enter the <SMTP Server Setup> menu to edit the related settings.

Users can select a different number for <E-mail Select> and follow the same steps above to add a new set of e-mail to receive events and alarm notifications. For more details about e-mail management setting, please refer to **OSD Setup Manual**.



NOTE: If a notification e-mail cannot be sent, the DVR will retry sending the e-mail automatically. It will stop the attempt after 5 minutes if the e-mail still cannot be sent.

4. Basic Operation

This chapter will introduce the general operations of the DVR.

4.1 View Live / Playback Video

The general functions in Live and Playback mode are described in the following sections.

4.1.1 Viewing Modes

The DVR provides users several display modes. Click on any CHANNEL directly to view the corresponding camera in full-screen mode. In addition, click on the Mode icon in the Live Panel to view in multiple-window mode. The following figures show the available multiple-window modes. Click on the Mode icon repeatedly to switch to the next available viewing mode.

1	2
3	4

4-Window

1	2	3
4	5	6
7	8	9

9-Window

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

16-Window



NOTE: 9-window mode is only available in 8CH and 16CH models, whereas 16-window mode is only available in 16CH models.

4.1.2 Digital Zoom

Users are able to view a 2× full-screen in Live and Playback mode. To view

the 2× full-screen, follow the steps.

- Click on a channel to display the full-screen image and scroll up the mouse wheel or click on the Enter icon in the Live Panel to zoom in.
- Click at any position to set the position as the center of the display screen.
- Scroll down the mouse wheel or click on the Enter icon again to zoom out.



NOTE: In Playback mode, the Digital Zoom function can only be accessed by clicking on the Enter icon. Scrolling the mouse wheel in

Playback mode is to rewind / fast-forward the playback.

4.1.3 Camera Info

When users move the cursor to the camera title at the top center of each channel, the camera information will be displayed. The information includes the type of camera, FPS, quality, resolution, and video format of the camera.

4.1.4 View Live Cameras

Users are allowed to view live camera in versatile viewing modes, including full-screen, 4-window, 9-window, and 16-window. The general operation under Live mode is described as follows.

Freeze Live Image

Click on the Freeze icon in the Live Panel while viewing Live image, the image is paused but the date / time information is not, and the system clock continues running.

Click on the Freeze icon to pause the Live image; click on the Freeze icon again to resume the Live camera view.

4.1.5 Playback Recorded Videos

Users can click on the Play icon directly to instantly playback the recorded videos. The DVR will start to resume playing back the recorded video from last suspended point. If it is the first time to initiate instant playback, the DVR will playback from the very beginning of the recorded videos.

In addition, users can right click the mouse at Live mode and select <Fast PB> to quick playback the recorded video of listed times.

Alternatively, users can select records from the Search menu to playback a specific video. Refer to section **Search Recorded Video** for more details.



NOTE: When playing back videos with mass motion recorded in D1 mode (resolution=720x480), click on the Seq icon to switch on “deflicker function” to avoid gleaming of images. Click on the Seq icon again to switch “deflicker off” and the image will return to real D1 resolution.

Playback Control Panel

The Playback Control Panel will be displayed during the playback. Refer to the following description for each control item.

- **Time Bar:** The time bar will show available normal videos in yellow, while the event videos will be displayed in red. Users can directly click on the time bar to select the preferred playback time.
- **Previous Time Step:** Click on this icon to change the displayed time bar to the previous time frame.
- **Rewind:** Click on this icon to reversely playback the recorded video. Click on this icon repeatedly to increase the speed of reverse playback by 1×, 2×, 4×, 8×, 16×, or 32×. When the video is paused, click on this icon repeatedly to move the video a single step backward.
- **Pause:** Click on it to pause the playback. When the playback is paused, click on the Rewind / Fast Forward icons to single step backward / forward the video. Click on it again to resume the playback.
- **Fast Forward:** Click on this icon to fast-forward the playback in 1×, 2×, 4×, 8×, 16×, or 32× speed. Click on this icon repeatedly to increase the speed of forward playback. When the video is paused, this icon is used for single step forward.
- **Next Time Step:** Click on this icon to change the displayed time bar to the next time frame.
- **Channel Select:** Click to select a channel to display it in full-screen.
- **Mode:** Click on this icon to change display mode. This will not function when the playback is paused.
- **Search:** Click on this icon to enter the Search menu.
- **Copy:** Click on this icon to mark start / end time of quick video export.
- **Live:** Click on this icon to return to Live mode.
- **24hr:** Click on this icon to scale the time bar by 24 hours.

- **12hr**: Click on this icon to scale the time bar by 12 hours.
- **4hr**: Click on this icon to scale the time bar by 4 hours.



NOTE: Users can also click and drag the time slider bar to select a preferred playback video time.

For more information about the Search menu and quick video export, please refer to sections [Search Recorded Video](#) and [Quick Video Export](#).

Key Usage of Remote Controller

Refer to the following for key usage of the remote controller in Playback mode.

- **LEFT** (Reverse Playback): The key is used to reverse the recorded video while the unit is playing back. Press the key repeatedly to increase the speed of reverse playback by 1×, 2×, 4×, 8×, 16×, or 32×.
- **RIGHT** (Forward Playback): The key is used to play the recorded video fast forward. Press the key repeatedly to increase the speed of forward playback by 1×, 2×, 4×, 8×, 16×, or 32×.
- **FREEZE**: Press FREEZE to pause the playback video. When the recorded video is paused, press LEFT / RIGHT to resume playback video single step reverse / forward, respectively. Press FREEZE again to continue playing video.
- **PLAY**: Press it to start playing back video, exit current mode, or stop playing back video and return to Live mode.

Pause Playback and Single Step Forward

To pause and resume recorded videos, follow these steps.

- Press any CHANNEL button to view the corresponding camera in full-screen.
- Press FREEZE to pause the current playback image.
- Press LEFT / RIGHT Direction buttons to move the video single step reverse / forward. Press and hold LEFT / RIGHT to repeatedly reverse / forward the video single step.
- Press FREEZE again to resume the playback operation.

4.1.6 Capture Snapshots

When the Playback video of a single channel display is paused, users can click on the Enter icon in the Live Panel to capture and export snapshots to an external storage device, excluding optical drives. Note that the system log will keep a record of any snapshot exportation.

4.2 Sequence

This section introduces how to view Sequence mode with both Main Monitor and Call Monitor, if connected. Sequence function can avoid manual backtracking and provides more flexibility while monitoring surveillance.

4.2.1 Sequence with Main Monitor

Automatic sequence function can be observed in any viewing mode, excluding 16-window mode. Select certain viewing mode and click on the Seq icon to toggle the automatic sequence; click on the Esc icon to stop.

4.2.2 Sequence with Call Monitor

Two viewing modes can be displayed on Call monitor: Sequence display and Single camera display. To setup sequence schedule of the call monitor, refer to ***OSD Setup Manual***, section **Sequence Setup**.

Follow the steps to control the display of the call monitor.

- Click on the Call icon in the Live Panel to enter Call Monitor Control mode. The “Call Mode” icon will be shown in the status bar.

Press 1-16 Key To Select Channel
Press SEQ To Enable Sequence

- Click on a Channel icon to display the selected camera on call monitor.
- Alternatively, click on the Seq icon repeatedly to display the sequence of cameras previously programmed in Call Monitor Schedule menu.
- Click Esc / Call to return to Main Monitor Control mode.

4.3 Search Recorded Video

The DVR is capable of searching and playing back the recorded videos by date / time or events. To search by time, select a specific date and time of the wanted video. To search by event, select the event type and channels to display the event list.

In Live or Playback mode, click on the Search icon in the Live Panel to enter the Search menu, shown as below.

Search Menu	
Search By Time	
From:	2014/02/01 AM 00:00:00
End:	2014/02/18 AM 00:00:00
Select:	2014/02/17 AM 00:00:00
Begin Playback	
Calendar Search	
Search By Event-----	
From:	2014/02/01 AM 00:00:00
End:	2014/02/18 AM 00:00:00
Select Event:	AlmIn Mot VLoss Others All
Select Channel:	Ch1 Ch2 Ch3 Ch4 All
Event List	



NOTE: Please refer to section **Playback Recorded Videos** for playback controls.

4.3.1 Search by Time

Follow the steps to search video by date and time.

- Click on “From” to start the playback from the beginning of the database.
- Click on “End”, and the playback will start from the end of the database.
- Click at the target position next to “Select” and click on UP / DOWN buttons to adjust the values in the selected field.
- Click on <Begin Playback> to start playing back the selected video.



NOTE: If no available recorded video matches the specified time and date, the unit will start playing back from the next available video.



NOTE: The date / time information will be shown on the screen with a DST icon if the Daylight Saving Time function is enabled. “S” indicates summer time, and “W” indicates winter time.

4.3.2 Calendar Search

Follow the steps below to search recorded video via Calendar Search.

- Select <Calendar Search>, and the following menu will be displayed.

Calendar Search

Date/Time

Normal | Motion | AlarmIn | VLoss

CH01
CH02
CH03
CH04
CH05
CH06
CH07
CH08
CH09
CH10
CH11
CH12
CH13
CH14
CH15
CH16

00 02 04 06 08 10 12 14 16 18 20 22 24

Begin Playback

February							2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
26	27	28	29	30	31	1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	1	2	3	4	5	6	7	8

From End

Select
2014/02/10
PM 03:18:46

START

- Select any date shown in underlined font, which indicates the recording data are available. The table shown on the left will display available videos of each channel within the selected date.
- The videos are classified into four categories: Normal, Motion, Alarm In and Video Loss, shown as four different tabs on the top.
- Then, select a preferred time from the time bar. Alternatively, specify the values of date / hour / minute / second under <Select> on the right.
- The <From> and <End> buttons allow users to playback video from the beginning or end of the database.
- Select <Begin Playback> or <START> to start playing back the selected video.

4.3.3 Search by Event

Follow the steps below to search event video through Event List.

- Adjust date / time next to <From> and <End> under <Search By Event> to specify time range of the event search.
- Next to <Select Event>, choose which event types to be included in the event search.
- Select the channels to be added to the event search.
- Click on <Event List> to list event videos that meet the above searching criteria.

The Event List will be shown as below. The list displays by date, time, triggered camera, and alarm type. As some events are deleted, others will be displayed. The latest recorded event video will be listed on the top of the list.

Event List		
Date Time	Ch	Type
2014/02/08 PM 01:56:50	2	Loss
2014/02/08 PM 01:53:03	4	Alarm
2014/02/18 PM 01:44:42	3	Alarm
2014/02/08 PM 01:35:31	1	Motion
2014/02/08 PM 01:25:56	1	Alarm
2014/02/08 PM 01:15:56	2	Motion
First Page		
<<< << < > >> >>>		

Follow the steps to playback videos from the Event List.

- Click on the buttons below to go to previous / next pages.
- Click on a preferred event, and the event preview will be displayed in full-screen. In the meantime, a pop-up window will be shown.
- Click on <Play> to begin the playback.
- Click on <Replay> to replay the preview video from the beginning.
- Click on <Back To List> to return to the Event List.

4.4 Video Export

The following sections will show how to export video through the OSD setup menu and via the quick export function. Note that the system log will keep records of all video exportations, including duration, start time, and end time.



NOTE: Make sure an external storage device is available and connected to the appropriate port for video export.



NOTE: The exported videos will be in Main stream.

4.4.1 OSD Export Menu

The Export menu enables only the accounts with proper authority to export recorded videos to USB storage devices. The Export menu is displayed as below.

Export	
Select Device	
Select Ch:	Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7 Ch8 All
From:	2014/02/07 AM 11:50:05
To:	2014/02/09 PM 03:09:18
Select Events	
Data Type	Normal
Export Format	Original
Digital Signature	No
Erase Disc	No
Begin Export	No

The exported videos will be named by the exporting date and time, and classified by event type. Each recorded video will be exported into four files if digital signature is required, including *.gpg, *.avi (or *.drv), *.sig and readme.txt.

4.4.1.1 Select the External Device

The available external devices for exporting video will be listed by name and free size in the Select Device menu, which is displayed as follows.

Select Device		
Device Name	Available	Sel
xxx-xxx-x-x-xx	256 MB	No
xx-xxx-xx-xxxx	1.5 GB	No



NOTE: The DVR only exports files to external USB drives with FAT32 format. Please format the external device (<Database> → <External Device>, select the device to format), or make sure the USB drive is in FAT32 format before it is connected to the DVR.



NOTE: The volume of the FAT32 file system can only be up to 2TB. Therefore, it is not recommended to format any HDD with capacity greater than 2TB to FAT32 file system, otherwise the volume beyond 2TB will be wasted.

Device Name

The item shows the name of the available device.

Available

The item shows the free space of the available device.

Sel

Set the item to <Yes> to set it as an exporting destination, or <No> to cancel.

4.4.1.2 Select Video for Exporting

Select videos from desired channel(s) with specific date / time and/or event(s), and set the item <Begin Export> to <Yes> to start exporting. The following items are for selecting videos.

Select Channel

Select the channel to export the recorded videos.



NOTE: This item is only available when <Export Format> is set to <DRV> or <AVI>. If <Export Format> is set to <Original>, all channels will be selected.

From / To Time

The items are used to set the time which data export begins and ends. Click to choose date / time and scroll the mouse wheel to adjust the values.

Select Events

Click on this item to display the event list. Set <Sel> column of the exporting event(s) to <YES>.



NOTE: This is only available when <Data Type> is set to <Event> or <Both>.

Data Type

The item is used to select exporting video type. The options are <Normal> (export normal videos only), <Event> (export event videos only) and <Both> (export both normal and event videos).

Export Format

This item is for selecting exporting video format. The options are <DRV>, <AVI>, and <Original>. The DRV and AVI files are compressed video files, while the original files are raw data of the DVR's recorded videos.

The DRV and original files can only be played back with the remote monitoring software and **DVRPlayer**. Multiple-camera video can be played back from one DRV or original file. The AVI files can be played back with Windows Media Player. Note that if multiple channels are exported to AVI files, each channel is exported to a separate file.

4.4.1.3 Digital Signature

Users can export video clip with or without a digital signature. Set this item to <Yes> to export with the signature file, or <No> to export without it.

Each recorded video with digital signature will be exported into four files, including *.gpg, *.avi (or *.drv), *.sig and readme.txt. The *.gpg file name is as the last eight MAC (Media Access Control) address of the unit.

For more information on verifying digital signature, see appendix **DVR Player** in ***OSD Setup Manual***.

4.4.1.4 Begin Export

Set this item to <Yes> and the DVR will prepare to export the select recorded video. The Backup Confirmation window will be displayed for users to double confirm data of the exporting video. Click <Yes> to begin the exportation.

4.4.2 Quick Video Export

In the Playback Control Panel, the Copy icon allows users to easily export the wanted video as *.drv file to an external device, such as a USB ThumbDrive.

If the video is to be exported to an external device, make sure the device is connected to the DVR and the port has been set appropriately for video export.

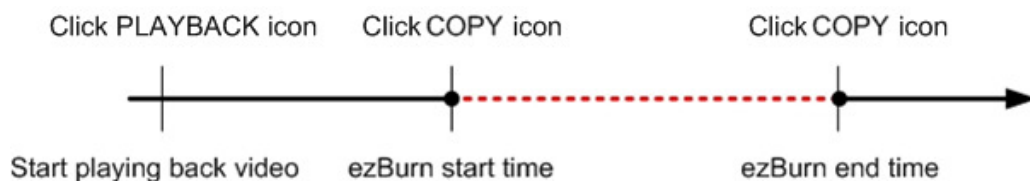
Depending on the size of video, the exporting process may take about 10 minutes to 1 hour.

4.4.2.1 ezBurn Introduction

Built with the ezBurn technology, ezBurn function provides the easier way to export the desired video to an external device, e.g. a USB ThumbDrive.

TWO icons (Playback and Copy) and THREE clicks are all what is needed for completing the exportation. The entire exporting process will be done through the Live Panel and Playback Control Panel, without needing to enter the OSD setup menu.

The ezBurn exporting process is illustrated as below figure:



The entire process is described step by step in the following sections.

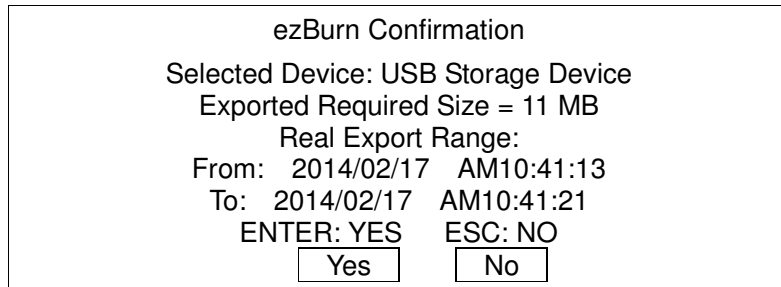


NOTE: The file exported via ezBurn will be in .drv file format, and the video can only be played via the remote player software.

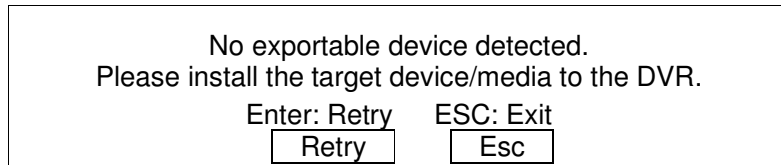
4.4.3 Export Normal Video

To export normal video to external devices, follow these steps:

- Click on the Search icon in the Live Panel, and playback the preferred normal video. Refer to section **Search by Time** or **Calendar Search** for information about normal video playback.
- In Playback mode, the Playback Control Panel will be displayed. Click on the Copy icon once to mark the starting point of the export video. The playback continues.
- Click on the Copy icon again to mark the ending point of the export video. Then, the “ezBurn” window will be displayed as the figure below. The shown information is “read-only”.



- Click on <Yes> to start the exportation, or click on <No> to abort.
- If no exportable device is connected to the DVR, a warning message will be shown as below.



4.4.4 Export Event Video

To export event video, follow these steps:

- Click on the Search icon in the Live Panel, and playback the preferred event video. Refer to section **Searching by Event** for information about event playback.
- In Playback mode, click on the Copy icon. The confirmation message will be displayed as the figure below. The shown information is “read-only”.

ezBurn confirmation			
Selected Device: USB Storage Device			
Exported Required Size = 11 MB			
Export Event Info:			
Data	Time	Ch	Type
2014/02/17	AM10:42:35	13	Motion
ENTER: YES		ESC: NO	
Yes		No	

- If no exportable device is connected to the DVR, a warning message will be shown on the screen.
- Click on <Yes> to start exporting the whole event video to the connected device, or click on <No> to abort.

4.5 Dome Control

The DVR allows users to control a dome camera by the Dome Control function. In Live mode, users can click on a dome camera channel to display it in full-screen. Then click on the Dome Camera Control icon and the Dome Control Panel will be displayed. Please refer to **Setup Guide** for the graphical illustration of the control buttons.

4.5.1 Dome Connection

Follow the steps to install dome cameras.

- See **Setup Guide** for RS-485 port pin definition.
- Connect the R+, R- terminals on the dome camera to the D+, D- terminals on the RS-485 port by RS-485 cable respectively. Refer to the connection figure illustrated in **Setup Guide**.

4.5.2 Dome Protocol Setup

The Dome Protocol item lists the available dome protocols for communicating with dome cameras connected to the DVR. From the OSD setup menu, select <Camera> and the following menu is displayed.

Camera	
Analog Camera Select	CH01
Dome Protocol	None
Dome ID	0
Camera Name	CH1
Covert	No
Termination	Yes
Adjust Video	
Audio Association	Yes
Copy Setting	

To configure dome protocol, select a camera first and set the communications protocol associated with dome camera.



NOTE: The changed settings take effect after users exit the setup menu.

4.5.3 RS485 Setup

The DVR controls the dome cameras via RS-485 communication protocol. The RS-485 parameters in the DVR must be set to the same parameters set in dome camera.

Users are allowed to change the RS-485 settings of the DVR. Select <System> in the OSD setup menu, then select <RS485 Setup> from the System menu. The following menu is displayed.

RS485 Setup	
Unit ID	224
Baud Rate	9600
Bits	8
Stop	1
Parity	None

The ID number must match the ID address set by the dome camera. The Unit ID ranges from 1 to 255. Note that there cannot be any two devices on the same bus given the same ID address, or a conflict may occur.



NOTE: The changed settings take effect after users exit the setup menu.

4.5.4 Dome Control Buttons

After the DVR is in Dome Control mode, a Dome Control Panel will be displayed. The control buttons are: Iris Close/Open, Focus Far/Near, Zoom Out/In, Preset, Live, Pan/Tilt Speed, Direction buttons, and Auto Focus. The functions are described as below.



NOTE: There will be no reaction when users click on the control functions that are not supported by the dome cameras.

Iris Close

Click on it to close the Iris on the dome camera.

Iris Open

Click on it to open the Iris on the dome camera.

Focus Far

Click on it to focus the lens of selected dome camera at a farther point.

Focus Near

Click on it to focus the lens of selected dome camera at a nearer point.

Zoom Out

Click on it to zoom out the lens of selected dome camera. This enables users to shrink the current image and a larger viewing area can be displayed.

Zoom In

Click on it to zoom in the lens of selected dome camera. This function enables users to enlarge a certain area.

Preset

This button is used to enter the Dome Preset menu to set up certain position as a preset and go to the predetermined preset positions for viewing.

Live

Click on it to exit Dome Control mode and return to Live full-screen viewing mode.

Pan/Tilt Speed

Users can select preferred pan/tilt speed.

Direction Buttons

Click on the buttons to pan and tilt the lens of selected dome camera.

Auto Focus

Click on this button to automatically adjust focus of the dome camera.

4.5.5 Set Preset Points

The DVR allows users to set preset positions. The amount of preset points depends on the dome manufacturer.

Follow the steps to set preset points.

- Click on a dome camera channel to display it in full-screen.
- Then, click on the Dome Control icon, and the Dome Control Panel will be displayed.
- Click on the Direction buttons to pan / tilt the dome camera to the desired position.
- Click on the Preset button on the Dome Control Panel to access the Set/Go Preset function. A numeral keyboard will be displayed as below.

1	2	3	←
4	5	6	Set Preset
7	8	9	Go Preset
Exit	0	Clear	Run Tour

- Input a desired preset number.
- Click on the <Set Preset> button to save the position. Now, the preset position is set and ready to be called.

4.5.6 Call Preset Points

Follow the steps to call preset points.

- Click on a dome camera channel to display it in full-screen.
- Then, click on the Dome Control icon, and the Dome Control Panel will be displayed.

- Click on the Preset button on the Dome Control Panel to access the Set/Go Preset function. A numeral keyboard will be displayed.
- Input a desired preset number.
- Click on the <Go Preset> button to call the preset point. Then, the selected dome camera will rotate to the preset position automatically.

4.5.7 Run Dome Camera Tour

Users can also display dome camera tour setup at the dome camera side. Follow the steps to run display of dome camera tour.

- Click on a dome camera channel to display it in full-screen .
- Then click on the Dome Control icon to enter Dome Control mode. The Dome Control Panel will be displayed.
- Click on the Preset button on the Dome Control Panel to access the Set/Go Preset function. A numeral keyboard will be displayed.
- Input a number of the preset tour line.
- Click on the <Run Tour> button to run display of dome camera tour.
- Click on any Direction button to end the display of dome camera tour.

4.6 System Log Exportation

In the Configuration setup menu, select <System Log> and a list of system logs will be displayed on the screen. Users can export the system log as a data file to an external storage device. Connect a USB storage device and click on <Export> to export the system log file to the USB storage device. Note that a digital signature file will also be exported in the mean time.

Configuration	
Load Factory Default	No
Import Config	
Export Config	
System Log	
Operation Log	Off

Also, under the Configuration setup menu, set <Operation Log> to <On> and operation logs will start to be recorded in the system log. Alternatively, set to <Off> and operation logs will not be part of the system log.

5. Remote Monitoring Software

The remote monitoring software is a remote browser-based software designed to operate with the DVR products. By using the software, users are allowed to view live and recorded video, and configure the DVRs remotely via a LAN, WAN or Internet on a personal computer.

The connected PC will automatically download the remote monitoring software plug-ins from the DVR when the DVR is connected by entering its IP address in the address bar of the browser.

The tasks can be performed with the remote monitoring software are listed below:

- Remote viewing of live / recorded video
- Remote setup of the DVR
- Remote control of dome cameras
- Alarm notification from the DVR
- Up to three connections to one DVR using the remote monitoring software, including the preset “admin” and two other accounts



NOTE: The Menu function allows users to remotely access the DVR's OSD setup menu, with some limitations. Refer to the sections above or ***OSD Setup Manual*** for setting configuration of the DVR.

5.1 Remote Monitoring System Requirements

Items	Requirements
Personal Computer	Minimum: Intel® Core™ 2 Duo, 2.4 GHz RAM 1 GB
	Recommended: Intel® Core™ i7-2600, 3.4 GHz RAM 4 GB
Hard Disk Drive	Requires 20 MB for software installation
Operating System	Windows XP, Windows 7, Windows 8
Web Browser	32bit, Microsoft Internet Explorer version 8.0 or above
Monitor Resolution	Minimum 1024 x 768 with 16-bit color
Network Card	Minimum: 10/100 Mbps
	Recommended: 10/100/1000Mbps

5.2 Software Installation

Before operating the remote monitoring software, please first find out the IP address of the DVR. To find the IP address, enter the OSD setup menu and select <System> → <Network Setup> → <LAN Setup> → <IP>. Refer to the following description to install the remote monitoring software.

5.2.1 Change Internet Settings

The PC operating with the remote monitoring software should be set to accept ActiveX plug-ins. Please follow the steps to set the Internet security settings appropriately.

- Start the IE; it can be started either by clicking on the desktop icon, or by using the Start menu to access it.



NOTE: If users wish to use the function “Snapshot” in the remote monitoring software, users must run IE as administrator. To run IE as administrator, right click on the IE browser icon on the desktop and select “Run As Administrator” to launch IE.

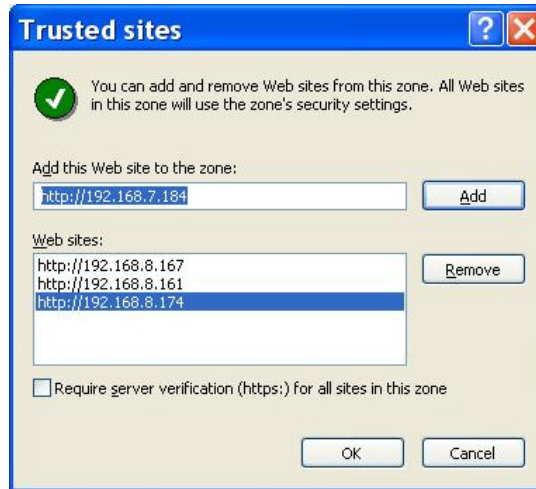


NOTE: Windows IE provides the ActiveX component that is required when using the remote monitoring software.

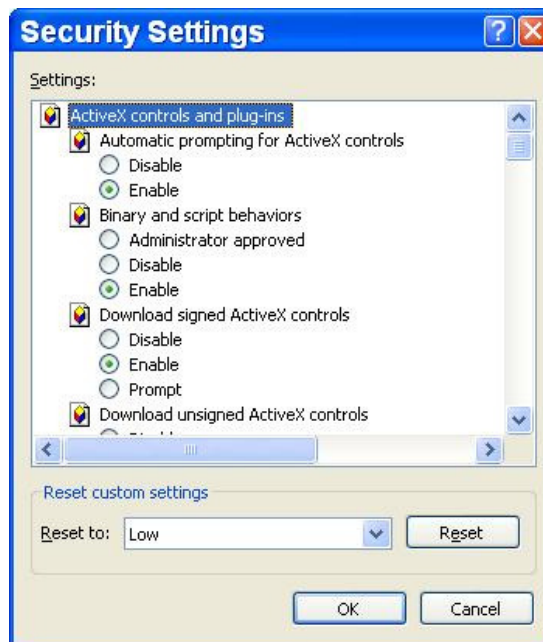
- Select <Tools> from the main menu of the browser, then <Internet Options>, and then click the <Security> tab.
- Select <Trusted sites> and click <Sites> to specify its security setting.



- Uncheck “Require server verification (https:) for all sites in this zone”. Type the IP address of the unit in field and click <Add> to add this web site to the zone.



- Click <OK> to confirm the setting and close Trusted sites dialog.
- In the Security Level area, click <Custom Level>. The Security Settings screen is displayed.



- Under <ActiveX controls and plug-ins>, set all items to <Enable> or <Prompt>.
- Click <OK> to apply the setting and close the <Security Settings> screen.
- Click <OK> to close Internet Options dialog.

Now the installation can continue to the next step.

5.2.2 Install the Remote Monitoring Software

With the IP address of the DVR, the next step is to install the remote monitoring software via connecting to the DVR. Follow the steps below.

- Enter the IP address of the DVR in the address bar of the web browser. The IP address of the DVR can be saved as a Favorites item in the web browser to enable easy access in the future.
- The ActiveX controls and plug-ins dialog will show twice for confirmation. Click <Yes> to accept the installation of ActiveX plug-ins. The remote monitoring software plug-ins will be downloaded and installed on the PC automatically.



NOTE: Do not enter any leading “0” characters in the address, for example, “192.068.080.006” should be entered as “192.68.80.6”. If the default trigger port 80 is changed into another one, take port 81 for example, the IP address should be entered as “192.68.80.6:81”.



- A version check starts to verify whether the remote monitoring software was installed already, and also check if the version is the same as what is stored in the connecting DVR. This process may take up to 30 seconds.
- When the software is completely downloaded and installed, the Login Screen is now displayed.



5.2.2.1 Login / Logout

Login with the same accounts setup in the DVR. The authority level of the accounts is also the same as what was setup in the DVR.

One preset account “admin” and up to two other accounts can access a DVR at the same time. However, if the “admin” account is currently accessing the OSD setup menu of the DVR at the DVR side, then the “admin” account at the remote monitoring site cannot change the settings at the same time. The “admin” account of the DVR at the DVR side has priority.



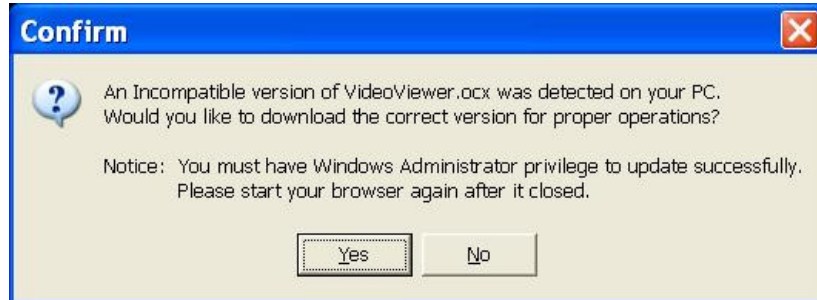
The following steps demonstrate procedures to connect and login to the DVR.

- Start the remote monitoring software by entering the IP Address of the DVR in the address bar of the browser. Alternatively, click on the Favorite entry for the unit (if the IP address of the unit has been set).
- Enter the username and password of the account. The login username and password can be saved to ease future login. The default username and password is **admin / 1234**.
- Click <OK> to login to the DVR. The process may take a few seconds.
- If the connection is made successfully, the main window will display live video of the connected cameras.

If the IE browser is closed, the remote system is logout and disconnected from the DVR at the same time.

5.2.2.2 Software Upgrades

If a new version of the remote monitoring software is available on the DVR, upgrade will be prompted while accessing the unit. Follow the steps to upgrade the software.



- The message as the above figure will be prompted. Click <Yes> to accept version upgrade.
- Start the IE again and enter the IP address of the DVR in the address bar of the browser; or if the unit address is set as a Favorite site, click the Favorites entry for the unit.
- When the software is completely downloaded and installed, the Login Screen will be displayed.

5.3 Basic Operation

When a DVR is successfully connected, the main window of the remote monitoring software will be displayed. Please refer to **Setup Guide** for the graphical illustration of functional items.

The functions on the remote monitoring software will be described in the following sections.

5.3.1 View Live Video

View live video from the cameras attached to the DVR by clicking <Live> button on the main window toolbar. Choose a desired display mode – full-screen, 4-window, 9-window, and 16-window – after the Live images of the DVR are displayed on the main window. When a dome camera is connected and viewed in single channel full-screen mode, the PTZ Control operation can be accessed. To choose a preferred display mode and to operate dome camera control, refer to the following sections.

5.3.1.1 Select Display Mode

Choose the number of windows to be displayed on the main window. Click one of the display buttons in MODE section. Available selections are 4, 9 and 16 camera displays. To view certain window in full-screen, either double-click on the wanted window, or click on the corresponding CAMERA button.

5.3.1.2 Operate Cameras with Dome Control

The remote monitoring software allows users to control and configure a dome camera remotely.

Click on any CAMERA button displayed with a dome icon to view the camera in full-screen. The PTZ Control Panel will be displayed on the main window. The items on the PTZ Control Panel are described as follows.

Auto Focus (A.F.)

Click on it and the focus of the camera will be automatically adjusted to show a clearer image.

Set/Go Preset (•) & Run Tour (•←)

The remote monitoring software allows its user to set up to 255 preset positions according to the allowance of the supported dome cameras.

Use Direction buttons to move dome camera to an appropriate position. Then, click the button, select <Set Preset>, and choose a wanted number from the pull-down list. The preset position is named as the selected number.

Click this button, select <Go Preset> and choose a preferred number from the pull-down list to call the preset point for viewing.

Click this button, select <Run Tour> and the dome camera will start the tour set previously at the dome camera side.

Dome ID (ID)

Click for changing the dome ID and protocol. Proper authority is required to access this function.

Focus +/-

Use these buttons to adjust the camera lens to focus on objects for a clear view. Click on <Focus +> to focus near or <Focus -> to focus far.

Iris +/-

This item is used to open and close the iris to let more or less light into the camera. Click on <Iris +> to open iris or <Iris -> to close iris.

Zoom +/-

Users are allowed to zoom-in or zoom-out by using the adjusting buttons. Zoom-in to enlarge a certain area and zoom-out to view more area.

Direction Button

This button is used to pan and/or tilt the dome camera. Click the arrows in the directions to be viewed.

5.3.1.3 Digital Zoom of Camera Display

Users can view the camera zoom-in images via the digital zoom function. Zoom in/out can be easily controlled via the mouse scroll wheel.

Scroll up the mouse wheel to zoom in and down to zoom out. On the upper-left corner will show zoom-in magnification. The maximum magnification is X7. Also, on the lower-right corner will display the position of the current viewing area (shown as an inner white rectangle) comparing with the original screen (shown as an outer rectangle frame).

In addition, the viewing area can be changed by left clicking and dragging the mouse.



NOTE: This function will use up a lot of CPU resources. It is recommended not to open too many programs at the same time to avoid CPU crash.

5.3.2 Instant Recording

The Instant Recording function allows users to record video quickly to the PC.



NOTE: The Audio function is set to OFF by default.

5.3.2.1 Record Video Instantly

Follow the steps to start recording instantly:

- Click on the <Instant Recording> button.
- Select the destination folder to save the video.
- Click on the button again to stop recording.



NOTE: The instant recording video will be saved as *.drv file.

5.3.2.2 Playback Instant Recorded Video

Follow the steps to playback a video recorded by “Instant Recording”.

- Click <Play> on main window toolbar and click <Local Playback> tab.
- Click <Open> to choose a recorded file.
- Click <OK> to start playing the recorded video.

5.3.3 Playback Video

The remote monitoring software allows users to view recorded video either from the DVR, or from the hard disk drive of the PC

To access the Playback screen, click <Play> button on the main window toolbar. There are three tabs in the Playback screen: <Remote Playback>, <Local Playback>, and <Verify> tabs. <Remote Playback> allows users to play back from the DVR. <Local Playback> enables users to playback a recorded video file stored on the hard disk drive of the PC. <Verify> is provided for users to authenticate if the exported video is altered.

The DVR continues recording while playing back recorded video on the PC, either remote playback or local playback.

5.3.3.1 Playback Remote Video

To view remote video, click <Play> on the main window toolbar, and then <Remote Playback> tab. The <Remote Playback> screen will be displayed.

The <From> and <To> in the <Available Record Video> display the date and time from which recorded video is available for playback. The calendar on the right indicates dates with available videos. The time slider bar is shown for different channels with classified event videos.

To playback remote video segments, follow these steps:

- Choose <Playback> in <Select> field for playback recorded video.
- In <Start> field, users can change the date and time either by typing desired numbers directly or using the arrow buttons.

To type directly:

Click on day, month and year of date field respectively, and type the desired numbers directly. Follow above steps to adjust the hour, minute and second of time field.

To use the arrow buttons:

Click on the arrow button next to the date field to display the calendar; then click the left and right arrow at the top of the calendar to change the date. Use up and down arrow next to the time field to change to the wanted time.

- The other way to select date and time is by moving the blue sliding bar.
- Click <OK> to start the playback, or click <Close> to abort.
- The other option <Download (.DRV)> in <Select> field enables users to download the video segment of selected date and time to the PC. The selection of time duration is the same as described above. Files downloaded will be in *.drv format..

5.3.3.2 Playback Local *.drv Files

The <Local Playback> tab allows users to playback *.drv video files stored in the PC's hard drive.

Follow below steps to playback a downloaded *.drv file with the remote monitoring software.

- Click <Open> and the file selection screen is displayed.
- Select the *.drv video file for playback and click <OK>.
- Click <OK> in the <Local Playback> Screen to start the playback, or click <Cancel> to abort.
- View the video playback using the Playback controls.
- To end the playback, click <Live> to return to live video.

5.3.3.3 Playback Controls

When the video playback begins, the remote monitoring software is in Playback Mode. The playback controls toolbar will emerge on the main window toolbar. The Playback controls and indicators are described as below.

Icon	Name	Description
	Fast Backward / Step Backward	1. Click to play the recorded video in backward direction. Click repeatedly to select the backward playback speed: 1×, 2×, 4×, 8×, 16×, or 32×. 2. When playback is paused, click repeatedly to move backward step-by-step.
	Play / Pause	1. While playing, click to pause the playback. 2. When paused, click to resume the playback.
	Fast Forward / Step Forward	1. Click to play the recorded video in forward direction. Click repeatedly to select the forward playback speed: 1×, 2×, 4×, 8×, 16×, or 32×. 2. When playback is paused, click repeatedly to move forward step-by-step.

5.3.4 Verify Digital Signature

The digital signature aims to authenticate a video file exported from the unit. Follow the description to verify the digital signature.

- Click <Play> on the main window toolbar.
- Click <Verify> tab to display the Verify window.
- Click <Browse> to select the *.gpg, *.avi, *.sig files respectively, which belong to the exported video to be authenticated.
- Click <Verify> to start verifying digital signature.
- The result of verify shows in the <Status Log> field. It returns a GOOD or BAD signature result. A GOOD signature indicates the exported clip has not been altered.

5.3.5 Search from Event List

Click SEARCH, the Event List appears. The List contains information about the alarm events that the unit recorded and saved. Up to 1024 events can be listed in the Event List.

The Event List displays each event by its number, the date and time of the event, the type of the event (including Alarm In, Motion Detection, and Video Loss), and the camera channel where the event took place.

To view an event video, follow these steps:

- Click SEARCH button in the main window toolbar. The Event List appears.
- Scroll through the Event List and highlight the interested events.
- The event list can be filtered by date / time, channel, or event type via the search option on the right.
- Double-click on the desired event to view the event video.

5.3.6 Take a Snapshot

Snapshot is a simple screen capture tool. When users click on the SNAPSHOT button, it will capture the screenshot of the window that is currently showing on the screen. Each click captures one screenshot to be saved as a JPEG file on the desktop. The snapshot file will be named as "Snapshot-*".



NOTE: To ensure that the snapshot files can be saved on the desktop, users must run IE as administrator. To run IE as administrator, right click on the IE browser icon on the desktop and select "Run As Administrator" to launch IE.

5.3.7 Health Status

This function verifies the HDD status of the DVR. The information items in the status chart are described as below.

Device Name

This item shows the model name of the HDD.

Int./Ext.

This item indicates whether the HDD is an internal or external device.

Total Size

This item indicates the total size of the HDD.

State

This item indicates whether the HDD is active or non-active.

Temperature

This item indicates the current temperature of the HDD in Celsius degree.

5.3.8 Normal and Dual Streaming

For different networks with different bandwidths, two streaming options are provided – normal and dual streaming. The preset is normal streaming.

Users who are using high-speed networks, normal streaming will be a recommended choice. According to the HDD capacity and network usage, set the remote monitoring software to occupy high or low bandwidths.

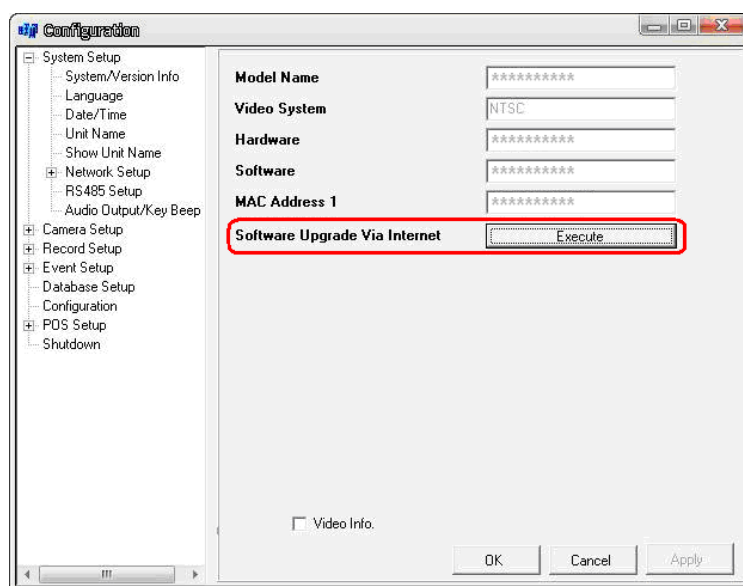
For networks with limited bandwidth, dual streaming will be a better choice. It enables coexistence of high quality streaming at the local DVR site and lower quality streaming but faster transmission for the remote monitoring site. To select dual streaming, click on the bandwidth icon and the icon will change color. Then, users can further choose different bit rates to adjust for the best displaying quality.

5.3.9 Upgrade Remote Software / Reboot of Connected DVR

Users can remotely perform software upgrade or reboot the connected DVR.

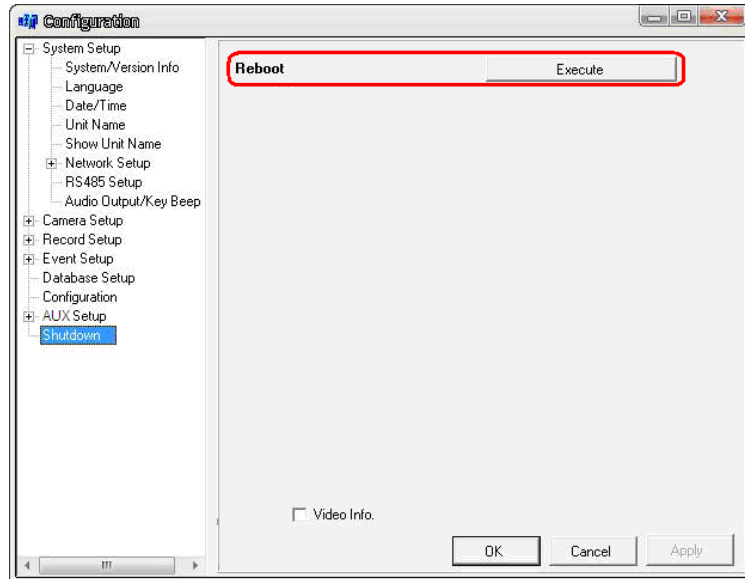
Remote Software Upgrade

Click MENU button in the main window toolbar. A Configuration window will be displayed. Go to <System Setup> → <System/Version Info> and the menu is as shown below. Then click on the Execute button and locate the upgrade file “*.tar” or files “*.tgz & *.md5” to start remote software upgrade.



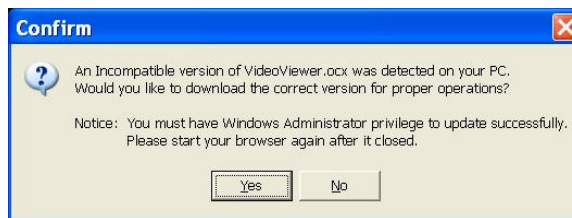
Remotely Reboot

Also from the Configuration window, access the Shutdown menu as shown below. Then click on the Execute button to remotely reboot the DVR.

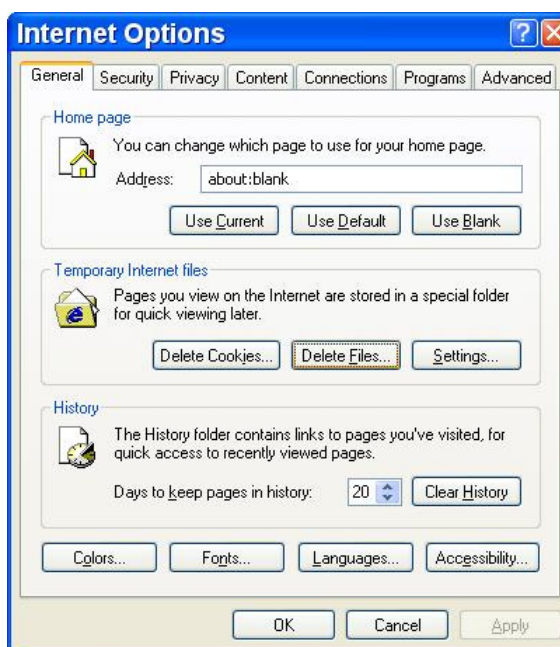


5.3.10 Remote Monitoring Software Troubleshooting

What happened if the server requests to upgrade the software every time the DVR is connected? If the following screen displays repeatedly, please follow the steps to delete the temporary internet files.



- Select <Tools> from the main menu of the web browser, then <Internet Options>, and then click the <General> tab.



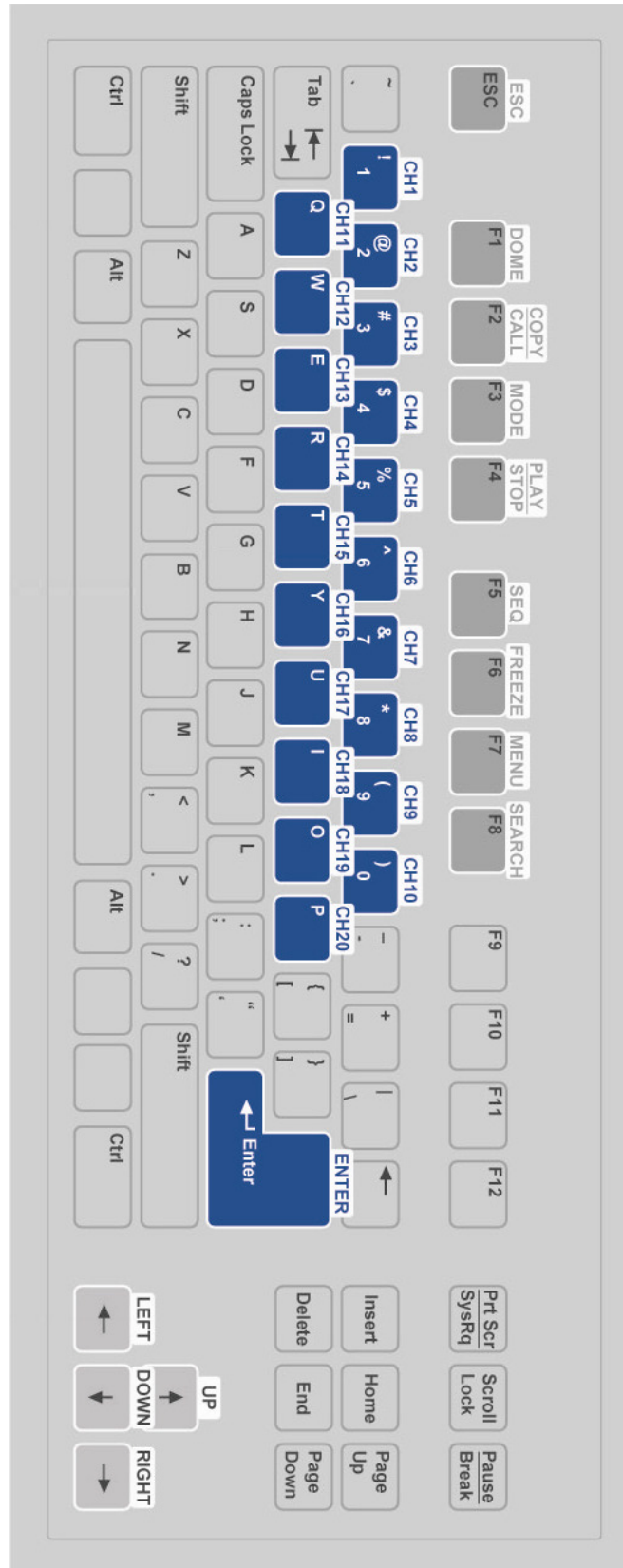
- Click the <Delete Files> button in the <Temporary Internet Files> field; the <Delete Files> window displays as below.



- Check the <Delete all offline content> box and click <OK>.
- Now, enter the IP address of the DVR to make the connection again.

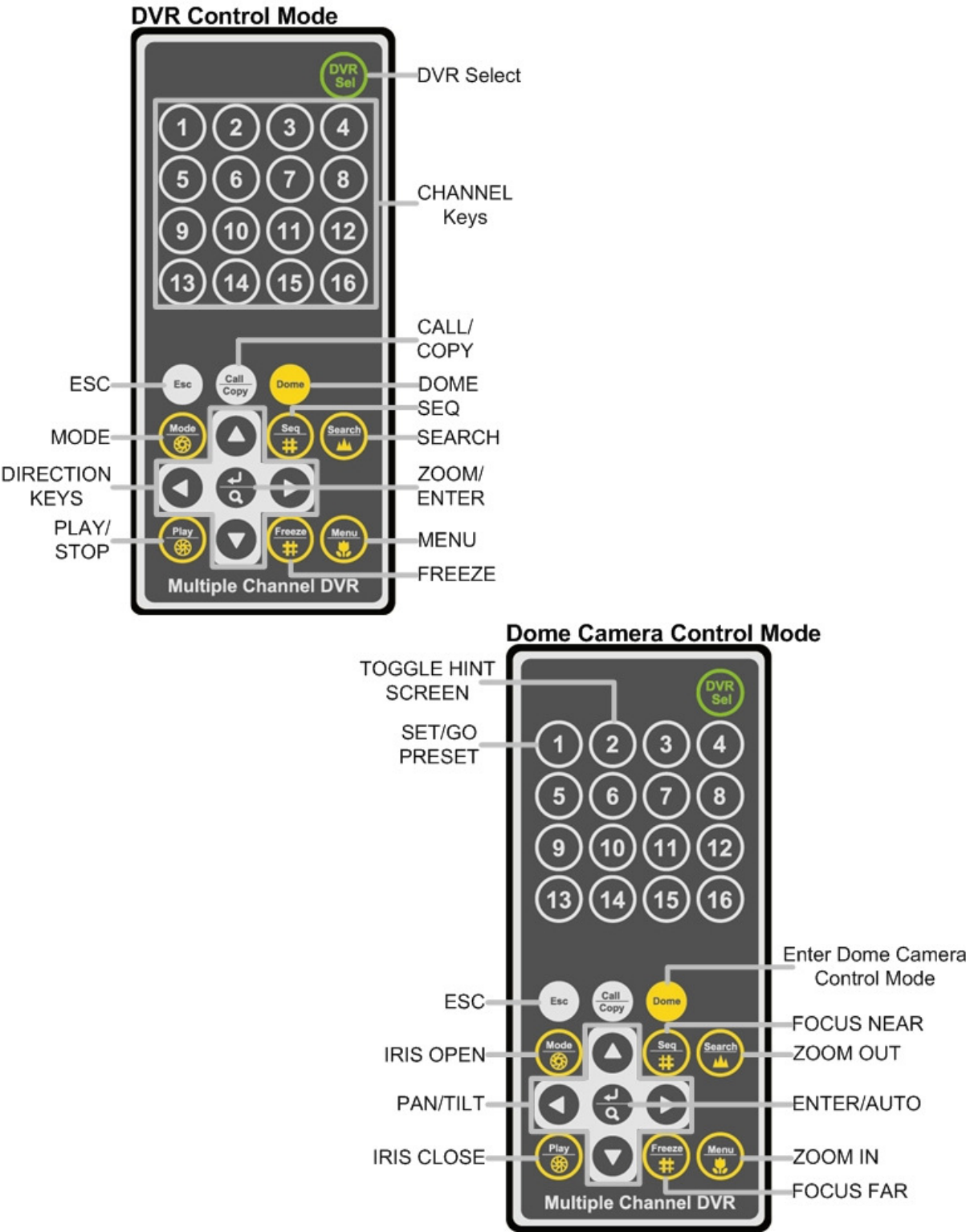
Appendix A: Keyboard Access Sketch

The following sketch shows the keys used to access and control the connected DVR.



Appendix B: Remote Controller

The operational function keys on the remote control are listed as below figure:



The keys of the remote control function as the icons of the Live Panel of the DVR. The only difference between the two is the “DVR SEL” key. The DVR Selection key is used to switch control between each DVR.

The remote control can be used to control up to 16 DVRs. To setup the remote control, the first thing is to assign a unique DVR Unit ID to each DVR.

Use the Live Panel of the DVR, and follow this path to change the DVR Unit ID, <Main Menu> → <System> → <RS485 Setup> → <Unit ID>. Change the DVR Unit ID to any number between 224 and 239, and exit the menu.

The ID Table is listed below for reference.

DVR Unit ID	224	225	226	227	228	229	230	231
Remote Control #	1	2	3	4	5	6	7	8

DVR Unit ID	232	233	234	235	236	237	238	239
Remote Control #	9	10	11	12	13	14	15	16

After the DVR Unit ID is changed, setup the “DVR SEL” of the remote control. Press “DVR SEL”, and then press the Remote Control # immediately to select the DVR. For example, assuming the DVR Unit ID is set to 225, press “DVR SEL” and then press “2” immediately. Now, the remote control will only be able to control the specified DVR. Press “DVR SEL”, and then press the Remote control # to switch between DVRs.

To exit the single DVR Control mode, press “DVR SEL”, and then press “ESC” to do so.

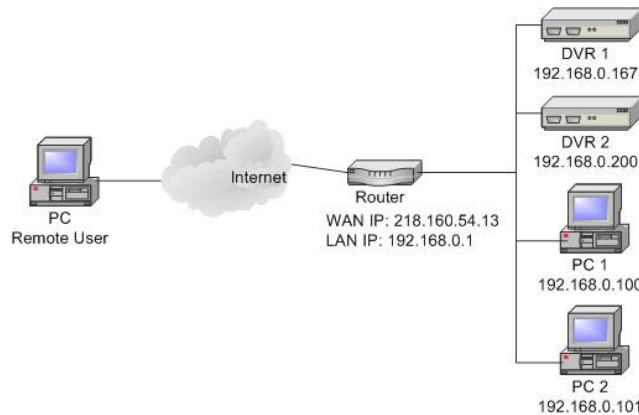
Appendix: Setup a DVR Behind a Router

This appendix describes how to set up a router if the DVR connects to the internet via a router.

To properly operate a web server, e.g. a DVR, users have to set up both the IP and port of the DVR, which are essential for data and command transmission. The port setting is adjustable in OSD setup menu of the DVR and only one port is needed to do remote operation. Typically and by the default, the DVR operates on port 80, which is well known as the http port. Please make sure that port 80 is not blocked by the ISP. Otherwise, a different available port shall be reset and the setting of the DVR shall be changed.



In case a router or sometimes a DSL modem is in place, the real IP is now assigned to the router instead of the DVR. The DVR is located behind the wall (router) and operates on virtual IP. In most cases, virtual IP starts with 192.168.x.x. The router has two IP: one is real IP (WAN IP); the other is virtual IP (LAN IP). The virtual IP would be 192.168.x.1. When the remote users want to operate the DVR, they will have to send command to the real IP, i.e. the router. Then the router has to map (forward) the command to the DVR. Thus, it is required to set up the router for port mapping (forwarding) before images from the DVR can be remotely viewed on a PC.

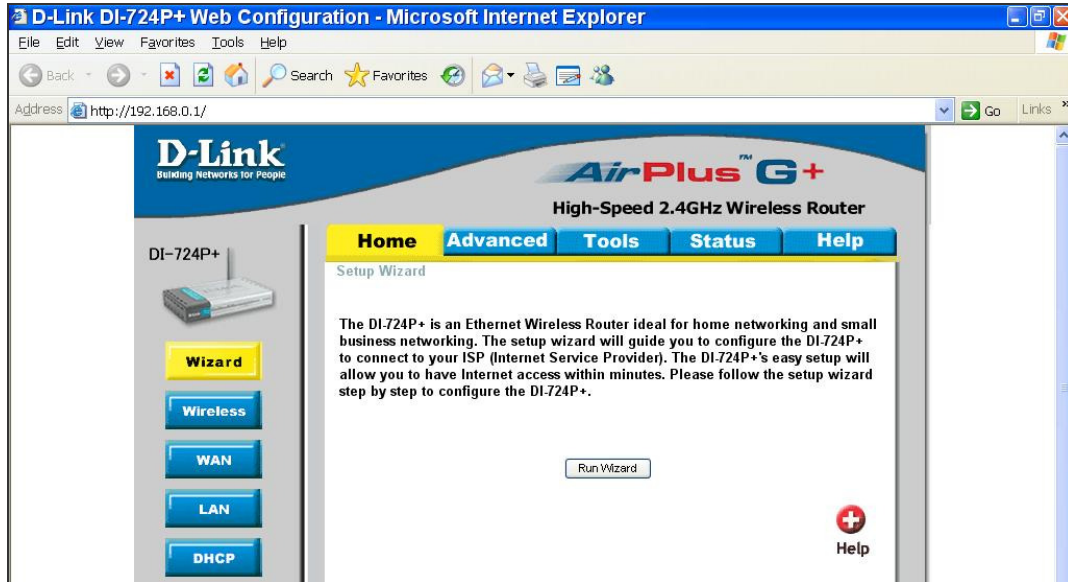


See the router manufacturer's websites for more instructions on port mapping.

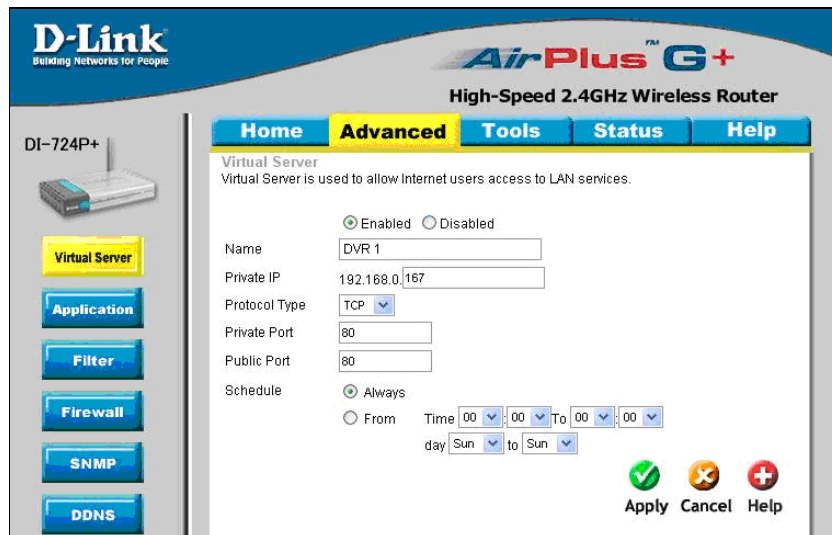
Following is an example of how the router should be set.

Router	PC	DVR 1	DVR 2
(D-Link DI-724P+) WAN IP: 218.160.54.13 LAN IP: 192.168.0.1	IP: 192.168.0.100	IP: 192.168.0.167 Trigger port: 80	IP: 192.168.0.200 Trigger port: 81

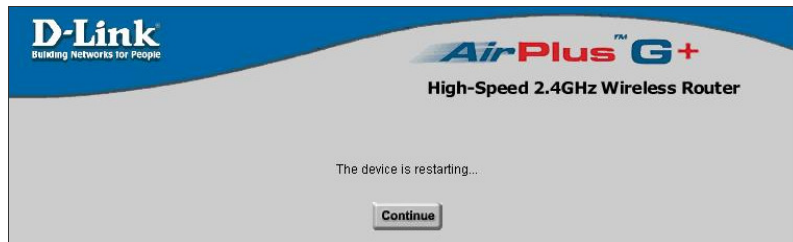
- To change the setting of the router, a PC with web browser is required.
- Connect to D-Link DI-724P+ from PC via IE. The setup screen will be shown after entering the correct username and password.



- Click the <Advanced> tab and follow the steps to set up web port forward to DVR 1.



- A. Select <Enabled> to set up the service.
 - B. Enter the name of the setting in the Name field: DVR 1.
 - C. Enter Private IP: 167
 - D. Choose <TCP> as the Protocol Type.
 - E. Enter Private Port: 80.
 - F. Enter Public Port: 80.
 - G. Click <Always> for the Schedule setting.
 - H. Click <Apply>.
- Click <Continue> to go on when the following screen displays.



- Follow the steps to set up web port forward to DVR 2.
 - A. Click <Enabled> to set up the service.
 - B. Enter the name of the setting in the Name field: DVR 2.
 - C. Enter Private IP: 200
 - D. Choose <TCP> as the Protocol Type.
 - E. Enter Private Port: 81.
 - F. Enter Public Port: 81.
 - G. Click <Always> for the Schedule setting.
 - H. Click <Apply>.
- Now DVR 1 can be connected via <http://218.160.54.13:80> and DVR 2 can be connected via <http://218.160.54.13:81>.
- If there are more than one DVR behind the router, repeat the steps for port mapping setting.