

**USER'S GUIDE** Ver.037

# *Workhorse* **120-4**

English

Operating Instructions & User's Guide



# Statement of Compliance with FCC

Model Name: Workhorse 120-4

This device complies with Section 15 of the FCC Rules. Operation is covered by the following provisions: (1) This device shall not cause harmful interference, and; (2) This device must accept any interference received including interference that may cause unintended operations.

## Warning

- Unauthorized reproduction of all or part of the contents of this manual is strictly prohibited.
- The figures in this manual are for illustration purposes only (may differ from the actual product).
- The specifications and design of the product are subject to change without prior notice for purposes of quality improvement.

## Cautions



To get the best use out of the product, be sure to read the cautions before using the product.

For your safety, please take note of the following:

- Caution
  1. To prevent electric shock when installing, moving, or opening the DVR and peripheral devices, connect and disconnect the cables as instructed in this manual. All cables must be connected to grounded outlets.
  2. Install the DVR such that it is easy to disconnect the power cord.
  3. Do not use the DVR in water or in wet places (may cause electric shock).
  4. Keep the vinyl packing materials used for the DVR or other peripheral devices out of reach of children (may cause suffocation).
- DVR Installation Environment
  1. The operating temperature should be 0°C ~ 40°C, and the operating humidity, 10% ~ 80%.
  2. Install the DVR in a safe, vibration-free place.
  3. Install the DVR in a well-ventilated place.
  4. To protect the hard drive from data loss and problems, install the DVR away from magnetic interference.
  5. When a standard rack is not used, use a separate table that allows gaps of 60cm from the floor, 50cm from the ceiling, and 20cm from the wall.
- Safety Notes on the DVR
  1. When installing additional boards and HDDs, disconnect the power cable and turn off the power of the DVR completely.
  2. Keep the product away from heat sources such as heaters.
  3. Do not use a damaged power cord.
  4. To prevent and minimize trouble due to magnetic interference and electric surge, use only grounded cables and outlets.

5. Do not touch the power supply while the power cord is connected. Even if the switch is turned off, electricity continues to flow through the cable and power supply while the power cord is connected.
  6. Do not place heavy objects on the product.
  7. Do not drop conductive objects into the ventilation holes.
  8. Allow sufficient space for system cabling (video inputs/loop outs) on the back of the unit.
  9. Use only the items indicated in this manual. Do not attempt to disassemble, repair, or remodel the product without permission. IT WILL VOID YOUR WARRANTY.
  10. Incorrect system setup may cause undesirable effects.
  11. Shut down the system properly as instructed in this manual.
  12. The UPS power supply contains a small amount of toxic substances. Improper installation of the battery, exposure to fire or moisture, disassembly or short circuit may cause explosion. Keep the battery pack out of reach of infants or children.
- Safety Notes on the Lithium Battery
    1. Replace lithium batteries as instructed in this manual.
    2. Dispose of used lithium batteries properly.

Warnings and Cautions are indicated as follows:

 <b>Warning</b>	Possible injury or product damage
 <b>Caution</b>	Risk of minor injury or product damage

# Workhorse 120-4

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## C/O/N/T/E/N/T/S

### Workhorse 120-4

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# 1. Overview

## 1-1. About the Product

Workhorse 120-4 is a digital video monitoring system. This product can display and record, at a high resolution rate, the video data of up to four cameras.

Front buttons, remote control, and mouse are provided for the user's convenience; along with network features including monitoring and remote system setup.

Workhorse 120-4 supports up to 120/100 (NTSC/PAL) fps.

## 1-2. Major Features

- Stable Standalone DVR (embedded Linux)
- Video output
  - Loop output: 4 BNC
  - Monitor output: 1 BNC, 1 VGA
- Simultaneous real-time display, recording, and playback at 120/100 (NTSC/PAL) fps
- Resolution
  - NTSC: 320x240, 640x240, 640x480
  - PAL: 320x288, 640x288, 640x576
- Compression type: MPEG4 (video)/G.726 (audio)
- Backup/Copy: Ethernet, USB2.0, Built-in CD-RW
- System operation: Front buttons/Remote control/Network/USB2.0 mouse/System control
- 2-channel audio input
- Various-network-interfaces
  - Cable modem, Ethernet, ADSL/DHCP client
- System automation (all features are remote controllable)
- NTP support
- Various-recording-modes
  - Auto, Continuous, Event (sensor, motion, sound) recording
- Recording schedule
- Multi-language support, Automatic emailing
- PTZ control through RS485 communication
- Remote monitoring software, Remote monitoring through the web browser, PDA viewer
- Storage device
  - Internal storage device: Max. of 4HDD, 2TB

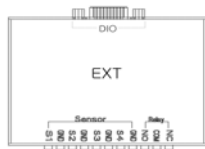
### 1-3. Components

After unpacking the product, check whether the following accessories are included:

#### 1) Basic parts



#### 2) Optional parts



DIO (Sensor/Relay) Extension Module



DIO (Sensor/Relay) Extension Module Cable

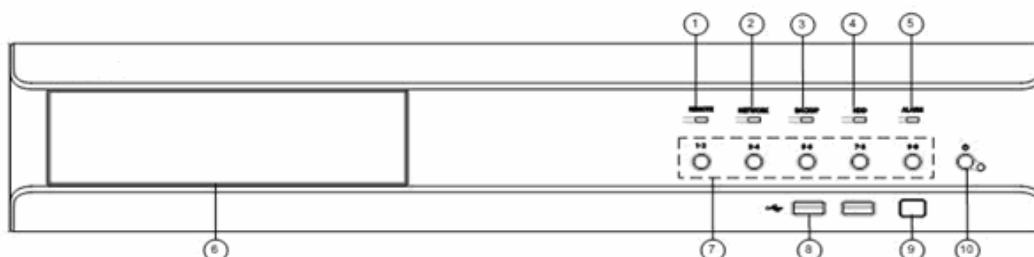


## 2. Installation and Connection

### 2-1. Name and Features of Each Part

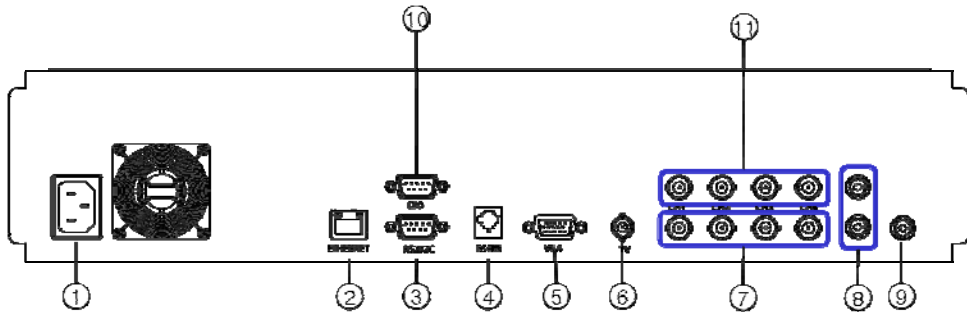
Buttons are conveniently located on the front panel of the Workhorse 120-4, and various interfaces, on its rear panel. Workhorse 120-4 can be easily installed in a standard rack using the rack mounting handles (on the left and right sides).

#### 2-1-1. Front Part



No	Name	Features
1	<b>Remote</b>	The green light is ON when the remote control is accessing the DVR
2	<b>Network</b>	The green light is ON when the DVR is being accessed through the network
3	<b>Backup</b>	The green light is ON when the DVR is making a backup
4	<b>HDD</b>	The green light is turned ON when the hard drive is operating.
5	<b>Alarm</b>	The red light is ON when an alarm is triggered.
6	<b>CD-RW/DVD-RW</b>	CD-RW/DVD-RW installation slot
7	<b>Numeric buttons</b>	Numeric buttons
8	<b>USB</b>	External backup device or USB mouse connection
9	<b>Remote control sensor</b>	Remote control reception sensor
10	<b>Power</b>	System power ON/OFF or Selection button

## 2-1-2. Rear Part



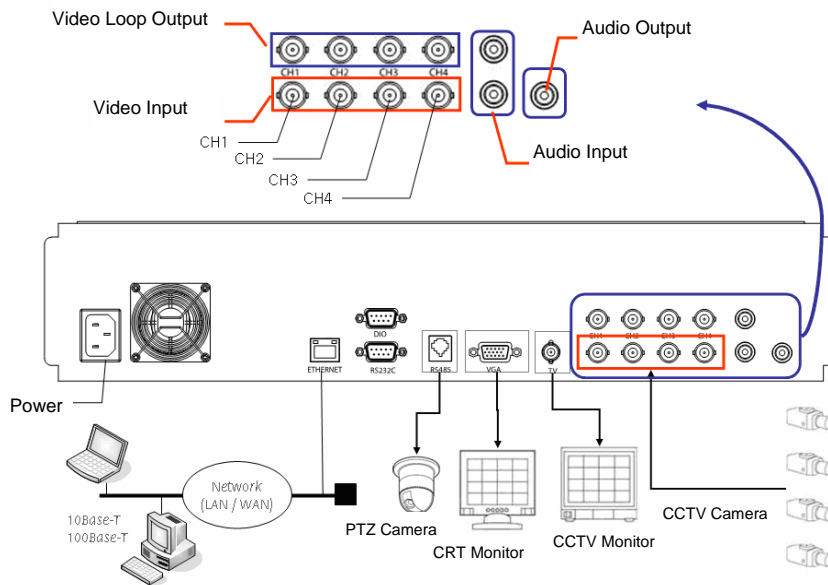
No	Name	Features	Form
1	AC in	Power cable connection to the body	
2	Ethernet	ADSL, Cable modem, and Ethernet 10/100 Base-T connection	RJ-45
3	RS-232C	PSTN/ISDN modem connection or Serial cable connection for system upgrade	D-SUB 9 pin
4	RS485	PTZ camera control cable connection	RJ-11 6-pin
5	VGA	VGA monitor connection	D-SUB 15 pin
6	TV	CCTV monitor connection	BNC
7	Video in	Video camera connection	BNC
8	Audio in	Audio input connection (line only input) - 2-line	RCA
9	Audio out	Audio output connection (line only output) -1-line	RCA
10	DIO	DIO (sensor/relay) extension module connection	D-SUB 25 pin
11	Video out (loop-out)	Video signal loop-out connection	BNC

## 2-2. Installation and Connection

### 2-2-1. Basic Connection

Connect the DVR to the CCTV cameras, CCTV monitor (or PC monitor), PTZ camera control cable, audio input/output port, network, and sensor as shown below:

	Connection Device	DVR Port
1	CCTV camera	BNC Video input
2	CCTV monitor (or PC monitor)	BNC or VGA
3	PTZ camera control cable	RS485
4	Audio input/output	Audio input (line in)/Audio output (line out)
5	LAN cable	Ethernet
6	DIO (sensor/relay) extended module	DIO



1. The inputted video type must be either NTSC or PAL; these two types must not be used together.
2. The inputted video type (NTSC/PAL) is automatically recognized upon the initial operation of the system.

**(1) PTZ camera**

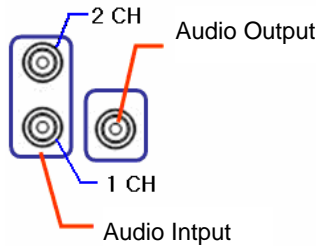
□ To use a PTZ camera, connect the control cable to the RS485 connector.

RS485 uses the RJ-11 6-pin type. Below is the pin arrangement:

Pin	1	2	3	4	5	6
RS485	GND	TR+	TR-	TR+	TR-	GND

**(2) Audio input/output**

There are two audio input ports and one audio output port.

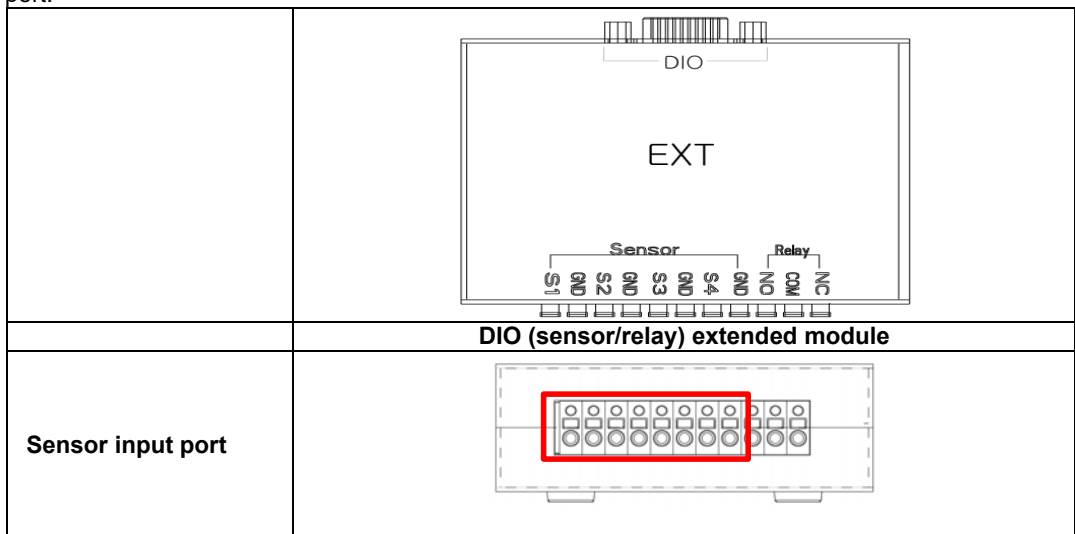


**(3) DIO (sensor/relay) extension module**

Connect the DIO (sensor/relay) extension module to the DIO connector on the rear side using a D-SUB 25-type extension cable.

**A) External sensor connection option**

The DIO (sensor/relay) extension module consists of four sensor input ports and one relay output port.



Connecting the external sensors

- Connect the external sensor cables to S1 ~ S4 on the input ports of the DIO (sensor/relay) extension module with the GND symbol.
- Each input port may be used regardless of the channel number.

Example - Connecting three external sensors

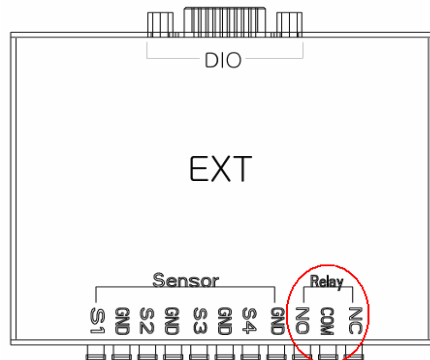
Connect the external sensor cable to the sensor input ports as shown below:

External Sensor	Input Port	Ground Port
Sensor 1	S1	GND
Sensor 2	S3	GND
Sensor 3	S4	GND

Sensor types include Normal Close (NC) or Normal Open (NO). For more information on sensor type setting, see **{5-1-2 Recording Setup} → {(7) Event Setup} → {(B) Sensor}**.  
**Normal Close (NC):** Opens in case of incoming signal when closed normally  
**Normal Open (NO):** Closes in case of incoming signal when opened normally

**B) Relay connection**

**Relay output port**



- Connect the alarm light or external alarm device to the relay output port to generate alarms through the external alarm device.
- Connect the external alarm device to the COM or NC/NO output port of the DIO (sensor/relay) extension module.

Example - Connecting one external sensor

Connect the external sensor cable to the relay output port:

External Alarm Device	Output Port	Ground Port
Relay 1	NC or NO	COM

Relay types include Normal Close (NC) or Normal Open (NO). For more information on relay setting, see **{5-1-2 Recording Setup} → {(8) Alarm Output} → {(C) Relay}**.  
**Normal Close (NC):** Opens in case of incoming signal when closed normally  
**Normal Open (NO):** Closes in case of incoming signal when opened normally

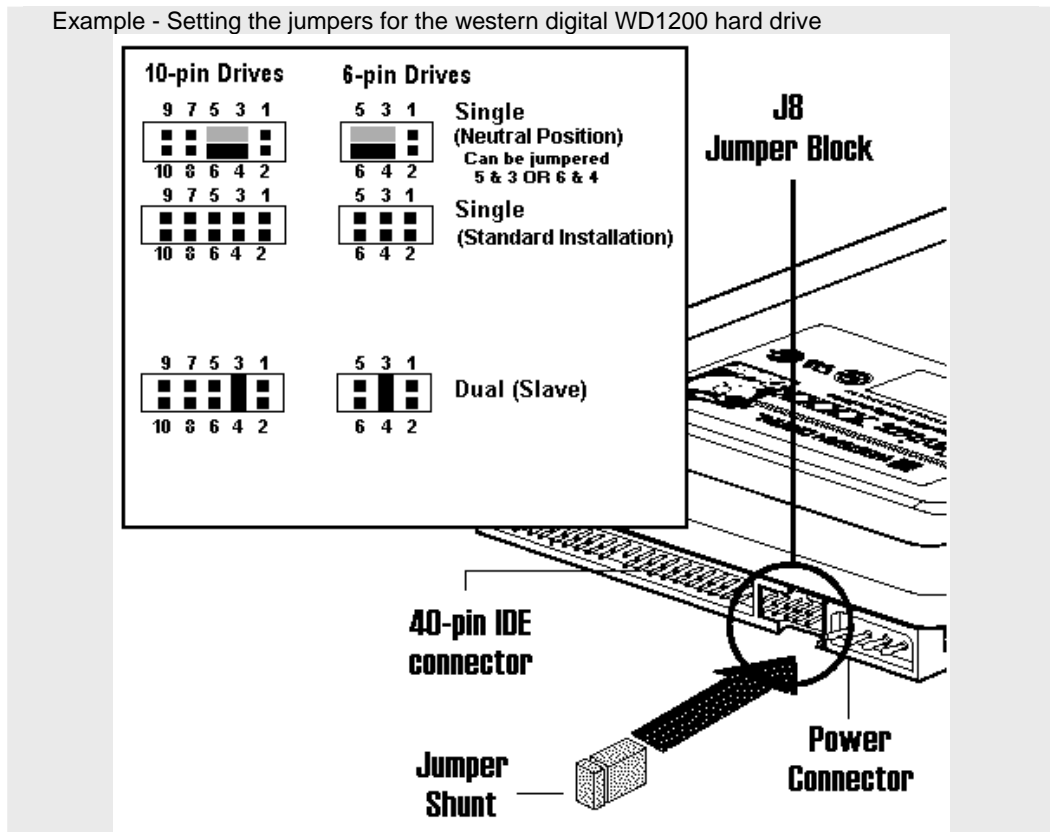
## 2-2-2. Adding a Hard Drive

- Up to four hard drive s may be installed in the system using two hard drive cables.
- Each hard drive cable can connect two hard drive s, which must be configured in master-slave structure.
- In the absence of CD-RW, two hard drive bays are installed: one on the right and the other on the left. If there is a CD-RW, however, only two hard drive bays are installed on the right.



The jumper setting method varies by manufacturer or model. Refer to the jumper setting information marked on the front side of the hard drive .

Example - Setting the jumpers for the western digital WD1200 hard drive



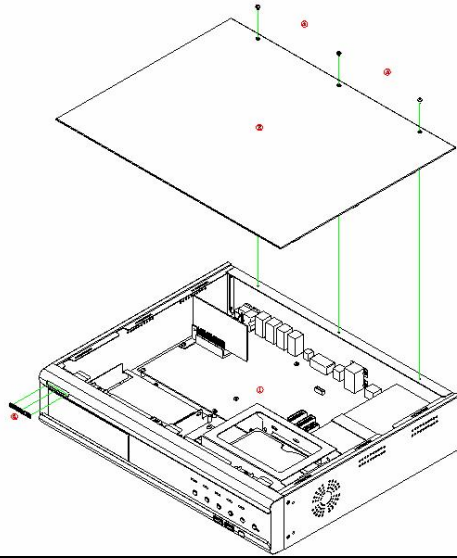
### ■ Adding a Hard Drive



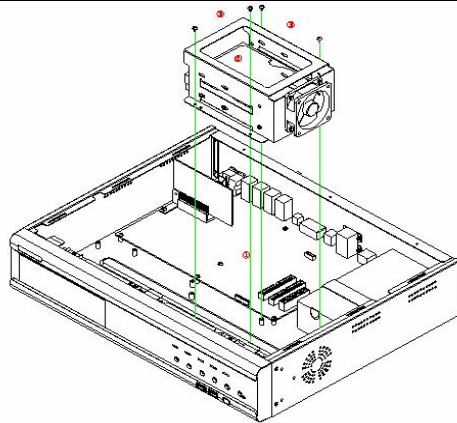
- 1) Before installing the HDD, turn off the DVR and disconnect the power cord.
- 2) Never touch grounded metallic objects when installing the HDD (may cause the body to absorb static electricity, which in turn can cause problems in the DVR).
- 3) After installing the HDD, do not turn the power ON until the top cover is closed. Never use the DVR with the top cover opened.

□ Before turning OFF the power, shut down the system first.

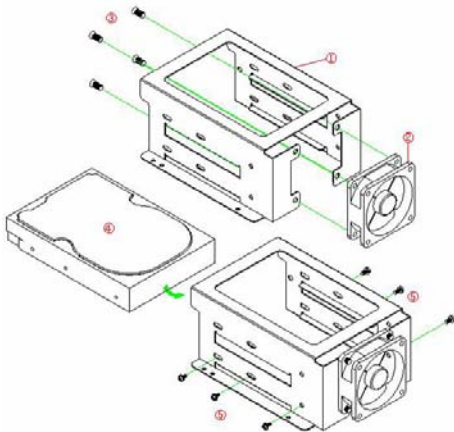
□ Unscrew and open the upper case.



□ Unscrew the hard drive bay using a screwdriver and separate the hard drive bay from the body.



□ Insert the hard drives into the hard drive bay

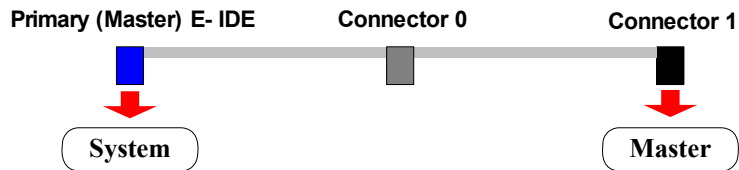


- Connect the hard drive power cable and hard drive connection cable to the corresponding plugs.

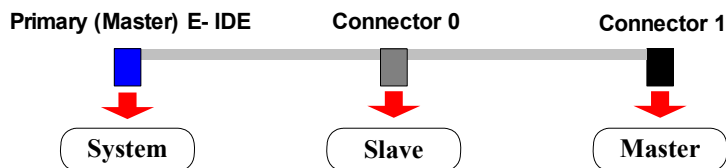
Connect the hard drive connection cable as follows:

1. Connecting one hard drive connection cable

1) Installing one HDD

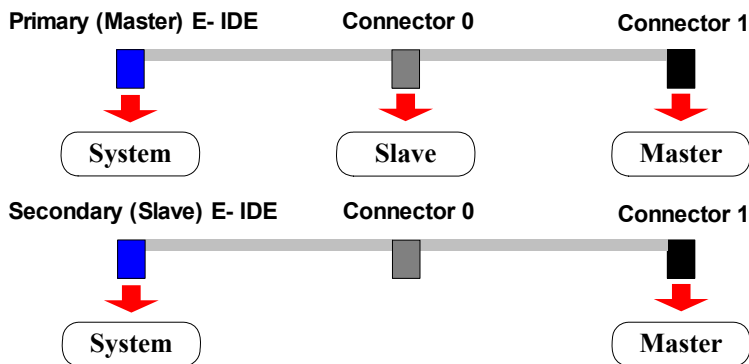


2) Installing two HDDs

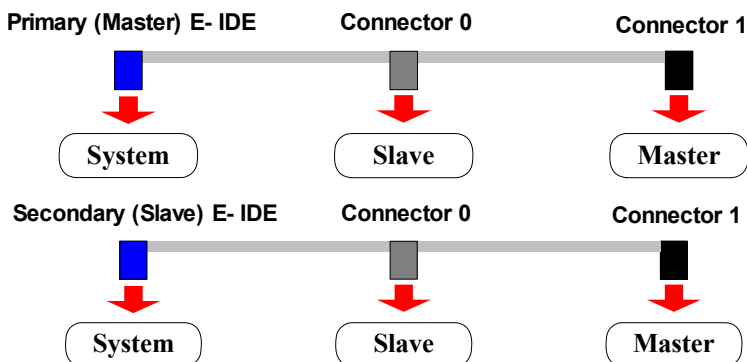


2. Connecting two hard drive connection cables

1) Installing three HDDs



2) Installing four HDDs





Place the hard drive bay back in the DVR and fasten with screws.

Close the upper case and fasten the screws.

Turn the power ON and start the system.

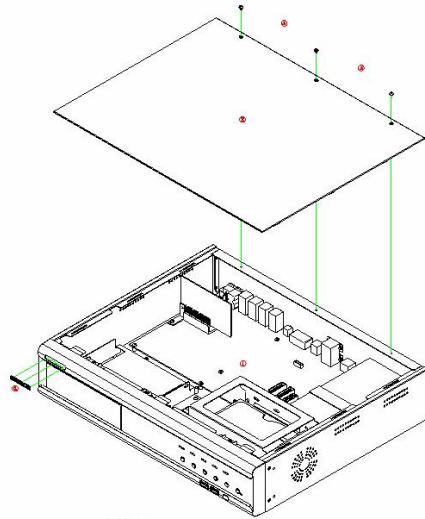


After adding a hard drive, select **{Main Setup} -> {Storage Device} -> {Local} -> {3. Manage Local Storage Device}**. For more information, see **{5. System Setup} -> {5-1 Main Setup} -> {5-1-5 Storage Device}**.

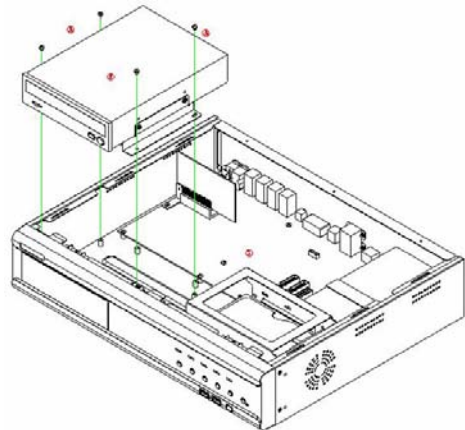
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### 2-2-3. CD-RW/DVD-RW

- Unscrew and open the upper case.

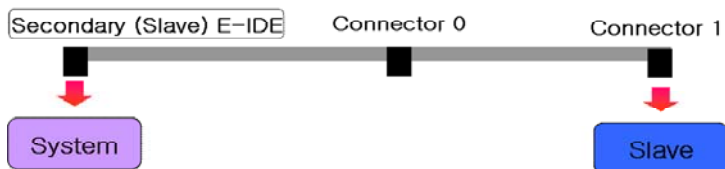


- Screw in the **CD-RW/DVD-RW** on the front **CD-RW/DVD-RW** bay.



- Connect the power cord of the **CD-RW/DVD-RW** and the **E-IDE** cable to the corresponding ports.

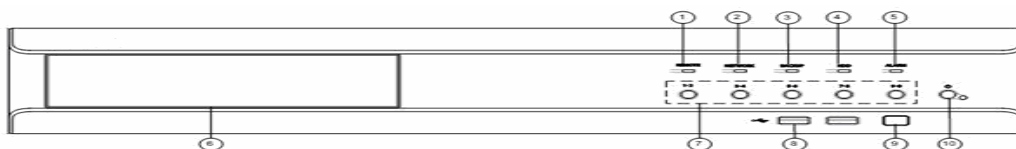
**Note !** Before connecting the **E-IDE** cable to the slave **E-IDE**, set the **jumper** of the **CD-RW/DVD-RW** as **slave**.



## 3. Operation and Setup Tools

The user can operate Workhorse 120-4 easily using the front buttons, remote control, and mouse.

### 3-1. Front Buttons

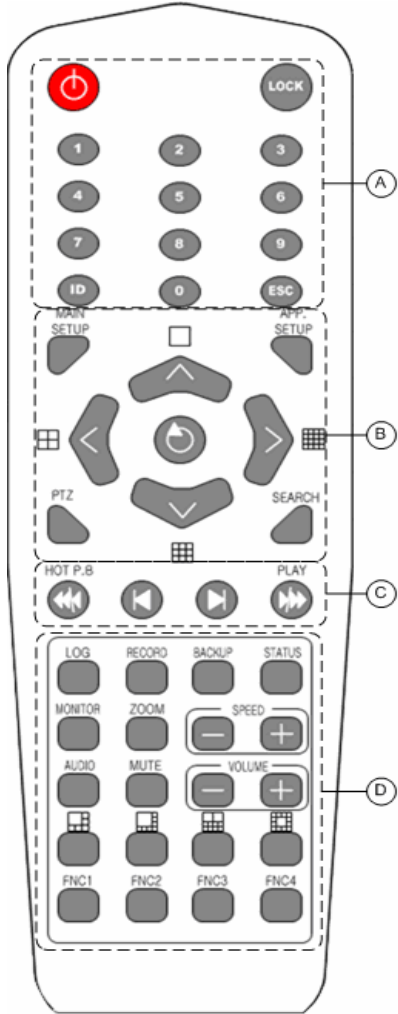


No.	Name	Features
1	<b>Remote</b>	The green light is ON when the remote control is accessing the DVR
2	<b>Network</b>	The green light is ON when the DVR is being accessed through the network
3	<b>Backup</b>	The green light is ON when the DVR is making a backup
4	<b>HDD</b>	The green light is turned ON when the hard drive is operating.
5	<b>Alarm</b>	The red light is ON when an alarm is triggered.
6	<b>CD-RW/DVD-RW</b>	CD-RW/DVD-RW installation slot
7	<b>Numeric buttons</b>	Numeric buttons
8	<b>USB</b>	External backup device or USB mouse connection
9	<b>Remote control sensor</b>	Remote control reception sensor
10	<b>Power</b>	System power ON/OFF or Selection button

The front buttons are used only for inputting numeric data. Use the mouse or remote control for the other features.

Menu	Key Type	1st	2nd	3rd	4th	5th	Power
Live	Short	1CH full	2CH full	3CH full	4CH full	Quad	Power
	Long	X	X	X	Status	X	Select
Password	Short	1	3	5	7	9	ESC
	Long	2	4	6	8	0	Select
Playback	Short	1CH full	2CH full	3CH full	4CH full	Quad	X
	Long	X	X	X	X	X	Select

## 3.2 Remote Control



### A. Basic control buttons

	<b>Power</b>	Turns the system ON or OFF
	<b>Lock</b>	Disables the mouse, remote control, and front buttons
	<b>Number</b>	Used to input numeric data
	<b>ID setting</b>	Used to set the remote control ID
	<b>ESC</b>	Exits the current menu or selects the upper menu

### B. System operation and setup buttons

	<b>Main setup</b>	Used to set up the recording, recording schedule, and system
	<b>APP setup</b>	Used to set up the PTZ and network
	<b>PTZ</b>	Changes the PTZ camera control mode
	<b>Search</b>	Searches recorded images
	<b>Move</b>	Moves an item or changes the display mode
	<b>Select</b>	Selects an item or converts screens sequentially

### Setting the remote control ID

Example - Setting the remote control ID as 1







Select the **[ID]** button and input the two-digit remote control ID. Afterward, press the **[ID]** button again.

















To control all DVRs with different IDs, set the remote control ID as 999.

### C. Search buttons

	<b>Forward play/Fast-forward</b>	Used to play forward and to fast-forward
	<b>Fast-forward frames by frame or tab</b>	Used to play frames forward frame-by-frame
	<b>Reverse frame by frame or tab</b>	Used to play frames backward frame-by-frame
	<b>Reverse play/Fast reverse</b>	Used to play backward and to rewind

### D. Other buttons

	<b>Log</b>	Used to view the system logs
	<b>Record</b>	Used to record all channels or stop recording all channels
	<b>Backup</b>	Used to back up the stored video data in Search mode
	<b>Status</b>	Used to view system information or change the display setup
	<b>Monitor</b>	-
	<b>Audio</b>	Used to change the audio channel
	<b>Mute</b>	Turns off the audio
	<b>Speed up</b>	Used to increase the playing speed
	<b>Speed down</b>	Used to decrease the playing speed
	<b>6-segmentation</b>	-
	<b>8-segmentation</b>	-
	<b>10-segmentation</b>	-
	<b>13-segmentation</b>	-
	<b>FNC 1</b>	Displays/Hides the OSD status

FNC 2~4	FNC 2~4	-
---------	---------	---

### 3-3. Mouse

The user can operate the system using a USB mouse.

- To go to the On Screen Display (OSD) menu, right-click as shown below:
- To close the OSD menu, right-click once again.
- To execute the OSD menu, click each button.
- To exit the sub-menu, just right-click.



No	Name	Features
1	Lock	Disables the mouse, remote control, and touch screen
2	Main setup	Used to set up the recording, recording schedule, and system
3	Additional setup	Used to set up the PTZ and network
4	PTZ	Changes the PTZ camera control mode
5	Search	Searches recorded images
6	Log	Used to view the system log list
7	Record	Used to record all channels or stop recording all channels
8	Status	Used to view system information or change the display setup
9	Monitor	-
10	Voice	Used to change the audio channel
11	F1	Displays/Hides the OSD status
12	F2	-
13	F3	-
14	F4	-

# 4. System Operation

## 4-1. Starting and Shutting down the System

### 4-1-1. Starting the System



The default password of the local administrator is "00000."

To change the password, select **{Main Setup} → {System} → {Local Administrator's Password}**.

- With the power connected to the body, press the Power button on the remote control.
- **The Remote, Network, Backup, and Alarm LEDs** on the front panel are then turned ON.
- Input the local administrator's password using the numeric buttons.
- Once the correct password is inputted, the system is initialized, and the initial screen appears.
- After the system is initialized and started, the video of all connected channels is displayed.

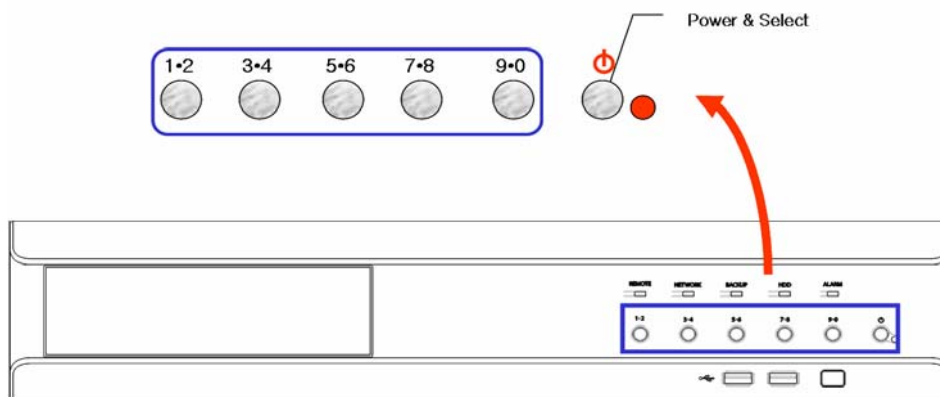
Note: The password may contain up to five digits. If the password has less than five digits, press the button.

When using a five-digit password, however, the user does not need to press the button.

The user can input a number using the front buttons as shown below:

Odd number: Short-press Even number: Long-press

Input initialization: Press the [Power] button.



### 4-1-2. Shutting down the System




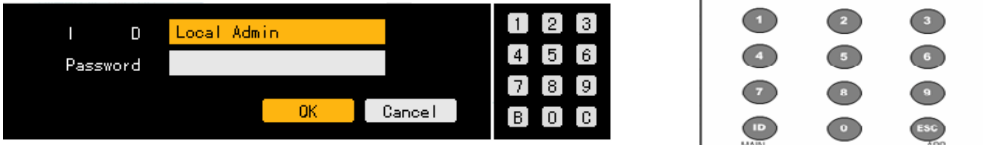
The default password of the local administrator is "00000."

To change the password, select **{Main Setup} → {System} → {Local Administrator's Password}**.



□ Press the Power button  on the remote control.

□ Input the system administrator's password using the numeric buttons and press the  button.



□ Once the correct password is inputted, all lights on the front part blink, and a warning sound is generated for approximately 20 seconds before the system shuts down.

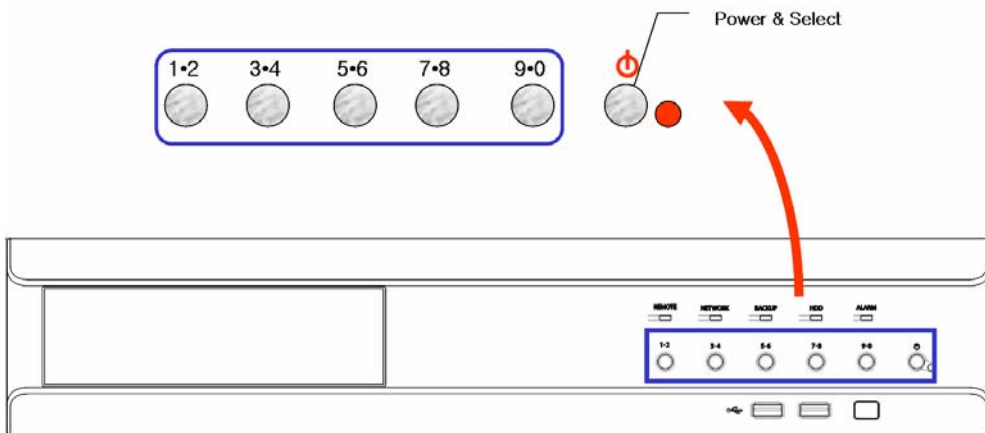
□ If an incorrect password is inputted, a warning message is displayed followed by the previous screen as shown below:



The user can input a number using the front buttons as shown below:

Odd number: Short-press Even number: Long-press

Input initialization: Press the [Power] button.



## 4-2. System Login

### 4-2-1. User Account

System users are divided into local system administrators and general users. The local system administrator can use all features.






<b>Local admin</b>	<p>Default account; the default password is "00000"</p> <p>Has access to all features including System Setup, System Power ON/OFF, Monitoring, and View Recorded Video</p> <p>Remote access not supported, however</p>
<b>User</b>	<p>Up to four users can be created. System features may be used depending on the authorities given to each user.</p>

#### ■ System features creating authorities

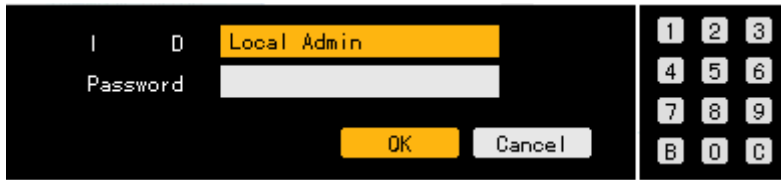
<b>Network live</b>	Network access - real-time display
<b>Network play</b>	Network access - view recorded video
<b>Download network file</b>	Network access and file download
<b>Main setup Additional setup</b>	<p>Recording setup, Recording schedule, System, Storage device, NTP, Advanced setting</p> <p>PTZ camera, Network setup</p>
<b>Network PTZ control</b>	Network access - PTZ camera control
<b>Network backup</b>	Network access - backup
<b>Remote upgrade</b>	Remote upgrade

### 4-2-2. Login

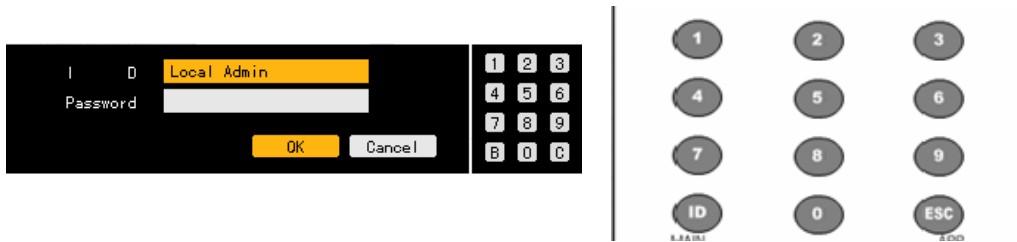
For system security, log in to the system to use the following features:

	<b>Power</b>	<p>System power ON/OFF</p> <p>Only the local system administrator can use this feature.</p>
	<b>Lock/Unlock</b>	<p>Locks/Unlocks the system</p> <p>Only the local system administrator can use this feature.</p>
	<b>Main setup</b>	Recording setup, Recording schedule, System, Storage device, NTP, Advanced setting
	<b>Additional setup</b>	PTZ, Network setup
	<b>Record</b>	Used to record all channels or stop recording all channels

- Select the **Power, Lock, Main Setup, APP. Setup, and Record** buttons. The IP and password input window is then displayed as shown below:



- Select the login account and input the password using the numeric buttons on the remote control.



- The default password of the local administrator is “00000.”
- Click the ID selection box and press the **arrow (▲▼)** buttons on the remote control or double-click the ID selection box to log in using another user account.


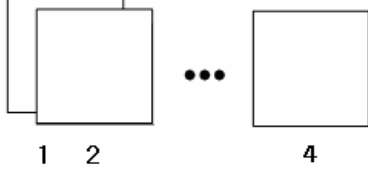

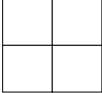
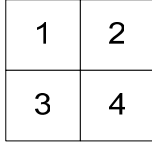






- If an incorrect password is inputted, the following warning message appears:



### 4-3. Monitoring

- Once the system starts, video data from the CCTV/VGA monitor is displayed on the 4-divided screen.
- The user can choose from full screen and 4-divided screen.

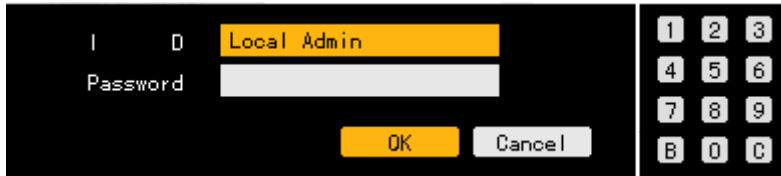
#### 4-3-1. Divided Screen and Automatic Screen Conversion

 <p>View all (4 sub-screens)</p>	
<p>To view the video of a certain channel, select the desired channel by pressing the numeric buttons.</p> <p>Press the arrow up  button on the remote control. Pressing the arrow up each time causes the next screen to be selected.</p> <p>To view the video of Channel No. 1, press <b>[1-2]</b>, to view the video of Channel No. 2 Press <b>[3-4]</b>, to view the video of Channel No. 3 <b>[5-6]</b>, and, to view the video of Channel No. 4 press the <b>[7-8]</b> button.</p>	
 <p>4-divided screen (1 screen)</p>	
<p>Press the Left button  on the remote control and short-press the <b>[9-0]</b> button.</p> <p>On the 4-divided screen, double-click the channel to enlarge its video.</p> <p>Double-click any area on the View All window to convert into a 4-divided screen.</p>	
	<p>Automatic screen conversion</p>
<p>In Live Full Screen mode, press the  button on the remote control.</p> <p>To convert the screen automatically, press the  button on the remote control again.</p> <p>The user can convert the screens in current division mode.</p> <p>To set the conversion interval, Press the  buttons on the remote control.</p> <p>Select  to increase the time.</p> <p>To disable the conversion mode, shift to 4-divided View mode.</p>	

## 4-4. Audio Live, Recording, and Playing

### 4-4-1. Audio Live and Recording Setup

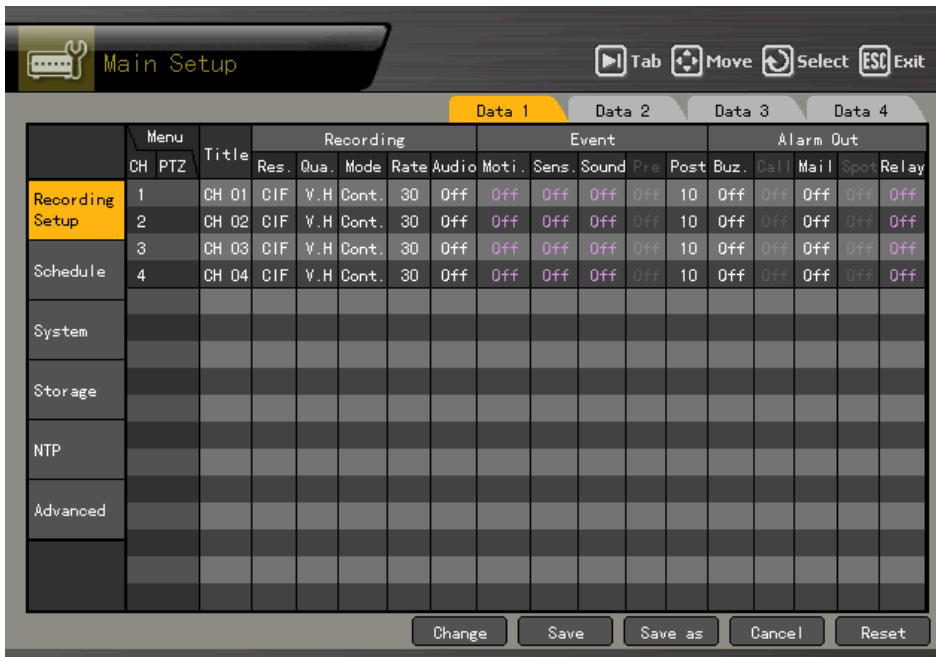
- On the real-time monitoring screen, select the **[Main Setup]** button on the remote control.
- The login window is then displayed as shown below:



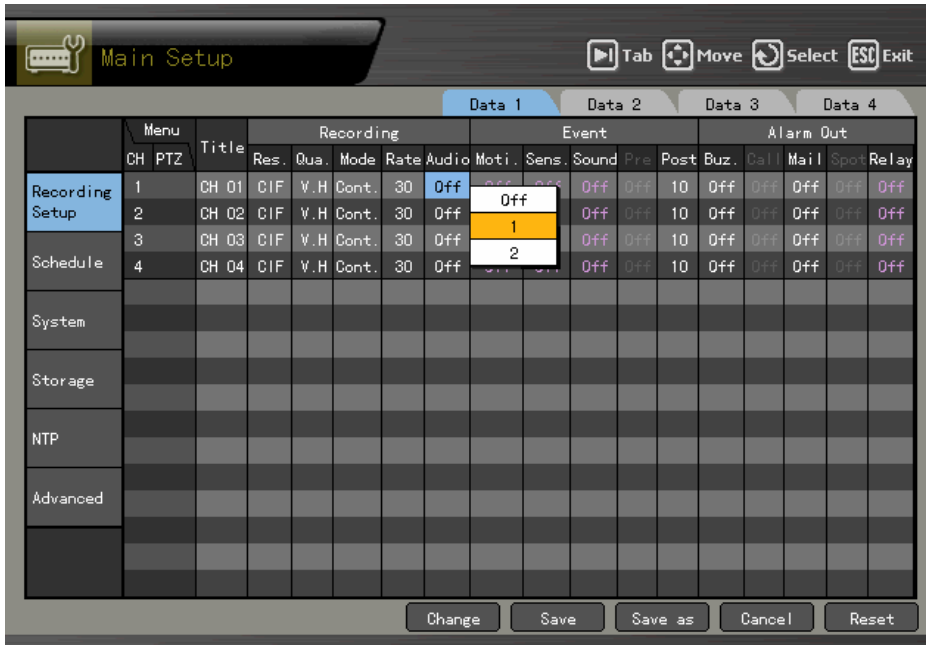
- Select the login account, input the password using the numeric buttons on the remote control, and select **[OK]**.

- (The default password of the local administrator is “00000.”)
- Go to the ID selection box and press the **arrow (▲▼)** buttons on the remote control or double-click the ID selection box on it to log in using another user account.

- Once the correct password is inputted, the initial screen of the **(Main Setup)** appears as shown below:

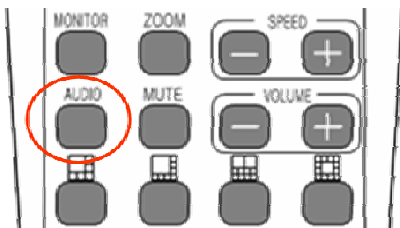


- Navigate on the screen using the arrow (▲▼◀▶) buttons. Select {Main Setup} → {Data 1~4} → {Recording} → {Audio} menu and choose the desired channel. Afterward, click the [Select] button.
- On the channel selection box, select and save the audio channel.
- An audio icon is then displayed on the real-time monitoring screen.




#### 4-4-2. Changing the Audio Live Channel

- Select the **Audio** button on the remote control or on the menu on the Real-time Monitoring screen.



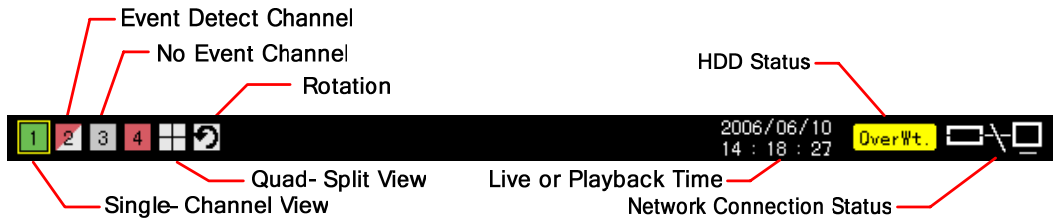
- The Audio icon and active window are then displayed on the channel, with the voice set on the real-time monitoring window as shown below:



- Change the window using **the arrow (▲▼◀▶)** buttons and click the **[Select]**  button to select an audio channel.
- The real-time monitoring screen is then selected, and the voice for the selected channel, outputted.

## 4-5. Viewing System Information and Changing the Display Setup

Workhorse 120-4 displays basic system information through the OSD on the real-time screen to enable the user to monitor the screen, view system information, and set the screen.



- Selecting the **[Status]** button causes the setup menus to be displayed in the following order:



Channel selection window

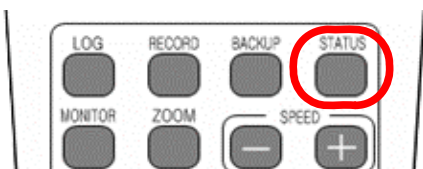
<b>Activation mode</b>	The channel selection window can be moved. At this time, the border of the channel screen is displayed in orange.
<b>Selection mode</b>	The channel is selected. At this time, the border of the channel screen is displayed in blue.

Viewing a divided screen

Pressing the buttons in Brightness, Contrast, or Camera Control mode enables monitoring the video in full screen or 4-divided screen.

### 4-5-1. Viewing System Information

- Button operation



- To view product information, press the **Status** button on the remote control or go to the Status



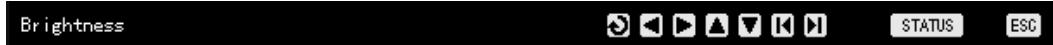
menu.



<b>1. ID</b>	Product ID (1~99) (used for remote control by ID)
<b>2. Name</b>	Product name
<b>3. Software version</b>	Software version (build number)
<b>4. Hardware version</b>	Hardware version (equipment type)
<b>5. Front firmware version</b>	Firmware version on the front part
<b>6. Video mode</b>	Video mode (NTSC/PAL)
<b>7. HDD information</b>	Hard drive
<b>Total space</b>	Total space
<b>Used space</b>	Used space
<b>Free space</b>	Remaining space
<b>Start day</b>	Recording start date (date changed)
<b>End day</b>	Recording end date (date changed)
<b>8. Network setup</b>	Network setup status
<b>IP address</b>	IP address
<b>9. Overwrite</b>	Overwrite status
<b>10. DDNS server</b>	Domain name, OFF/ACT

### 4-5-2. Brightness Control

- Press the **[Status]** button to shift to brightness control mode as shown below:



Select the channel on the monitoring screen to adjust the brightness.

- Adjust the brightness of the selected channel using the **arrow (▲▼)** buttons.



- Go to the channel selection window using the **[ESC]** button and adjust the brightness of the channel video.
- After adjusting the brightness of all channel videos, press the **[ESC]** button again.

### 4-5-3. Adjusting the Contrast

- Press the **[Status]** button to shift to contrast control mode as shown below:



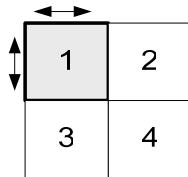
- Select the channel on the monitoring screen to adjust the contrast.
- Adjust the contrast of the selected channel using the **arrow (▲▼)** buttons.



- Go to the channel selection window using the **[ESC]** button and adjust the contrast of the channel video.
- After adjusting the contrast of the all channel videos, press the **[ESC]** button again.

### 4-5-4. Camera Control

- Use Camera Control to control the displayed images by moving the channel screen as shown below:



- Press the **[Status]** button to shift to camera control mode as shown below:



- Select the channel on the monitoring screen to control the camera.



- Adjust the camera of the selected channel using the **arrow** (◀▶) buttons.
- Go to the channel selection window using the **[ESC]** button and adjust the camera of the channel video.
- After adjusting the camera of the channel video, press the **[ESC]** button again.

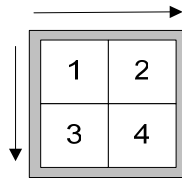
Moving the monitor up, down, right, or left excessively may cause a black or gray part to appear on the screen. This is a normal response to excessive movement. A proper control range is achieved when there is no black or gray parts on the screen.

#### 4-5-5. TV Control

- Use TV Control to adjust the images displayed on the CCTV monitor by moving the CCTV monitor screen up, down, right, or left as shown below:
- Press the **[Status]** button to shift to TV control mode as shown below:



- Adjust the CCTV monitor screen using the **arrow** (▲▼◀▶) buttons as shown below:



- After adjusting the video, press the **[ESC]** button.

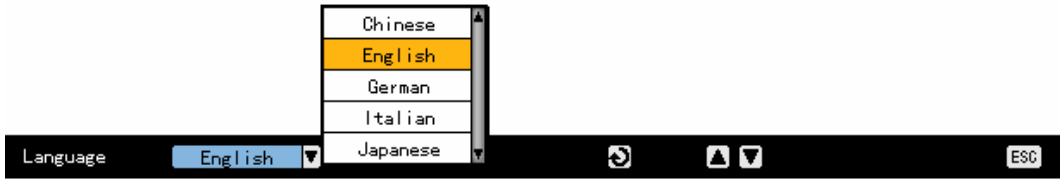
Moving the monitor up, down, right, or left excessively may cause a black or gray part to appear on the screen. This is a normal response to excessive movement. A proper control range is achieved when there is no black or gray parts on the screen.

#### 4-5-6. Language

- The user can select the language for the On Screen Display (OSD) menu of the system.
- Press the **[Status]** button to shift to language selection mode as shown below:



- Press the **[Select]** button. On the language selection menu as shown below, select the language using the **arrow (▲▼)** buttons and press the **[ESC]** button:



#### 4-5-7. Displaying/Hiding the Camera Name

Displays/Hides each channel on the monitoring screen

- Press the **[Status]** button to display/hide the camera name as shown below:



- Press the **[Select]** button. On the ON/OFF menu as shown below, select ON or OFF using the **arrow (◀▶)** buttons and press the **[Select]** button.



#### 4-5-8. Controlling the Screen Border

Used to display/hide the screen border and to control the border form, thickness, transparency, and color

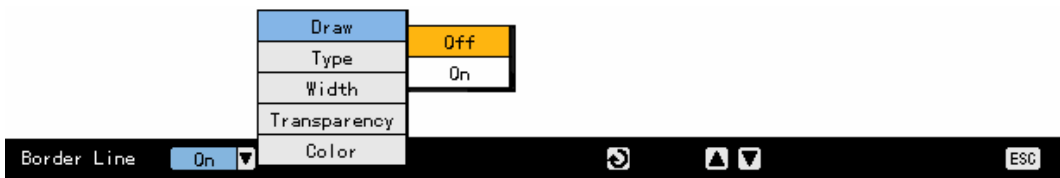
- To display/hide the border as shown below, press the **[Status]** button:



- Press the **[Select]** button. On the setting menu as shown below, select the desired item using the **arrow (▲▼)** buttons.



- After setting the selected item, save the setting and press the **[Select]** button.



- After setting each field, press the **[ESC]** button to exit the borderline setting mode.

### Border setting fields



Field	Setting	Description
Mode	ON	Displays the border
	OFF	Hides the border
Form	Internal	Hides the external borderline
	All	Displays all borderlines
Width	2, 4	Sets the width
Transparency	10%, 25%, 50%, 75%, 100%	Sets the transparency
Color	Black, White, Red, Green, Blue	Sets the color of the border

#### 4-5-9. Reset

Resets the [Status] settings

- Press the **[Status]** button to shift to reset mode as shown below:



Click the **[Select]**  button, on the dialog box as shown below, select **[Yes]** or **[No]** using the **arrow** (**▲▼◀▶**) buttons and **[Select]**  buttons.



## 4-6. System Log

Workhorse 120-4 records the logs of all operations including system power ON/OFF, system setup in/out, and network connection/disconnection.

### 4-6-1. Log Type

#### (1) General

Logs related to power ON/OFF, file copy/backup failure, setup start/end, play, and other basic system operations

#### (2) Recording event

Logs related to recording such as detection of motion, sensor, and sound

#### (3) Network

Logs related to network operations such as network login, network logout, and network live

#### (4) Failure

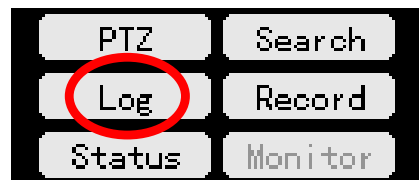
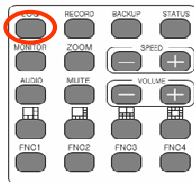
Logs related to operation failures such as signal loss and network connection failure

#### (5) All

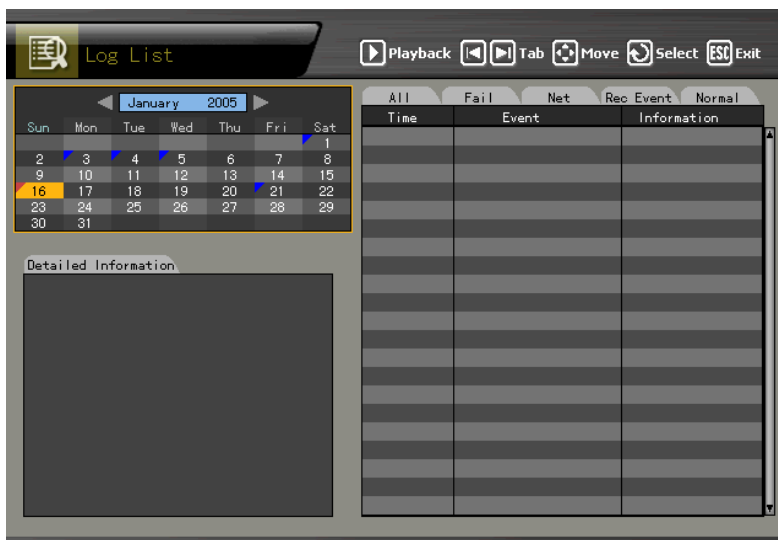
Logs related to all system operations


### 4-6-2. Viewing the System Log

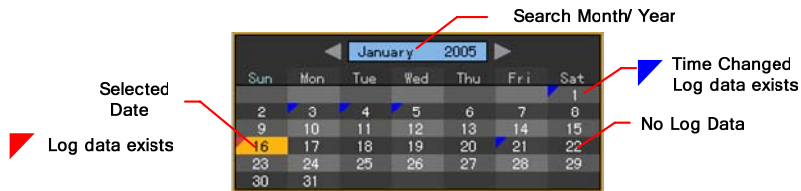
- In real-time monitoring mode, press the **[Log]** button on the remote control or **[Log]** button on the menu.



- The initial menus of the log list are then displayed as shown below:

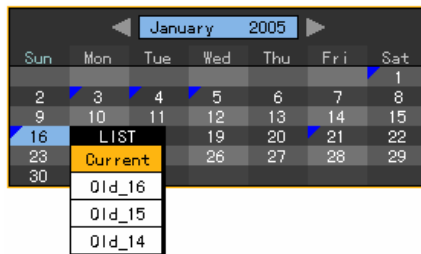


- On the active calendar window, select the search date using the **arrow (▲▼◀▶)** buttons and **[Select]**  buttons as shown below:



### Viewing time change-related log data

The stored data folder is updated each time the user changes the time. On the other hand, a blue triangular icon is displayed on the date each time a change is made in the date on the calendar window. Otherwise, a red triangular icon is displayed on the unchanged date. To view the log details, select the date with a red icon. Selecting a date with a blue icon causes the changed date list to appear.



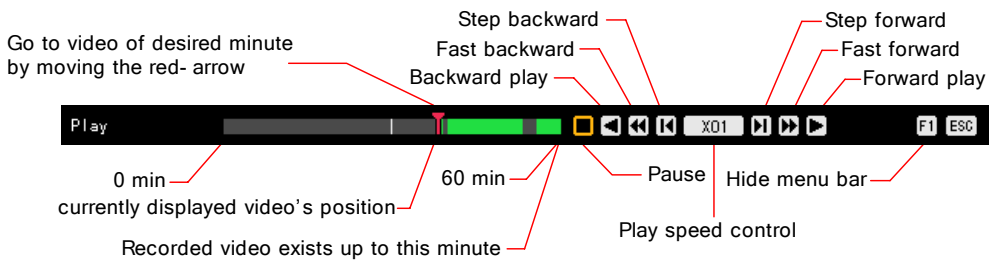
- Select the (new) date on the calendar window to display the log list as shown below:



- Navigate on the screen using the **arrow (▲▼)** buttons and check the logs by time and type.
- The user can check the logs by time and type on each page using the **[TAB]** ◀▶ buttons.
- Press the **[Play]** button on the selected log to play the recorded video for the corresponding time.



- On the recorded video screen, press the **[Play]** button.



Recorded video is played each second.

Example - The user can play the video from the 19:45:16 log by selecting 19:45:16.

- To return to the previous log list, press the **[ESC]** button.



## 4-7. Record

### 4-7-1. Recording Type

Workhorse 120-4 supports various recording types.

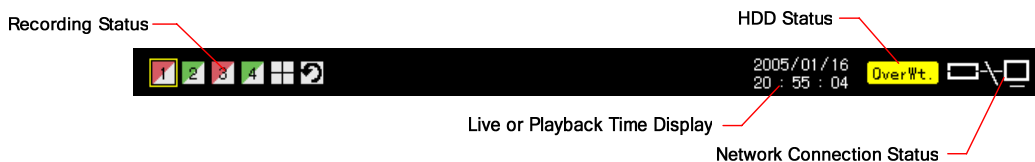
Recording Type	Description
<b>Automatic</b>	Set the event recording frame and general recording frame separately for automatic recording based on the setting. When motion, sensor, or sound is detected, the event recording frame is selected. Otherwise, the general recording frame is selected.
<b>Continuous</b>	Recording is done based on the general frame setting.
<b>Motion</b>	Recording is done based on the event frame setting in case motion is detected.
<b>Sensor</b>	Recording is done based on the event frame setting in case of input signal from an external sensor.
<b>Sound</b>	Recording is done based on the event frame setting in case sound is detected.

### 4-7-2. Recording Setup

Select **{Main Setup} -> {Recording Setup}**. For more information on the recording setup, go to **{5-1-2 Recording Setup} -> {Recording}**.

### 4-7-3. Viewing the Recording Status

The user can monitor the video and recording status of each channel in real time through the OSD at the bottom of the screen.



Recording status by shape

	Triangle	Only video is recorded.
	Triangle	Only audio is recorded.
	Rectangle	Both audio and video are recorded.


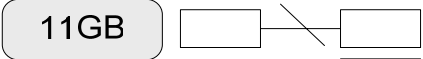
Recording status by color

	Green	Continuous recording
	Red	Motion is recorded.
	Blue	Sensor signals are recorded.
	Yellow	Sound is recorded.
	Transparent	No recording is done.

### Hard drive status


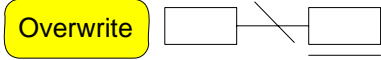
The right part of the OSD shows the status of the hard drive where video data is recorded.

To turn HDD Overwrite ON/OFF, select **{Main Setup}** -> **{Storage Device}**.

<p>▪When HDD Overwrite is turned ON</p> 	<p>▪When HDD Overwrite is turned OFF</p> 
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### Network access

The right part of the OSD shows the network connection status.

<p>▪Network connected</p> 	<p>▪Network disconnected</p> 
---	---

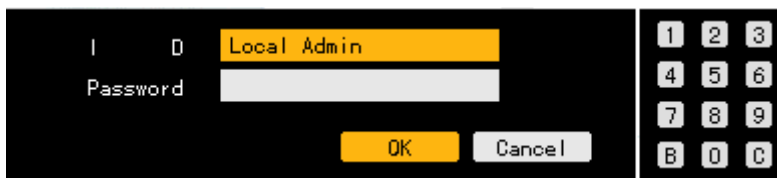
### 4-7-4. Starting and Stopping Record All

To start or stop All Recordings, press the **[Record]** button on the remote control or on the **[Record]** menu in real-time monitoring mode.



#### (1) Stopping Record All

- Press the **[Record]** button on the remote control or on the menu.
- On the login window as shown below, input the ID and password and select **[OK]**:



- The recording of all channels then stops, and the recording status is displayed on the OSD as shown below:



## (2) Starting Record All

- Select the **[Record]** button on the remote control or on the **[Record]** menu with Record All stopped.
- On the login window as shown below, input the ID and password and select **[OK]**:



- Based on the recording setting, all channels are recorded, and the recording status, displayed on the OSD as shown below:



### 4-7-5. Watermark

This system uses Watermark technology to detect video forgery and alteration.

Fragile Watermark technology is used.

Fragile Watermark technology detects the locations and types of counterfeited or altered video. It has been designed for purposes of authentication and to guarantee integrity of the video.

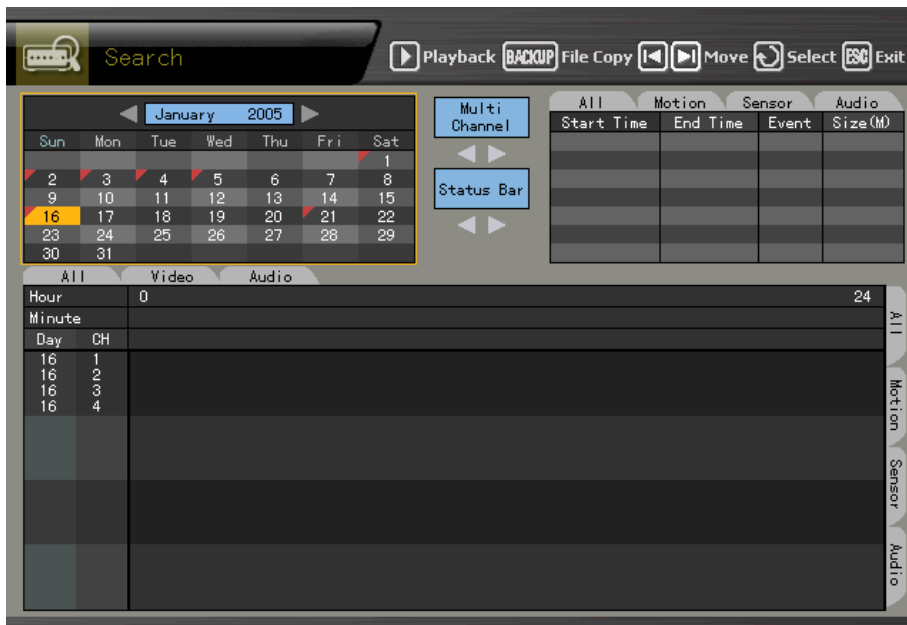
In Workhorse 120-4, the watermark is inserted into all recorded video data; any forgery and alteration of the video is detected.

## 4-8. Search

Use [Search] to search the recorded video by time and to play the searched video.

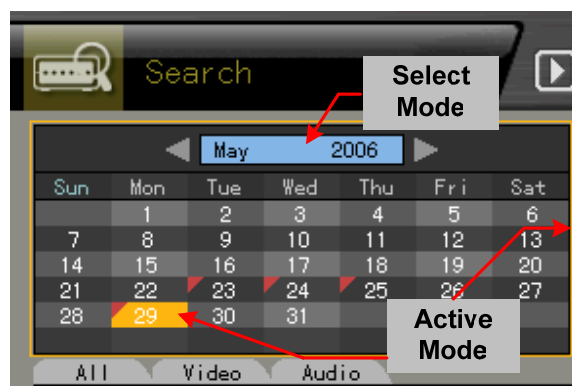
### 4-8-1. Selecting Search Mode

- In real-time monitoring mode, select the **[SEARCH]** button on the remote control or on the **[Search]** menu. The initial menus of the search mode are then displayed as shown below:

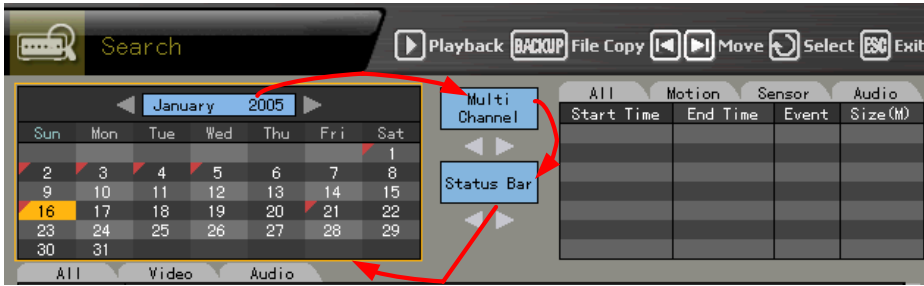


Activation mode and Selection mode

<b>Activation mode</b>	The field can be moved or selected on the OSD menu. At this time, the border or highlighted part of the activated window is displayed in orange.
<b>Selection mode</b>	Items are selected in OSD mode. At this time, the border of the selection window or the selection box is displayed in blue.



### 4-8-2. Search Method



- Before selecting the date, go to the search method selection box by pressing the [TAB] button. Afterward, select the Search method using the arrow (◀▶) buttons.



<b>Multi-channel</b>	Searches the video of multiple channels for the defined time
<b>Multi-date</b>	Searches the video of one channel for multiple dates in a certain time zone
<b>Multi-hour</b>	Searches the video of one channel for the multiple time zones of one date

### 4-8-3. Selecting the Search Tool

- Before selecting the date, go to the search tool selection box by pressing the [TAB] button. Afterward, select the search tool using the arrow (◀▶) buttons.



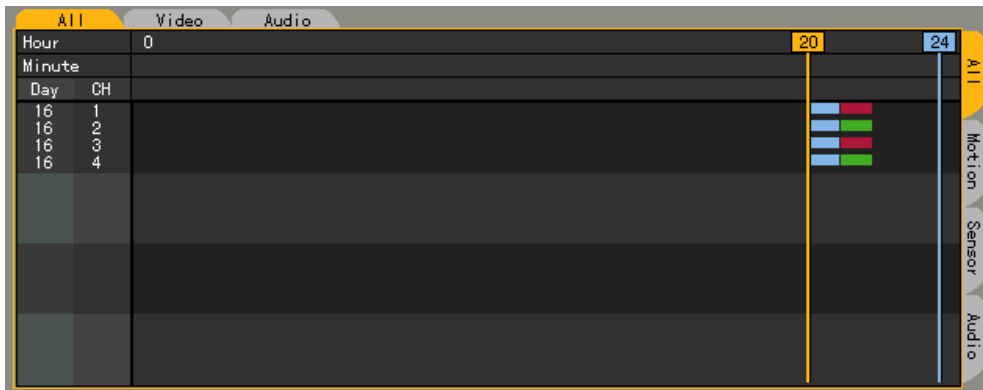
#### (1) Searching video using the bar graph

- Select the search date. The recorded video is then displayed in a bar graph as shown below:

<b>Green</b>	Continuous recording
<b>Red</b>	Motion is recorded.
<b>Blue</b>	Sensor signals are recorded.
<b>Yellow</b>	Sound is recorded.
<b>Light blue</b>	Shows that recording was done before the time was changed

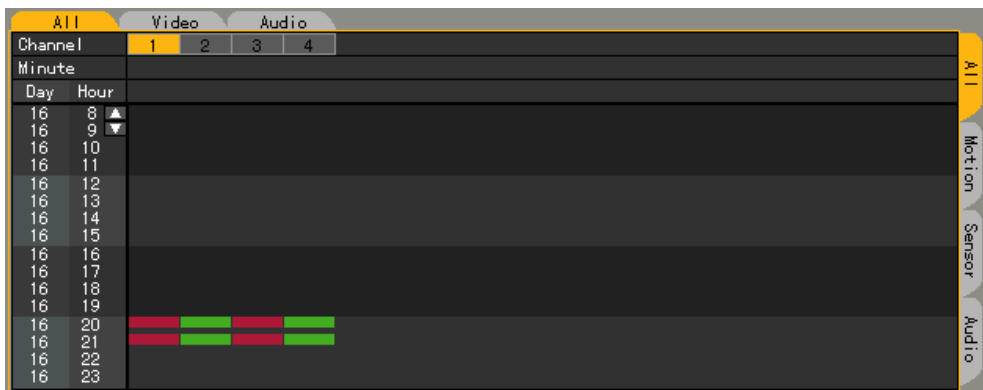
### A) Multi-channel

Select the time using the **arrow** (▲▼) buttons.



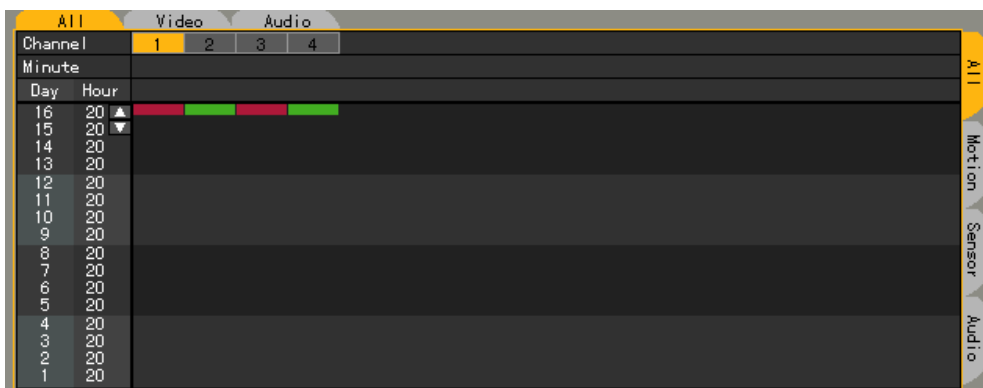
### B) Multi-time

Select the time and channel using the **arrow** (◀▶▲▼) buttons.



### C) Multi-day

Select the time and channel using the **arrow** (◀▶▲▼) buttons.



## (2) Search using the file list

- Select the search date. The one-hour file list of the recorded video is then displayed as shown below:
- Select the time zone using the **arrow** (◀▶▲▼) buttons.



- View the file list data related to time change.
    - 1) Changing the time by selecting **{Main Setup}-> {NTP} -> {2. Date and Time}** causes the data folder to be updated and subsequently displayed in blue on the file list.
    - 2) Selecting the changed time causes a list including the updated folder to be displayed.
- Supported only in multi-channel mode

All	Motion	Sensor	Audio
Start Time	End Time	Event	Size(M)
00:00:00	00:59:59	Time Change	
01:00:00	01:59:59	Time Change	
02:00:00	02:59:59	Time Change	
03:00:00	03:59:59	Time Change	
04:00:00	04:59:59	Time Change	
05:00:00	05:59:59	Time Change	
06:00:00	06:59:59	Time Change	
07:00:00	07:59:59	Time Change	
08:00:00	08:59:59	Time Change	
09:00:00	09:59:59	Time Change	
10:00:00	10:59:59	Time Change	
11:00:00	11:59:59	Time Change	
12:00:00	12:59:59	Time Change	
13:00:00	13:59:59	Time Change	
14:00:00	14:59:59	Time Change	
15:00:00	15:59:59	Time Change	
16:00:00	16:59:59	Time Change	
17:00:00	17:59:59	Time Change	
18:00:00	18:59:59	Time Change	
19:00:00	19:59:59	Time Change	
20:00:00	20:59:59	Time Change	
21:00:00	21:59:59	Time Change	
22:00:00	22:59:59	C M	7

All	Motion	Sensor	Audio
Start Time	End Time	Event	Size(M)
00:00:00	00:59:59	Time Change	
01:00:00	01:59:59	Time Change	
02:00:00	02:59:59	Time Change	
03:00:00	03:59:59	Time Change	
04:00:00	04:59:59	Time Change	
05:00:00	05:59:59	Time Change	
06:00:00	06:59:59	Time Change	
07:00:00	07:59:59	Time Change	
08:00:00	08:59:59	Time Change	
09:00:00	09:59:59	Time Change	
10:00:00	10:59:59	Time Change	
11:00:00	11:59:59	Time Change	
12:00:00	12:59:59	Time Change	
13:00:00	13:59:59	Time Change	
14:00:00	14:59:59	Time Change	
15:00:00	15:59:59	Time Change	
16:00:00	16:59:59	Time Change	
17:00:00	17:59:59	Time Change	
18:00:00	18:59:59	Time Change	
19:00:00	19:59:59	Time Change	
20:00:00	20:59:59	Time Change	
21:00:00	21:59:59	Time Change	
22:00:00	22:59:59	Time Change	

LIST
Current
Old_18

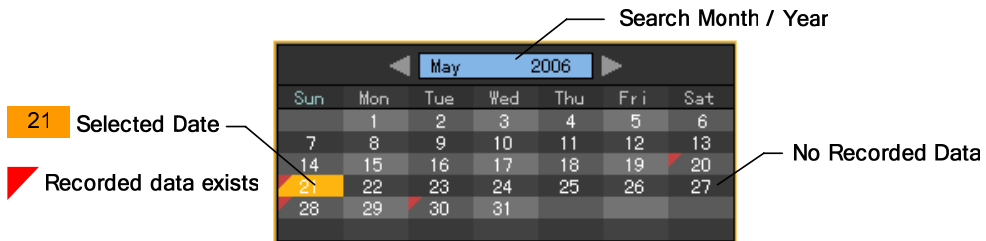
<b>Current</b>	Recorded video file based on the current system time
<b>Old_NUM</b>	Recorded video file based on the previous system time

#### 4-8-4. Multi-channel

Searches the video of multiple channels for the defined time

##### (1) Date search

- Select the search date using the **arrow** (▲▼◀▶) buttons and **[Select]** button on the active calendar window as shown below:



##### (2) Search time

- Select the search date on the calendar window. The recorded one-hour video of each channel is then displayed in a bar graph as shown below:

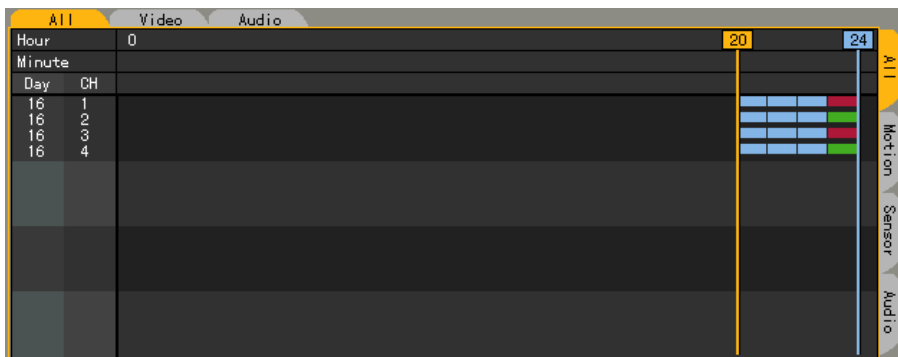
<b>Green</b>	Continuous recording
<b>Red</b>	Motion is recorded.
<b>Blue</b>	Sensor signals are recorded.
<b>Yellow</b>	Sound is recorded.
<b>Light blue</b>	Shows that recording was done before the time was changed

- Set the time by using the **arrow** (◀▶) or numeric buttons or moving the time indicator and press the **[Select]** button.

Input numbers that are less than 10 in two digits using the numeric buttons, e.g., 01 for 1 and 02 for 2.

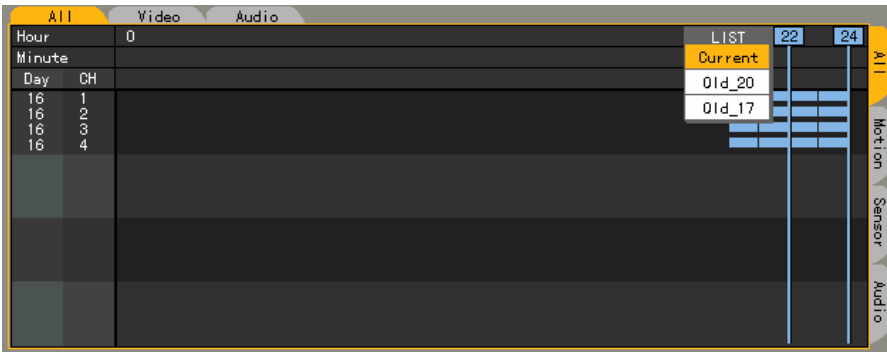
Viewing the status bar related to time change

- 1) After the changed folder is searched by the status bar, the bar for the corresponding time zone is displayed in light blue as shown below:



- 2) Selecting a changed time causes a list including the updated folder to be displayed as shown below:  
Supported only in multi-channel mode

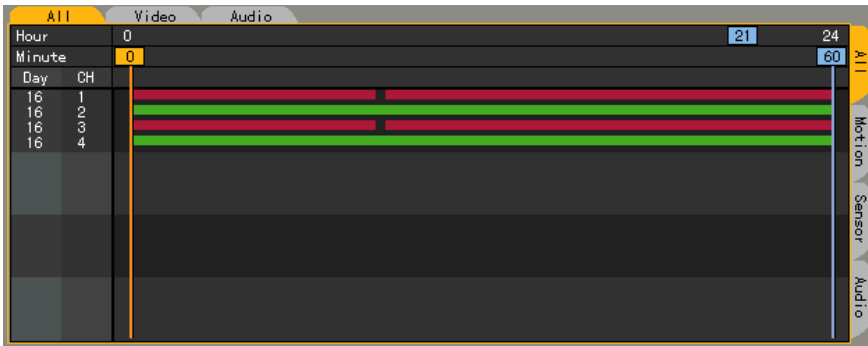




### (3) Minute

- Select the time. The recorded video of each channel is then displayed in a minute-unit bar graph.
- Define the starting point of the search time using the **arrow** (▲▼◀▶) and numeric buttons and click the **[Select]** (⌂) button.

Input numbers that are less than 10 in two digits using the numeric buttons, e.g., 08 for 8 and 09 for 9.

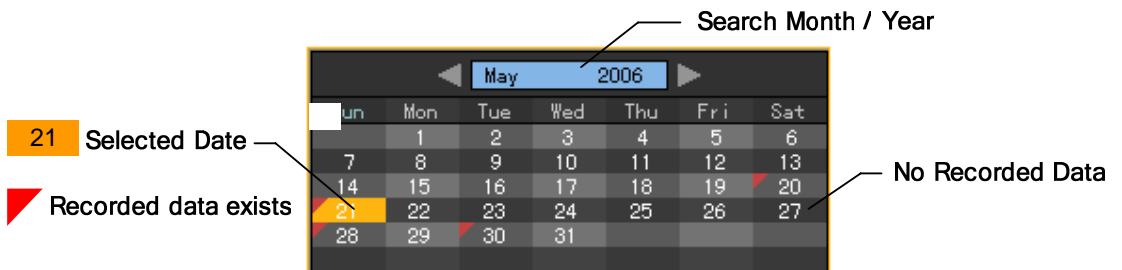


### 4-8-5. Multi-hour

Searches the video of one channel for the multiple time zones of the same date

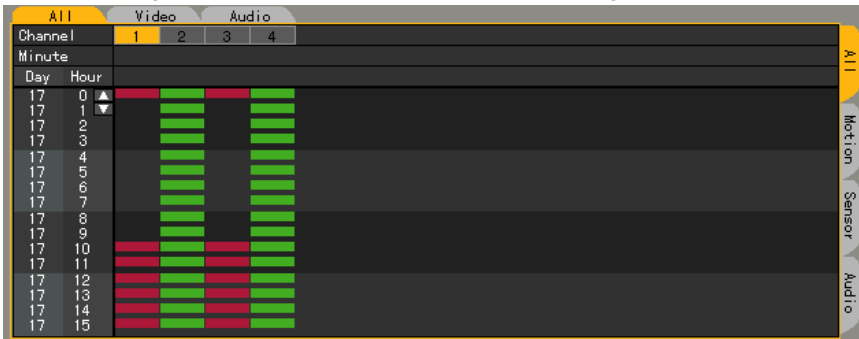
#### (1) Date search

- Select the search date using the **arrow** (▲▼◀▶) and **[Select]** (⌂) buttons on the active calendar window as shown below:




## (2) Selecting the starting time and channel

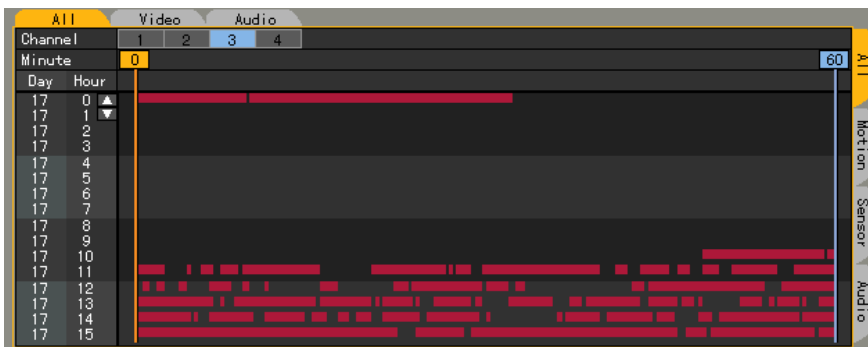
- Select the date. The time and channel of the selected date are then displayed as shown below:
- Define the starting point of the search time and channel using the **arrow (▲▼◀▶)** buttons.



### (2) Minute

- The video recorded by the hour of the selected channel is then displayed in a minute-unit bar graph.
- Define the starting point of the search time using the **arrow (▲▼◀▶)** and numeric buttons and click the **[Select]**  button.

Input numbers that are less than 10 in two digits using the numeric buttons, e.g., 08 for 8 and 09 for 9.

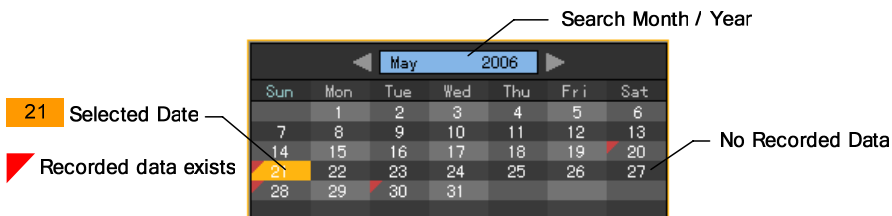


## 4-8-6. Multi-date

Searches the video of one channel for multiple dates in a certain time zone

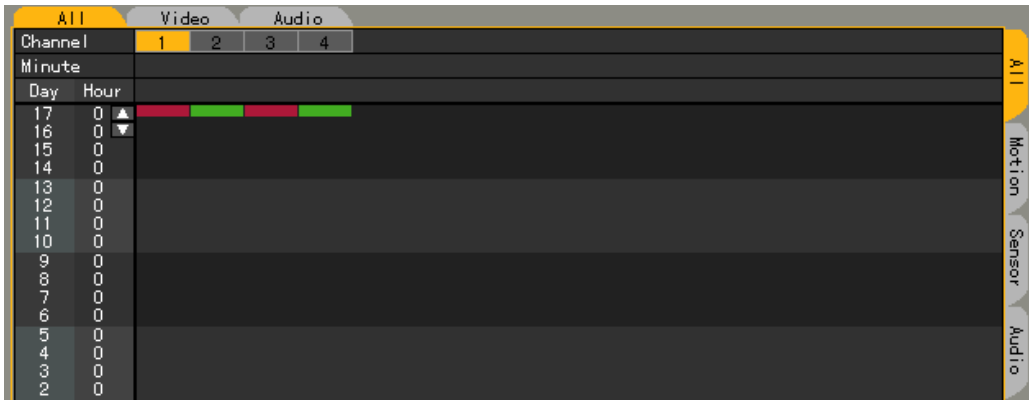
### (1) Date search

- Select the search date using the **arrow (▲▼◀▶)** and **[Select]**  buttons on the active calendar window as shown below:



## (2) Selecting the time and channel

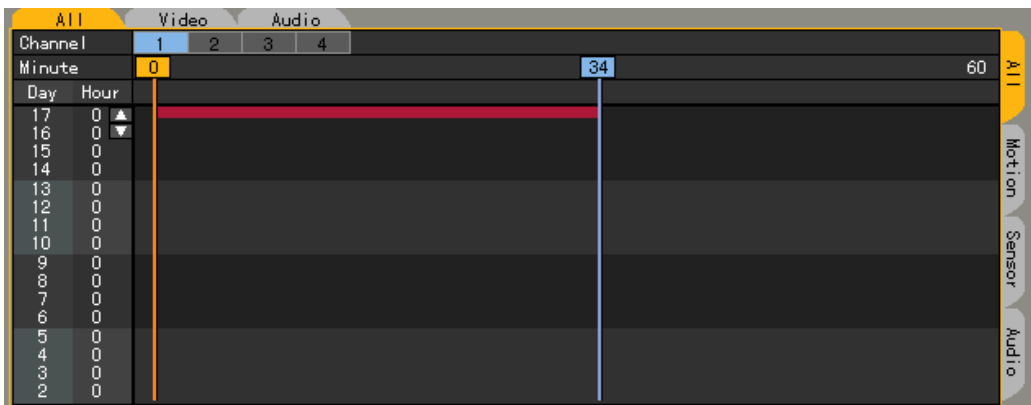
- Select the date. The date list, time, and channel are then sorted in descending order.
- Select the time and channel by pressing the **arrow** (▲▼◀▶) buttons.



## (3) Minute

- The recorded video of the selected channel is then displayed in a minute-unit bar graph.
- Define the starting point of the search time by using the **arrow** (▲▼◀▶) and numeric buttons and moving the minute indicator and click the **[Select]** button.

Input numbers that are less than 10 in two digits using the numeric buttons, e.g., 08 for 8 and 09 for 9.



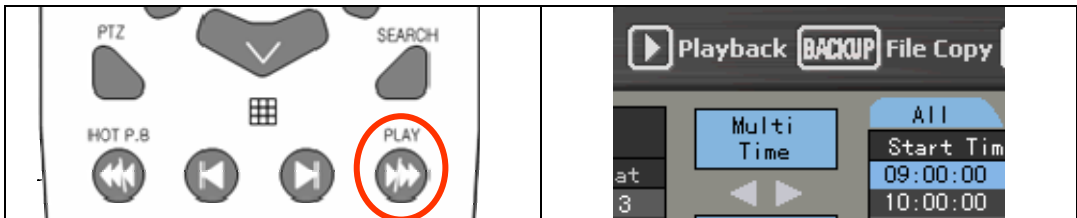
## 4-9. Play

### 4-9-1. Selecting Play Mode

To shift to {Play} mode, press the **[Play]** button on the remote control or on the menu in **{Search}**, **{Log}**, or **{Real-time Monitoring}** mode. In log or real-time monitoring mode, only Multi-channel mode is allowed. To search and play, however, either Multi-channel or Multi-date or Multi-hour mode may be used.

#### (1) Search

- In **{Search}** mode, select Multi-channel, Multi-date, or Multi-hour.
- Set the play date, time, channel, or minute and select the **[Play]** button on the remote control or at the upper center of the screen in **{Search}** mode.



- The playback screen for Multi-channel, Multi-date, and Multi-hour is then displayed as shown below:

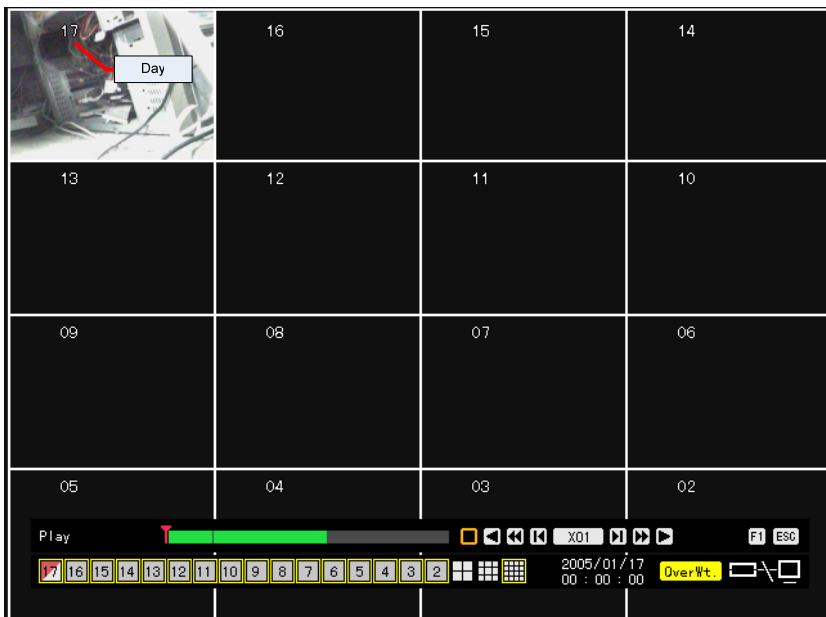
#### 1) Multi-channel



## 2) Multi-time

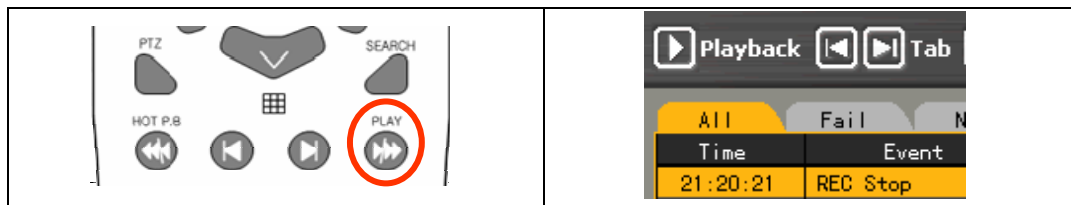


## 3) Multi-day



## (2) Log

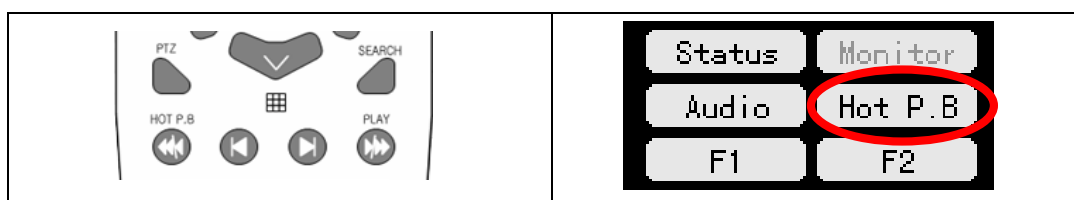
- In **{Log}** mode, select the date and focus for playback and press the **[PLAY]** button on the remote control or the **[Playback]** button at the upper center of the **{Log}** mode screen.



- The initial playback screen of Multi-channel mode is then displayed.

## (3) Playback (Hot PB)

- Press the **[HOT PB]** button on the remote control or on the menu on the real-time monitoring screen.



- Press the **[HOT PB]** button on the remote control or **[Play]** button on the menu to display the initial playback screen in Multi-channel mode.

The user cannot play the data recorded before the time change.

## 4-9-2. Playing and Controlling the Play Speed

### (1) Playing

- In Play mode, press the Search button. The video is then played based on the features of each button.

Description of search buttons

Button	Name	Features
	<b>Fast-forward frames by frame</b>	Used to play frame-by-frame or to pause
	<b>Forward play/Fast-forward</b>	Used to play forward (x1) and to fast-forward (x30)
	<b>Reverse frame by frame</b>	Used to play frames backward frame-by-frame or to pause
	<b>Reverse play/Fast reverse</b>	Used to play backward (x1) and to rewind (x30)
	<b>Speed down</b>	Used to decrease the playing speed
	<b>Speed up</b>	Used to increase the playing speed

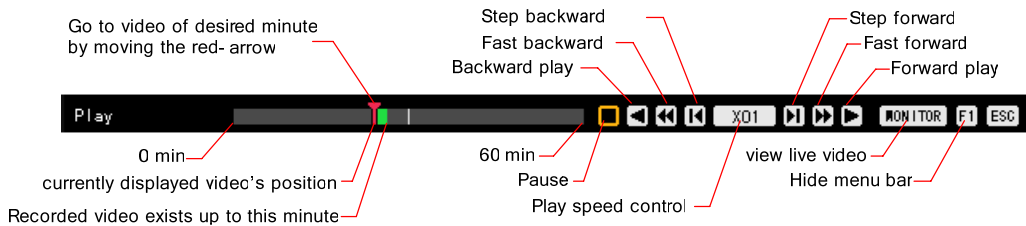
## (2) Controlling the Play speed

### A) Increasing/Decreasing the speed by X1

□ To increase/decrease the speed by X1, press the **Speed (+/-)** button on the remote control. The user can play the video by x1 or X1~X29.






### B) Increasing/Decreasing the speed by X30

□ To increase/decrease the speed by X1, press the **Speed (+/-)** button on the remote control. The user can play the video by X30 up to X300.


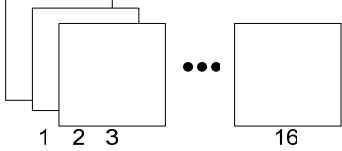


### 4-9-3. Playing on a Divided Screen


In multi-channel mode, video can be played on full screen or 4-divided screen.


 <p>Select sub-screen (4 sub-screens)</p>					
<p>To view the video of a certain channel, select the desired channel by pressing the numeric buttons.</p> <p>Pressing the  button on the remote control enables changing the screen. To view the video of Channel No. 1 on full screen, press [1-2]. Press [3-4] to view the video of Channel No. 2, [5-6] to view the video of Channel No. 3, and to view the video of Channel No. 4, short-press the [7-8] button.</p>					
 <p>4-divided screen (1 screen)</p>	<table border="1" data-bbox="799 1302 957 1450"> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>3</td> <td>4</td> </tr> </table>	1	2	3	4
1	2				
3	4				
<p>Press the  button on the remote control or short-press the [9-0] front button.</p> <p>To enlarge the video of a certain channel on a 4-divided screen, double-click the corresponding video.</p> <p>Double-click any area on the Enlarge window to convert into a 4-divided screen.</p>					


In multi-time or multi-day mode, video can be played on full screen or 4-divided, 9-divided, or 16-divided screen.

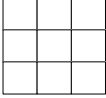
 Select sub-screen (16 sub-screens)	
--	--

To view the video of a certain channel, select the desired channel by pressing the numeric buttons.

Pressing the  button on the remote control or short-pressing the **[1-2]** front button enables viewing the next screen.


 4-divided screen (4 screens)	<table style="margin: auto;"> <tr> <td style="border: 1px solid black; padding: 5px;">1</td><td style="border: 1px solid black; padding: 5px;">2</td> <td style="border: 1px solid black; padding: 5px;">5</td><td style="border: 1px solid black; padding: 5px;">6</td> <td style="border: 1px solid black; padding: 5px;">9</td><td style="border: 1px solid black; padding: 5px;">10</td> <td style="border: 1px solid black; padding: 5px;">13</td><td style="border: 1px solid black; padding: 5px;">14</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">3</td><td style="border: 1px solid black; padding: 5px;">4</td> <td style="border: 1px solid black; padding: 5px;">7</td><td style="border: 1px solid black; padding: 5px;">8</td> <td style="border: 1px solid black; padding: 5px;">11</td><td style="border: 1px solid black; padding: 5px;">12</td> <td style="border: 1px solid black; padding: 5px;">15</td><td style="border: 1px solid black; padding: 5px;">16</td> </tr> </table>	1	2	5	6	9	10	13	14	3	4	7	8	11	12	15	16
1	2	5	6	9	10	13	14										
3	4	7	8	11	12	15	16										

To view the next screen, press the  button on the remote control or short-press the **[3-4]** front button. On the 4-divided screen, double-click the video to view it on full screen. Double-click any area on the Enlarge window to convert into a 4-divided screen.

 9-divided screen (2 screens)	<table style="margin: auto;"> <tr> <td style="border: 1px solid black; padding: 5px;">1</td><td style="border: 1px solid black; padding: 5px;">2</td><td style="border: 1px solid black; padding: 5px;">3</td> <td style="border: 1px solid black; padding: 5px;">8</td><td style="border: 1px solid black; padding: 5px;">9</td><td style="border: 1px solid black; padding: 5px;">10</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">4</td><td style="border: 1px solid black; padding: 5px;">5</td><td style="border: 1px solid black; padding: 5px;">6</td> <td style="border: 1px solid black; padding: 5px;">11</td><td style="border: 1px solid black; padding: 5px;">12</td><td style="border: 1px solid black; padding: 5px;">13</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">7</td><td style="border: 1px solid black; padding: 5px;">8</td><td style="border: 1px solid black; padding: 5px;">9</td> <td style="border: 1px solid black; padding: 5px;">14</td><td style="border: 1px solid black; padding: 5px;">15</td><td style="border: 1px solid black; padding: 5px;">16</td> </tr> </table>	1	2	3	8	9	10	4	5	6	11	12	13	7	8	9	14	15	16
1	2	3	8	9	10														
4	5	6	11	12	13														
7	8	9	14	15	16														

To view the next screen, press the  button on the remote control or short-press the **[5-6]** front button. On the 9-divided screen, double-click the video to view it on full screen. To go back to the 9-divided screen, double-click the video again.

 16-divided screen (1 screen)	<table style="margin: auto;"> <tr> <td style="border: 1px solid black; padding: 5px;">1</td><td style="border: 1px solid black; padding: 5px;">2</td><td style="border: 1px solid black; padding: 5px;">3</td><td style="border: 1px solid black; padding: 5px;">4</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">5</td><td style="border: 1px solid black; padding: 5px;">6</td><td style="border: 1px solid black; padding: 5px;">7</td><td style="border: 1px solid black; padding: 5px;">8</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">9</td><td style="border: 1px solid black; padding: 5px;">10</td><td style="border: 1px solid black; padding: 5px;">11</td><td style="border: 1px solid black; padding: 5px;">12</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">13</td><td style="border: 1px solid black; padding: 5px;">14</td><td style="border: 1px solid black; padding: 5px;">15</td><td style="border: 1px solid black; padding: 5px;">16</td> </tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4														
5	6	7	8														
9	10	11	12														
13	14	15	16														

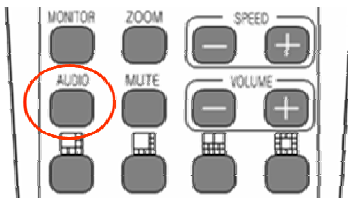
Press the  button on the remote control or short-press the **[7-8]** front button.

Double-click the video to be viewed on the channel. On the Enlarge window, double-click the video to convert into a divided screen.

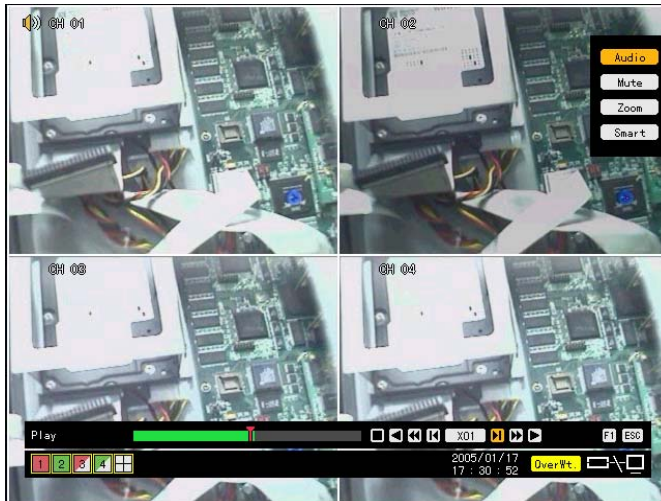


#### 4-9-4. Changing the Audio Channel

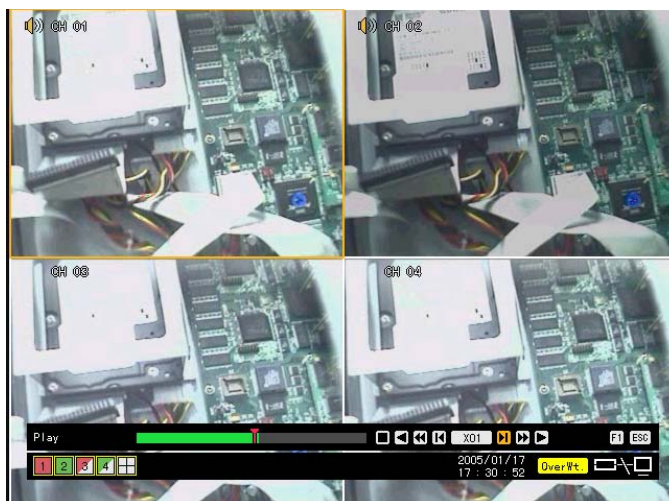
- In Play mode, press the **[Audio]** button on the remote control.



- Drag the cursor to the **upper right** corner. On the popup menu, select the **[Audio]** button.



- The Audio symbol is then displayed for the channel with the voice recording set together with an orange-colored activation window.

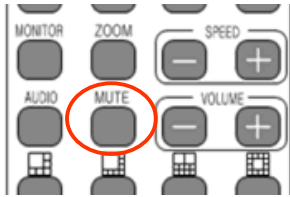


- Go to another window using the **arrow** (**▲▼◀▶**) buttons and press the **[Select]**  button.
- The recorded audio of the selected channel is then played.

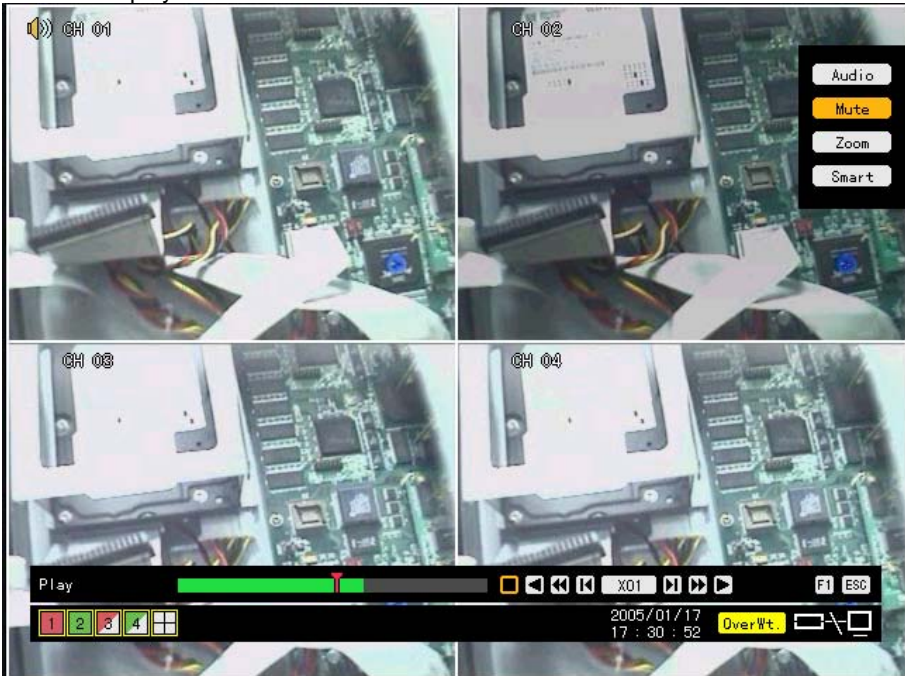
#### 4-9-5. Mute

Use Mute to block the sound of the selected channel.

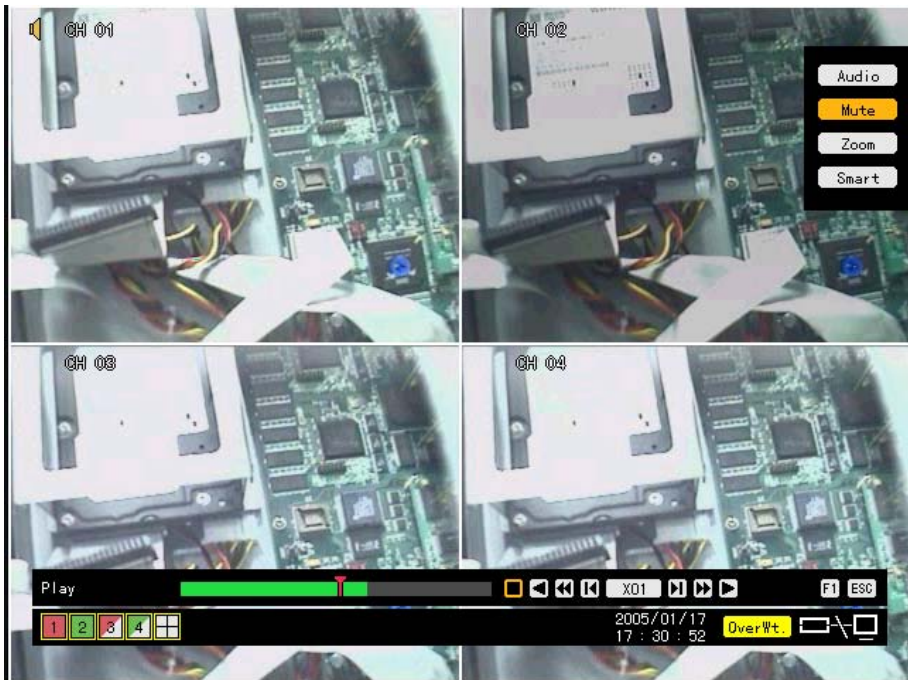
- In Play mode, press the **[Mute]** button on the remote control.



Drag the cursor to the upper right corner. On the popup menu, select **[Mute]**. An audio icon is then displayed on Channel No. 2.



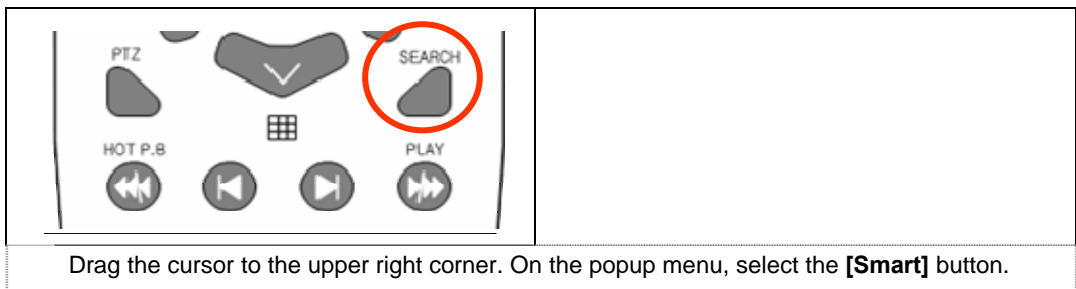
- Press the **[Mute]** button. The Audio Output icon is then changed as shown below:

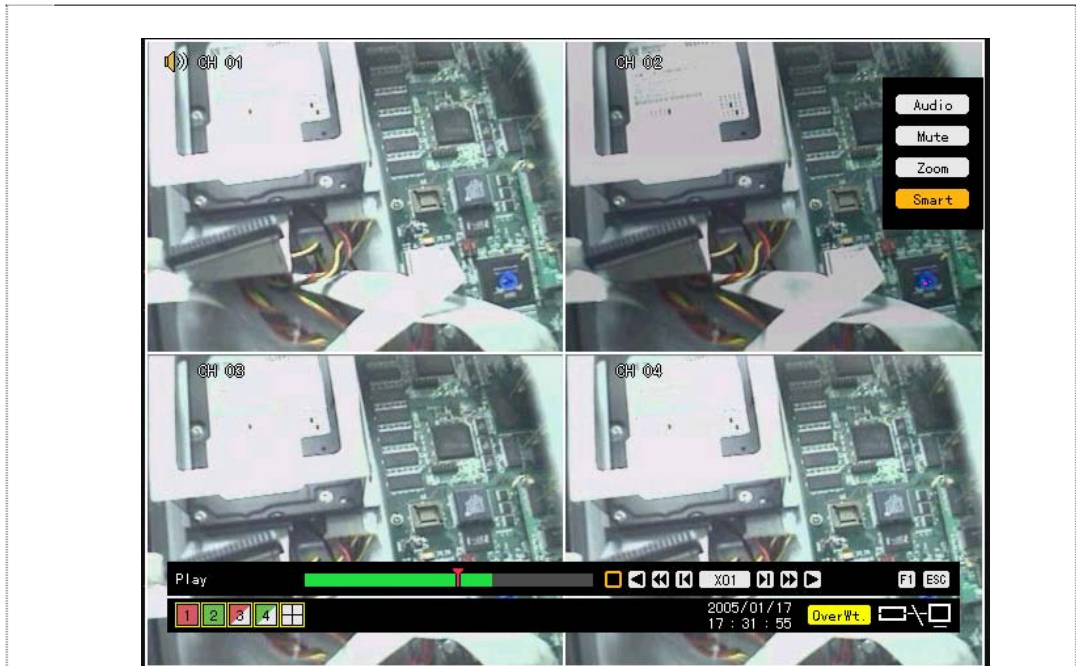


#### 4-9-6. Smart Search

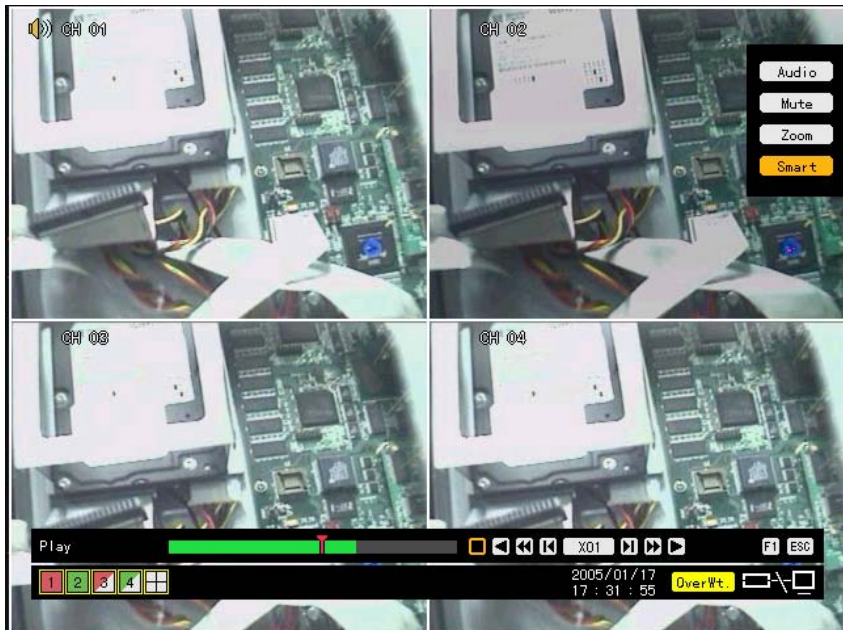
Use Smart Search to search the motion of objects in a certain zone quickly.

- In Play mode, select the **[Search]** button.





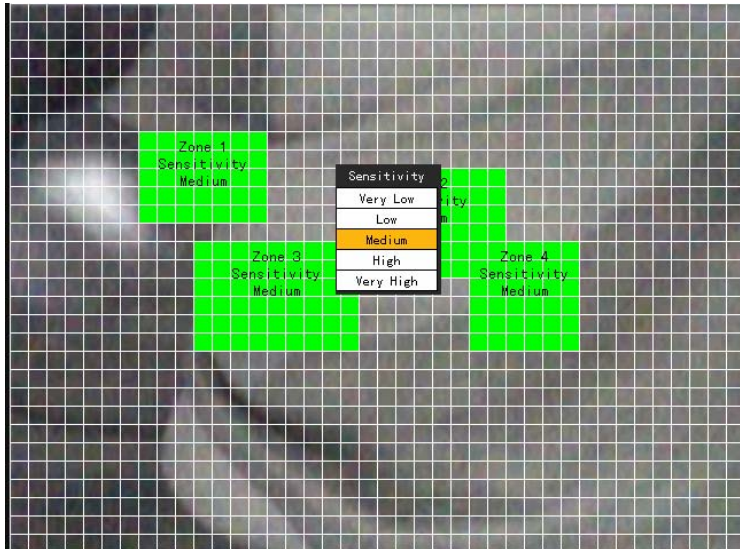


□ Select the channel to be searched.





- On the zone setting window, go to the desired zone using the **arrow** (▲▼◀▶) buttons. To set the search zone, press **[Select]**  Shifting the blue focus using the **arrow** (▲▼◀▶) buttons causes the search zone to be displayed in green. After setting the search zone, press the **[Select]**  button.



The user can set up to four search zones.

Right-click the green zone or press the **[Main Setup]** button on the remote control to set the motion degree. There are five motion degrees: Lowest, Low, Middle, High, and Highest. The default setting is Middle.

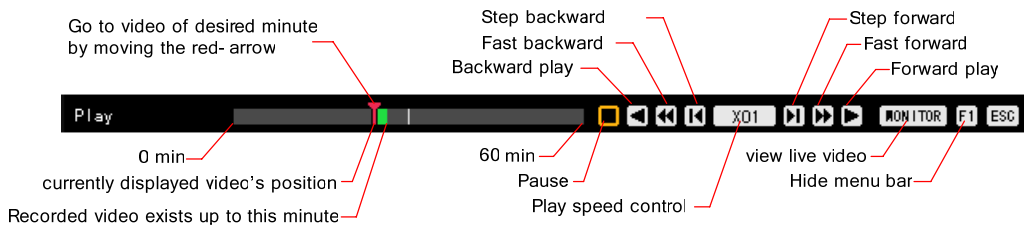
- After setting the search zone, press the **[Play]** button or go to the play control bar in Play mode. The play control bar is then displayed. Press the **[Play]** button to start Smart Search.



- After Smart Search is completed, the following search window appears:



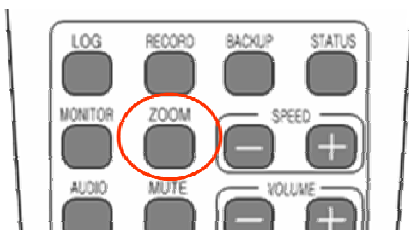
- The search zone where motion is detected turns green.
- The user can play the video searched via Smart Search using the following search buttons:



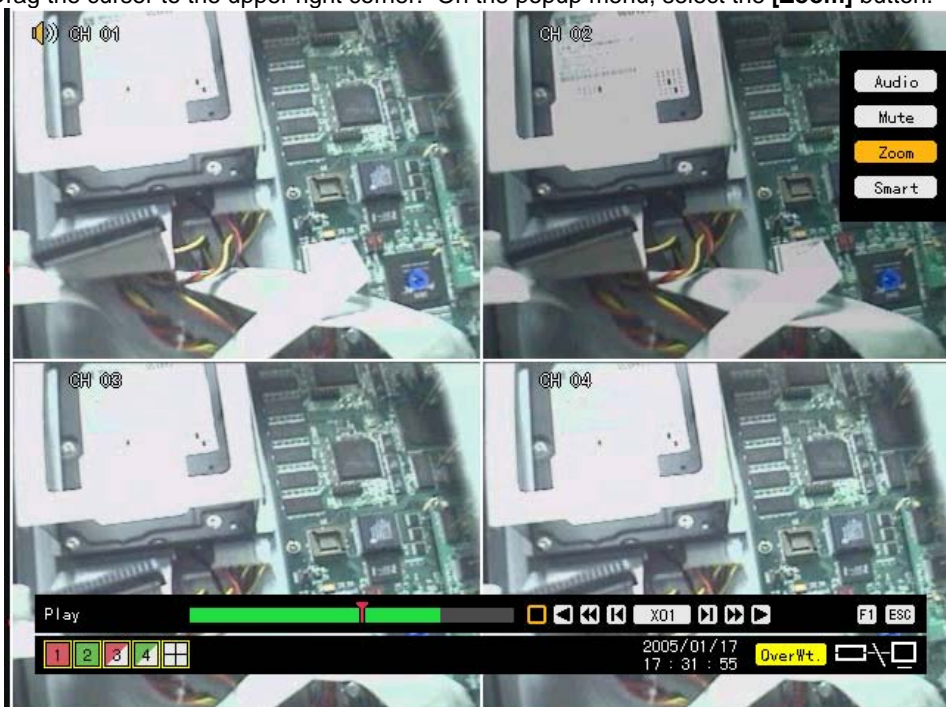
#### 4-9-7. Digital Zoom-in

The user can enlarge a certain part while playing the video.

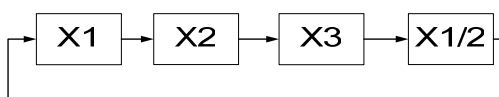
- In Play mode, press the **[Zoom]** button on the remote control.



Drag the cursor to the upper right corner. On the popup menu, select the **[Zoom]** button.



- On the active window, select a channel using the **arrow** (◀▶) buttons and press the **[Select]** button.
- Selecting the **[Zoom]** button to zoom in/out the video from X2, X3 up to X1/2 causes the selected channel to be displayed.



The user can select another channel using the **arrow** (▲▼◀▶) button on the zoom-in screen.

Clicking any point on the screen enables the user to change the direction.

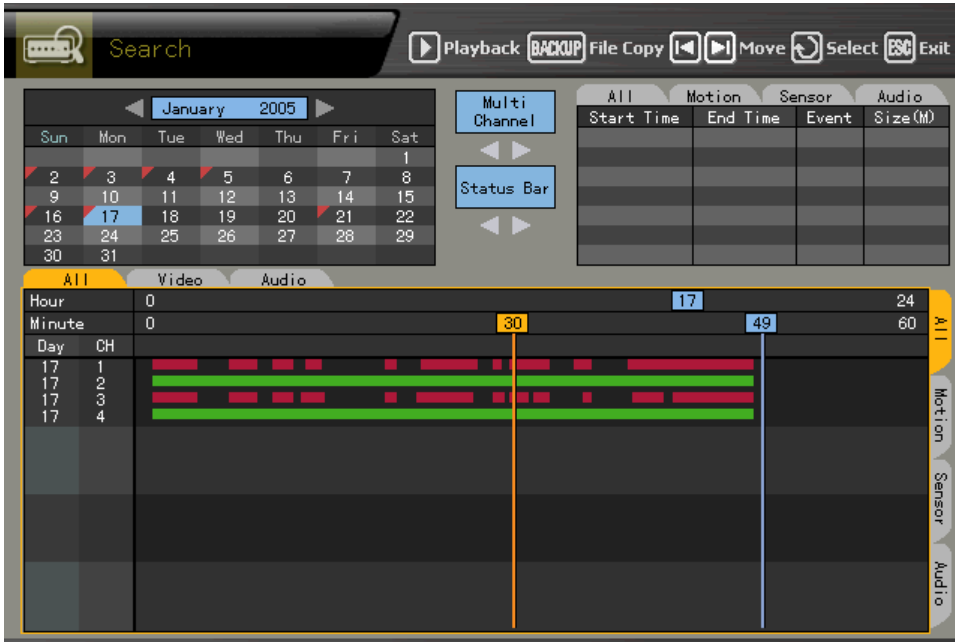
## 4-10. Backup

Workhorse 120-4 provides USB 2.0 and CD-RW/DVD-RW backup interfaces.

Before backing up the data, check whether the CD-RW/DVD-RW is installed or connect an external hard drive with USB2.0 interface, an external CD-RW/DVD-RW, or any other storage device to the USB2.0 port on the front side. Refer to the appendix for the list of supported external devices.

- Select **{Search} – {Multi Channel} – {Minute}** as shown below:

For the search method, refer to Section 4-8 Search.

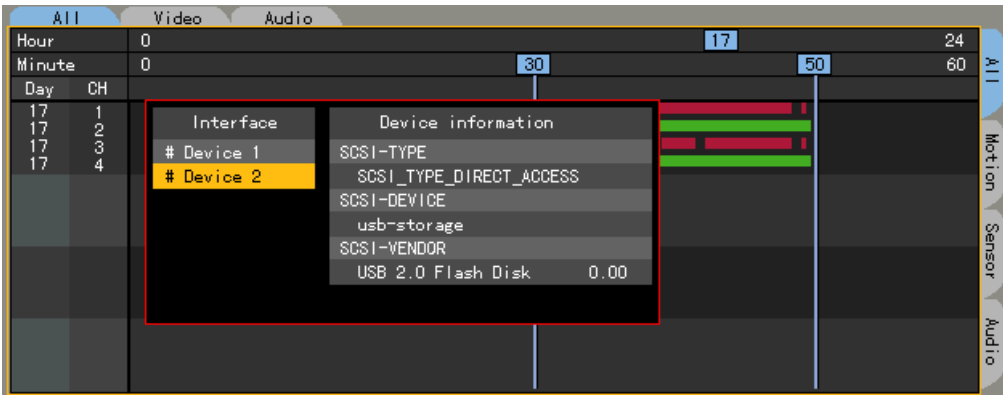


- Press the **[Backup]** button on the remote control or go to the **[Backup]** menu at the center of the **{Search}** mode screen.



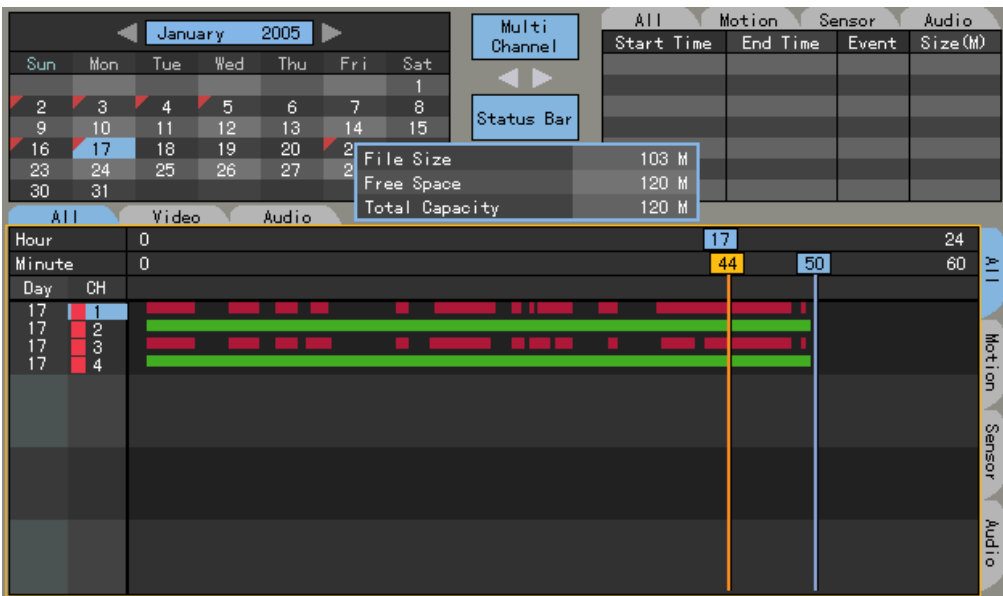


- In the access device selection list, select one for the connected storage devices.

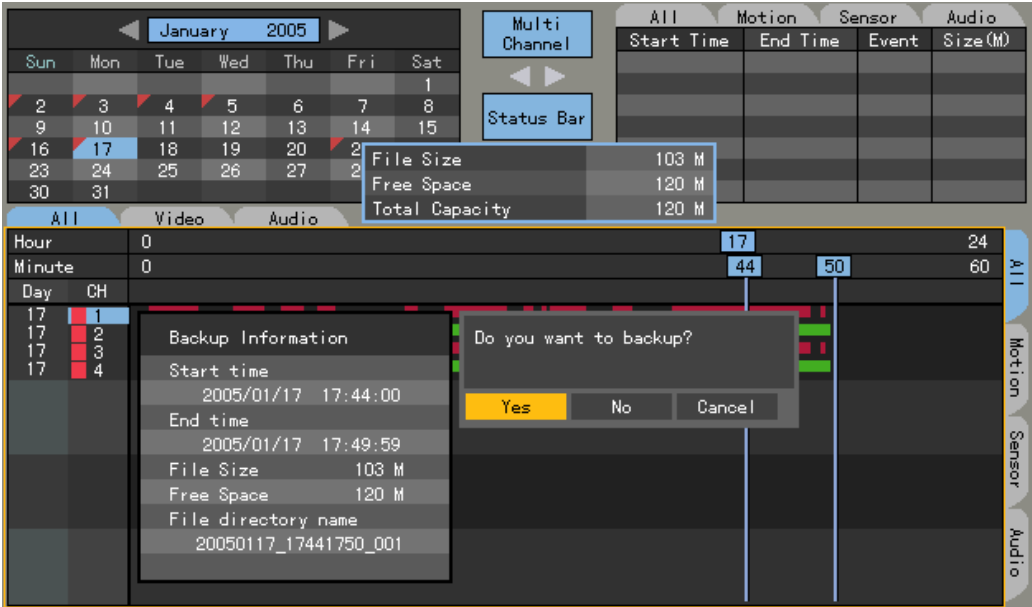


- Check the backup capacity and adjust the available space by using the **arrow** (▲▼◀▶) buttons or pressing the **[Select]** ⌂ button.

To back up a channel or cancel backup, go to the backup channel by using the **arrow** (▲▼) buttons and pressing the **[Select]** ⌂ button.  
 The backup channel is then displayed in red.  
 To change the backup time, go to the starting point of the backup time by selecting the ⏪ button and change the minute bar using the **arrow** (◀▶) buttons.

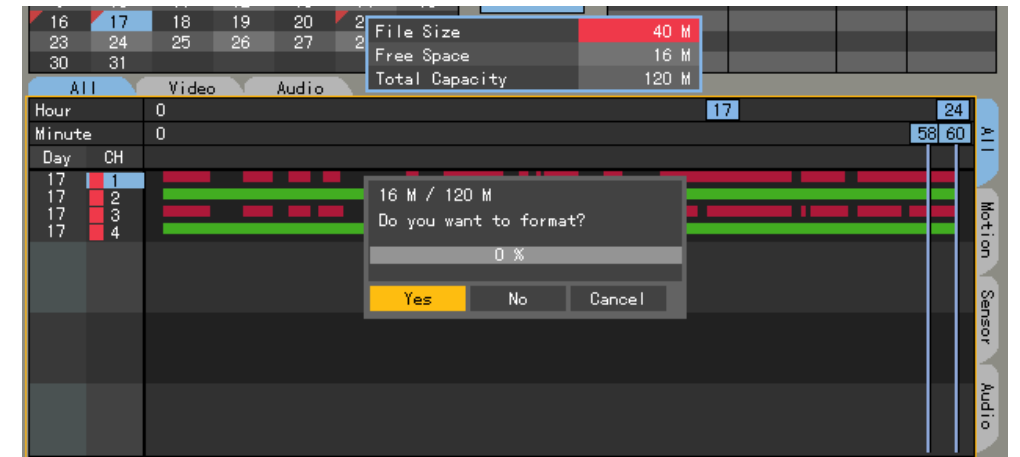


- Select the **[Backup]** button at the upper center on the **{Search}** mode screen. The corresponding backup information is then displayed. Check the backup information and click **[Yes]** on the message window as shown below:

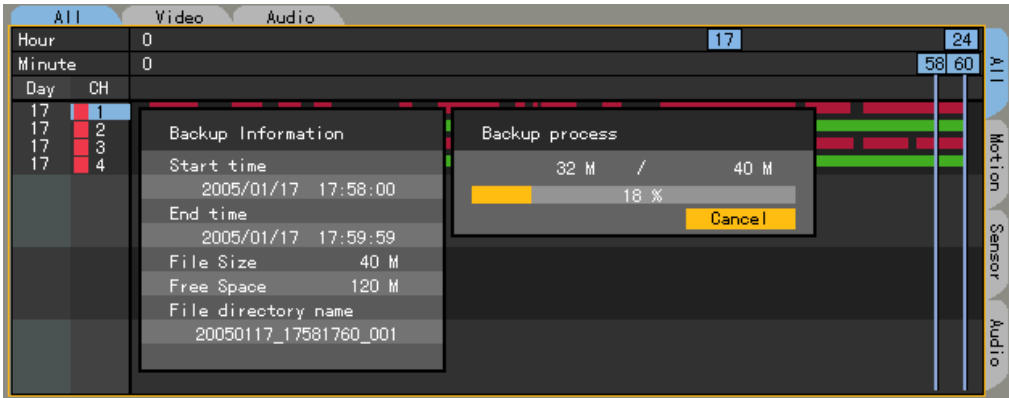


If the backup storage device has not been formatted, or in case the storage space is already in use, the following message appears:

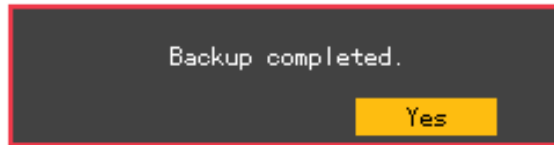
To delete the data, select **[Yes]**.



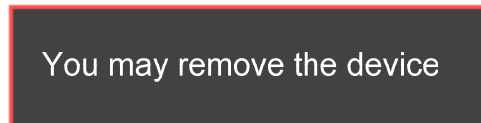
- The backup process starts after the following message appears:



- After backup is completed, press the **[Select]**  button on the message window as shown below:



- Once the following message appears, separate the backup device from the USB 2.0 port on the front side of the system or remove the built-in CD-RW/DVD-RW:



## 4-11. PTZ Camera Control

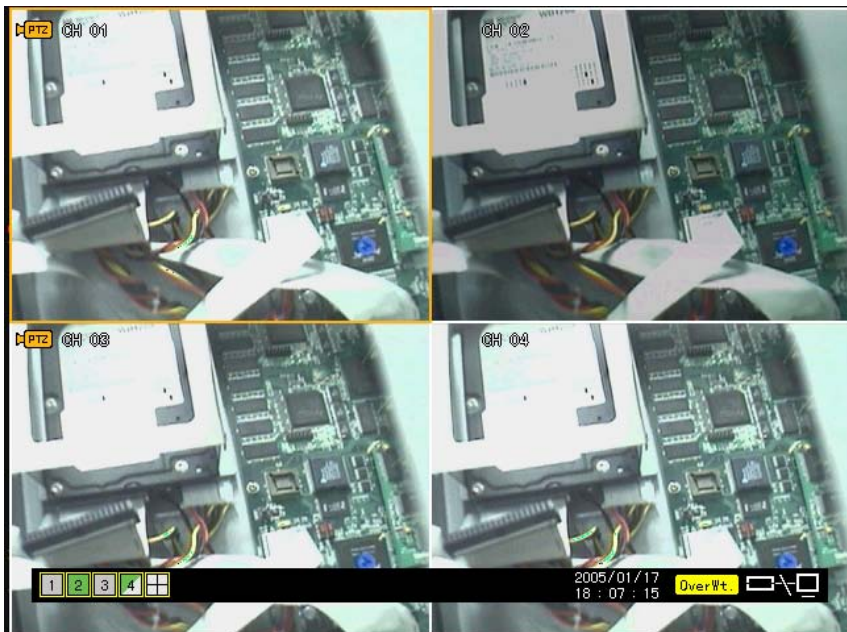
### 4-11-1. Conditions for Using PTZ

- The PTZ camera must connect with the system.
- Select **{Additional Setup}** -> **{PTZ Setup}** and check whether the PTZ camera protocol is available.

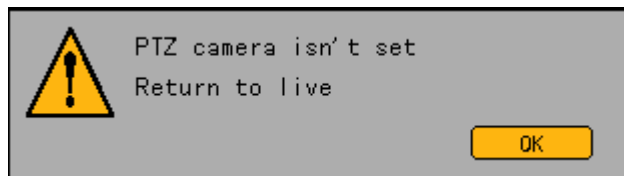
For more information on PTZ camera setting, go to **{Additional Setup}** -> **{PTZ Setup}**.

### 4-11-2. Shifting to PTZ Mode

- In real-time monitoring mode, press the **[PTZ]** button on the remote control.
- An icon is then displayed on the channel with the PTZ camera, set together with the channel selection window as shown below:



- If the PTZ camera is not set for that channel, the following message window appears:



### Channel selection window


<b>Activation mode</b>	The channel selection window can be moved. At this time, the border of the channel screen is displayed in orange.
<b>Selection mode</b>	The channel is selected. At this time, the border of the channel screen is displayed in blue.

### 4-11-3. PTZ Control

#### (1) Horizontal/Vertical rotation

- In {PTZ} mode, go to the channel selection window and select a channel from among those with the PTZ camera set.
- After a channel is selected, the horizontal/vertical rotation mode can be selected as shown below:




- Adjust horizontally or vertically using the **arrow (▲▼◀▶)** buttons.
- To select another screen in horizontal/vertical rotation mode, press the right/left **[TAB]**  button.

#### (2) Zoom in/Zoom out

- In horizontal/vertical rotation mode, press the **[PTZ]** button on the remote control. A toolbar is then displayed as shown below:




**Zoom out (▲)** and **zoom in (▼)** using the **arrow (▲▼)** buttons.

- To select another screen in zoom in/out mode, press the right/left **[TAB]**  button.

#### (3) Focus control



- In zoom in/out mode, press the **[PTZ]** button on the remote control. A toolbar is then displayed as shown below:



- Adjust the camera focus using the **arrow (▲▼)** buttons.
- To select another screen in focus control mode, press the right/left **[TAB]**  button.

#### (4) Preset

Use Preset to store the horizontal/vertical/zoom/focus settings of the PTZ camera.

- In horizontal/vertical rotation, zoom, or focus control mode, press the **[Select]**  button.
- Select a number using the numeric and **arrow (◀▶)** buttons on the OSD menu and press the **[Select]**  button.
  - The preset numbers are between 1 and 8.



- The selected number is then changed into blue, and the current screen, stored together with the selected number.



### (5) Using the Preset feature

- In horizontal/vertical rotation, zoom, or focus control mode, press any numeric button between 1 and 8 on the remote control.
- The selected horizontal/vertical/zoom/focus setting of the PTZ camera is selected.

### (6) Using the Tour feature

Use Tour to select the preset settings sequence.

Use Preset to store the horizontal/vertical/zoom/focus settings of the PTZ camera.

For more information on setting the Tour feature, go to **{Additional Setup}** -> **{PTZ Setup}** -> **{Tour}**.

- Once the Tour feature is enabled, No. 9 or No. 0 on the OSD is displayed in blue in horizontal/vertical rotation, zoom, or focus control mode.



- In horizontal/vertical rotation, zoom, or focus control mode, press the numeric buttons (9, 0) on the remote control.
- The current screens are automatically changed according to the defined tour order.
- Once the Tour feature is enabled, press the currently enabled Tour numbers (9 and 0).

<b>Tour1</b>	Set as 9.
<b>Tour2</b>	Set as 0.

# 5. System Setup

System setup includes {Main Setup} and {Additional Setup}:

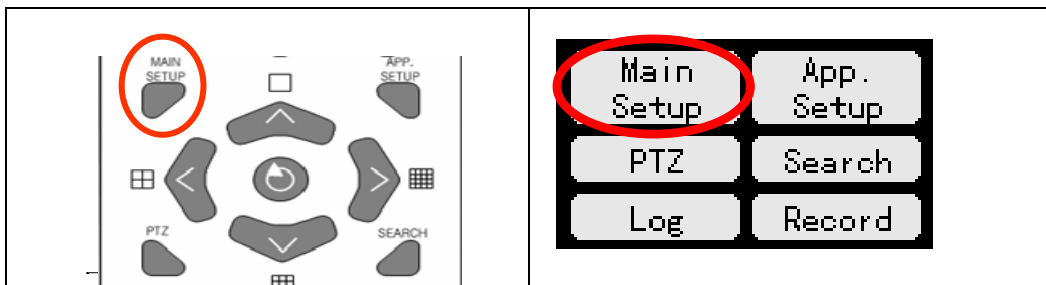
Main Setup	Additional Setup
Recording setup	PTZ setup
Recording schedule	Network
System	
Storage device	
NTP	
Advanced	

## 5-1. Main Setup

Use {Main Setup} to set the recording and system environment and major features.

### 5-1-1. Starting the Main Setup

- Press the [Main Setup] button on the remote control or go to the [Main Setup] menu on the real-time monitoring screen.



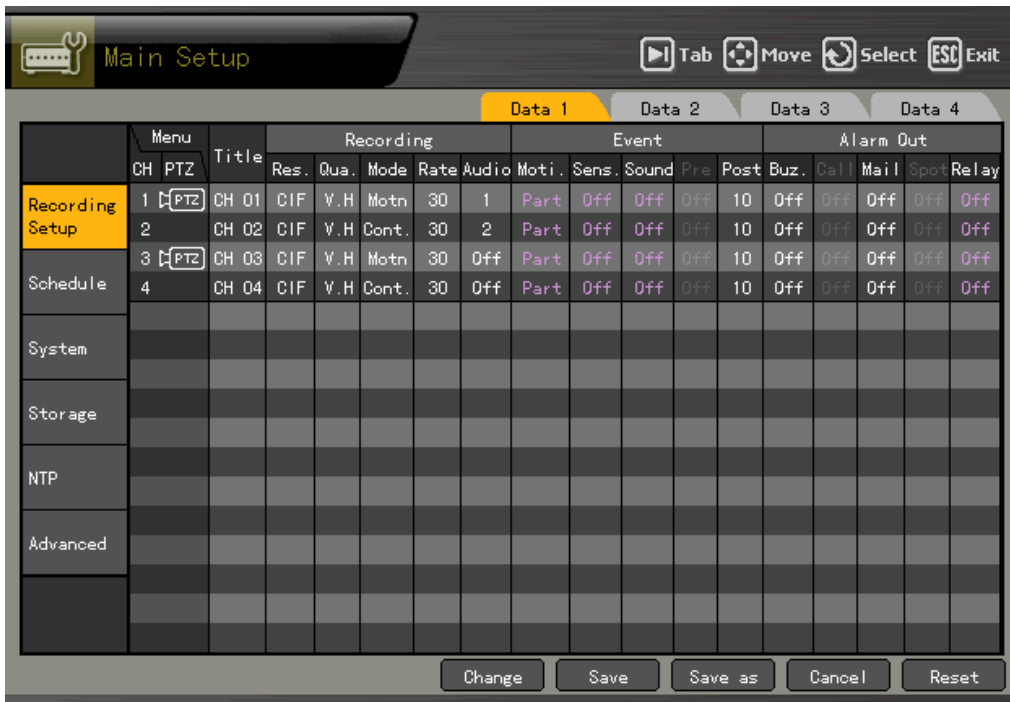
- The login window is then displayed as shown below:



- Select the login account and input the password using the numeric buttons on the remote control or on the menu. Afterward, select [OK] or press the [Select] button on the remote control.

- (The default password of the local administrator is "00000.")
- In case the password contains less than five digits, click the [OK] button or press the [Select] button on the remote control.
- Go to the ID selection box and change the ID using the arrow (▲▼) buttons.

- Once the correct password is inputted, the initial screen of **{Main Setup}** is displayed as shown below:







## 5-1-2. Recording Setup

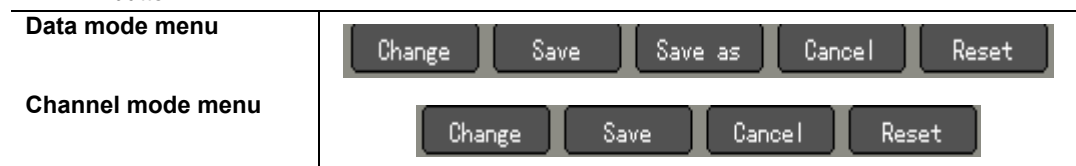
Used to set the recording and events

### (1) Selecting the recording setup menu mode

**{Recording Setup}** supports two modes: data mode and channel mode.

#### A) Selecting the menu method

- Navigate by pressing the **[TAB]**  and **arrow** ( ) buttons on the remote control. Select the **[Change]** button on the data mode menu and channel mode menu and press the **[Select]**  button.





■ Data mode

The user can set the data for Channel Nos. 1 ~ 4 based on the data profile as shown below:

Menu		Title	Recording				Event				Alarm Out						
CH	PTZ		Res.	Qva.	Mode	Rate	Audio	Moti.	Sens.	Sound	Pre	Post	Buz.	Dal.	Mail	Spot	Relay
Recording Setup	1	CH 01	CIF	V.H	Motn	30	1	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
	2	CH 02	CIF	V.H	Cont.	30	2	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
Schedule	3	CH 03	CIF	V.H	Motn	30	Off	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
	4	CH 04	CIF	V.H	Cont.	30	Off	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
System																	
Storage																	
NTP																	
Advanced																	

■ Channel mode

The user can set the data of Channel Nos. 1 ~ 4 based on the four channel groups as shown below:

Menu		Title	Recording				Event				Alarm Out						
CH	Data		Res.	Qva.	Mode	Rate	Audio	Moti.	Sens.	Sound	Pre	Post	Buz.	Dal.	Mail	Spot	Relay
Recording Setup	1	CH 01	CIF	V.H	Motn	30	1	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
	2	CH 01	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	3	CH 01	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
Schedule	4	CH 01	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	2	CH 02	CIF	V.H	Cont.	30	2	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
	3	CH 02	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
System	4	CH 02	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	3	CH 03	CIF	V.H	Motn	30	Off	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
	2	CH 03	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
Storage	4	CH 03	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	3	CH 04	CIF	V.H	Motn	30	Off	Part	Off	Off	Off	10	Off	Off	Off	Off	Off
	2	CH 04	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
NTP	4	CH 04	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	3	CH 04	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	4	CH 04	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
Advanced	4	CH 04	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	3	CH 04	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off
	4	CH 04	CIF	V.H	Cont.	30	Off	Off	Off	Off	Off	10	Off	Off	Off	Off	Off

(2) Saving the recording setting

Set each menu in {Recording Setup} and save the new setting before exiting the menu.



### A) Save

- Select the **[Save]** button by pressing the **[TAB]**  and **arrow** ( ) buttons on the remote control and press the **[Select]**  button.



### B) Save as

Save the current setting as multiple data from Data 1 to Data 4.

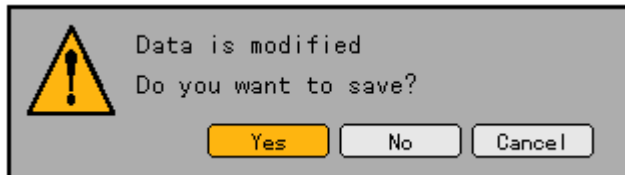
- Select the **[Save As]** button by pressing the **[TAB]**  and **arrow** ( ) buttons on the remote control and press the **[Select]**  button.



- The user can select multiple data from Data 1 to Data 4. The selected data are then displayed in green, and others, in blue.

### C) Saving on the message window

- Closing the window without saving the new recording setting causes a warning message to appear as shown below:
- Select **[Yes]** to save the new setting.



<b>Yes</b>	Saves the current setting and goes back to the main setup screen
<b>No</b>	Goes back to the main setup screen without saving the current setting
<b>Cancel</b>	Cancels the current operation and goes back to the previous screen

### (3) Naming a channel

Used to name each channel and to set camera input

- On the **{Recording Setup} → {Data 1~4} → {Title}** menu, go to the channel using the **arrow (▲▼◀▶)** buttons and press the **[Select]** button.
- On the selection box, go to **{Title}** and press the **[Select]** button.

Menu		Title	Recording				
CH	PTZ		Res.	Qua.	Mode	Rate	Audio
1	[PTZ]	CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3	[PTZ]	CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off

Menu		Title	Recording				
CH	PTZ		Res.	Qua.	Mode	Rate	Audio
1	[PTZ]	CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3	[PTZ]	CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off

- On the title input box, input the channel name using the **arrow (▲▼◀▶)** buttons and press the **[Select]** button.

CHO1									
a	b	c	d	e	f	g	h	i	
j	k	l	m	n	o	p	q	r	
s	t	u	v	w	x	y	z	0	
1	2	3	4	5	6	7	8	9	
@	#	&	_	+	-	*	/	%	
=	.	,	^	?	!	~	(	)	
Caps Lock BS Space Cancel Save & Exit									

<b>Caps lock</b>	Used to shift to upper case
<b>BS</b>	Backspace; used to delete
<b>Space</b>	Used to insert space
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

- After inputting the data, go to **[Save and Exit]** using the **arrow (▲▼◀▶)** or **[Tab]** buttons and save the setting by pressing the **[Select]** button.

### (4) Hiding a channel

Hides the channel video on the real-time monitoring screen

- On the **{Recording Setup} → {Data 1~4} → {Title}** menu, go to the channel using the **arrow (▲▼◀▶)** buttons and press the **[Select]** button.

On the selection box, go to **[Covert]** and press the **[Select]** button.

Menu		Title	Recording				
CH	PTZ		Res.	Qua.	Mode	Rate	Audio
1	[PTZ]	CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3	[PTZ]	CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off


Menu		Title	Recording				
CH	PTZ		Res.	Qua.	Mode	Rate	Audio
1	[PTZ]	CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3	[PTZ]	CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off

Screen display based on the recording setup and video input of the camera

<b>VL</b>	Stands for Video Loss, which indicates camera video loss or absence of video on that channel
<b>VD</b>	Stands for Video Disconnection, which indicates the presence of a video input on the channel but Record and Live are turned off
<b>VC</b>	Stands for Video Covert, which means that recording is done but the video is hidden only in Live Mode


### (5) Channel ON/OFF

Used to connect the camera to each channel port and to set video input

- On the **{Recording Setup}**→**{Data 1~4}** → **{Title}** menu, go to the channel using the **arrow** (**▲▼◀▶**) buttons and press the **[Select]**  button.


Menu		Title	Recording				
CH	PTZ		Res.	Qua.	Mode	Rate	Audio
1		CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3		CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off

Menu		Title	Recording				
CH	PTZ		Res.	Qua.	Mode	Rate	Audio
1		CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3		CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off

To set all channels at the same time, go to **{Title}** and press the **[Select]**  button.

Menu		Channel Title	Recording				
CH	PTZ	Title	Res.	Qua.	Mode	Rate	Audio
1		CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3		CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off

Menu		Title	Recording				
CH	PTZ	Title	Res.	Qua.	Mode	Rate	Audio
1		CH 01	CIF	V.H	Motn	30	1
2		CH 02	CIF	V.H	Cont.	30	2
3		CH 03	CIF	V.H	Motn	30	Off
4		CH 04	CIF	V.H	Cont.	30	Off

- On the selection box, go to **[On]** or **[Off]** and press the **[Select]**  button.


<b>On</b>	Connects the inputted video of the camera
<b>Off</b>	Disconnects the inputted video of the camera

### (6) Record

Sets the resolution, recording quality, recording type, recording frame, and audio recording status

#### A) Resolution

Sets the resolution of the recorded channel

- On the **{Recording Setup}**→**{Data 1~4}**→**{Recording}**→**{Resolution}** menu, go to the channel and press the **[Select]**  button.


Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Motn	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Motn	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

To set all channels at the same time, go to **(Resolution)** and press the **[Select]**  button.

Resolution				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Motn	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Motn	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off


- On the selection box, set the resolution using the **arrow (▲▼)** and **[Select]**  buttons.

### Resolution by video type

Resolution \ Type	NTSC	PAL
<b>CIF</b>	320x240	320x288
<b>Field</b>	640x240	640x288
<b>Full</b>	640x480	640x576


### B) Recorded video quality

Sets the quality of the recorded video

- On the **{Recording Setup}→{Data 1~4} →{Recording}→{Quality}** menu, go to the channel and press the **[Select]**  button.

Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Motn	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Motn	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

To set all channels at the same time, go to **(Quality)** and press the **[Select]**  button.

Quality				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Motn	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Recording		
Res.	Qua.	
		Lowest
CIF	V.H	Low
CIF	V.H	Medium
CIF	V.H	High
CIF	V.H	Highest

- On the selection box, set the recorded video quality using the **arrow (▲▼)** and **[Select]** buttons.

**Note !** The size of recorded video files according to recording quality

Recording quality	The size of recording video files
Lowest	↑ Smaller ↓ Larger
Low	
Middle	
High	
Highest	

### C) Recording type

Recording Type	Description
<b>Automatic</b>	Sets the event recording speed and normal recording speed separately for automatic recording based on the setting
<b>Continuous</b>	Recording done based on the normal frame setting
<b>Motion</b>	Recording done based on the event frame setting in case motion is detected
<b>Sensor</b>	Recording done based on the event frame setting in case of inputted signal from an external sensor
<b>Sound</b>	Recording done based on the event frame setting in case sound is detected

### ■ Recording conditions

Recording Type	Setting
<b>Continuous</b>	{Recording} → {Rate} → Normal: 1~30
<b>Motion</b>	{Event} → {Motion}: Partial or Full
<b>Sensor</b>	{Event} → {Sensor}: 1~4
<b>Sound</b>	{Event} → {Sound}: 1~2
<b>Automatic</b>	Enables selecting both normal and event recording frames at the same time

- On the {Recording Setup}→{Data 1~4}→{Recording}→{Mode} menu, go to the channel using the arrow (▲▼◀▶) buttons and press the [Select] ⏻ button.

Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Cont.	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Cont.	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Auto  
 Continuous  
 Motion  
 Sensor  
 Sound

To set all channels at the same time, go to (Mode) and press the [Select] ⏻ button.

Reco Recording Mode					
Res.	Qua.	Mode	Rate	Audio	Moti.
CIF	V.H	Cont.	30	1	Part
CIF	V.H	Cont.	30	2	Part
CIF	V.H	Motn	30	Off	Part
CIF	V.H	Cont.	30	Off	Part

Recording				
Res.	Qua.	Mode	Rate	Sens.
CIF	V.H	Cont.	30	Off
CIF	V.H	Cont.	30	Off
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Auto  
 Continuous  
 Motion  
 Sensor  
 Sound

- On the selection box, set the recording type using the arrow (▲▼) and [Select] ⏻ buttons.

#### D) Recording frame

Recording frames include the normal type and event type.

<b>Normal</b>	Sets the recording frame rate for Automatic and Continuous recording
<b>Event</b>	Sets the recording frame rate for Automatic, Motion, Sensor, and Sound recording


**Note!** Maximum recording frame by resolution

Model \ Resolution	CIF (NTSC/PAL) (320X240 /320X288)	Field (NTSC/PAL) (640X240/640X288)	Full (NTSC/PAL) (640X480/640X576)
<b>Workhorse 120-4</b>	120/100fps	60/50fps	30/25fps

- On the {Recording Setup}→{Data 1~4}→{Recording}→{Rate} menu, go to the channel using the arrow (▲▼◀▶) buttons and press the [Select] ⏻ button.
- On the selection box, set the recording frame using the arrow (▲▼) and [Select] ⏻ buttons.


Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Cont.	30	1
CIF	V.H	Cont.	30	2
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Off  
 1  
 2  
 3  
 4

To set all channels at the same time, go to **{Rate}** and press the **[Select]**  button.


### E) Audio Recording/Live setting

Sets the Recording/Live status for the audio input from an external device that is compatible with the system

- On the **{Recording Setup}**→**{Data 1~4}**→**{Recording}**→**{Audio}** menu, go to the channel using the **arrow** (**▲▼◀▶**) buttons and press the **[Select]**  button.

Recording				
Res.	Qua.	Mode	Rate	Audio
CIF	V.H	Cont.	30	Off
CIF	V.H	Cont.	30	Off
CIF	V.H	Motn	30	Off
CIF	V.H	Cont.	30	Off

Recording					E	
Res.	Qua.	Mode	Rate	Audio	Moti.	Sens.
CIF	V.H	Cont.	30	Off	Off	
CIF	V.H	Cont.	30	Off	1	
CIF	V.H	Motn	30	Off	2	
CIF	V.H	Cont.	30	Off		

- On the selection box, set the audio channel using the **arrow** (**▲▼**) and **[Select]**  buttons.

## (7) Event setup

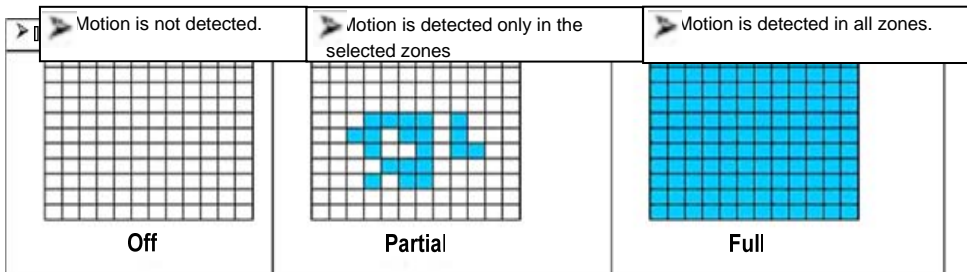
### A) Motion

Used to detect motion

Detection settings include Full, Partial, and OFF. The default setting is OFF.


The full video of a certain channel is displayed as shown below (blocks are used to separate the areas where motion is detected).

**The blue block indicates the areas where motion is detected.**



### ■ Full


Used to detect motion in each zone

- On the **{Recording Setup}**→**{Data 1~4}**→**{Event}**→**(Motion)** menu, go to the channel using the **arrow** (**▲▼◀▶**) buttons and press the **[Select]**  button.

Event				
Moti.	Sens.	Sound	Pre	Post
Full	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10


Event				
Moti.	Sens.	Sound	Pre	Post
Full	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10



To set all channels at the same time, go to **{Motion}** and press the **[Select]**  button.

Motion Detection				
Moti.	Sens.	Sound	Pre	Post
Full	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event				
Moti.	Sens.	Sound	Pre	Post
Moti.	Off	Off	Off	10
Full	Partial	Off	Off	10
Part	Full	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

- On the selection box, select **[Full]** using the **arrow (▲▼)** and **[Select]**  buttons.

### ■ Partial

Used to detect motion only in user-defined zones

- On the **{Recording Setup}**→**{Data 1~4}**→**{Event}**→**{Motion}** menu, go to the channel using the **arrow (▲▼◀▶)** buttons and press the **[Select]**  button.


Event				
Moti.	Sens.	Sound	Pre	Post
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event				
Moti.	Sens.	Sound	Pre	Post
Part	Off	Off	Off	10
Part	Partial	Off	Off	10
Part	Full	Off	Off	10
Part	Off	Off	Off	10

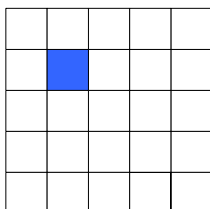
To set all channels at the same time, go to **{Motion}** and select the **[Main Setup]** button.

Motion Detection				
Moti.	Sens.	Sound	Pre	Post
Full	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

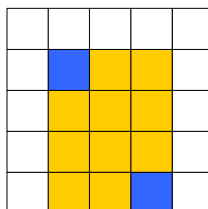
Event				
Moti.	Sens.	Sound	Pre	Post
Moti.	Off	Off	Off	10
Part	Partial	Off	Off	10
Part	Full	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

- On the selection box, select **[Partial]** using the **arrow (▲▼)** and **[Select]**  buttons.
- The following figure then appears:

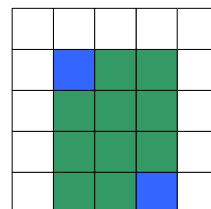
Move the focus to the motion detection-setting area.




Select zones.

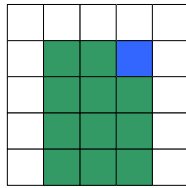


Double-click on the selected zones.

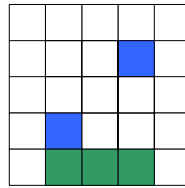


- Select the area where motion is detected using the **arrow (▲▼)** and **[Select]**  buttons.
- **The user can cancel the selected areas.**

Move the blue focus to the motion detection-setting area, and double-click on it.






Select the zone to detect motion and click on it.



- Select the zone and press the **[ESC]** button.

Selecting the zone

- 1) To view the zone set in yellow, press the **[Select]**  button.
- 2) Set the zone using the **arrow** buttons and press the **[Select]**  button.
- 3) Once set, the **zone** is displayed in green.

The **[Select]**  button may be used for toggling.

## ■ OFF

Disables the detection of motions in the video

## ■ Setting the motion detection sensitivity

- On the **{Recording Setup}→{Data 1~4}→{Event}→{Motion}** menu, go to the channel using the **arrow (▲▼◀▶)** buttons and select the **[Main Setup]** button. Afterward, right-click **[Motion]**.


Event				
Moti.	Sens.	Sound	Pre	Post
Part	Off	Off	Off	10
Part	Motion			10
Part	Sensitivity: M			10
Part	Off	Off	Off	10

Event				Alarm			
Moti.	Sens.	Sound	Pre	Post	Buz.	Call	Mail
Part	Off	Off	Off	10	Off	Off	Off
Part	Motion			10	Off	Off	Off
Part	Sensitivity: M				Very Low		ff
Part	Off	Off	Off		Low		ff
					Medium		
					High		
					Very High		

To set all channels at the same time, go to **{Motion}** and select the **[Main Setup]** button.

Motion Detection				
Moti.	Sens.	Sound	Pre	Post
Part	Motion			10
Part	Sensitivity: M			10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Motion Detection				Alarm			
Moti.	Sens.	Sound	Pre	Post	Buz.	Call	Mail
Part	Motion			10	Off	Off	Off
Part	Sensitivity: M				Very Low		ff
Part	Off	Off	Off		Low		ff
Part	Off	Off	Off		Medium		ff
					High		
					Very High		

- On the selection box, set the sensitivity using the **arrow (▲▼)** and **[Select]**  buttons.

### Setting the sensitivity


Sensitivity levels include Lowest, Low, Middle, High, and Highest, indicating the proportion of pixels to the motions being detected. The higher the grade, the more accurate the detection of motion is.

## B) Sensor

Defines the settings for detecting input from an external sensor compatible with the system


The user can set up to four external sensors. Once signal input is detected, the video of the corresponding channel is recorded.

### ■ Sensor setting

- On the **{Recording Setup}→{Data 1~4}→{Event}→{Sensor}** menu, go to the channel using the **arrow (▲▼◀▶)** buttons and press the **[Select]**  button.


Event				
Moti.	Sens.	Sound	Pre	Post
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event				
Moti.	Sens.	Sound	Pre	Post
Part	Off	Off	Off	10
Part	Off	1		10
Part	Off	2		10
Part	Off	3		10
		4		

To set all channels at the same time, go to **{Sensor}** and press the **[Select]**  button.

Sensor Detection				
Moti.	Sens.	Sound	Pre	Post
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event			
Moti.	Sens.	Off	Post
Part	Off	1	10
Part	Off	2	10
Part	Off	3	10
Part	Off	4	10

- On the selection box, set the input port number for the external sensor using the **arrow (▲▼)** and **[Select]**  buttons.

### ■ Sensor type setting

- On the {Recording Setup}→{Data 1~4}→{Event}→{Sensor} menu, go to the channel using the arrow (▲▼◀▶) buttons and select the [Main Setup] button. Afterward, right-click [Sensor].

Event				
Moti.	Sens.	Sound	Pre	Post
Part	1	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event					Alar		
Moti.	Sens.	Sound	Pre	Post	Buz.	Call	M
Part	1	Off	Off	10	Off	Off	0
Part	Off	Off	Off	10	Off	Off	0
Part	Off	Off	Off	10	NC		
Part	Off	Off	Off	10	NO		

- On the selection box, set the sensor type using the arrow (▲▼) and [Select] button.

**Normal Close (NC):** Opens in case of incoming signal when closed normally

**Normal Open (NO):** Closes in case of incoming signal when opened normally

### C) Sound

Defines the settings for detecting audio input from an external device compatible with the system. The user can set the audio input for two external devices compatible with the system. Once audio input is detected, the video of the corresponding channel is recorded. Each channel can detect audio from up to two devices.

- On the {Recording Setup}→{Data 1~4}→{Event}→{Sound} menu, go to the channel using the arrow (▲▼◀▶) buttons and press the [Select] button.


Event				
Moti.	Sens.	Sound	Pre	Post
Part	1	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event				
Moti.	Sens.	Sound	Pre	Post
Part	1	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	1
Part	Off	Off	Off	2

- To set all channels at the same time, go to {Sound} and press the [Select] button.

Event					
Moti.	Sens.	Sound	Pre	Post	Buz.
Part	1	Off	Off	10	Off
Part	Off	Off	Off	10	Off
Part	Off	Off	Off	10	Off
Part	Off	Off	Off	10	Off

Event				
Moti.	Sens.	Sound	Pre	Post
Part	1	Off	Off	1
Part	Off	Off	Off	2
Part	Off	Off	Off	10
Part	Off	Off	Off	10

On the selection box, select the audio channel using the **arrow (▲▼)** and **[Select]**  buttons.

The user can detect audio input from multiple devices by defining the settings as follows:


Event				
Moti.	Sens.	Sound	Pre	Post
Part	1	Multi	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event				
Moti.	Sens.	Sound	Pre	Post
Part	1	Multi	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

To adjust the audio sensitivity of each channel, go to **{Sound}** and select the **[Main Setup]** button. Afterward, right-click **[Sound]**.

Event					Alarm Out			
Moti.	Sens.	Sound	Pre	Post	Buz.	Call	Mail	Spot
Part	1	Multi	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0

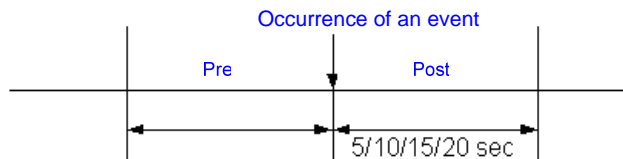
Event					Alarm Out			
Moti.	Sens.	Sound	Pre	Post	Buz.	Call	Mail	Spot
Part	1	Multi	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0

On the selection box, set the audio channel using the **arrow (▲▼)** and **[Select]**  buttons.

#### D) Post (This DVR does not support Prerecord time)

Sets the recording time upon the occurrence of an event

The unit is in seconds. Whenever an event is detected, recording is done for the defined time.



On the **{Recording Setup}**→**{Data 1~4}**→**{Event}**→**{Post}** menu, go to the channel using the **arrow (▲▼◀▶)** buttons and press the **[Select]**  button.

Event				
Moti.	Sens.	Sound	Pre	Post
Part	1	Multi	Off	5
Part	Off	Off	Off	10
Part	Off	Off	Off	10
Part	Off	Off	Off	10

Event					Ala			
Moti.	Sens.	Sound	Pre	Post	Buz.	Call	Mail	Spot
Part	1	Multi	Off	5	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0
Part	Off	Off	Off	10	Off	Off	Off	0

To set all channels at the same time, go to **{Post}** and press the **[Select]** button.

Event					Post		
Moti.	Sens.	Sound	Pre	Post	Buz.	Call	Mail
Part	1	Multi	Off	5	Off	Off	Off
Part	Off	Off	Off	10	Off	Off	Off
Part	Off	Off	Off	10	Off	Off	Off
Part	Off	Off	Off	10	Off	Off	Off

Event					Ala		
Moti.	Sens.	Sound	Pre	Post			
Part	1	Multi	Off	5	10		
Part	Off	Off	Off	10	15		
Part	Off	Off	Off	10	20		
Part	Off	Off	Off	10	Off	Off	

On the selection box, set the time using the **arrow** (▲▼) and **[Select]** button.

This DVR does not support the calling feature.

### (8) Alarm generation

Used to generate alarms through the buzzer, mail, or relay in case of an event

#### A) Buzzer

Used to sound the buzzer in the system in case of an event

- On the **{Recording Setup}**→**{Data 1~4}**→**{Generate Alarm}**→**{Buzzer}** menu, go to the channel and press the **[Select]** button.

Alarm Out				
Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off

Event				Alarm Out				
Sens.	Sound	Pre	Post	Buz.	Call	Mail	Spot	Relay
1	Multi	Off	5	Off	Off	Off	Off	Off
Off				Off	Off	Off	Off	Off
Off				Off	Off	Off	Off	Off
Off				Off	Off	Off	Off	Off

- On the selection box, set an event to sound the buzzer using the **arrow** (▲▼) and **[Select]** buttons. Multiple events may be selected.

Event				Alarm Out				
Sens.	Sound	Pre	Post	Buz.	Call	Mail	Spot	Relay
1	Multi	Off	5	Off	Off	Off	Off	Off
Off				Off	Off	Off	Off	Off
Off				On	Off	Off	Off	Off
Off				Off	Off	Off	Off	Off

To set all channels at the same time, go to **{Buzzer}** and press the **[Select]** button.

Buzzer				
Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off

Event				Alarm Out				
Sens.				Buz.	Call	Mail	Spot	Relay
1	Motion	Off		Off	Off	Off	Off	Off
Off	Sensor	Off		Off	Off	Off	Off	Off
Off	Sound	Off	10	Off	Off	Off	Off	Off
Off			10	Off	Off	Off	Off	Off

Event				Alarm Out			
Sens	Buz	Call	Mail	Spot	Relay		
1	Motion : Off	Off	Off	Off	Off	Off	Off
	Sensor : Off	Off	Off	Off	Off	Off	Off
	Sound : Off	Off	Off	Off	Off	Off	Off
	Off	Off	Off	10	Off	Off	Off
	Off	Off	Off	10	Off	Off	Off

- On the selection box, select ON or OFF using the arrow (▲▼) and [Select] ⌚ buttons. The Call Feature and the Spot Monitor are disabled in the Workhorse120-4 DVRs.

### B) Mail

Used to send email to a predefined address in case of an alarm or an event

- On the {Recording Setup}→{Data 1~4}→{Generate Alarm}→{Mail} menu, go to the channel using the arrow (▲▼◀▶) buttons and press the [Select] ⌚ button.

Alarm Out				
Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off

Alarm Out						
Pre	Post	Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off	Off	Off
		Motion : Off	Off	Off	Off	Off
		Sensor : Off	Off	Off	Off	Off
		Sound : Off	Off	Off	Off	Off

- On the selection box, set an event to send an email using the arrow (▲▼) and [Select] ⌚ buttons. Multiple events may be selected.

Alarm Out						
Pre	Post	Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off	Off	Off
		Motion : Off	Off	Off	Off	Off
		Sensor : Off	Off	Off	Off	Off
		Sound : Off	Off	Off	Off	Off
				Off	Off	Off
				On	Off	Off

To set all channels at the same time, go to Mail and press the [Select] ⌚ button.

E-Mail					
Post	Buz.	Call	Mail	Spot	Relay
5	Off	Off	Off	Off	Off
10	Off	Off	Off	Off	Off
10	Off	Off	Off	Off	Off
10	Off	Off	Off	Off	Off

Alarm Out				
	Mail	Spot	Relay	
	Motion : Off	Off	Off	Off
	Sensor : Off	Off	Off	Off
	Sound : Off	Off	Off	Off
10	Off	Off	Off	Off
10	Off	Off	Off	Off


Alarm Out				
	Mail	Spot	Relay	
	Motion : Off	Off	Off	Off
	Sensor : Off	Off	Off	Off
	Sound : Off	Off	Off	Off
		Off	Off	Off
		On	Off	Off
10	Off	Off	Off	Off
10	Off	Off	Off	Off

- On the selection box, select ON or OFF using the arrow (▲▼) and [Select] ⌚ buttons.

### C) Relay


Runs the alarm device connected to the DIO (sensor/relay) extension module in case of an alarm or an event

#### ■ Relay setting


- On the {Recording Setup}→{Data 1~4}→{Generate Alarm}→{Relay} menu, go to the channel using the **arrow (▲▼◀▶)** buttons and press the **[Select]**  button.

Alarm Out				
Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off

Alarm Out				
Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off
Off	Motion : Off			Off
Off	Sensor : Off			Off
Off	Sound : Off			Off
Off	Off	Off	Off	Off

- On the selection box, set an event to run the alarm device using the **arrow (▲▼)** and **[Select]**  buttons. Multiple events may be selected.


Alarm Out						
Pre	Post	Buz.	Call	Mail	Spot	Relay
Off	10	Off	Off	Off	Off	Off
Off	10	Off	Motion : Off			Off
Off	10	Off	Sensor : Off			Off
Off	10	Off	Sound : Off			Off
Off		Off	Off	Off	Off	Off
		Off				
		On				

To set all channels at the same time, go to {Relay} and press the **[Select]**  button.

Relay Out				
Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off

Alarm Out				
Buz.	Call	Mail	Spot	Relay
Off	Motion : Off			Off
Off	Sensor : Off			Off
Off	Sound : Off			Off
Off	Off	Off	Off	Off
Off	Off	Off	Off	Off

Alarm Out						
Pre	Post	Buz.	Call	Mail	Spot	Relay
Off	10	Off	Motion : Off			Off
Off	10	Off	Sensor : Off			Off
Off	10	Off	Sound : Off			Off
Off		Off	Off	Off	Off	Off
Off		Off	Off	Off	Off	Off
		Off				
		On				

- On the selection box, select ON or OFF using the **arrow (▲▼)** and **[Select]**  buttons.



## ■ Relay type setting

- On the {Recording Setup}→{Data 1~4}→{Generate Alarm}→{Relay} menu, go to the channel using the **arrow** (▲▼◀▶) buttons and select the [Main Setup] button. Afterward, right-click [Relay].

Alarm Out				
Buz.	Call	Mail	Spot	Relay
Off	Off	Off	Off	Off
Relay Type				Off
Relay01: NO				Off
Off	Off	Off	Off	Off

Alarm Out						
Pre	Post	Buz.	Call	Mail	Spot	Relay
Off	10	Off	Off	Off	Off	Off
Off	10	0	Relay Type			Off
NC			Relay01: NO			Off
NO		ff	Off	Off	Off	Off

### 5-1-3. Recording Schedule

Use **{Recording Schedule}** to save the system configuration as data from **Data 1 to Data 4** and to perform recording based on the system configuration for each day/time zone.



To apply the new setting, save the new setting.

- [Holiday]

Sets holidays

- [Save]

Saves the setting

- [Cancel]

Exits without saving the setting

- [Reset]

Initializes the setting



#### (1) Selecting the Recording Schedule menu

In **{Main Setup}** mode, go to **{Recording Schedule}** and click the **[Select]**  button.

		Hour																							
Day		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Recording Setup	Sun	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Mon	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Schedule	Tue	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
	Wed	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
System	Thu	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
	Fri	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	
Storage	Sat	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	Hol	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
NTP																									
Advanced		1: Data 1      2: Data 2      3: Data 3      4: Data 4																							

#### (2) Recording schedule setting

##### A) Setting by row


On the **{Recording Schedule}** menu, go to the date and time using the **arrow (▲▼◀▶)** or numeric buttons on the remote control.


Input numbers that are less than 10 in two digits using the numeric buttons, e.g., 01 for 1 and 02 for 2. At this time, the time line is highlighted.

	Hour Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
		Recording Setup	Sun	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Mon	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Schedule	Tue	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Wed	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
System	Thu	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Fri	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Storage	Sat	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NTP	Hol	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Advanced	1: Data 1      2: Data 2      3: Data 3      4: Data 4																								

Select the time to set the data.

a) To set the selected time only, press the **[Main Setup]** button or right-click the corresponding button on the menu.

b) To set all rows after the selected time, press the **[Select]**  button or double-click the corresponding button on the menu.


On the selection box, go to the data using the **arrow (▲▼)** buttons and press the **[Select]**  button.

	Hour Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
		Recording Setup	Sun	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Mon	2	2	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Schedule	Tue	2	2	4	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Wed	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
System	Thu	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Fri	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Storage	Sat	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NTP	Hol	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Advanced	1: Data 1      2: Data 2      3: Data 3      4: Data 4																								

Data are set based on the buttons pressed during time selection.

a) Clicking the [Main Setup] button causes the data to be set only for the selected time.

		Hour																								
		Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Recording Setup	Sun	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Mon	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Schedule	Tue	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
	Wed	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	

- b) Clicking the **[Select]**  button causes the data to be set for all times after the selected time.

		Hour																								
		Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Recording Setup	Sun	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	Mon	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
Schedule	Tue	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
	Wed	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
System	Thu	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	

### B) Setting by column


- On the schedule menu, go to the row using the **arrow (▲▼)** or numeric buttons on the remote control.


Input numbers that are less than 10 in two digits using the numeric buttons, e.g., 01 for 1 and 02 for 2.

		Hour																								
		Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Recording Setup	Sun	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	Mon	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
Schedule	Tue	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
	Wed	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
System	Thu	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
	Fri	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
Storage	Sat	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	Hol	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
Advanced	1: Data 1      2: Data 2      3: Data 3      4: Data 4																									

- Select the time to set the data.

a) To set only one column of the selected time, press the **[Main Setup]** button on the remote control or right-click the corresponding button on the menu.


b) To set all rows and columns after the selected time at the same time, press the **[Select]**  button or double-click the corresponding button on the menu.

- On the selection box, go to the data using the **arrow (▲▼)** buttons and press the **[Select]**  button.

		Hour																							
Day		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Recording Setup	Sun	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Mon	2	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Schedule	Tue	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Wed	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
System	Thu	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Fri	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Storage	Sat	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Hol	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
NTP																									
Advanced	1: Data 1      2: Data 2      3: Data 3      4: Data 4																								

- Data are set based on the buttons pressed during time selection.
  - Pressing the **[Main Setup]** button causes the data to be set only for the column with the selected time.

		Hour																							
Day		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Recording Setup	Sun	2	2	2	1	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Mon	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Schedule	Tue	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Wed	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
System	Thu	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
	Fri	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Storage	Sat	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Hol	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
NTP																									
Advanced	1: Data 1      2: Data 2      3: Data 3      4: Data 4																								

- Clicking the **[Select]**  button causes the data to be set for all rows and columns after the selected time.

	Hour Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
		Recording Setup	Sun	2	2	2	1	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Mon	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Schedule	Tue	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Wed	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
System	Thu	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Fri	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Storage	Sat	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NTP	Hol	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Advanced		1: Data 1      2: Data 2      3: Data 3      4: Data 4																							

### C) Holiday setting

Enables the user to set holidays

If the holiday and the date are the same on the **{Recording Schedule}** menu, the holiday setting precedes the date setting.

#### a Calendar

- The defined holidays are marked with a red tag.

#### b Holiday list

- The list of all defined holidays is displayed.
- 15 holidays are displayed on each page; the rest is displayed on the next pages.

#### c Holiday information

- Detailed information of the selected date is displayed.
- **{Page}** shows the page count in case of more than 15 holidays.  
{Current page/Total page}
- **{Holiday No.}** denotes the holiday number based on the date.

{Number of selected holidays/Total number of holidays}

**{Date}** shows the date of the holiday.

The screenshot shows the 'Holiday Registration' window. At the top, it displays 'January 2005'. Below is a calendar grid where the 17th is highlighted with a red tag. To the right is a table with two columns: 'No' and 'Date'. Below the calendar is a 'Detailed Information' section. At the bottom, there are three buttons: 'Save', 'Cancel', and 'Reset'.

- On the **{Recording Schedule}** menu, go to **{Holiday}** at the bottom using the **[Tab]** and **arrow** buttons and press the **[Select]** button.



- On the **{Add Holiday}** window, go to the date using the **arrow** and **[Select]** buttons and press the **[Select]** button.
- After setting the holiday, press the **[ESC]** button followed by the **[Save]** button at the bottom of the menu and press the **[Select]** button.
  - [Save] Saves the setting
  - [Cancel] Exits without saving the setting
  - [Reset] Resets the setting




### 5-1-4. System

Use the {System} menu to set up the system and define its auxiliary features.

1. {Local administrator password}	Used to set the password of the local administrator
2. {Menu Time Out}	Used to set the time to exit the System Setup menu automatically and to go to the real-time monitoring screen
3. {Modem baud rate}	Sets the modem transmission rate
4. {DVR name}	Used to name the DVR
5. {Remote ID}	Used to name the remote control to run the system
6. {Date display type}	Used to set the date format
7. {Users}	Used to register, add, or delete users
8. {Buzzer}	Turns the alarm sound feature ON/OFF
9. {Alarm Duration}	Sets the alarm generation time (in seconds)
10. {Firmware Upgrade}	Upgrades the system firmware
11. {Factory Setup}	Used to reset the systems

#### (1) Selecting the System menu

On {Main Setup}, go to {System} and press the [Select]  button.



#### (2) Local administrator password

##### Local admin


- The local system administrator's default password is "00000."
- The local administrator can use all features including System Setup, System Power ON/OFF, Monitoring, and Viewing Recorded Video.

Remote access is not supported, however.

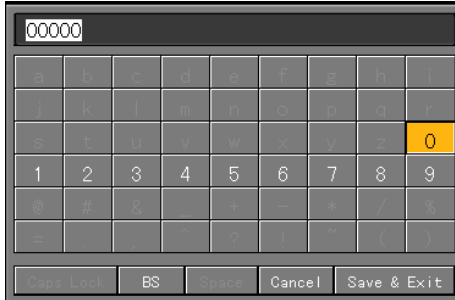


On the {System} menu, go to the {1. Local Administrator Password} input field using the **arrow (▲▼)** buttons and press the **[Select]**  button.





On the password input field, enter the password using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.

The password may contain up to five digits.




<b>BS</b>	Backspace
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit


After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.

### (3) Menu Time Out

If no input is made on the System Setup menu using the front buttons, remote control, or mouse, the system automatically shifts to real-time monitoring mode.

On the {System} menu, go to {2. Menu Time Out} using the **arrow (▲▼)** buttons and press the **[Select]**  button.

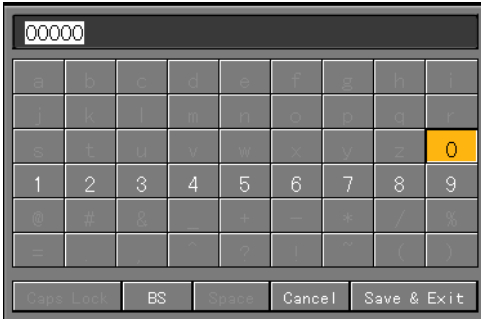


On the selection box, select the time to be set using the **arrow (▲▼)** and **[Select]**  buttons.

2. Menu Time Out	Off		
3. Modem Baud Rate	115200	Off	
4. DVR Name	DVR	10 SEC	
5. Remote ID	01	20 SEC	
6. Date Display Type	Year/Mon/Day	30 SEC	
7. Users	Modify	Custom	Delete

<b>OFF</b>	The Automatic Exit menu is not used. The user can exit the menu by pressing the <b>[ESC]</b> button on the System menu.
<b>10/20/30 seconds</b>	If no input is made using the touch pad, remote control, or mouse, the system shifts to real-time monitoring mode.
<b>User setting</b>	Enables the user to input the time The time is between 5 and 99 seconds.

Selecting User setting causes the time input window to appear as shown below:



<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

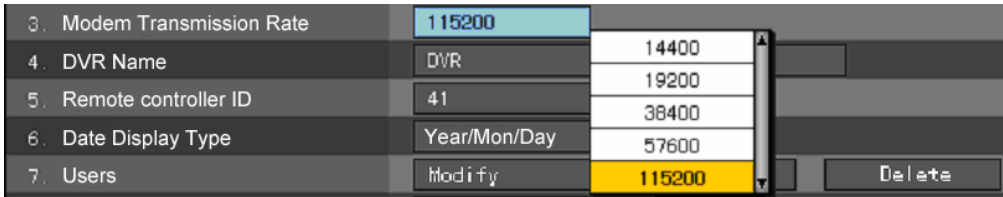
Enter the time using the **arrow** (▲▼◀▶) and **[Select]** (⌂) buttons or the numeric buttons on the remote control.

After inputting the data, go to **[Save and Exit]** using the **[Tab]** (⇧) or **arrow** (▲▼) buttons and press the **[Select]** (⌂) button.

#### (4) Modem Baud rate

Sets the modem transmission rate

On the **{System}** menu, go to **{3. Modem Baud Rate}** using the **arrow** (▲▼) buttons and press the **[Select]** (⌂) button.




For the modem baud rate, refer to the modem manual.

On the selection box, set the modem baud rate using the **arrow** (▲▼) and **[Select]** (⌂) buttons.

#### (5) Renaming the DVR



On the **{System}** menu, go to **{4. DVR Name}** using the **arrow** (▲▼) buttons and press the **[Select]** (⌂) button.



On the name input field, enter the name using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.



<b>Caps lock</b>	Used to shift between upper and lower case
<b>BS</b>	Backspace; used to delete
<b>Space</b>	Used to insert a space
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

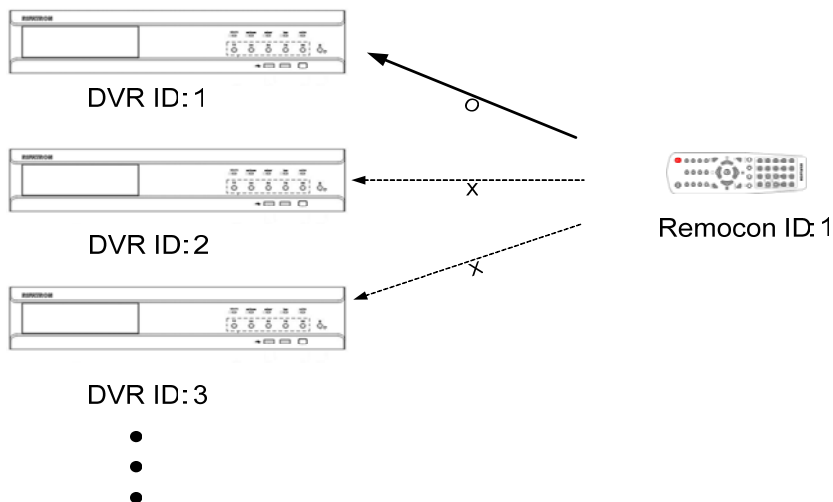
After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.


The system name may contain up to 20 alphanumeric characters.

### (6) Remote ID

Sets the remote control ID when multiple devices are used

Input signals from the remote control are received only when the DVR ID and remote control ID match as shown below:

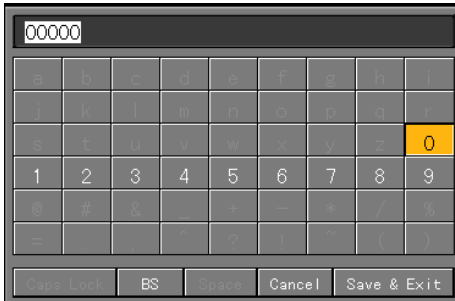


On the **{System}** menu, go to the remote control ID selection box using the **arrow (▲▼)** buttons and press the **[Select]**  button.



On the ID input field, enter the ID using the numeric buttons on the remote control or the **arrow** (▲▼◀▶) and **[Select]** (⏻) buttons.

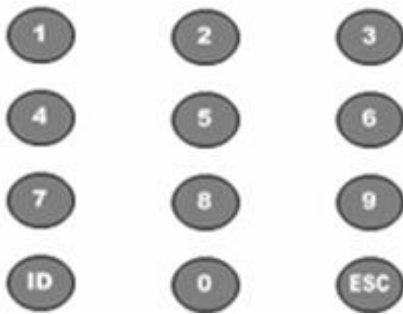
- The ID may be between 0 and 99.



<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

After inputting the data, go to **[Save and Exit]** using the **[Tab]** (▶) or **arrow** (▲▼) buttons and press the **[Select]** (⏻) button.

After setting the remote control ID of the DVR, apply the new setting.



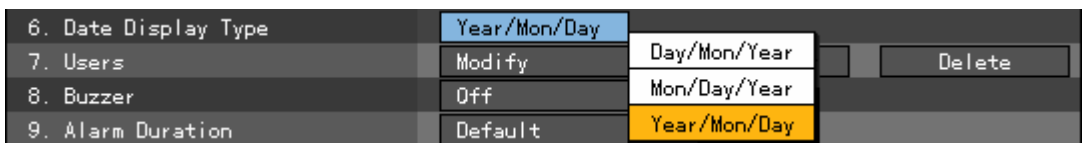
Select the ID button and enter the two-digit remote control ID. Afterward, select the ID button again.



To control all DVRs with different DVR IDs, set the remote control ID as 999.

### (7) Date Display Type

On the **{System}** menu, go to **{5. Date Display Type}** using the **arrow** (▲▼) buttons and press the **[Select]** (⏻) button.



On the selection box, set the date display format using the **arrow** (▲▼) and **[Select]** (⏻) buttons.

### (8) User

Used to add, modify, or delete system users


■ System authority

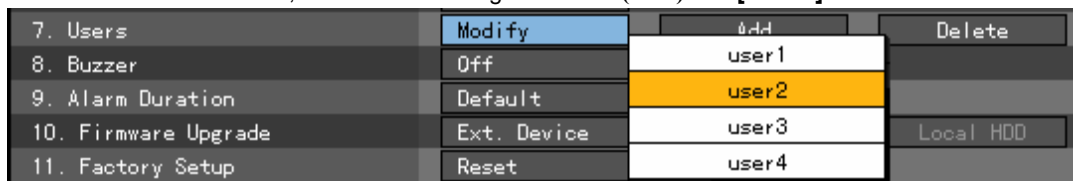
<b>Network live</b>	Viewing screen in real time
<b>Network play</b>	Viewing recorded screen
<b>Download network file</b>	Network access, File download
<b>Main setup</b>	Data, Schedule, System setup
<b>Additional setup</b>	PTZ camera, Network setup
<b>Network PTZ control</b>	PTZ camera control
<b>Network backup</b>	Backup feature
<b>Remote upgrade</b>	Remote upgrade


**A) Modifying user information**

On the **{System}** menu, go to **{6. User} ->{Modify}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.





On the selection box, select a user using the **arrow (▲▼)** and **[Select]**  buttons.



On the user authority setting window, set the user authorities using the **arrow (▲▼)** and **[Select]**  buttons.




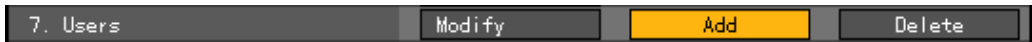
<input checked="" type="checkbox"/>	Gives the user the authority to use the feature
<input type="checkbox"/>	Prohibits the user from using the feature


After inputting the data, go to **[Modify]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.

## B) Adding a user

The user ID and password may contain up to 31 alphanumeric characters.

- On the **{System}** menu, go to **{6. User}**->**{Add}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.

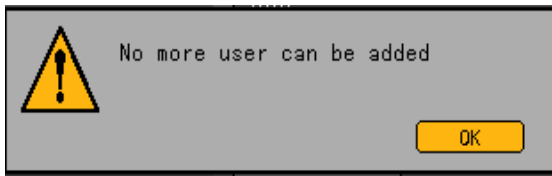



- On the Users registration window, go to the ID input field and press the **[Select]**  button.


A screenshot of a user registration window. It has fields for 'ID' and 'PASSWORD'. Below these are several checkboxes for permissions: 'Network Live', 'Network Playback', 'Network File Download', 'Main/App Setup', 'Network PTZ Control', 'Network Backup', and 'Remote Upgrade'. At the bottom are 'Add' and 'Cancel' buttons.

<input checked="" type="checkbox"/>	Gives the user the authority to use the feature
<input type="checkbox"/>	Prohibits the user from using the feature

Up to four users can be registered. After four users are registered, the following message is displayed:






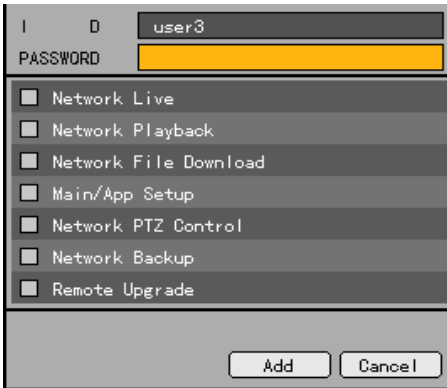
- To go back to the previous menu, press the **[Select]**  button.

- On the user ID input window, enter the user ID using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.

A screenshot of a numeric keypad for user ID input. It has a grid of letters and numbers. At the bottom are buttons for 'Caps Lock', 'BS', 'Space', '취소' (Cancel), and '저장 & 종료' (Save & Exit).

<b>Caps lock</b>	Used to shift between upper and lower case
<b>BS</b>	Backspace; used to delete
<b>Space</b>	Used to insert a space
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

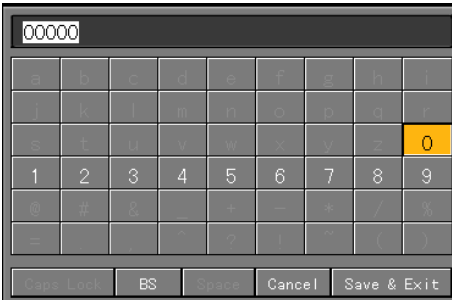
- After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.
- After setting the user ID, go to the password input field using the **arrow (▲▼)** buttons and press the **[Select]**  button.



<input checked="" type="checkbox"/>	Gives the user the authority to use the feature
<input type="checkbox"/>	Prohibits the user from using the feature

- On the password input window, enter the password using the numeric buttons on the remote control or the **arrow** (▲▼◀▶) and **[Select]** ⌂ buttons.

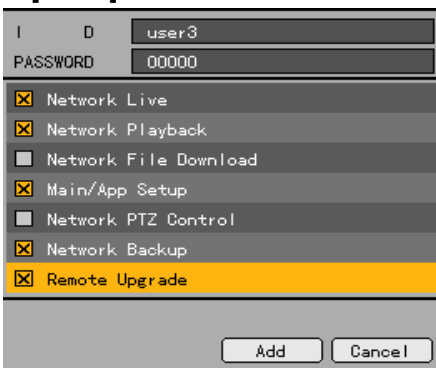
The password may contain up to **31** digits.



<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

- After inputting the data, go to **[Save and Exit]** using the **[Tab]** ⏩ or **arrow** (▲▼) buttons and press the **[Select]** ⌂ button.

- After setting the user ID and password, set the user authorities using the **arrow** (▲▼) and **[Select]** ⌂ buttons.




<input checked="" type="checkbox"/>	Gives the user the authority to use the feature
<input type="checkbox"/>	Prohibits the user from using the feature

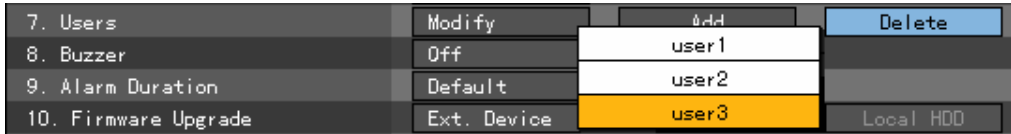
- After defining the authority to use the feature, go to **[Add]** using the **[Tab]** ⏩ or **arrow** (▲▼) buttons and press the **[Select]** ⌂ button.

### C) Deleting a user



- On the **{System}** menu, go to **{6. User}**->**{Delete}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.

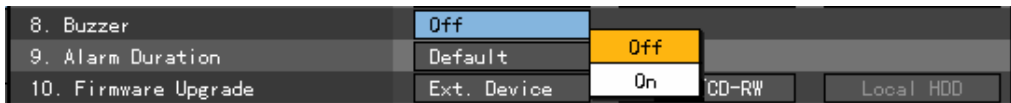


- On the selection box, select the user to be deleted using the **arrow (▲▼)** and **[Select]**  buttons.



### (9) Buzzer


- On the **{System}** menu, go to **{7. Alarm Sound}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.
- On the selection box, select ON or OFF using the **arrow (▲▼)** and **[Select]**  buttons.




An alarm is sounded through the buzzer inside the system in case of HDD Failure, Backup Failure, Network Failure, Fan Failure, Power Failure, or Signal Loss.

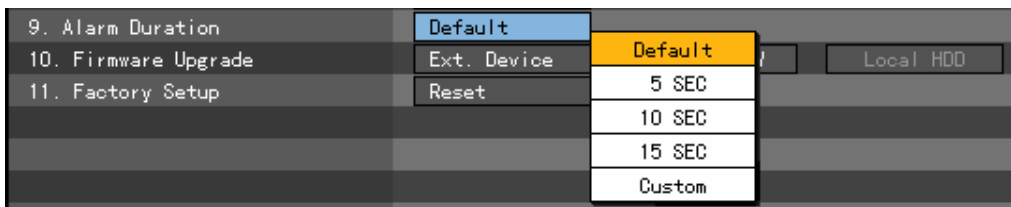
### (10) Alarm Duration

Sets the alarm duration time

- On the **{System}** menu, go to **{8. Alarm Duration}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.



- On the selection box, set the alarm duration time using the **arrow (▲▼)** and **[Select]**  buttons.



### (11) Firmware Upgrade

Workhorse 120-4 can be easily upgraded using an external storage device or a portable storage device with USB 2.0 port or built-in CD-RW/DVD-RW.



- Find the upgrade file and copy it to the highest folder in the external storage device or portable storage device.



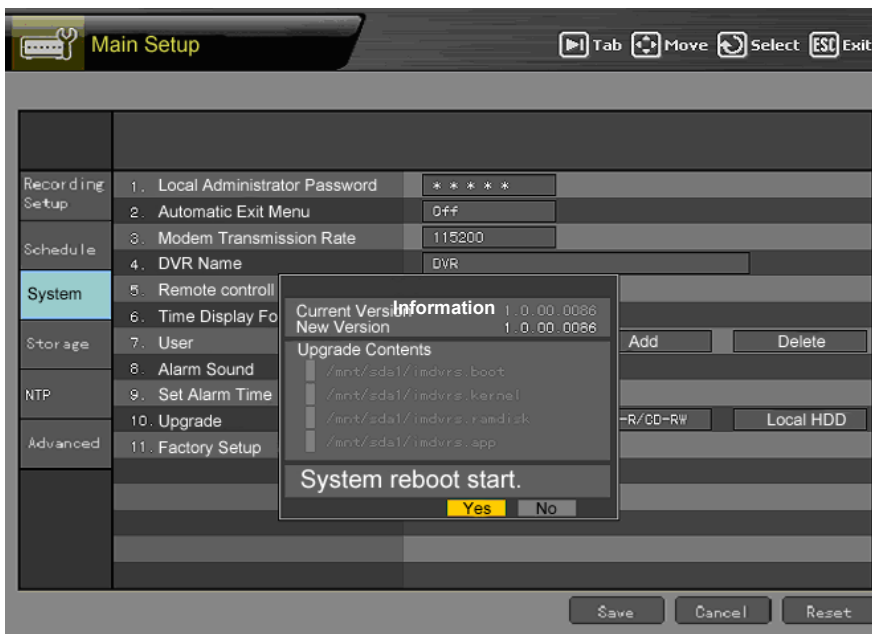
- 1) When copying an upgrade file from the PC, connect the USB device to the PC first.
- 2) If the USB device is disconnected from the port while the upgrade file is being copied, the DVR system may not automatically recognize the file.
- 3) Upgrading cannot proceed if no HDD is installed.

- Connect the storage device containing an upgrade file to the USB port on the DVR.
- On the **{System}** menu, go to **{10. Firmware Upgrade}** using the arrow (▲▼) buttons.

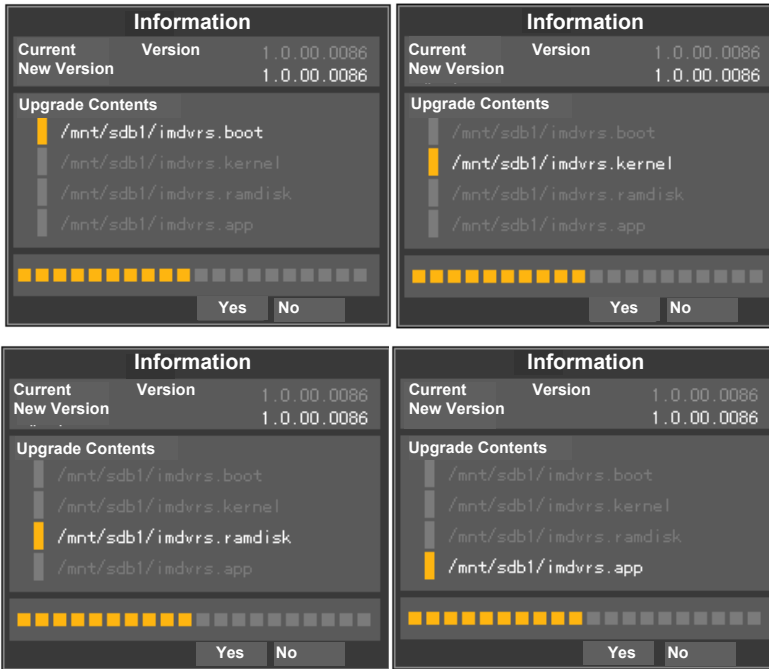


- Press the **[Select]** button.

The upgrade information window then appears within 15 seconds as shown below:



- After checking the information, select the **[Yes]** button. Upgrading then proceeds in the following order (selecting the **[No]** button causes the system to shift to **{System}** mode):



Once it starts, upgrading cannot be canceled.

- After upgrading is completed, the system restarts.
- The system automatically starts, and upgrading is completed.
- Select **{Status}** -> **{Product Information}** -> **{3. Software Version}**.

## (12) Factory Setup

- On the **{System}** menu, go to **{11. Factory Setup}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.



- To reset, click the **[Yes]** button.





All settings except the network configuration are reset.

Used to select the factory setting

### (13) Saving the system configuration

After changing the system configuration on the **{System}** menu, save the new configuration before exiting the menu.

- After completing the system configuration, go to **[Save]** by selecting the **[Tab]**  button and press the **[Select]**  button.

#### ▪**[Save]**

Saves the new configuration

#### ▪**[Cancel]**

Exits without saving the new configuration

#### ▪**[Reset]**

Resets the configuration



## 5-1-5.Storage Device

### (1) Selecting the Storage Device menu

- Select {Main Setup} and {Storage Device}.



### A) Local

#### (1) Selecting the Local menu

- On the {Storage Device} menu, go to the {Local} tab using the arrow (◀▶) and [Select] buttons .



To apply the new setting defined in the [Storage Device] menu, save the new setting.

#### [Update]

Used to read local storage device management information again

#### [Save]

Saves the setting

#### [Cancel]

Exits without saving the setting

#### [Reset]

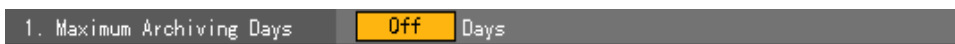
Resets the setting



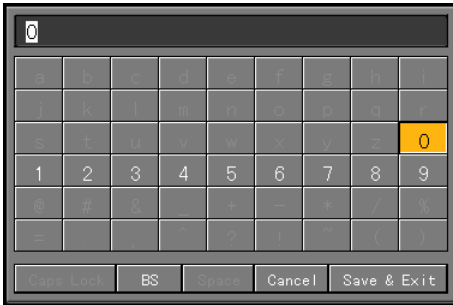
#### (2) Maximum Archiving days

Limits the recording days

- On the {Storage Device} menu, go to {1. Maximum Archiving Days} using the arrow (▲▼) buttons and press the [Select] button.

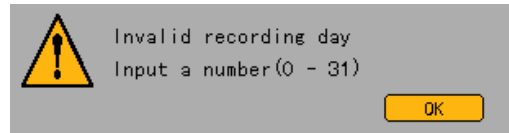


- On the input window, enter the recording date using the numeric buttons on the remote control or the **arrow** (▲▼◀▶) and **[Select]** (⌂) buttons.



Only numbers between 1 and 31 are recognized; each number denotes a date.

In case a number higher than 32 is entered, the following warning message appears:



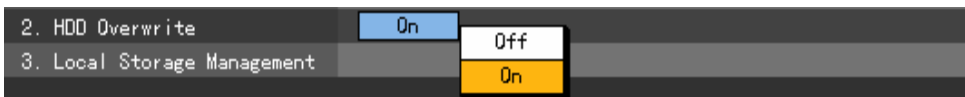
### (3) HDD Overwrite

Used to enable/disable overwrite HDD

- On the **{Storage Device}** menu, go to **{2. HDD Overwrite}** using the **arrow** (▲▼) buttons and press the **[Select]** (⌂) button.



- On the selection box, select ON or OFF using the **arrow** (▲▼) and **[Select]** (⌂) buttons.



<b>On</b>	In case of insufficient hard drive space, files starting from the oldest ones are overwritten.
<b>Off</b>	Once the hard drive space is used up, recording stops.

### (4) Selecting the Local Storage Management menu

- On the **{Storage Device}** menu, go to **{3. Manage Local Storage Device}** using the **arrow** (▲▼) buttons.

### (5) Management of the local storage device

Similar to a hard drive, a local storage device saves data in real time. It supports the following features:

- **{Initialize}**: Sets the selected storage device as a recording storage device
- **{Online}**: Makes the selected storage device available online
- **{Offline}**: Disconnects the selected storage device from the DVR
- **{Format}**: Formats the selected storage device

In Healthy and Warning states, the commands described above are executed; in Fault state, however, no command is executed.

## (6) Configuration of the local storage device

- **{Model}**: Storage device model
- **{Serial}**: Serial number of the storage device
- **{Location}**: Physical location of the storage device
- **{Capacity (F/T)}**: Capacity of the storage device (T: Total; F: Free)
- **{Status (HW/SW)}**: Status of the storage device (HW/SW; SW: Software; HW: Hardware)

Three software status types

- **Active**: Connected to the DVR; the storage device is currently recording
- **Online**: Connected to the DVR, but the storage device is not recording
- **Offline**: Not connected to the DVR

Three hardware status types

- **Healthy**: Connected to the DVR; the storage device is recording normally
- **Warning**: Connected to the DVR, but an error has occurred; in this state, recording may fail (for more information, see the warning below)
- **Fault**: Not connected to the DVR, possible hardware damage; in this state, the storage device cannot operate




1. **Fault state**: The storage device is damaged and unable to function properly. Fault state is not related to DVR troubles. The DVR detects errors in the storage device and stops recording.
  2. **Warning state**: The storage device has a physical error that can be corrected by the storage device or DVR. Failure to repair the error may damage the storage device (and cause it to shift to fault state). In this case, backing up the data in the corresponding storage device and replacing the device with a normal one is strongly recommended.
  3. If the active storage device is in warning or fault state, an alarm message is displayed on the upper left hand corner of the screen. After the user views the alarm message on the **{Log}** menu, however, the alarm message is deleted.
-

### (7) After adding a local storage device


- Open the DVR body, connect the drive to the IDE cable, and connect the power cord.
- Supply power to the DVR and boot the system.
- Select the **[Main Setup]** button and enter the password. On the **{Storage Device}** menu, go to **{Storage Device}->{Local}** using the **arrow (▲▼)** buttons.
- The following window is then displayed together with information on the newly installed drive :

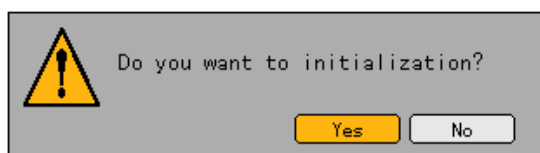
No	Model	Serial	Location	Size (F/T)	Status (HW/SW)
1	WDC WD1200JB...	WD-WMANN1088514	Pri. Master	16GB/120GB	HEALTHY/ACTIVE
2	WDC WD1200JB...	WD-WMANN1019069	Pri. Slave	120GB/120GB	HEALTHY/NEW

- Select a model using the **arrow (▲▼)** and **[Select]**  buttons as shown below and reset the selected model:

No	Model	Serial	Location	Size (F/T)	Status (HW/SW)
1	WDC WD1200JB...	WD-WMANN1088514	Pri. Master	16GB/120GB	HEALTHY/ACTIVE
2	WDC WD1200JB...	WD-WMANN1019069	Pri. Slave	120GB/120GB	HEALTHY/NEW

Initialize  
Online  
Offline  
Format

- Selecting a menu using the **[Select]**  button causes a confirmation message to appear as shown below:

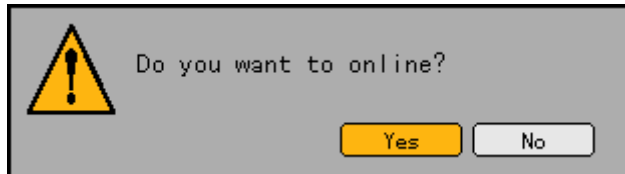


- Select **[Yes]**. Drive is in offline state are then displayed as shown below:

- To make a model available online, select the desired model using the **[Select]** button followed by the Online menu.

No	Model	Serial	Location		Status (HW/SW)
1	WDC WD1200JB...	WD-WMANN1088514	Pri. Master	Initialize Online Offline Format	HEALTHY/ACTIVE
2	WDC WD1200JB...	WD-WMANN1019069	Pri. Slave	119GB/120GB	HEALTHY/OFFLINE

- Selecting a menu using the **[Select]** button causes a confirmation message to appear as shown below:



- Select **[Yes]**. Drive s in online state are then displayed as shown below:

No	Model	Serial	Location	Size (F/T)	Status (HW/SW)
1	WDC WD1200JB...	WD-WMANN1088514	Pri. Master	16GB/120GB	HEALTHY/ACTIVE
2	WDC WD1200JB...	WD-WMANN1019069	Pri. Slave	119GB/120GB	HEALTHY/ONLINE

### (8) Operation of the local storage device

- The user can select any valid storage device using the **arrow** (▲▼) buttons.
- Select a storage device using the **[Select]** button. A popup menu is then displayed as shown below:

No	Model	Serial	Location		Status (HW/SW)
2. HDD Overwrite On					
3. Local Storage Management					
1	WDC WD1200JB...	WD-WMANN1088514	Pri. Master	Initialize Online Offline Format	HEALTHY/ACTIVE
2	WDC WD1200JB...	WD-WMANN1019069	Pri. Slave	119GB/120GB	HEALTHY/ONLINE

- Select and execute the corresponding menu using the **arrow** (▲▼) and **[Select]** buttons.
- The system confirms the execution of every command as shown below:



- Click **[OK]** to execute the corresponding command.



## B) NAS backup

### (1) Selecting the NAS Backup menu

- Select **{Main Setup}**, **{Storage Device}** -> **{NAS Backup}**.



### (2) NAS Use

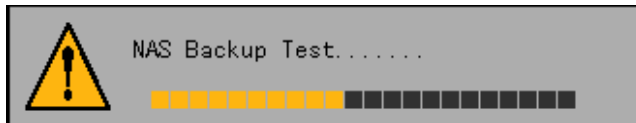
- On the **{Storage}** menu, go to **{NAS Backup}** -> **{1. Use NAS}** using the **arrow (▲▼)** buttons and press the **[Select]** button.



- On the selection box, select ON or OFF using the **arrow (▲▼)** and **[Select]** buttons.

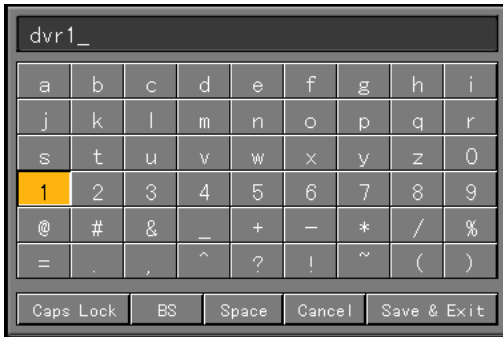


- Selecting ON or Test causes a test to run as shown below:



### (3) ID

- Go to the **{2. ID}** menu using the **arrow (▲▼)** buttons and press the **[Select]** button.
- On the input window, enter the ID using the **arrow (▲▼◀▶)** and **[Select]** buttons.

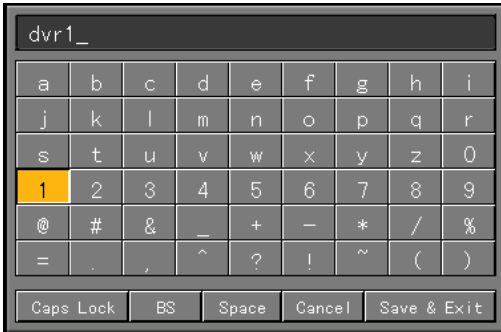


<b>Caps lock</b>	Used to shift between upper and lower case
<b>BS</b>	Backspace; used to delete
<b>Space</b>	Used to insert space
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

- After inputting the data, go to **[Save and Exit]** using the **arrow (▲▼)** or **[Tab]** buttons and save the setting by pressing the **[Select]** button.

#### (4) Password



- Go to the **{3. Password}** menu using the **arrow (▲▼)** buttons and press the **[Select]** button.
- On the input window, enter the password using the **arrow (▲▼◀▶)** and **[Select]** buttons.

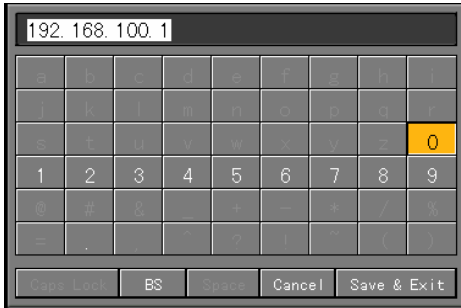


<b>Caps lock</b>	Used to shift between upper and lower case
<b>BS</b>	Backspace; used to delete
<b>Space</b>	Used to insert space
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

- After inputting the data, go to **[Save and Exit]** using the **arrow (▲▼◀▶)** or **[Tab]** buttons and save the setting by pressing the **[Select]** button.



## (5) IP

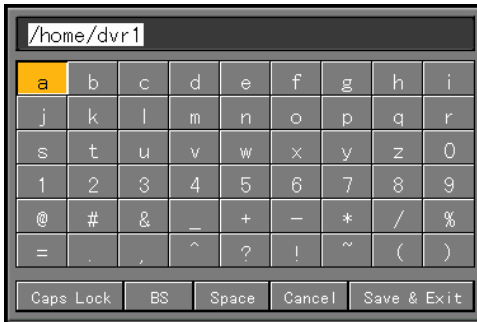
- Go to the **{4. IP}** menu using the **arrow (▲▼)** buttons and press the **[Select]**  button.
- On the input window, enter the IP using the **arrow (▲▼◀▶)** and **[Select]**  buttons.




<b>Caps lock</b>	Used to shift between upper and lower case
<b>BS</b>	Backspace; used to delete
<b>Space</b>	Used to insert space
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

## (6) Directory



- Go to the **{5. Directory}** menu using the **arrow (▲▼)** buttons and press the **[Select]**  button.
- On the input window, enter the directory using the **arrow (▲▼◀▶)** and **[Select]**  buttons.

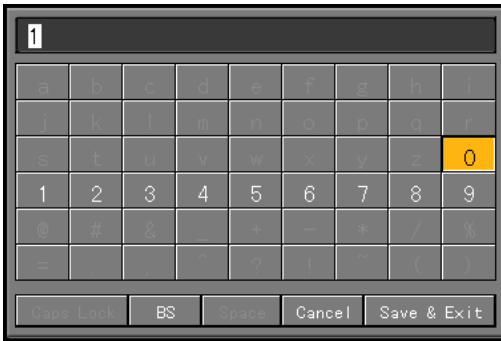


<b>Caps lock</b>	Used to shift between upper and lower case
<b>BS</b>	Backspace; used to delete
<b>Space</b>	Used to insert space
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

- After inputting the data, go to **[Save and Exit]** using the **arrow (▲▼◀▶)** or **[Tab]**  buttons and save the setting by pressing the **[Select]**  button.

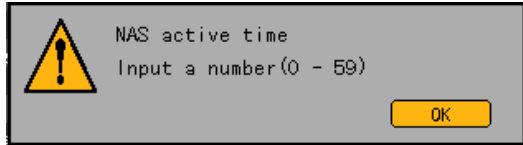
## (7) Execution time

- Go to the **{6. Execution Time (Hourly)}** menu using the **arrow (▲▼)** buttons and press the **[Select]**  button.
- On the input window, enter the execution time using the **arrow (▲▼◀▶)** and **[Select]**  buttons.




Only numbers between 0 and 59 are recognized; each number denotes a minute.


Beyond 59 minutes, the following warning message appears:



### (8) Maximum Save time



- On the **{Storage Device}** menu, go to **{NAS Backup}** -> **{7. Maximum Save Time}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.

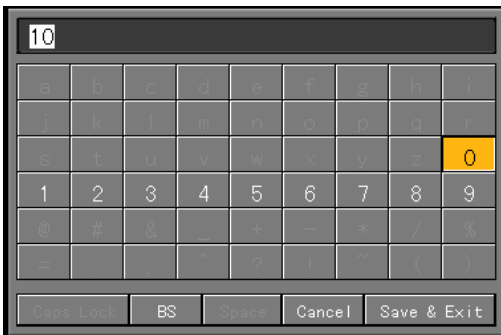


- On the selection box, enable or disable the field using the **arrow (▲▼)** and **[Select]**  buttons.



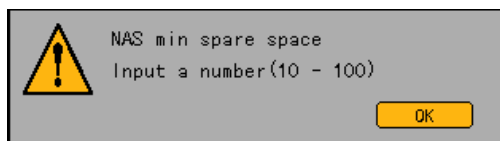
### (9) Min Spare Space

- Go to the **{8. Min Spare Space}** menu using the **arrow (▲▼)** buttons and press the **[Select]**  button.
- On the input window, enter the minimum space using the **arrow (▲▼◀▶)** and **[Select]**  buttons.




Only numbers between 10 and 100 are recognized; each number denotes the space in GB (gigabyte).

If the number is more than 100GB, the following warning message is displayed:




### (10) Overwrite

Turns NAS overwriting ON/OFF

- On the **{Storage Device}** menu, go to **{NAS Backup}**->**{9. Overwrite}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.



- On the selection box, select ON or OFF using the **arrow** (▲▼) and **[Select]**  buttons.



## 5-1-6. NTP

Protocol for synchronizing the time between devices connected through the network

Description of features

### 1. Time synchronization

#### 1) Synchronization with the NTP server

Time is synchronized with the NTP server by the hour.

##### A. Automatic setting

Connection with the server nearest to the user-defined zone is attempted or the next nearest server if connection fails.

##### B. User setting

The user sets the URL or IP of the NTP server. If connection is not established, a message is sent to the user, and the corresponding logs, saved.

If synchronization with the NTP server fails, synchronization with the RTC ensues.

#### 2) Synchronization with the DVR Time Server

The DTS server runs in Workhorse 120-4; time is synchronized by the hour. Workhorse 120-4 DTS clients referring to the DTS synchronize the time of the DVR system.

Any change in the DTS time or zone is reflected on the Workhorse 120-4 of the network (synchronization signals are broadcast without passing through the router or gateway; the DVR time server does not support automatic connection).

### 2. Daylight saving time (DST) setting

The DST is automatically processed depending on the zone, i.e., whether the NTP server or the DST server is used as a reference.

### 3. User time setting

The user can set the time.

For NTP client setting, however, the user can only read the time but not change it.

### (1) Selecting the NTP menu

- Select **{Main Setup}** and **{NTP}**.

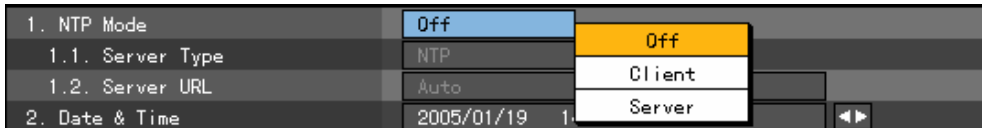


### (2) NTP mode

- On the **{NTP}** menu, go to **{1. NTP Mode}** using the **arrow (▲▼)** buttons and press the **[Select]** button.



- On the selection box, shift to NTP mode using the **arrow (▲▼)** and **[Select]** buttons.




<b>OFF</b>	NTP is not used.
<b>Server</b>	The DVR time server is used.
<b>Client</b>	DTS client is used, and server time, synchronized.

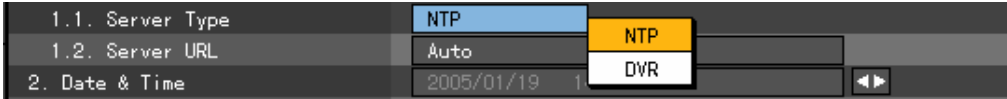
### B) Server type

Settings may be defined in client **{NTP Mode}**. Select either the NTP server or DVR time server.

- On the NTP menu, go to **{1.1. Server type}** using the **arrow (▲▼)** buttons and press the **[Select]** button.




- On the selection box, set the audio channel using the **arrow (▲▼)** and **[Select]**  buttons.




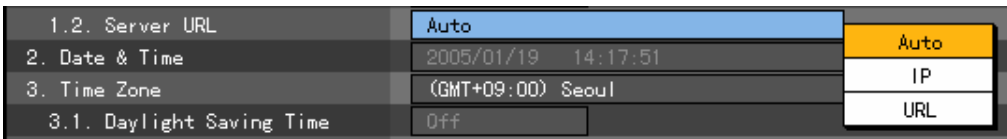
### C) Server URL

Settings may be defined only in client NTP mode. Set the address of the NTP server or DVR time server.

- On the **{NTP}** menu, go to **{1.2. Server URL}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.



- On the selection box, set the server URL using the **arrow (▲▼)** and **[Select]**  buttons.



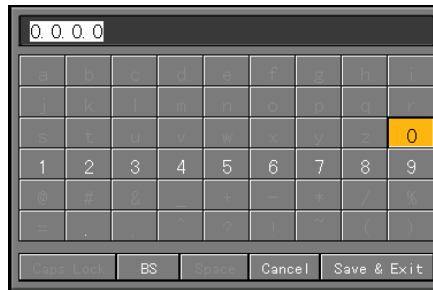
- The user can input the IP only when the server type is DVR. For the NTP server, Automatic, IP, or URL should be selected.

#### ■ Automatic

Attempts to connect to the server nearest to the user-defined zone or the next nearest server if connection fails

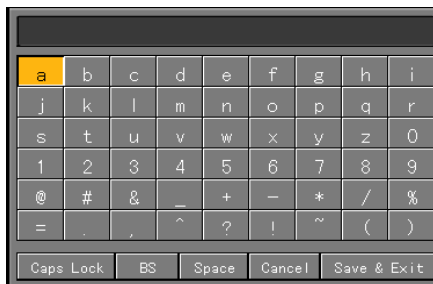
#### ■ IP

On the numeric data input window, enter the IP of the server to synchronize the time.



#### ■ URL

On the text input window, enter the URL of the server to synchronize the time.






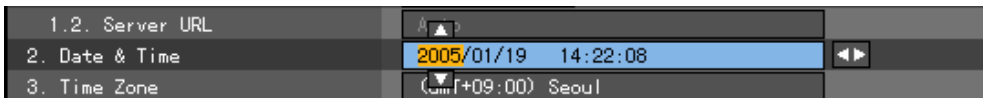


### (3) Changing the system date and time

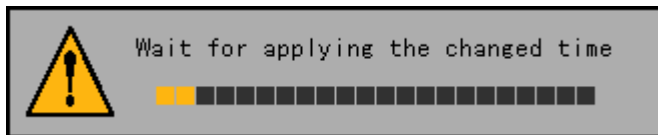
The system date and time can be changed only in NTP Server or OFF mode.

The system date and time format is Year/Month/Day Hour/Minute/Second. To set the display format, select **{Main Setup}->{System}->{6. Date & Time}**.

- On the **{NTP}** menu, go to **{2. Date and Time}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.
- Go to the field to be changed using the **arrow (◀▶)** buttons and press the **[Select]**  button.
- After changing the date and time using the **arrow (▲▼)** buttons, press **[Select]** .

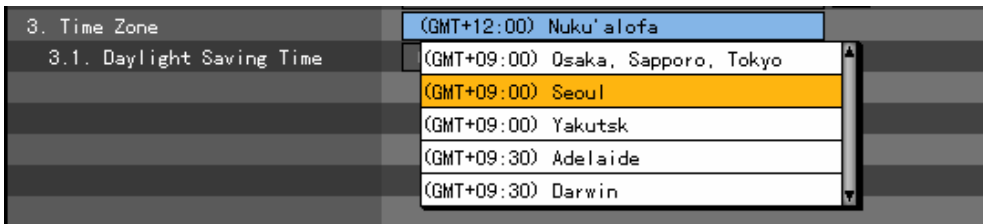


- The following message is then displayed, and the system time, changed:




### (4) Time zone

Used to set the standard time



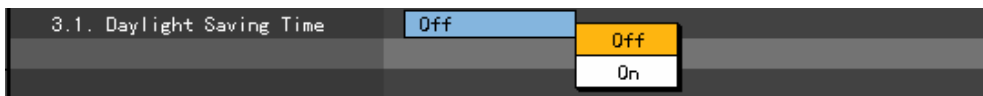
#### A) Daylight savings time

Used to apply the daylight savings time system

- This field may be selected only when the corresponding region supports the DST.
- On the **{NTP}** menu, go to **{3.1. DST}** using the **arrow (▲▼)** buttons and press the **[Select]**  button.



- On the selection box, select ON or OFF using the **arrow** and **[Select]**  buttons.



After the DST is selected, existing data are displayed as "OLD\_" in the search and log list.

Before changing the date and time, set the standard time first.

### 5-1-7. Advanced

Sets the picture quality more specifically per channel

#### (1) Selecting the Advanced menu

□ Select **{Main Setup}** and **{Advanced}**.

■ Advanced menu configuration

The user can set each channel in detail as shown below (data may be set for each channel, e.g., from Channel No. 1 to Channel No. 4):

	Channel	Filter	Average Filter	Quad	Max Bitrate	H Anti Aliasing	V Anti Aliasing	Peaking	C/Y Coring
Recording Setup	1	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	2	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	3	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	4	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
System									
Storage									
NTP									
Advanced									

#### (2) Advanced option setting per channel

##### A) Filter

□ On the **{Filter}** menu, press the **[Select]** button.

	Channel	Filter	Average Filter	Quad	Max Bitrate	H Anti Aliasing	V Anti Aliasing	Peaking	C/Y Coring
Recording Setup	1	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	2	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	3	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	4	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No

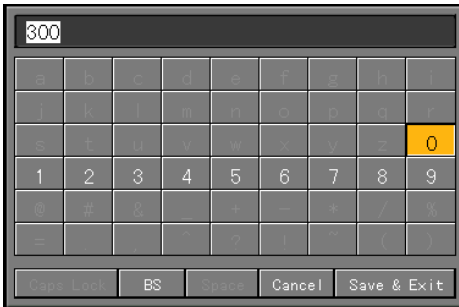
## B) Average filter

- On the **{Average Filter}** menu as shown below, press the **[Select]** button:

	Channel	Filter	Average Filter	Quad	Max Bitrate	H Anti Aliasing	V Anti Aliasing	Peaking	C/Y Coring
Recording Setup	1	Temporal	1:6:1		300KB	4MHz	Full	93%	No
	2	Temporal	1:6:1	1:2:1	300KB	4MHz	Full	93%	No
	3	Temporal	1:6:1	1:6:1	300KB	4MHz	Full	93%	No
Schedule	4	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No

## C) Maximum bit rate

- Enter the bit rate using the **arrow** (▲▼◀▶) and **[Select]** button as shown below:



<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel
<b>Save and exit</b>	Used to save and exit


- After inputting the data, go to **[Save and Exit]** using the **arrow** (▲▼◀▶) or **[Tab]** button and save the setting by pressing the **[Select]** button.

## D) H anti-aliasing

- On the **{H Anti-aliasing}** menu as shown below, press the **[Select]** button:


	Channel	Filter	Average Filter	Quad	Max Bitrate	H Anti Aliasing	V Anti Aliasing	Peaking	C/Y Coring
Recording Setup	1	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	2	Temporal	1:6:1	Off	300KB	4MHz	4MHz	93%	No
	3	Temporal	1:6:1	Off	300KB	4MHz	2MHz	93%	No
Schedule	4	Temporal	1:6:1	Off	300KB	4MHz	1.5MHz	93%	No
							1MHz		

### E) V anti-aliasing

□ On the **{V Anti-aliasing}** menu as shown below, press the **[Select]**  button:


	Channel	Filter	Average Filter	Quad	Max Bitrate	H Anti Aliasing	V Anti Aliasing	Peaking	C/Y Coring
Recording Setup	1	Temporal	1:6:1	Off	300KB	4MHz	Full	Full	
	2	Temporal	1:6:1	Off	300KB	4MHz	Full	Full	
Schedule	3	Temporal	1:6:1	Off	300KB	4MHz	Full	0.25 Line	
	4	Temporal	1:6:1	Off	300KB	4MHz	Full	0.18 Line	

### F) Peaking

□ On the **{Peaking}** menu as shown below, press the **[Select]**  button:

	Channel	Filter	Average Filter	Quad	Max Bitrate	H Anti Aliasing	V Anti Aliasing	Peaking	C/Y Coring
Recording Setup	1	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	No
	2	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	31%
Schedule	3	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	62%
	4	Temporal	1:6:1	Off	300KB	4MHz	Full	93%	93%

### G) C/Y coring

□ On the **{C/Y Coring}** menu as shown below, press the **[Select]**  button:

	Channel	Filter	Average Filter	Quad	Max Bitrate	H Anti Aliasing	V Anti Aliasing	Peaking	C/Y Coring
Recording Setup	1	Temporal	1:6:1	Off	300KB	4MHz	Full	No	No
	2	Temporal	1:6:1	Off	300KB	4MHz	Full	+/-1	No
Schedule	3	Temporal	1:6:1	Off	300KB	4MHz	Full	+/-2	No
	4	Temporal	1:6:1	Off	300KB	4MHz	Full	+/-4	No

### (3) Description of advanced options

<b>Menu</b>	<b>Description</b>
<b>{Filter}</b>	This is used to filter the images. Either Median Filter or Temporal Filter may be selected. If there is lots of noise in the still image, select Median Filter; if there is lots of noise in the moving image, however, Temporal Filter is recommended. Since the DVR handles moving images, Temporal Filter is recommended.
<b>{Average filter}</b>	Either 1:6:1 or 1:2:1 may be selected. For 1:6:1 (which is also the default setting), however, the file size is high but the filtering degree is low; this means that the resulting image is close to the original image.
<b>{Quad}</b>	-
<b>{Maximum bit rate}</b>	This refers to the maximum size unit for the streaming of moving images.
<b>{H anti-aliasing}</b>	This is used to set the horizontal anti-aliasing. In most cases, 4MHz is closest to the actual video.
<b>{V anti-aliasing}</b>	This is used to set the vertical anti-aliasing. In most cases, the [All] option is closest to the actual video.
<b>{Peaking}</b>	Peaking emphasizes the edge of the Y elements. The user can select No, 31%, 62%, or 93%. At 93% (which is also the default setting), however, the edges are emphasized the most.
<b>{C/Y cording}</b>	Cording is used to keep the edges sharp among the Y elements of the image. The user can select No, +/-1, +/-2, or +/-4. To get the softest images, however, +/-4 is recommended; the default setting is No. The user can get the same output as that of Average Filter.

## 5-2. Additional Setup

Use **{Additional Setup}** to set the PTZ and network features.



After changing the setting on the **{Additional Setup}** menu, save the setting before exiting the menu.

- **[Save]**

Saves the setting

- **[Cancel]**

Exits without saving the setting

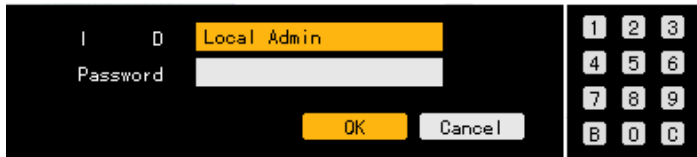
- **[Reset]**

Resets the setting



### 5-2-1. Selecting Additional Setup

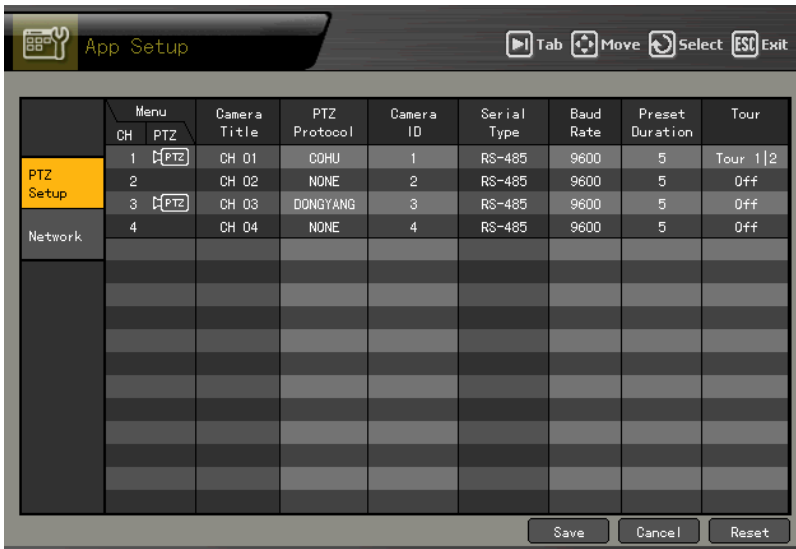
- On the real-time monitoring screen, select the **[Additional Setup]** button on the remote control.
- The login window is then displayed as shown below:



- Select the login account, enter the password using the numeric buttons on the remote control, and click **[OK]**.

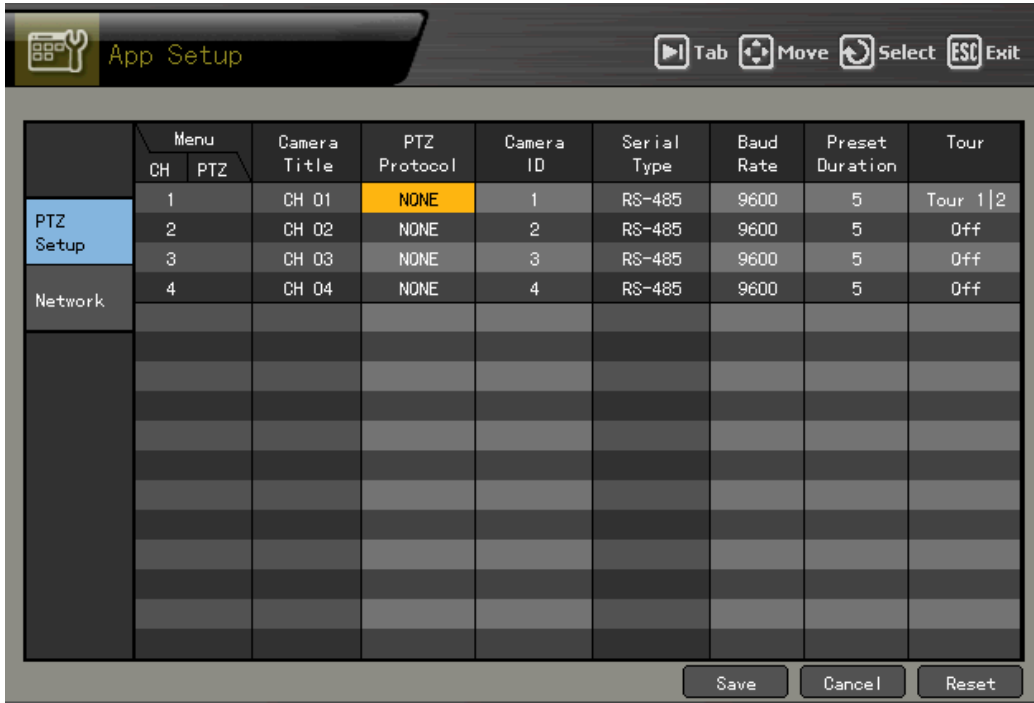
- (The default password of the local administrator is "00000.")
- To change the user ID, go to the ID selection box and select the **arrow (▲▼)** buttons.

- Once the correct password is inputted, the initial **{Additional Setup}** menu is displayed as shown below:



## 5-2-2.PTZ Setup

Sets the PTZ camera connected to the system



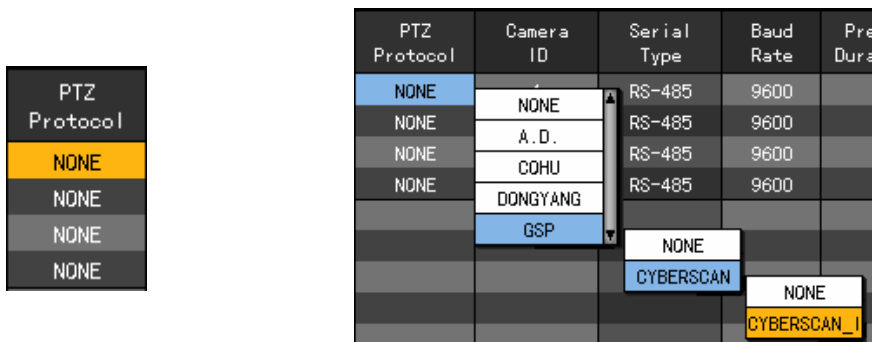
<b>Menu CH</b>	Displays the channel
<b>Menu PTZ</b>	Setting the PTZ causes a camera icon to be displayed.
<b>Camera name</b>	Displays the name of each channel
<b>PTZ protocol</b>	Sets the protocol used to communicate with the PTZ camera
<b>Camera ID</b>	ID set in the PTZ camera
<b>Transmission type</b>	Camera control cable type (RS-485)
<b>Transmission rate</b>	Communication speed (must be the same as the communication speed specified in the manual for the PTZ)
<b>Preset maintenance time</b>	Interval between the Preset as defined in the Tour feature and the next Preset (unit: 5 ~60 seconds)
<b>Tour</b>	Used to set the Tour feature (Tour 1 and Tour 2)

### (1) PTZ protocol setting

The PTZ protocol is used for communicating with the PTZ camera.

- On the **{PTZ Setup}** menu, select the **{PTZ Protocol}** sub-menu and go to the channel using the **arrow (▲▼◀▶)** buttons. Afterward, press the **[Select]**  button.



- On the selection box, set the protocol using the **arrow (▲▼)** and **[Select]**  buttons.

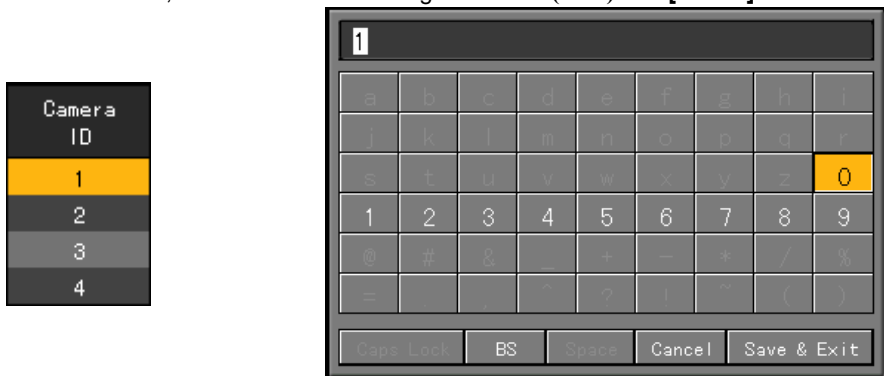


### (2) Camera ID setting

Camera ID refers to the address used to communicate with the PTZ camera.

- The camera ID must be the same as the address set in the PTZ camera.
- Different methods are used to set the address of the PTZ camera depending on the camera manufacturer or model. See the camera manual for reference.

- On the **{PTZ Setup}** menu, select the **{Camera ID}** sub-menu and go to the channel using the **arrow (▲▼◀▶)** buttons. Afterward, press the **[Select]**  button.
- On the selection box, set the camera ID using the **arrow (▲▼)** and **[Select]**  buttons.



### (3) Setting the transmission type

The transmission type pertains to the type of interface used to communicate with the PTZ camera. In Workhorse 120-4, the transmission type is RS-485.



<b>RS-485</b> Standard interface for multi-point communication line as approved by TIA/EIA
--

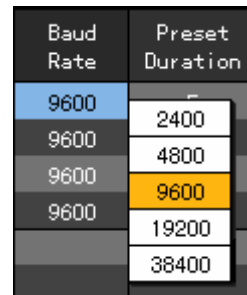


#### (4) Setting the transmission rate

The transmission rate denotes the speed of communication with the PTZ camera.



- The transmission rate must be the same as the communication speed of the PTZ camera.
- Different methods are used to set the address of the PTZ camera depending on the camera manufacturer or model. See the camera manual for reference.

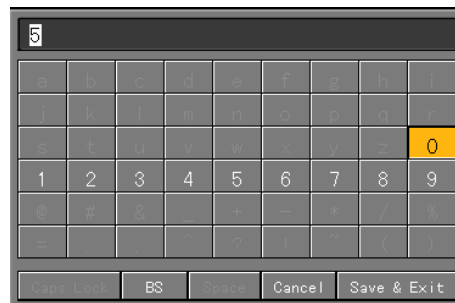
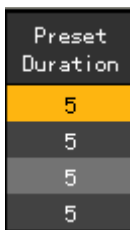
- On the **{PTZ Setup}** menu, select the **{Transmission Rate}** sub-menu and go to the channel using the **arrow (▲▼◀▶)** buttons. Afterward, press the **[Select]**  button.
- On the selection box, set the baud rate using the **arrow (▲▼)** and **[Select]**  buttons.



#### (5) Preset time setting

<b>Preset</b>	Used to move the PTZ camera up, down, right, and left, to zoom in the image, and to control the focus to save the new setting  Up to eight settings can be saved. Setting numbers between 1 and 8 may be selected.
<b>Tour</b>	Automatically controls the preset PTZ camera according to the predefined order  <b>Tour 1</b> is set as 9, and <b>Tour 2</b> , as 0.
Preset maintenance time	<b>Tour</b> interval (between 5 and 60 seconds)

- On the **{PTZ Setup}** menu, select the **{Preset Maintenance Time}** sub-menu and go to the channel using the **arrow (▲▼◀▶)** buttons. Afterward, press the **[Select]**  button.
- On the selection box, select the preset maintenance time using the **arrow (▲▼)** and **[Select]**  buttons.



### (6) Tour setting

<b>Preset</b>	Used to move the PTZ camera up, down, right, and left, to zoom in the image, and to control the focus to save the new setting Up to eight settings may be defined. Setting numbers between 1 and 8 may be selected.
<b>Tour</b>	Automatically controls the <b>preset</b> PTZ camera according to the predefined order  <b>Tour 1</b> is set as 9, and <b>Tour 2</b> , as 0.
<b>Preset maintenance time</b>	<b>Tour</b> interval (between 5 and 60 seconds)

Example - Tour feature when Tour 1 and Tour 2 are set as follows:

- When 9 is pressed in PTZ mode:  
Numbers are selected in the following order: 1 > 7 > 5 > 6.  
Selecting 9 again disables the feature.
- When 0 is pressed in PTZ mode:  
Numbers are selected in the following order: 3 > 2 > 4 > 8.  
Selecting 0 again disables the feature.

Tour1	Tour2
1	3
7	2
5	4
6	8

- On the **{PTZ Setup}** menu, select the **{Tour}** sub-menu and go to the channel using the **arrow** (▲▼◀▶) buttons. Afterward, press the **[Select]** ⌂ button.
- On the selection box, enable the Tour feature using the **arrow** (▲▼) and **[Select]** ⌂ buttons.

Tour
Off
Off
Off
Off

Serial Type	Baud Rate	Preset Duration	Tour
RS-485	9600	Off	Off
RS-485	9600	Set	Off
RS-485			Off
1		5	Off
2			
3			
4			
5			
6			
7			
8			
Off			

### 5-2-3. Network Setup

#### (1) Selecting the Network Setup menu

- In **{Additional Setup}** mode, go to **{Network}** and press the **[Select]**  button.




#### (2) Ethernet

Uses a fixed IP in the local area network environment

- On the **{Network Setup}** menu, go to **{Ethernet}** using the arrow (**◀▶**) buttons and press the **[Select]**  button.

















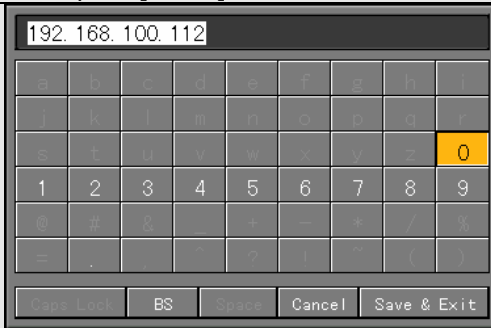
- To select 1, 2, or 3, use the **[Tab]**  button. For others, use the **arrow** ( ) buttons.



- On the LAN Setup menu, set the LAN field.




When changing the last part of the existing address:

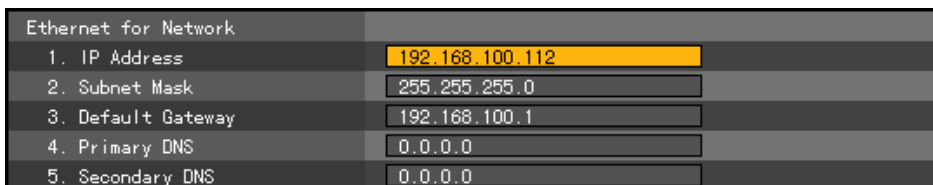
- Go to the input box using the **arrow** (   ) buttons and select the **left arrow** () button.
- Go to **[BS]** using the **[Tab]**  or **arrow** ( ) buttons.
- Delete only the incorrect value using the **[Select]**  button.
- Enter the new value using the numeric buttons on the remote control or the **arrow** (   ) and **[Select]**  buttons.




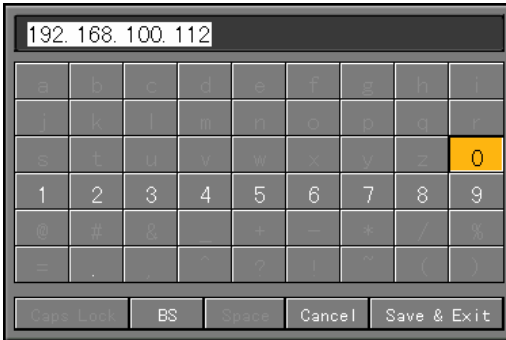
<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

## B) IP address setup



- On the **{Ethernet Setup}** menu, go to the IP address input field using the **arrow** ( ) buttons and press the **[Select]**  button.




- On the input window, enter the IP address using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.

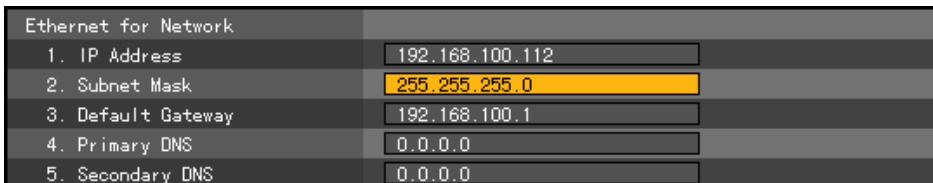



<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel
<b>Save and exit</b>	Used to save and exit

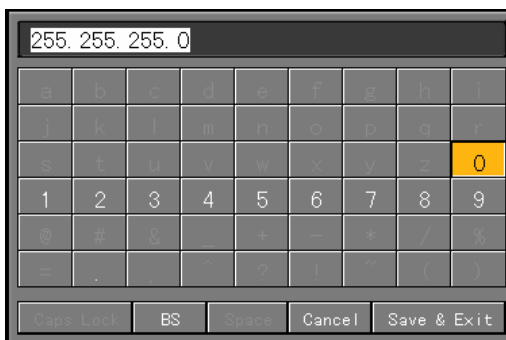
- After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.

### C) Subnet mask setting



- On the **{Ethernet Setup}** menu, go to the subnet mask input field using the **arrow (▲▼)** buttons and press the **[Select]**  button.




- On the input window, enter the subnet mask using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.




<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

- After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.

## D) Default gateway setting



- On the **{Ethernet Setup}** menu, go to the default gateway input field using the **arrow (▲▼)** buttons and press the **[Select]**  button.

Ethernet for Network	
1. IP Address	192.168.100.112
2. Subnet Mask	255.255.255.0
3. Default Gateway	192.168.100.1
4. Primary DNS	0.0.0.0
5. Secondary DNS	0.0.0.0


- On the input window, enter the default gateway using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.

192.168.100.1									
a	b	c	d	e	f	g	h	i	j
k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z	0			
1	2	3	4	5	6	7	8	9	
@	#	\$	%	&	*	+	=	/	%
=	.								
Cap Lock	BS	Space	Cancel	Save & Exit					


<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

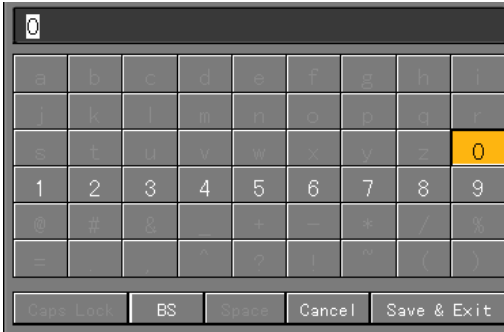
- After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.

## E) Default DNS setting



- On the **{Ethernet Setup}** menu, go to the default DNS input field using the **arrow (▲▼)** buttons and press the **[Select]**  button.

Ethernet for Network	
1. IP Address	192.168.100.112
2. Subnet Mask	255.255.255.0
3. Default Gateway	192.168.100.1
4. Primary DNS	0.0.0.0
5. Secondary DNS	0.0.0.0


- On the input window, enter the default DNS using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.

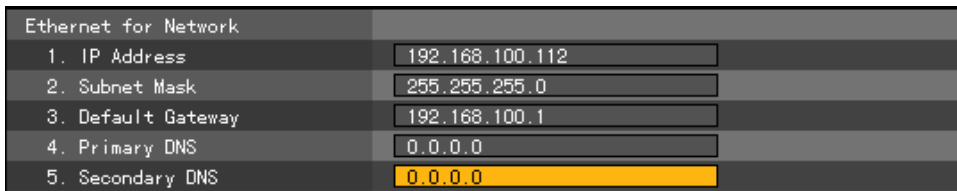



<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit

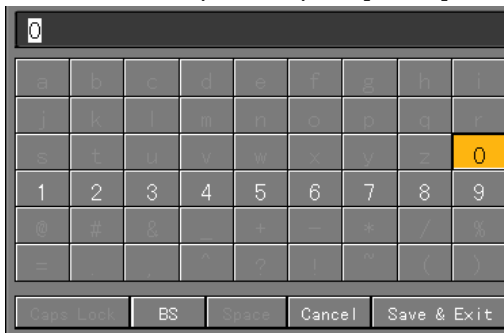
- After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.

### F) Auxiliary DNS setting



- On the **{Ethernet Setup}** menu, go to the auxiliary DNS input field using the **arrow (▲▼)** buttons and press the **[Select]**  button.



- On the input window, enter the auxiliary DNS using the numeric buttons on the remote control or the **arrow (▲▼◀▶)** and **[Select]**  buttons.



<b>BS</b>	Backspace; used to delete
<b>Cancel</b>	Used to cancel the save
<b>Save and exit</b>	Used to save and exit



- After inputting the data, go to **[Save and Exit]** using the **[Tab]**  or **arrow (▲▼)** buttons and press the **[Select]**  button.

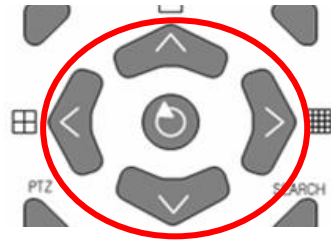
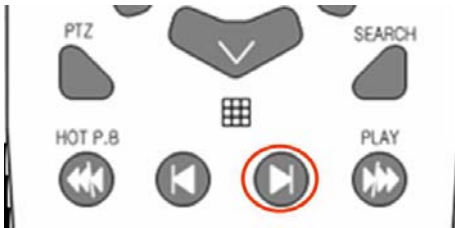
### (3) PSTN/ISDN

Sets the PSTN/ISDN modem

#### A) PSTN/ISDN 1:1

Used when the remote access software is connected to the DVR at a ratio of 1:1



- On the Network Setup menu, go to **{PSTN}** using the **arrow (◀▶)** buttons and press the **[Select]**  button.
- To select 1,2, or3 , use the **[Tab]**  button. For others, use the **arrow (◀▶)** buttons.

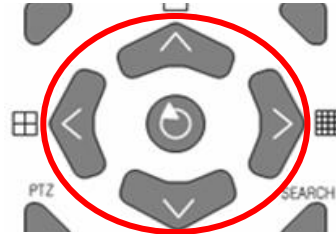




## B) PSTN/ISDN ISP


Used in the ISP-provided communication environment

- On the **{Network Setup}** menu, go to **{PSTN}** using the **arrow (◀▶)** buttons and press the **[Select]**  button.
- Use the **[Tab]**  or **arrow (◀▶)** buttons to navigate between items.




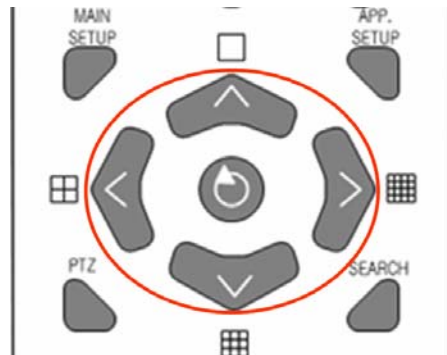
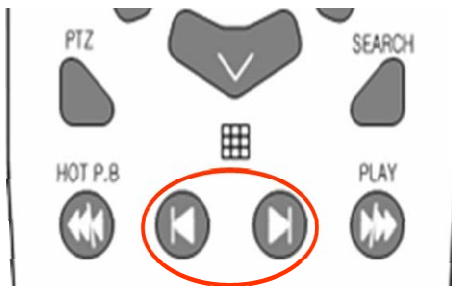
#### (4) Cable

Uses the automatic ADSL access or a dynamic IP

- On the **{Network Setup}** menu, go to **{Cable}** using the **arrow (◀▶)** buttons and press the **[Select]**  button.



- To select 1,2 or 3, use the **[Tab]**  button. For others, use the **arrow (◀▶)** buttons. Select Cable Modem DHCP.




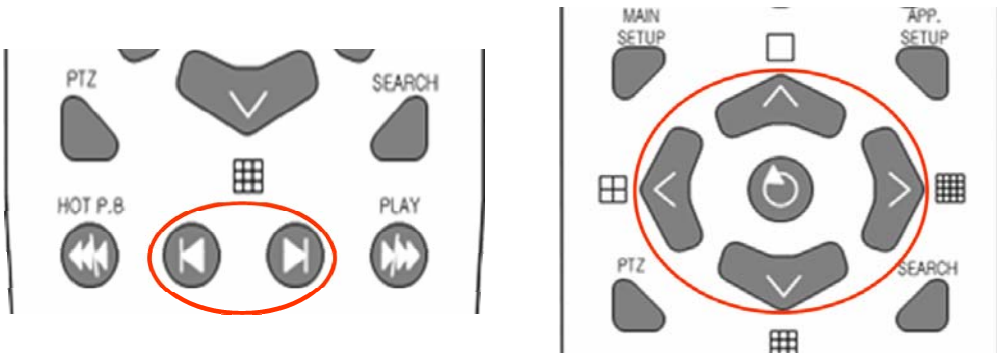
## (5) ADSL

Used only in the user authentication-type ADSL environment

- On the **{Network Setup}** menu, go to **{ADSL}** using the **arrow (◀▶)** buttons and press the **[Select]**  button.




- To select 1, 2, or 3, use the **[Tab]**  button. For others, use the **arrow (◀▶)** buttons. Enter the user ID and password and save them.

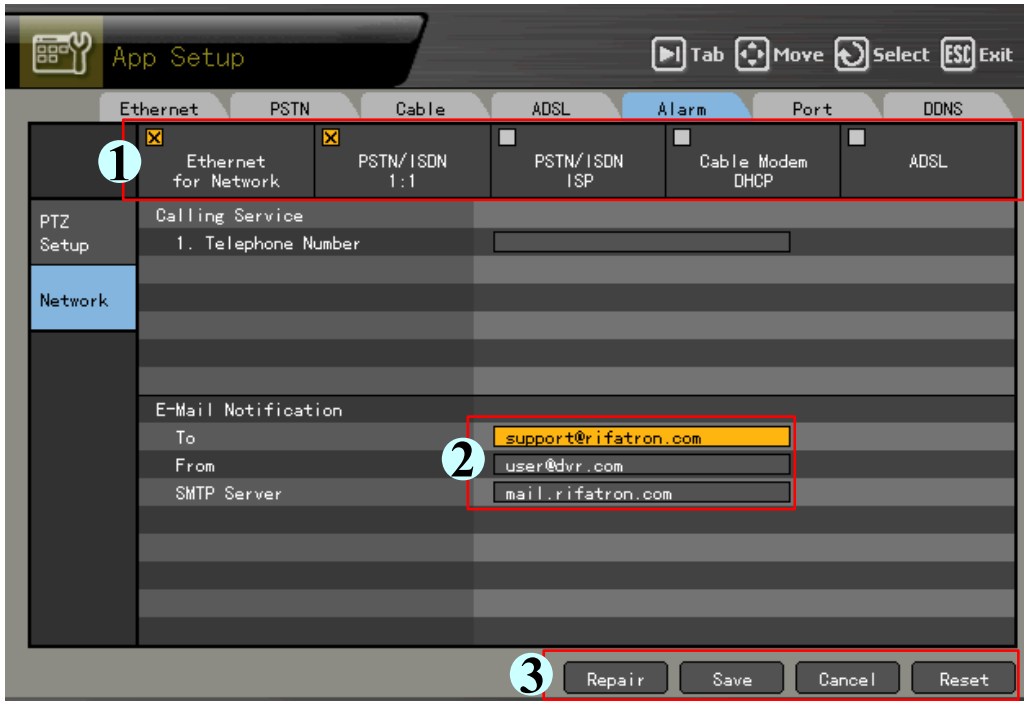



## (6) Alarm

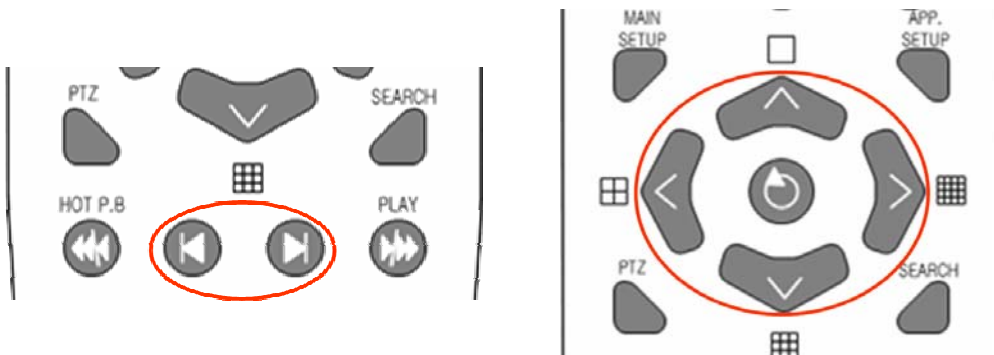
Fixed phone or mail alarm output setting for the event

To use this feature, select **{Main Setup}** → **{Data Setup}** and enable Call or Mail Alarm.

- On the **{Network Setup}** menu, go to **{Alarm}** using the **arrow (◀▶)** buttons and press the **[Select]**  button.




- To select 1, 2, or 3, use the **[Tab]**  button. For others, use the **arrow (◀▶)** button. Set the telephone number and the sending/receiving email addresses.



## (7) Port

Sets the user for the network port

The default is between 2000 and 2007; a randomly chosen value may be used depending on the network environment, e.g., firewall.

- On the **{Network Setup}** menu, go to **{Port}** using the **arrow (◀▶)** buttons and press the **[Select]**  button.



- Set the port number using the **[Tab]**  and **arrow (◀▶)** buttons.



## (8) DDNS

As part of the DNS system, the Dynamic Domain Name System (DDNS) service dynamically updates the IP addresses of the host names and allocates fixed domain names to systems connected with dynamic IP addresses. This way, the DDNS service ensures the user's access to the network using the same DNS name regardless of the changes in the IP address.

Workhorse/Premier Series provide a dynamic DNS to ensure URL access in a dynamic IP environment. Its built-in web server feature enables remotely monitoring images through the Internet anytime.

- Go to **{DDNS}** using the **{Network Setup}** menu and **arrow (◀▶)** buttons and press the **[Select]** button.



- Enable/Disable the use of DDNS using the **arrow (◀▶)** buttons as shown below:



- Register the domain name registered in the DNS server.

After accessing the DDNS server, register the domain name and enter a unique URL.

For more information on adding a domain please contact tech support at 866-301-2288

Host Domain Name

dvr001.ddns.net

- Enter the DDNS access password registered in the DDNS server.

Password

- Enter the IP address of the DDNS server.

The default IP address of the DDNS server is 211.117.45.25.

Server IP

000.000.000.000

- Set the default port of the DDNS server.

The default port of the DDNS server is 9100.

Server Port Number

9100

**USER'S GUIDE**

---

# ***Rugged Vision viewer/ Quick viewer***

---

English

Operating Instructions & User's Guide



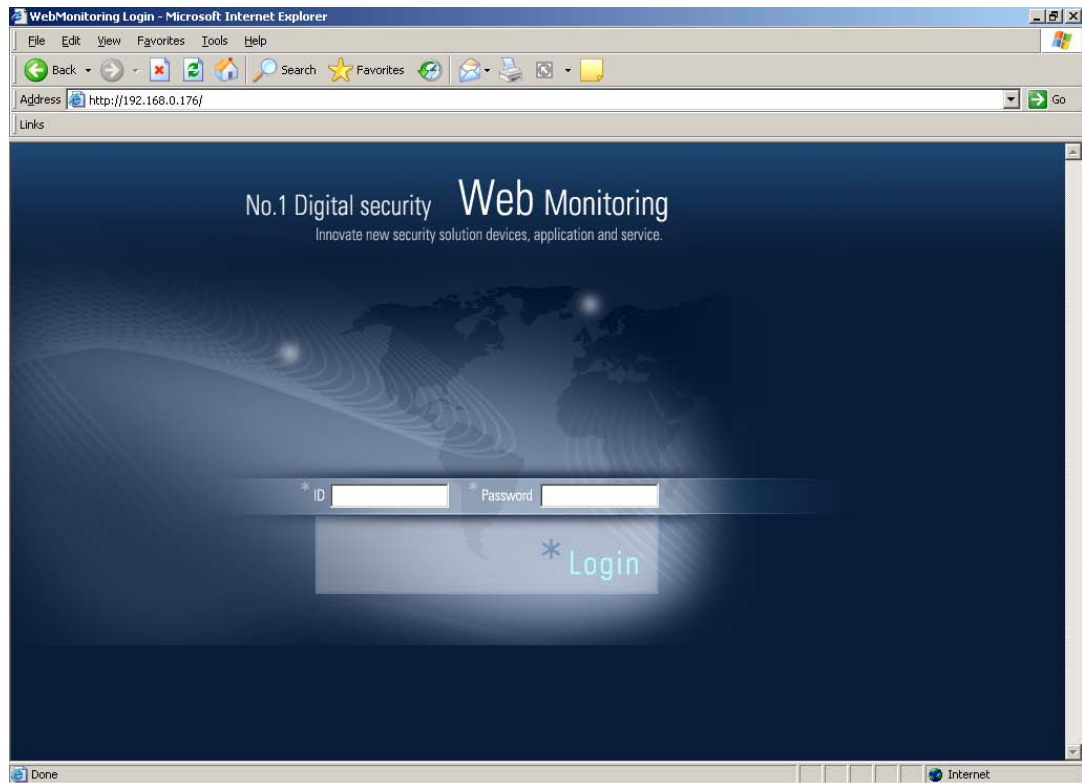


# 1. Rugged Vision Viewer(Web monitoring)

## 1-1. Access

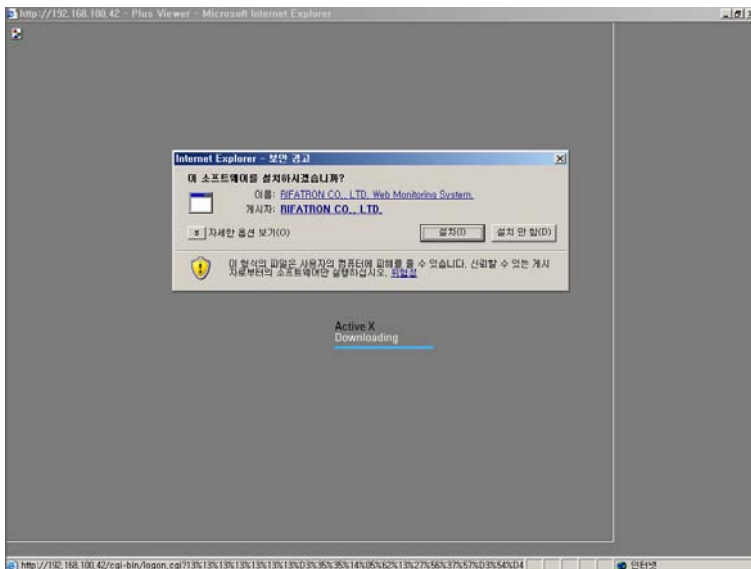
The user can access the DVR system through the web.

- Enter the IP of the DVR system on the address field of the web browser.

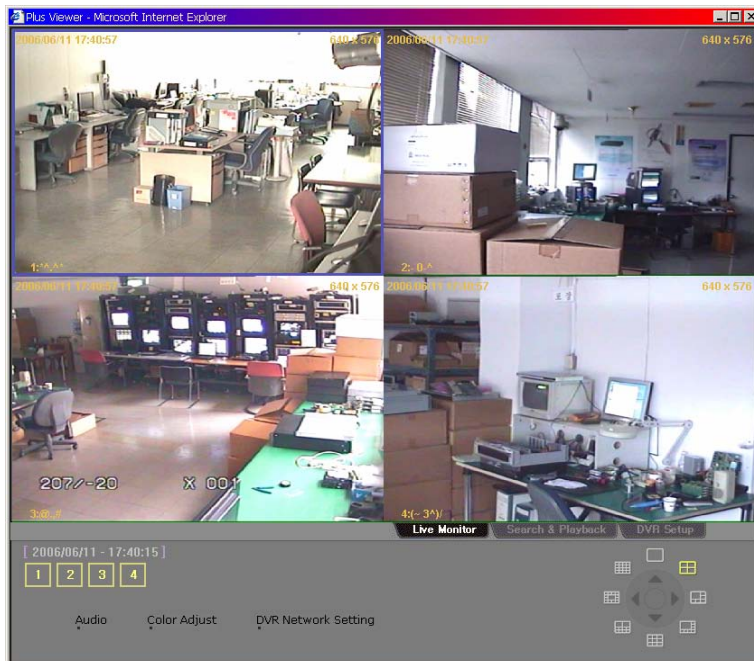


- The ID and password are the same as those of the user account set in the DVR system. After logging in to the system, install ActiveX for Windows XP SP2 or higher.

- Click [Install] on the window as shown below:



- After installing ActiveX, the user can use Plus Viewer on the web browser.

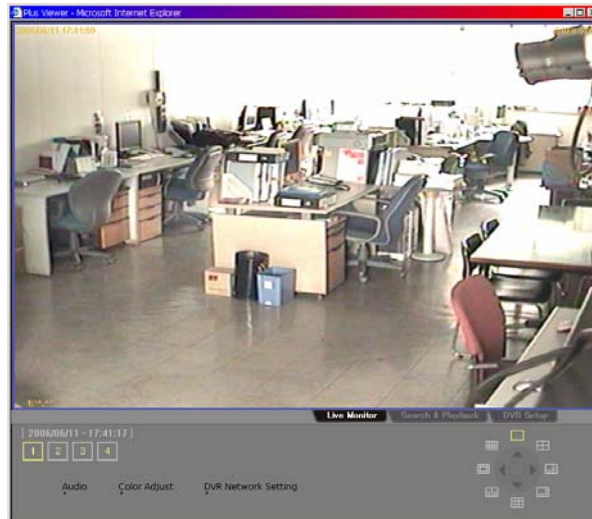


## 1-2. Description of the Basic Features

- The user can view the channel on full screen by clicking any of the following numbers:



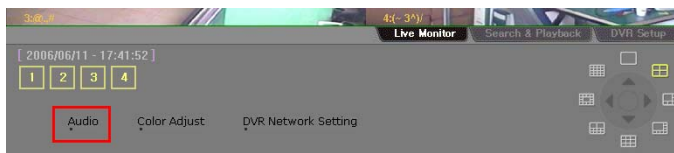
- Zoomed-in view of Channel No. 2



- Clicking Live screen causes the channel to be selected and the border of the corresponding screen to be displayed in a different color (the figure above shows the case where in Channel No. 1 is selected).
- The user can also view the channel on full screen by double-clicking the channel.

## 1-3. Audio

- Click the Audio button to control the volume.



- After adjusting the volume, click the Close button to exit the menu.

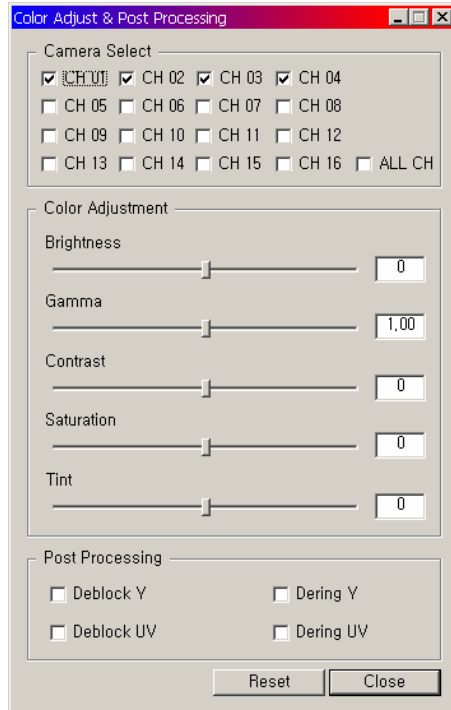


## 1-4. Color Adjust

- Click Color Adjust to adjust the display colors.

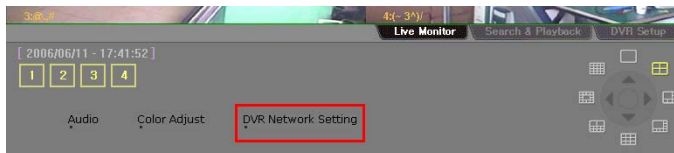


- After adjusting the display colors, click Close to save the setting and close the window.

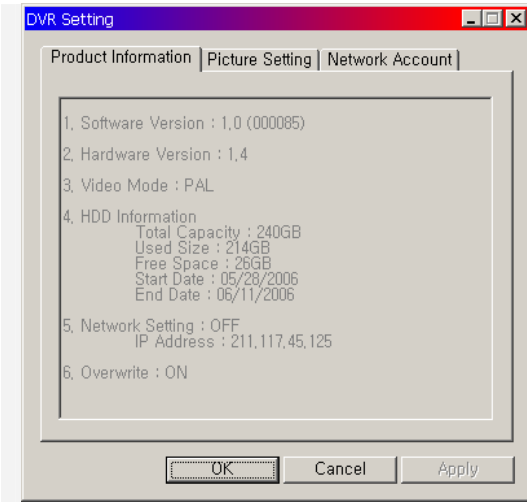


## 1-5. DVR Network Setting

- To view the DVR setting, click DVR Network Setting.

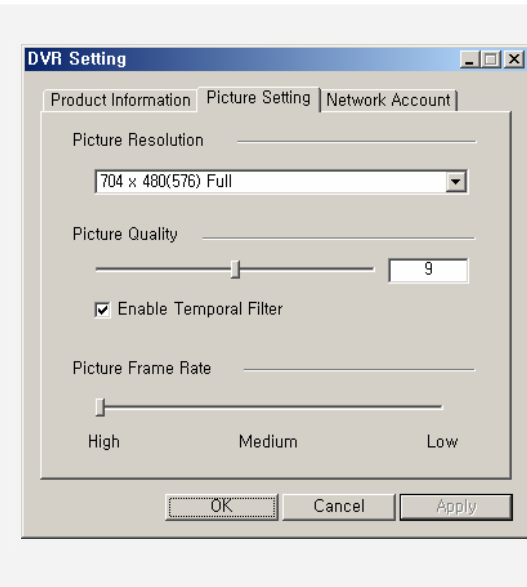


□ Product information



1. Software version: 00 (build no.)
2. Hardware version
3. Video type
4. Hard drive information
  - Total space
  - Used space
  - Free space
  - Recording start day
  - Last recording date
5. Network setting information
6. Whether to allow overwriting or not

Use Picture Setting to set the resolution, video quality, and frame speed.



**Picture resolution**

Used to adjust the resolution; the lower the resolution, the higher the transmission speed (CIF > Field > Full)

**Picture quality**

Used to adjust the picture quality; the higher the picture quality, the higher the compression rate (in case of low picture quality, the network transmission rate increases)

**Enable temporal filter**

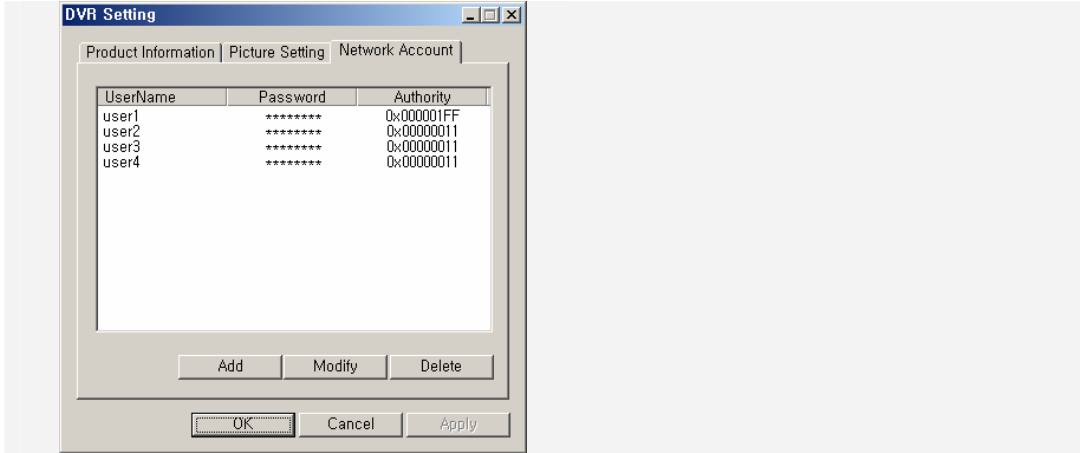
Removes any noise in the image to eliminate unnecessary data and enhance the network transmission speed

**Picture frame rate**

Controls the frame rate; the following are the frame rates for 30 frames:

High: 30; Medium: 15; Low: 7.5

- Use Network Account to display the user profile.



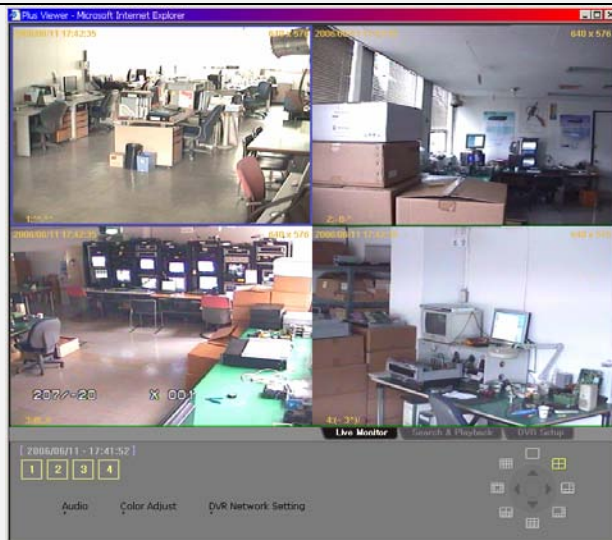
## 1-6. Viewing a Divided Screen



After the channel video is displayed on the monitoring window, the user can view the divided screen by clicking the Division Mode button.

To view one channel on full screen, double-click the channel. To return to division mode, double-click any area on the screen.

Example - Selecting 4-division mode

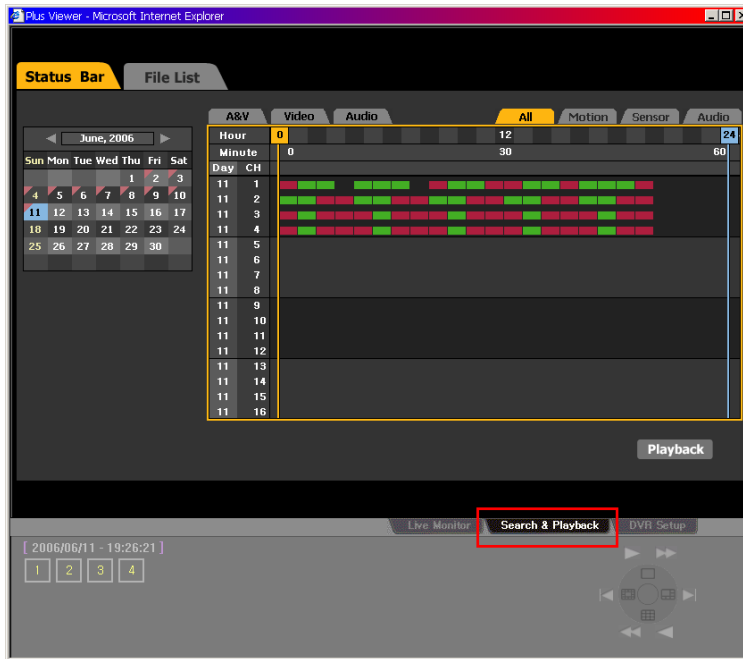


**4-division mode**

# 1-7. Search and Playback

Searches and plays the video recorded in a remote DVR in real time.

- Click the Search and Playback tab at the bottom.



## 1-7-2. Search Method

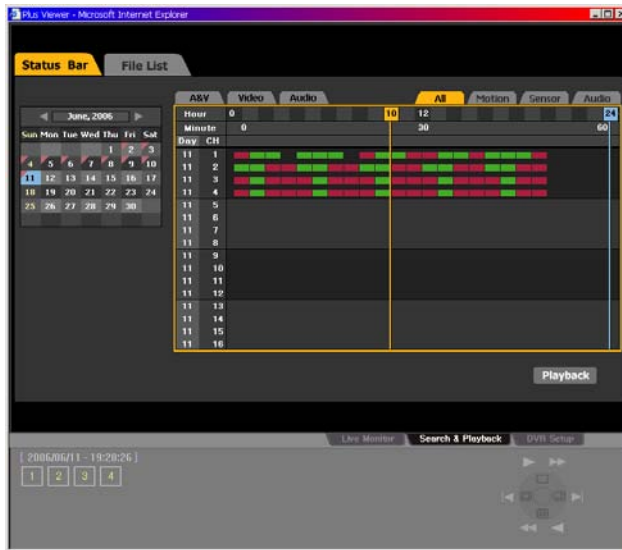
- **Status Bar** Search –Displays the recorded video in the form of an hour/minute bar graph
- **File List** Search –Displays the recorded video in the form of a file list

## 1-7-3. Search and Play

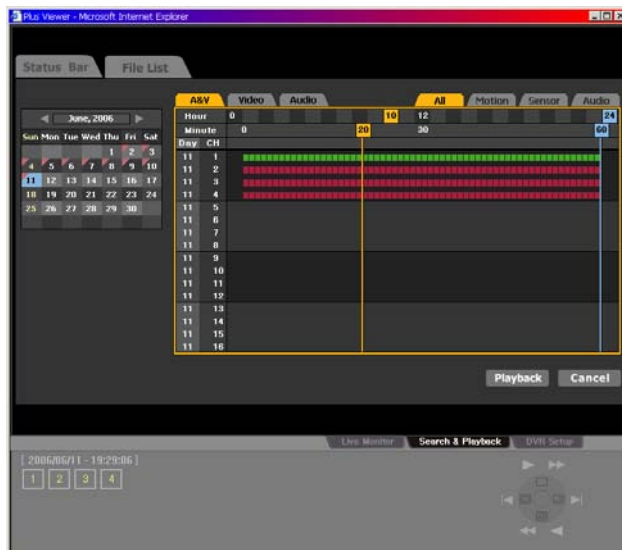
- On the search window, click the **Status Bar** or **File List** button and select the search method.
- Select a date from the calendar. The date when a video was recorded video is marked.



- Select the date and time and click **Playback**. The following screen is then displayed:

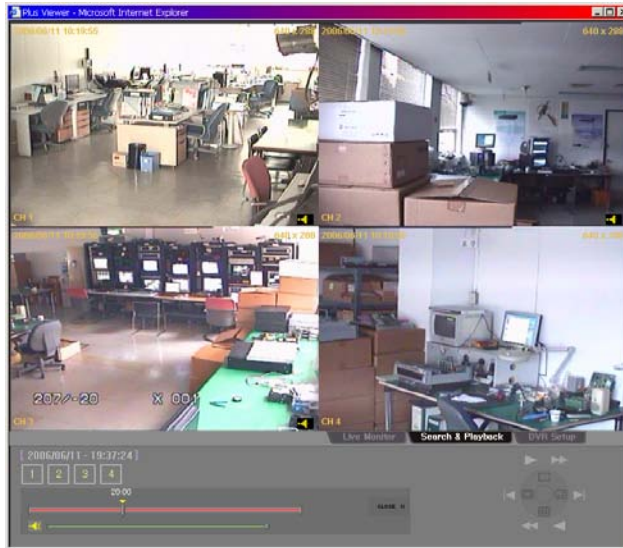


- Select the minute and click **Playback**. The video is then played. To go back to the previous screen, click **Cancel**.



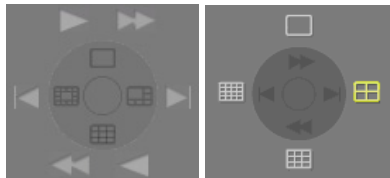


- Below is the playback screen:



#### 1-7-4. Playback Control

- The user can select the screen division and adjust the playback speed using the control at the lower right hand corner.



#### 1-7-5. Screen Description

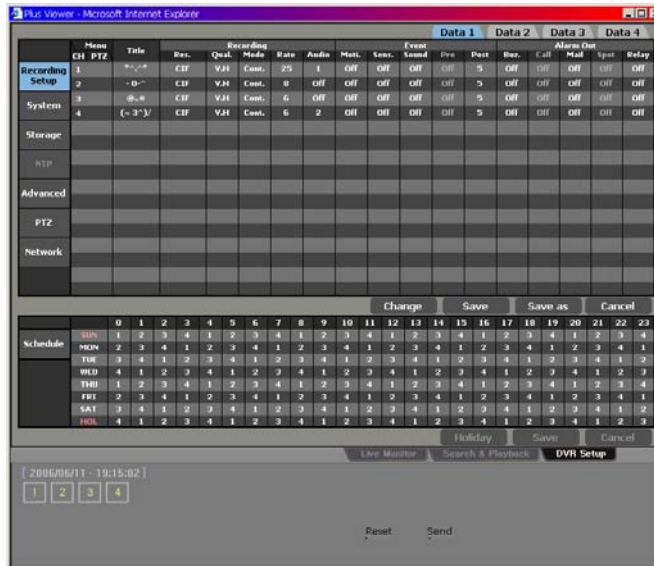
A&V		Video	Audio	All	Motion	Sensor	Audio
Hour	0		6	12			24
Minute	0			30			60
Day	CH						
29	1						
29	2						

- A & V – Displays all recorded files
- Video – Displays only files with video
- Audio – Displays only files with audio
- All – Displays all recorded videos on the list
- Motion – Indicates the motion events
- Sensor – Indicates the sensor events
- Audio – Displays the audio events
- General images displayed in green bars, and events, in red bars

## 1-8. DVR Setup

The remote DVR setup screen includes Graphic User Interfaces (GUIs) such as DVR OSD.

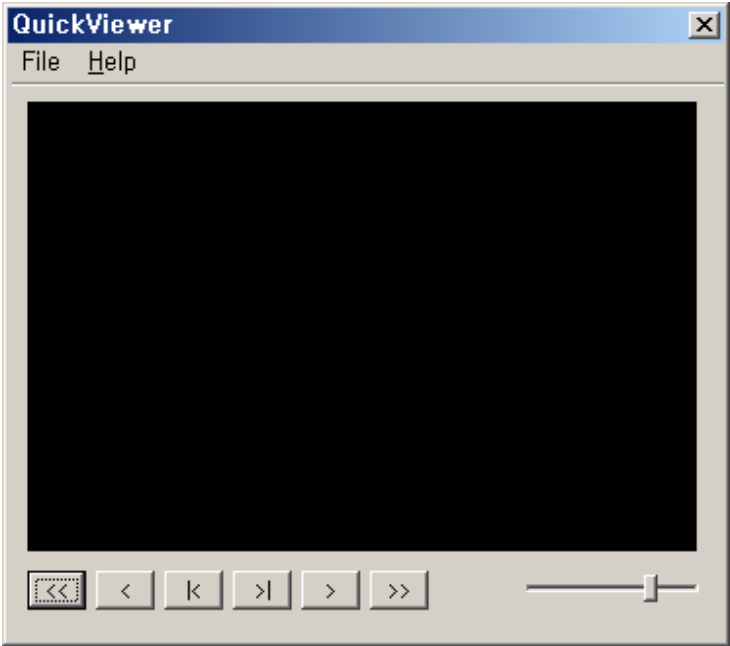
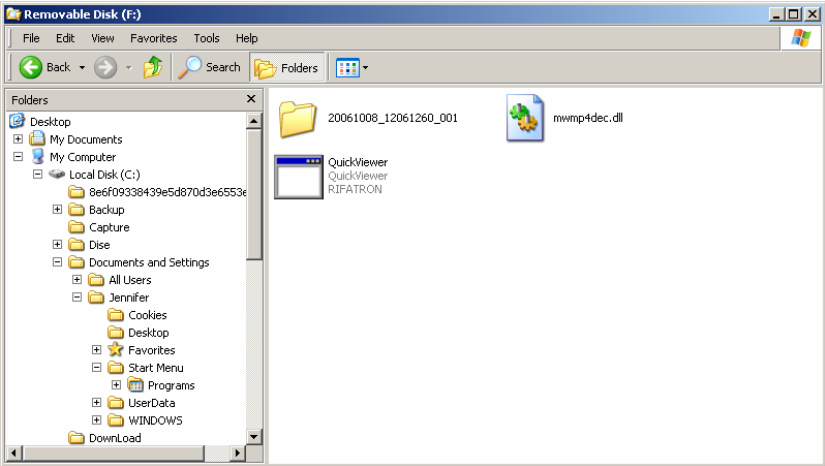
- Clicking **DVR Setup** causes the following screen to be displayed:



- Change the system setup on the DVR setup screen by clicking **[System Setup]**.  
For more information on system setup, see Chapter 5 (**System Setup**).
- After changing the system setting, click **Save**.
- Click the Send button to send the new system setting to the DVR and to complete the DVR setting.

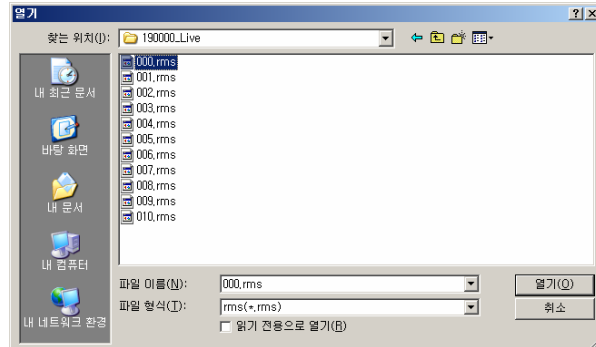
# 2. Quick Viewer

When recorded data is backed up from the DVR system, a new folder is created in the backup device including QuickViewer.exe and mwmp4dec.dll files. The user can run Quick Viewer by executing QuickViewer.exe.

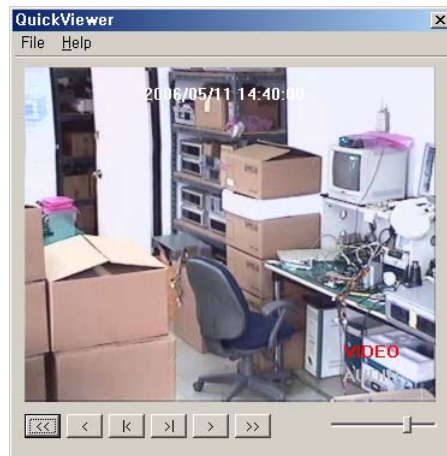


## 2-1. File Play







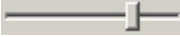
- Click [File] – [Open]. An open file dialog box then appears as shown below:



- Select the rms file of the channel to be played.



## 2-2. Description of Buttons

-  Fast backward play
-  Backward play
-  Previous frame
-  Next frame
-  Forward play
-  Fast-forward play
-  Volume control

### 2-3. Version Information

- To check the version of Quick Viewer, click [Help] – [About].



## **A/P/P/E/N/D/I/X**

<b>A/P/P/E/N/D/I/X .....</b>	<b>157</b>
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■ CD-RW, DVD-RW .....	159

## 1. PTZ Camera Protocol

No.	Vendor	Protocol
1	CHOU	COHU-3925
2	Kalatel	KALATEL
3	Hitron	FASTRAX2
4	Panasonic	WVCS854, WV-CS850A, WV-CS854, WV-CW860 external
5	Dongyang	DRX_500
6	Samsung	SCC641
7	GSP	CYBERSCAN_1
8	HONEYWELL	HSDN251
9	PHILIPS	PHILIPS
10	RIFATRON	RIFATRON
11	VICON	VICON
12	AMERICAN DYNAMICS	SENSORMATIC
13	PELCO	PELCO – D, PELCO - P
14	PROLINE	PROLINE - UK
15	SAMSUNG TECHWIN	SPD-1600

## 2. Recommended HDD

NO	Vendor	Model	Capacity	Buffer	RPM
1	Western Digital	WD WD1200	120GB	2M	7200
		WD WD2500	250GB	8M	7200
2	Seagate	SEAGATE BARRACUDA 7200.9 ST3120213A	120GB	8M	7200
		SEAGATE BARRACUDA 7200.7 ST3160023A	160GB	8M	7200
		SEAGATE BARRACUDA 7200.7 ST3200822A	200GB	8M	7200
		SEAGATE BARRACUDA 7200.7 ST3200827A	200GB	8M	7200
		SEAGATE BARRACUDA 7200.9 ST3250823A	250GB	8M	7200
		SEAGATE BARRACUDA 7200.9 ST3250824A	250GB	8M	7200
		SEAGATE BARRACUDA 7200.8 ST3300831A	300GB	8M	7200
		SEAGATE BARRACUDA 7200.8 ST3400832A	400GB	8M	7200
		SEAGATE BARRACUDA 7200.9 ST3250641A	500GB	8M	7200
3	Samsung	Samsung SP1203N/DOM	120GB	2M	7200
		Samsung SP2514N/OMD	250GB	8M	7200
4	MAXTOR	MAXTOR DIAMOND MAX 10	160GB	8M	7200
		MAXTOR DIAMOND MAX 10	200GB	8M	7200
		MAXTOR DIAMOND MAX 10	250GB	8M	7200
		MAXTOR DIAMOND MAX 11	500GB		7200

### 3. Recommended USB 2.0 Device

USB 2.0 Device	Media	File System
Memory Stick	Flash type	FAT32
2.5" Portable USB HDD	HDD type	FAT32
CD	CD R, R/W	ISO9660
DVD	DVD -R, -RW, +R, +R/W	ISO9660

#### ■ Memory Stick

No.	Vendor	Model	Capacity
1	Transcend	Ultra Speed JetFlash	256MB
2	FM semiconductor	MemoRive USB 2.0	256MB
3	LG	Xtick USB Drive	256MB
4	AL Tech	ANYDRIVE mini-USB	256MB
5	Kingston	DataTraveler USB FLASH DRIVE	256MB
6	Sarotech	FLEX FD-03U1	128MB
8	Sandrive	Cruzer Mini	128M
10	Samsung	PLEOMAX	128MB
11	Sony	Micro Vault	128M

#### ■ 2.5" Portable USB HDD

No.	Vendor	Model	Capacity
1	IT Mall	neo Q Plus USB 2.0	20GB
2	USBNET	Anypak USB 2.0 20GB	20GB

#### ■ CD-RW, DVD-RW

Vendor	Model
SONY	DRX-810UL
Plextor	PX-716UF
	DVR-A09XLB
SAMSUNG	SE-W164
	TS-H292A
Lite On	SOHR-5239S
	SHW-1635S
LG	GCE-8527B
	GSA-4163B
	GSA-4,167B
	LGE-DMGSA-H10L (B)



