IDVIEW

DIGITAL VIDEO RECORDER
IV-110TX-SN / IV-110TX-SN-CD

INSTALLATION &

OPERATION MANUAL

http://www.idview.com
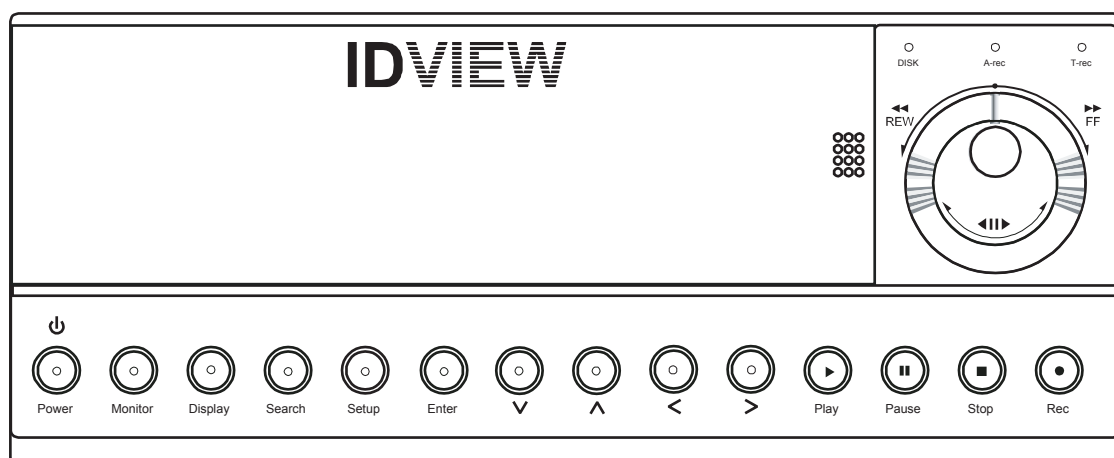
Before trying to connect or operate this product, please read this manual completely

SAFETY PRECAUTIONS

All the following safety and operated instructions which will prevent harm or damage to the operator and other persons should be read before the unit is operated.

INFORMATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference with radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

⚠ To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

⚠ Do not block ventilation openings.

⚠ Do not place anything on top of the unit that might spill or fall into it.

⚠ Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Please refer all servicing to qualified service personnel.

⚠ Do not use liquid cleaners or aerosols for cleaning.

⚠ This installation should be by a qualified service person and should conform to all local codes.

⚠ To prevent fire or electric shock, do not overload wall outlets or extension cords.

⚠ This unit must be grounded to reduce the risk of electric shock hazard.

CAUTION

⚠ Danger of explosion if battery(RTC Battery) is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

⚠ Risk of explosion if replaced by an incorrect type. Dispose of used batteries according to the instructions.

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1. INTRODUCTION

1. INTRODUCTION

1.1 Product Introduction

This 1CH Triplex DVR is a storage media of digital video image, which uses hard disk drives instead of VCR tapes to store video. It enables you to enjoy the extreme flexibility of digital image archiving instead of clumsy tape management, and is compatible with most multiplexers in the market. Equipped with a range of comprehensive features, such as playback picture-by-picture, fast accessed video recording by time and event, system software which can be upgraded, the expandable capacities of hard drive, and much more, the DVR will make your applications far more flexible and effective than ever before. For all, the DVR is going to prove the timely substitute for Time-lapse VCR.

1.2 Product Features

- The full-capability triplex DVR allows video recording while viewing live video images and video playback images at the same time.
- Stores video in hard-disk drives instead of VCR tapes.
- Main recording media: one fixed hard-disk drive and one removable hard-disk (for removable model only).
- Main recording media: one fixed HDD plus a CD-RW. (For CD-ROM model only)
- Hard-disk drive hot-swapping capability.
- Pre-alarm image recording.
- Capable of working with various known multiplexers.
- Time-lapse and real-time recording.

- Refresh rate up to 60 IPS (50 IPS for PAL).
- Image quality selectable at 4 different levels for recording.
- Event/Timer/Alarm recording mode.
- Quick search by time, alarm, event, and recording list.
- Fast and slow playback of recorded video at various speeds.
- Single-picture playback.
- On-screen setup menu, title and system timer.
- Password protection.
- Motion detection.
- Disk-full warning and operation status LEDs.
- RS-232, RS-485 communication ports.
- Remote control via RS-232, RS-485 and Ethernet ports.
- Power recovery on interruption.
- Operation-status record log.
- Distributes live and recorded images through the TCP/IP network environment.
- Audio function included (16 bits, 11 KHz / 22KHz).
- Built-in SD card slot for copying image to SD card.
- Supports DHCP protocol.

INTRODUCTION (continued)

1.3. FRONT / REAR VIEW

1.3.1 Front View

IV-110TX-SN-CD

(FOR CD-ROM MODEL)
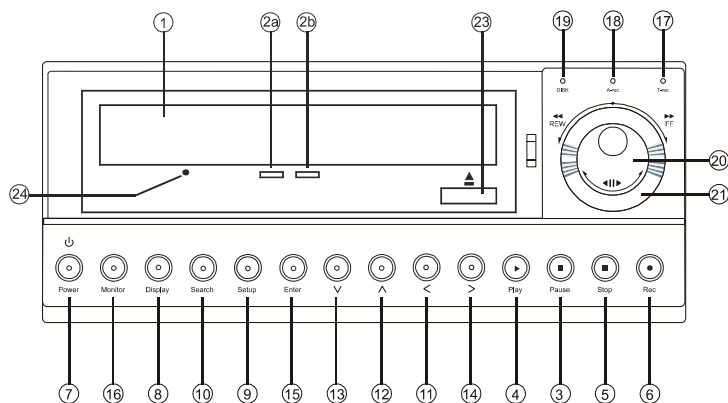
IV-110TX-SN

(FOR REMOVABLE HDD MODEL)
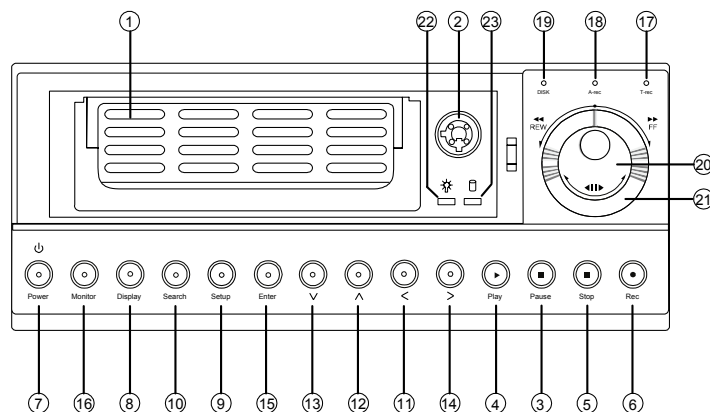
① **CD-RW device compartment:**

The compartment allows you to burn the data mostly for backup purposes. This tray is for loading the CD disc. It will accept 120 mm and 80 mm discs. Please place the discs in the exact center of the tray.

②a **Writing Display Light:**

When a disc is being burnt, the display light will be a red flash.

②b **Power Supply / Reading Light:**

When a disc has been ejected, the display light will be green. When a disc is unable to be read, or the device is being repaired, the display light will flash.

① **Hard-disk drive compartment:**

The compartment allows you to install a hard disk drive mostly for backup purposes. Make sure the drive is well secured with the mounting screws in the mobile rack before you put the rack into the compartment. And remember to turn on the power of the compartment by locking it.

② **Hard-disk compartment lock:**

The key lock secures a hard disk in place. Unlock the compartment before you remove the hard disk from the slot without turning off the device.

③ **PAUSE** button:

In a playback display, press this to freeze the display. During the freeze, press to display one frame/field of a picture at a time in the forward direction. (A green light is on the PAUSE mode.)

④ **PLAY** button:

Press to play back a recorded video from the hard disk. (A green light shows in the PLAY mode.)

⑤ **STOP** button:

Press to stop playing back a recorded video. (A green light goes on in the STOP mode.)

⑥ **REC** button:

Push to start recording video into a hard disk while in the live display mode. (A red light turns on in the REC mode.)

⑦ **POWER** button:

Press this button for at least 3 seconds to power off. Press again to activate the device.

⑧ **DISPLAY** button:

Press to show the system operation status on the screen.

⑨ **Setup** button:

Press this to enter the setup menu. Press again to exit the setup mode.

⑩ **Search** button:

Press to enter the search mode to access the recorded video.

⑪⑭ **Left / Right** buttons:

Press the two buttons to highlight desired items in the menu setup mode. For **Key Lock** operation, press these two buttons simultaneously once; to disable **Key Lock**, press these two buttons again simultaneously.

⑫⑬ **Up / Down** buttons:

Press these two buttons to select the desired contents for programming in the setup menu mode.

⑮ **Enter** Button:

Press to enter a selected item and save the setting in the menu setup mode.

⑯ **Monitor** button:

Press to switch between a multiplexer-decoded video and the encoded video to be displayed when connected with a multiplexer. When the button light is on it indicates the unit is displaying the decoded video.(The images are not multiplexing .) In this mode, the unit doesn't display the OSD message of the unit on the screen. However, this doesn't affect the unit's OSD message, which is recorded into hard-disk drives. When the button light is off it indicates the unit is displaying encoded video. (The images switch swiftly).

⑰ **T-rec Indicator:**

This indicator of the timer recording mode lights up to signal the scheduled record setting is on.

⑱ **A-rec Indicator:**

This indicator of the alarm-recording mode lights up to indicate the alarm record setting is on.

⑲ **DISK Indicator:**

The indicator shows the operation status of the unit's hard-disk drives. The green light indicates the hard-disk drive is storing or retrieving data. The red light signals the hard-disk drive is filling up.

The orange light indicates the hard-disk is retrieving a disk-full status.

⑳ **Jog Dial:**

This dial can act in both a forward and a backward direction, as well as step by step. Turn this left to play a recorded video in the reverse direction. Turn this right to play a recorded video in the forward direction.

㉑ **Shuttle Ring:**

The shuttle can be moved forward and backward for playback in either direction. Turn this left to play a recorded video in the reverse direction at faster or slower speeds than the recorded speed. Turn this right to play a recorded video in the forward direction at faster or slower speeds than the recorded speed.

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㉓ **Eject button**

Pressing this controls the insertion and ejection of the tray.

㉔ **Emergency Eject Button:**

When the power supply has been interrupted, or it is impossible to eject a disc, please use a pin to press the emergency eject button so that the caddy will eject the disc.

㉒ **Mobile Rack Power LED:**

Indicates the power status of the Mobile Rack. The green light indicates the Mobile Rack is activating.

㉓ **Mobile Rack HDD LED:**

Indicates the HDD status of the Mobile Rack. The orange light indicates the HDD is storing or retrieving data.

1.3.2 Rear View
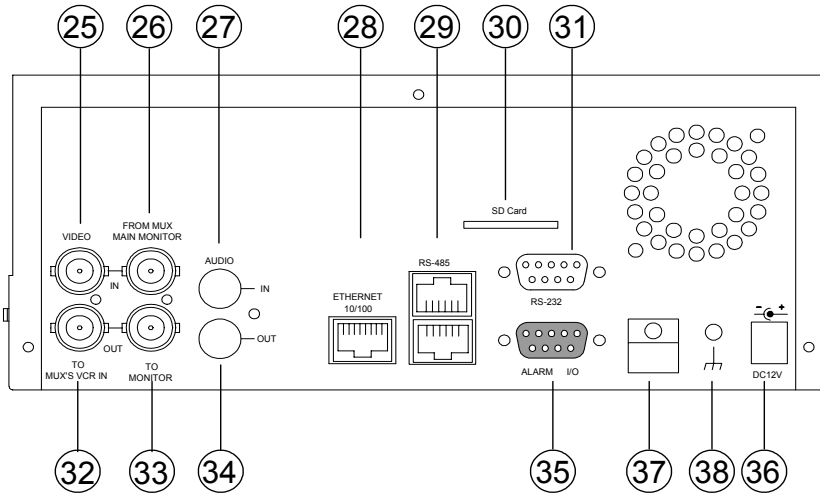
(25) **VIDEO IN** Connector**:** This BNC connector is used to connect the video output from a camera or a MUX to the DVR.

(26) **FROM MUX MAIN MONITOR** Connector**:** This BNC connector is used to connect the live video output from a MUX to the DVR.

(27) **AUDIO IN** Connector**:** This connector is used to connect the audio output from a camera, a MUX or other devices to the DVR.

(28) **ETHERNET 10/100** Connector**:** This is a standard RJ-45 connector for 10/100 Mbps Ethernet networks.

(29) **RS-485** Port**:** The RS-485 communication ports function as connectors when two or more units are serially connected to an external control device.

(30) **SD CARD** Slot**:** This is used for system software updating and archiving/accessing critical images.

(31) **RS-232** Port**:** The RS-232 communication port functions as a connector to an external control device. Please refer to **6.1 RS-232 & RS-485 Protocol** for more details.

(32) **VIDEO OUT** Connector**:** The connector provides the unit's composite video signals to a MUX.

(33) **MONITOR** Connector**:** The connector provides the unit's composite video or a MUX's live signal if connected to a display device.

(34) **AUDIO OUT:** This provides the unit's audio signal to a speaker.

(35) **ALARM I/O:** This is a 9-PIN D-SUB connector including **SWITCH OUT, GROUND, ALARM OUT, DISK FULL, RECORD IN, ALARM RESET,** and **ALARM IN** points for connecting with external devices. Please refer to the next section for details.

(36) **Plug Inlet:** The inlet connects to an external power supply. Connect the 12 V DC UL-listed Class 2 Power Supply.

(37) **Wire Catch:** The wire catch secures the power cord and keeps it in place (so that it does not droop or hang loosely).

(38) **Ground Screw's:** The ground screw is for a chassis terminal.

1.4 ALARM In / Out

DISK FULL
ALARM RESET
RECORD IN
ALARM OUT
GROUND

5 4 3 2 1

9 8 7 6

ALARM IN
NO CONNECTION
SWITCH OUT
NO CONNECTION
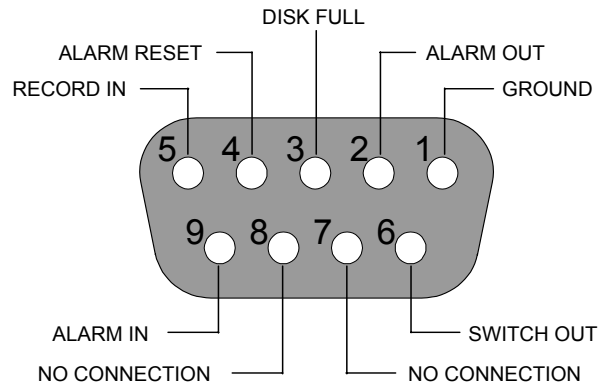
The above figure is a rear view.

1. **GND:** Ground Contact.

2. **ALARM OUT (OUTPUT):** This is an alarm-output trigger. Connect this to external devices such as buzzers or lights.

```
        - - - - - - - -  5V
        - - - - - - - -  0V(Active)
```
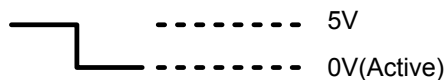
3. **DISK FULL (OUTPUT):** This is a disk-full output trigger. Connect this to external devices such as buzzers or lights.

```
        - - - - - - - -  5V
        - - - - - - - -  0V(Active)
```

4. **ALARM RESET (INPUT):** This pin connects to an alarm-clear device for clearing an alarm.

```
        - - - - - - - -  5V
        - - - - - - - -  0V(Active)
```

5. **RECORD IN (INPUT):** This pin connects to a record-triggering device for starting a record.

```
        - - - - - - - -  5V
        - - - - - - - -  0V(Active)
```

6. **SWITCH OUT (OUTPUT):** This pin, sending out timing signals (falling / negative) to a multiplexer, connects to a multiplexer's trigger terminal so the multiplexer can switch to using the same recording speed as the DVR.

7. **NO CONNECTION**

8. **NO CONNECTION**

9. **ALARM IN (INPUT):** This is an alarm input, which can be programmed in the menu system to Normally Open or Normally Closed.

```
        - - - - - - - -  5V
        - - - - - - - -  0V(Active)
```

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2. INSTALLATION

2. INSTALLATION
2.1 Basic Connection
A. Connecting with a **Single Camera**

Please set the **MULTIPLEXER** option to **OFF** on the **REC SETTING page** in the setup menu when it is connected with a single camera. (Please refer to section **4.1** MULTIPLEXER.)
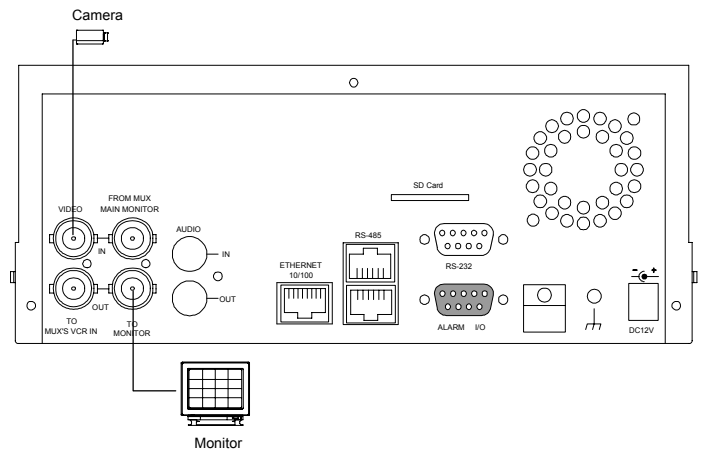
B. Connecting with a **Multiplexer**

To match the multiplexer's recording speed, please set the **MULTIPLEXER** option to **ON** on the **REC SETTING page** in the setup menu when it is connected with a multiplexer. (Please refer to section **4.1** MULTIPLEXER.)
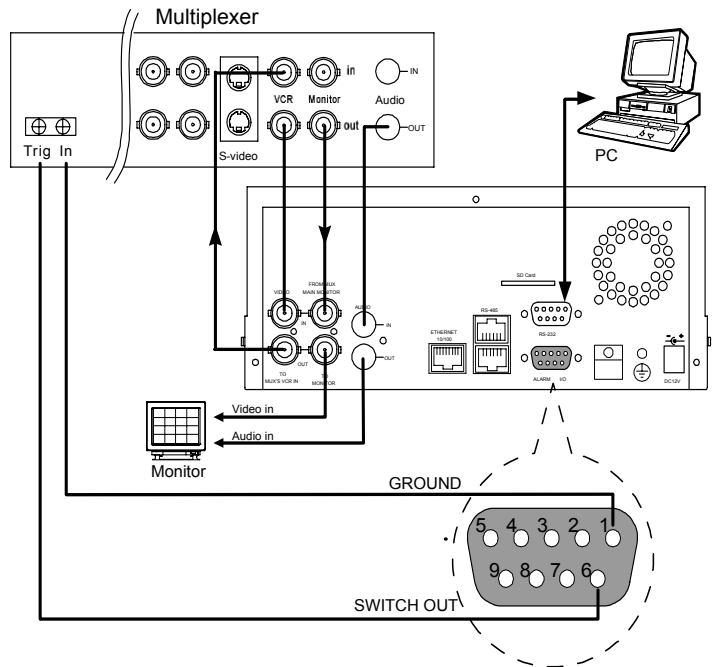
C. Connecting with a **Quad**

Please set the **MULTIPLEXER** option to **OFF** on the **REC SETTING page** in the setup menu when it is connected with a quad. (Please refer to section **4.1** MULTIPLEXER.)
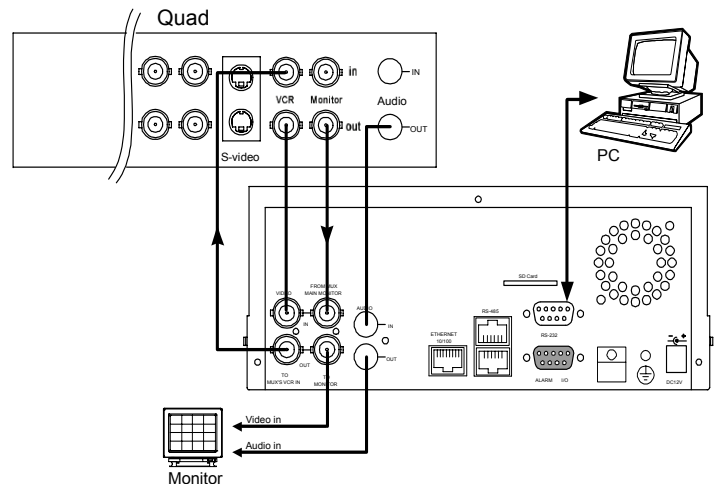
INSTALLATION (continued)

D. Attaching an External Device to DVR

Connect an alarm out, alarm input, and a peripheral device as shown in the diagram below.
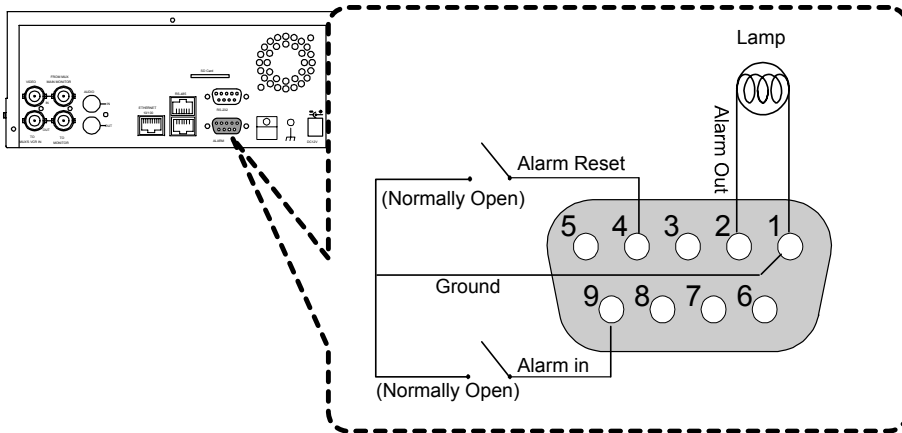
2.2 Hard-disk Drive Installation

The DVR is equipped with two compartments of hard disk drive **(for removable model only),** The unit usually comes with one hard-disk drive installed in the compartment HD1, which is default- configured as a master. If you need a second hard-disk drive to be installed in the compartment HD2 (Mobile), please contact your distributors or installers for specific instructions on how to install it. Please don't serve yourself before consulting your installers. If there is only one hard-disk drive in the mobile compartment, please set the **HD2 USAGE** option to **REC** (please refer to section **4.5**) before proceeding with the recording function. The jumper-settings arrangement of installed hard-disk drives for the system (Table 3.2 A.) is shown in the tables below.

Note: The **CD-RW model** is equipped with a fixed hard- disk and a CD-RW drive. The unit usually comes with one hard-disk drive installed in the compartment HD1, which is default-configured as a master.

Table 3.2 A. The jumper settings of hard-disk drives in the system

	Location	Jumper
IDE 1	Compartment HD 1	Master (Default)
IDE 2	Compartment HD 2	Master

Table 3.2 B. Compatible hard-disk drives

Manufacturer	Model	Capacity	Rotation
Western Digital	WD800AB	80GB	5400 RPM
	WD1200AB	120GB	5400 RPM
	WD800BB	80GB	7200 RPM
	WD1200BB	120GB	7200 RPM
	WD1800BB	180GB	7200 RPM
	WD2000BB	200GB	7200 RPM
	WD2500JB	250GB	7200 RPM
Seagate	ST380020A/P	80GB	5400 RPM
	ST340810A/P	40GB	5400 RPM
	ST320014A	20GB	5400 RPM
	ST340015A	40GB	5400 RPM
	ST380012ACE	80GB	5400 RPM
	ST3120025ACE	120GB	5400 RPM
Maxtor	4A160J0-1A	160GB	5400 RPM
	4R080L0-1	80GB	5400 RPM
	6Y120L0-1	120GB	7200 RPM
	6Y200P0-1A	200GB	7200 RPM
	6Y250P0-1A	250GB	7200 RPM
	6B300R0	300GB	7200 RPM
Samsung	SV0802N	80GB	5400 RPM
	SV1203N	120GB	5400 RPM

NOTE: Hard-disk drives not shown on this list have not been tested by the engineering team and are not recommended for use with this product. For the latest updated list on the recommended hard-disk drives, please contact your dealers or distributors.
NOTE: Use of only lead-free HDDs suggested.

2.3 System Information

You can display system settings information as shown on **Table 3.3 A** below at any time by pressing the **Display** button ⑧ . In the playback mode, the recorded video information is displayed. In the live or recording mode, the Manual Recording information is displayed. However, when the DVR is displaying a decoded image from a multiplexer, you must first switch the unit to encoded image displaying (the pictures is switching swiftly and the light of the **Monitor** button ⑯ is off) by pressing the **Monitor** button ⑯ . Each sequential press of the **Display** button ⑧ displays a different message detailed in the following example. By default, the unit displays the time, date, and an indicating bar of capacity status on a monitor as shown.

Default Display

(Capacity Used) (Capacity Remaining)

09- 05-2003   16:13:02
(Date)   (Time)

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Press the **Display** button ⑧ once; the DVR will display the following sample message plus the default display. Press the **Display** button ⑧ again; the unit will not display any OSD message. Press the button one more time to go back to the default display.

```
1+2 :59G      12.4 HR      🖼 📶
QUALITY : BEST      NTSC
RATE :6HR          20 F/S
MUX :ON            9K

 HD   SIZE   REC    PLAY
📇1   20G   10.0%   0.1%
  2    39G    0.0%   0.0% (For removable HDD model only)
 CD   133M   80.0% (For CD-RW model only)

 IP : 192.168.1.90      ▐███████    ▌

                  14-04-2005  09:46:53
```
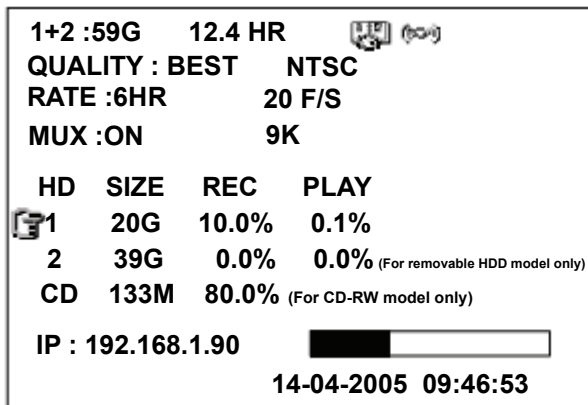
Total capacity of installed hard disk, 59 GB.

(12.4 HR): Total 12.4 hour recording time available.

(🖼)**:** Timer record activated.

(📶)**:** Alarm record activated.

(🏃)**:** motion detection activated.

(QUALITY: BEST): Record quality setting, BEST.

(NTSC): NTSC system.

(RATE: 6 HR): Setting of Record time mode, 6 hours.

(20 F/S): Record speed setting, 20 fields/sec.

(MUX: OFF): Only connected to a single camera.

(🔊)**:** Audio function activated.

(📇)**:** Indicates which HDD is activated.

(9K): The image file size.

(HD): Hard-disk compartment.**(HD2 IS FOR REMOVABLE MODEL ONLY)**

(CD):CD-RW Compartment. **(FOR CD-RW MODEL ONLY)**

(SIZE 20G): The capacity of the installed hard disk.

(REC): Percentage of system Recording.

(PLAY): Percentage of system Playback.

(IP : 192 . 168 . 1 . 90): Network IP Address 192.168.1.90

(◈)**:** External signal.

(📇X)**:** Cannot operate now.

2.4 Updating System Software
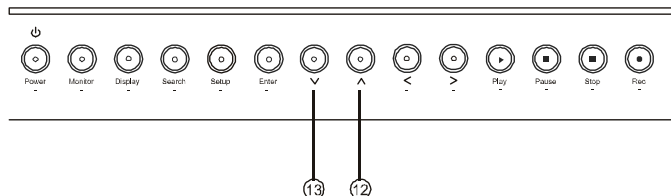
Please take the following steps to safely update it.

1. Turn off the DVR.

2. Insert the SD card into the built-in SD slot of the unit.

3. Hold down the **Up** ⑫ and **Down** ⑬ buttons simultaneously, and then turn on the unit.

4. Keep holding down the buttons until the DVR sounds a tone and display the message " **XXXXXX BYTES READ**" Now the DVR is updating the system software, which will take approximately 90 seconds to process.

5. Restart the unit when the device sounds a tone twice and displays the message "**PLEASE RESTART**". The process is complete.
   (If you have already followed procedure 1~5 and the unit is still unable to switch on, please first check if the SD card you are using is functioning and the file is intact. And then start procedures 1 ~ 5 all over again.)

6. Verify the version of the system software. (Please refer to section **4.6 VERSION.**)

⚠️**Caution:**

 1. Before carrying out the updating procedures, please ensure the SD card is working and the file of system software is intact.

 2. Don't interrupt the process while the unit is updating itself, as this will cause the unit to crash.

3. OPERATIONS

3. OPERATIONS

This section shows you how to operate and manage the DVR when it gets in the way.

3.1 Configuring Recording Settings

Recording time will vary depending on the image size, recording rate, and the capacity of the hard-disk drives. Generally, the DVR comes with a built-in hard-disk drive for continuous recording from one to four weeks under most recording conditions. The table below shows the possible recording times based on a 20GB hard-disk drive at certain refresh rates and the corresponding image quality. With one or more hard-disk drives in operation, please calculate the recording time using the table below in accordance with your requirement. For an NTSC unit, for example, if the unit is set to record images with **BEST** quality at a **60 fps** record rate, normally a 20GB hard-disk drive will be filled in 3.7 hours (see the gray area in the table). If the total capacity of 80GB hard-disk drives is in use under the same refresh rate and picture quality, it will be filled in 14.8 hours (4 times the rate of a 20GB hard-disk drive).

Note: Set up the REC Time Mode when a multiplexer is connected.

If a multiplexer is connected, for optimum image recording and playback, the record speed of the multiplexer must be correctly adjusted to match the DVR and set the **MULTIPLEXER** option on the setup menu to **ON**. This can be done by either of the two methods detailed below.

(1) If a multiplexer is connected for use, you can program the REC time mode of the multiplexer by referring to the table below (each refresh rate refers to one REC time mode).

(2) For a multiplexer other than APPRO, please connect the SW. OUT terminal in the 9-PIN D-SUB connector on the rear panel of the DVR to the multiplexer's trigger contact. The DVR will provide the timing signal (Negative/Falling) to the multiplexer. Thus, if the DVR changes the recording speed, the multiplexer will automatically adjust the record to match. A 2-hour and 4-hour timing signal in NTSC or a 3-hour and 6-hour one in PAL is constantly negative / falling.

NTSC (MUX ON)												
Audio ON (11KHz)		Possible Recording Time HDD=20GB (hour)										
Image Quality	BEST	3.5	4.4	6.6	11.0	23.6	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	HIGH	3.5	5.5	8.3	13.7	29.2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	STANDARD	3.7	7.4	11.0	18.1	38.2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	BASIC	5.5	11.0	16.4	26.7	55.3	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Refresh Rate (Field/Sec)		60	30	20	12	5.5	2.4	1.22	0.71	1/4	1/6	1/8
REC Time Mode		2 hr	4 hr	6 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

NTSC (MUX ON)												
Audio OFF		Possible Recording Time HDD=20GB (hour)										
Image Quality	BEST	3.6	4.5	6.7	11.3	24.8	56.5	110.7	192.1	544.7	816.0	1087.3
	HIGH	3.6	5.6	8.4	14.1	31.0	70.6	138.4	240.1	680.9	1020.0	1359.1
	STANDARD	3.7	7.5	11.3	18.8	41.1	94.1	184.6	320.2	907.9	1360.0	1812.2
	BASIC	5.6	11.3	16.9	28.2	62.1	141.2	276.9	480.3	1361.9	2040.1	2718.3
Refresh Rate (Field/Sec)		60	30	20	12	5.5	2.4	1.22	0.71	1/4	1/6	1/8
REC Time Mode		2 hr	4 hr	6 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

NTSC (MUX OFF)												
Audio ON (11KHz)		Possible Recording Time HDD=20GB (hour)										
Image Quality	BEST	3.5	4.4	8.8	13.2	25.7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	HIGH	3.5	5.5	11.0	16.4	31.7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	STANDARD	3.7	7.4	14.6	21.6	41.4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	BASIC	5.5	11.0	21.6	31.7	59.7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Refresh Rate (Field/Sec)		60	30	**20	**12	**5.5	2.4	1.22	0.71	1/4	1/6	1/8
REC Time Mode		2 hr	4 hr	6 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

NTSC (MUX OFF)												
Audio OFF		Possible Recording Time HDD=20GB (hour)										
Image Quality	BEST	3.6	4.5	9.0	13.5	27.1	58.7	113.0	194.4	547.0	818.3	1089.5
	HIGH	3.6	5.6	11.3	16.9	33.9	73.4	141.2	243.0	683.8	1022.8	1361.9
	STANDARD	3.7	7.5	15.0	22.6	45.2	97.9	188.3	324.0	911.7	1363.8	1815.9
	BASIC	5.6	11.3	22.6	33.9	67.8	146.9	282.5	486.0	1367.6	2045.7	2723.9
Refresh Rate (Field/Sec)		60	30	**20	**12	**5.5	2.4	1.22	0.71	1/4	1/6	1/8
REC Time Mode		2 hr	4 hr	6 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

PAL (MUX ON)												
Audio ON(11KHz)		Possible Recording Time HDD=20GB (hour)										
Image Quality	BEST	3.5	5.3	8.0	13.2	23.2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	HIGH	3.5	6.6	9.9	16.4	28.7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	STANDARD	4.4	8.8	13.2	21.6	37.6	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	BASIC	6.6	13.2	19.5	31.7	54.4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Refresh Rate (Field/Sec)		50	25	17	10	5.5	2.9	1.52	0.88	1/4	1/6	1/8
REC Time Mode		3 hr	6 hr	9 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

PAL (MUX ON)												
Audio OFF			Possible Recording Time HDD=20GB (hour)									
Image Quality	BEST	3.6	5.4	8.1	13.5	24.4	46.1	89.5	154.6	545.2	816.5	1087.7
	HIGH	3.6	6.7	10.1	16.9	30.5	57.6	111.8	193.2	681.5	1020.6	1359.7
	STANDARD	4.5	9.0	13.5	22.6	40.6	76.8	149.1	257.7	908.7	1360.8	1812.9
	BASIC	6.7	13.5	20.3	33.9	61.0	115.2	223.7	386.5	1363.1	2041.2	2719.4
Refresh Rate (Field/Sec)		50	25	17	10	5.5	2.9	1.52	0.88	1/4	1/6	1/8
REC Time Mode		3 hr	6 hr	9 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

PAL (MUX OFF)												
Audio ON(11KHz)			Possible Recording Time HDD=20GB (hour)									
Image Quality	BEST	3.5	5.3	10.6	15.7	25.7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	HIGH	3.5	6.6	13.2	19.5	31.7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	STANDARD	4.4	8.8	17.4	25.7	41.4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	BASIC	6.7	13.5	27.1	40.6	67.8	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Refresh Rate (Field/Sec)		50	25	**17	**10	**5.5	2.9	1.52	0.88	1/4	1/6	1/8
REC Time Mode		3 hr	6 hr	9 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

PAL (MUX OFF)												
Audio OFF			Possible Recording Time HDD=20GB (hour)									
Image Quality	BEST	3.6	5.4	10.8	16.2	27.1	48.8	92.2	157.3	547.9	819.2	1090.4
	HIGH	3.6	6.7	13.5	20.3	33.9	61.0	115.2	196.6	684.9	1024.0	1363.1
	STANDARD	4.5	9.0	18.0	27.1	45.2	81.3	153.7	263.2	913.2	1365.3	1817.4
	BASIC	6.7	13.5	27.1	40.6	67.8	122.0	230.5	393.3	1369.8	2048.0	2726.2
Refresh Rate (Field/Sec)		50	25	**17	**10	**5.5	2.9	1.52	0.88	1/4	1/6	1/8
REC Time Mode		3 hr	6 hr	9 hr	12 hr	24 hr	48 hr	96 hr	168 hr	480 hr	720 hr	960 hr

NOTE: Recording times on the tables above are estimated. For actual available recording time of a recording configuration, please refer to the system information of the DVR. (Please refer to section 2.3 system information for more details.)

NOTE: There is no audio function at the refresh rate in NTSC: 2.4 fields/sec ~ 1 fields/ 8 sec. There is no audio function at the refresh rate in PAL: 2.9 fields/sec ~ 1 fields / 8 sec.

NOTE: An actual recording field number could be less than the Refresh Rate on the table above.

** : In the NTSC and Mux Off mode, a recording rate of 20F/S would be actually 15 F/S, 12F/S would be 10 F/S and 5.5 F/S would be 5F/S.

** : In the PAL and Mux Off mode, a recording of rate 17F/S would be actually 12.5 F/S, 10F/S would be 8.3 F/S and 5.5 F/S would be actually 5F/S.

(This adjustment is to avoid image shaking during playback at the same speed.)

3.2 Recording Operations

This section details the way to record video into hard-disk drives. Before commencing with the recording function, please configure the recording setting properly according to your needs.
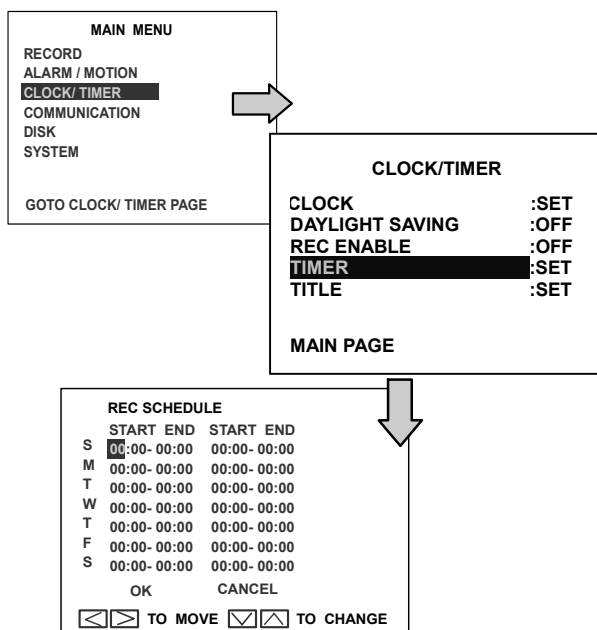
3.2.1 Manual Recording

Take the following steps to start and stop recording:

(1) Press the **REC** button ⑥ to record video into a hard-disk drive with the corresponding programmed recording settings. The **REC** button ⑥ will light up indicating the DVR is in the recording status.

(2) Press the **REC** button ⑥ for 3 seconds to stop recording any time.

(3) To access just recorded video, please refer to section 3.4 for more details.
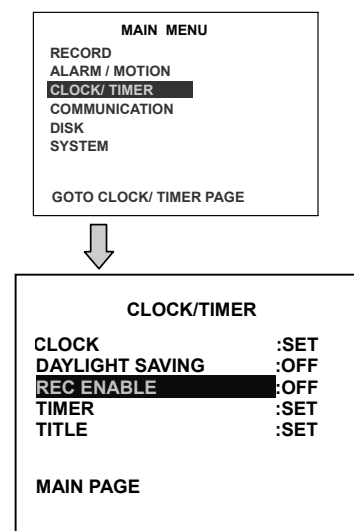
3.2.2 Timer Recording

Timer recording provides 2 periods of time each day in a weekly table which programs the DVR to turn on and off at specified times. This way the DVR will start/ stop recording according to the programmed schedule.

```
            MAIN  MENU
    RECORD
    ALARM / MOTION
    CLOCK/ TIMER
    COMMUNICATION
    DISK
    SYSTEM

    GOTO CLOCK/ TIMER PAGE
```

```
            CLOCK/TIMER

    CLOCK                    :SET
    DAYLIGHT SAVING          :OFF
    REC ENABLE               :OFF
    TIMER                    :SET
    TITLE                    :SET

    MAIN PAGE
```

```
    REC SCHEDULE
       START END   START END
    S  00:00- 00:00   00:00- 00:00
    M  00:00- 00:00   00:00- 00:00
    T  00:00- 00:00   00:00- 00:00
    W  00:00- 00:00   00:00- 00:00
    T  00:00- 00:00   00:00- 00:00
    F  00:00- 00:00   00:00- 00:00
    S  00:00- 00:00   00:00- 00:00

         OK         CANCEL
    ◁ ▷  TO MOVE  ▽ △  TO CHANGE
```

(1) Press the **Setup** button ⑨ to enter the **MAIN MENU**.

(2) Select the **CLOCK / TIMER** and press the **Enter** button ⑮ to enter the **CLOCK / TIMER** page**.**

(3) Select the **TIMER－SET**.

(4) Press the **Enter** button ⑮ to enter the **REC SCHEDULE** table.

(5) You can set up by using the "<" button ⑪ and the ">" button ⑭ to locate the specific day/hour/minute and use the "∧" button ⑫ and the "v" button ⑬ to set the day/hour/minute you wish.

You can also set up by using the **Shuttle Ring** and the **Jog Dial**. ◎ is the equal of the "<" button ⑪, ◎ is the equal of the ">" button ⑭, ○ is the equal of the "∧" button ⑫ and ○ is the equal of the "v" button ⑬.

The time is displayed in a 24-hour clock format.

(6) After scheduling is completed, press the **Enter** button ⑮ and set **OK** to save the setting or select **CANCEL** to leave the page without saving.

(7) To activate/ deactivate the programmed recording schedule, set the **REC ENABLE** to **ON/ OFF**. If the scheduled recording is on, the red indicator of the Timer Record ⑰ will be on as well.

```
            MAIN  MENU
    RECORD
    ALARM / MOTION
    CLOCK/ TIMER
    COMMUNICATION
    DISK
    SYSTEM

    GOTO CLOCK/ TIMER PAGE
```

```
            CLOCK/TIMER

    CLOCK                    :SET
    DAYLIGHT SAVING          :OFF
    REC ENABLE               :OFF
    TIMER                    :SET
    TITLE                    :SET

    MAIN PAGE
```
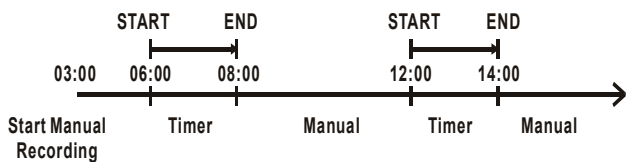
(8) Press the **REC** button ⑥ for 3 seconds

during the scheduled recording to stop it any time. If you wish to continue the scheduled recording, press the **REC** button ⑥ to proceed.

Note : You can proceed to start the scheduled recording from the current time if it is in the scheduled interlude as soon as setting is completed, and come out from the menu to start recording.
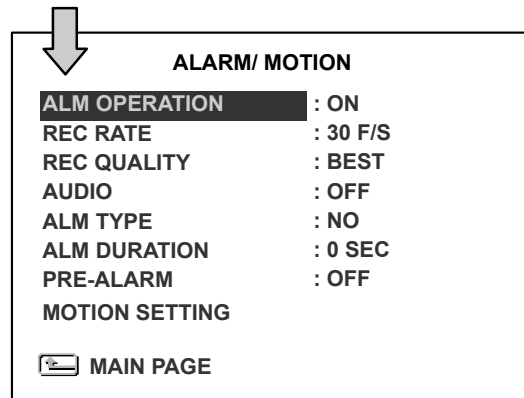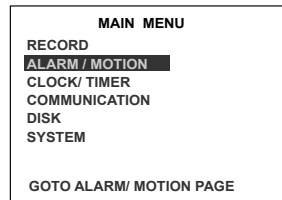
Note : If you activate the recording function before the scheduled recording, the unit will operate recording as shown in the diagram below and keep those Images in different files.

```
              START     END              START     END
               ┌─────────┐              ┌─────────┐
     03:00    06:00    08:00           12:00    14:00
───────┬───────┬────────┬───────────────┬────────┬──────────→
 Start Manual      Timer       Manual       Timer      Manual
 Recording
```
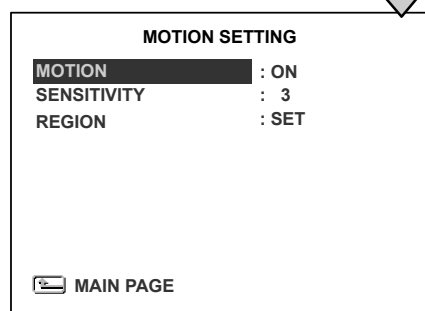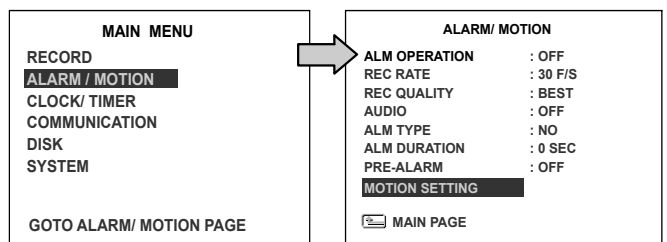
3.2.3 Alarm / Motion Recording

Take the following steps to activate the programmed alarm recording. For the **ALM OPERATION**, **REC RATE**, **REC QUALITY**, **AUDIO**, **ALM TYPE**, **ALM DURATION**, and **PRE-ALARM** settings, please refer to section **4.2** for more details.

(1) Press the **Setup** button ⑨ to enter the **MAIN MENU**.

(2) Select **ALARM / MOTION** and press the **Enter** button ⑮ to enter the **ALARM / MOTION**.

(3) Set the desired **REC RATE, REC QUALITY, ALM TYPE,** and **ALM DURATION** for use. If audio is required, set **AUDIO** to **ON**. If pre-alarm recording is required, set **PRE-ALARM** to **ON**.

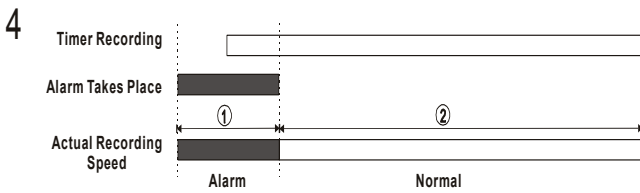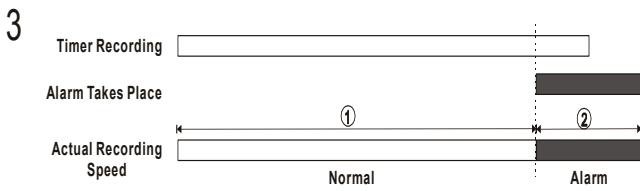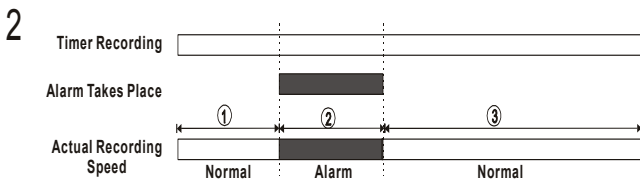(4) To activate/deactivate the alarm recording, set **ALM OPERATION** to **ON/ OFF**.

```
          MAIN  MENU
RECORD
ALARM / MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM

GOTO ALARM/ MOTION PAGE
```

```
             ALARM/ MOTION

ALM OPERATION        : ON
REC RATE             : 30 F/S
REC QUALITY          : BEST
AUDIO                : OFF
ALM TYPE             : NO
ALM DURATION         : 0 SEC
PRE-ALARM            : OFF
MOTION SETTING

    MAIN PAGE
```

(5) To active the motion alarm recording, select **MOTION SETTING** and press the **Enter** button ⑮ to enter the **MOTION SETTING** PAGE, set **MOTION ENABLE** TO **ON,** and set a suitable **SENSITIVITY** and **REGION** according to the video sources.

```
       MAIN  MENU                    ALARM/ MOTION
RECORD                      ALM OPERATION    : OFF
ALARM / MOTION              REC RATE         : 30 F/S
CLOCK/ TIMER                REC QUALITY      : BEST
COMMUNICATION               AUDIO            : OFF
DISK                        ALM TYPE         : NO
SYSTEM                      ALM DURATION     : 0 SEC
                            PRE-ALARM        : OFF
GOTO ALARM/ MOTION PAGE     MOTION SETTING

                               MAIN PAGE
```

```
          MOTION SETTING

MOTION              : ON
SENSITIVITY         :  3
REGION              : SET




    MAIN PAGE
```

3.2.4 Externally Triggered Recording

By connecting/ disconnecting **RECORD IN** of ALARM I/O on the rear panel of the DVR, you can activate/deactivate the recording function of a DVR. The file will be kept with a prefixed **"R"**.

NOTE: The status of recording operations when an alarm takes place is shown in the diagrams below.

1

Manual or Externally Triggered Recording

Alarm Takes Place

① ② ③

Actual Recording Speed

Normal   Alarm   Normal

2

Timer Recording

Alarm Takes Place

① ② ③

Actual Recording Speed

Normal   Alarm   Normal

3

Timer Recording

Alarm Takes Place

① ②

Actual Recording Speed

Normal   Alarm

4

Timer Recording

Alarm Takes Place

① ②

Actual Recording Speed

Alarm   Normal
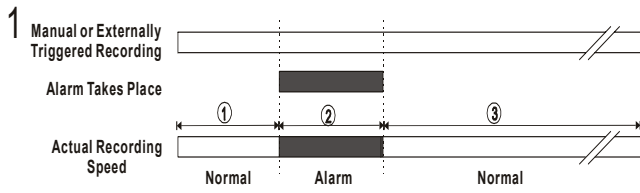
3.3 Playback Operations

This section shows you how to operate the fast, slow, and single-picture playback functions, and details how the unit is to playback a file in a different operation status. Please refer to the following paragraphs specifying the relevant details. When playing a file, the monitor should display a flashing **PLAY** message and the **PLAY** button ④ will light up indicating that the DVR is in the playback status.

3.3.1 Normal Playback

Once the user presses the PLAY button, the DVR will start playing back the recorded data at the recorded speed. The starting position varies according to different operation sequences.

A. Play back from the latest playback STOP position.

   [PLAY] - [STOP] - [PLAY]

B. Play back from the latest recorded video.

   [REC] – [PLAY] or

   [REC] – [REC Stop] – [PLAY]

C. Play back from a video clip in Search List.

   [Search] – [PLAY]

D. Play back from the start of hard disk recorded data.

   [STOP – press the key for 3 sec.] – PLAY

Once playback reaches the end of an HDD's recorded data, the DVR will show a message signaling the recording's end (use the **SEARCH** functions or rewind to replay the file if required) **.**

3.3.2 Fast Forward/Backward

There are **7** speeds available for playback: 1x, 2x, 4x, 8x, 16x, 30x and 100x.

While playing back recorded video at the recorded speed:

Forward: Turn the **Shuttle** dial ⑳ to the right to view the recorded video in the forward direction at a speed faster than the recorded speed. Each subsequent turn of the shuttle to the right increases the forward rate, as 2x, 4x, 8x, 16x, 30x and 100x.

Backward: Turn the **Shuttle** dial ⑳ to the left to view the recorded video in the reverse direction at a speed faster than the recorded speed. Each subsequent turn of the shuttle to the left increases the reverse rate, as -1x, -2x, -4x, -8x, -16x, -30x and -100x.

Normal: Release the **Shuttle** dial ⑳ to return to the normal speed of playback.

NOTE: While Normal playing a recorded video from a multiplexer at 60 F/S~30F/S (50F/S~25F/S for PAL), the playback speed is half the recorded speed.

NOTE: The playback speed will be displayed on the screen. However, when playing a recorded video from a multiplexer, the playback speed will only display in encoding (multiplexing) the mode. Press the Monitor button ⑯ to switch between decoding and encoding modes.

3.3.3 Slow Forward/Reverse

There are **4** speeds available for a slow playback: 1/2, 1/4, 1/8, 1/16.
While playing back recorded video at the recorded speed:

(1) Press the **PAUSE** button ③ for the slow playback mode.

(2) **Forward:** Turn the **Shuttle** dial ⑳ to the right to view the recorded video in the forward direction at a speed slower than the recorded speed. Each subsequent turn of the shuttle to the right increases the forward rate, as 1/2, 1/4, 1/8, and 1/16.

(3) **Reverse:** Turn the **Shuttle** dial ⑳ to the left to view the recorded video in the reverse direction at a speed slower than the recorded speed. Each subsequent turn of the shuttle to the left increases the reverse rate, as -1/2, -1/4, -1/8, and -1/16.

(4) **Normal:** Release the **Shuttle** dial ⑳ and then press the **PLAY** button ④ to return to the normal speed of playback.

3.3.4 Play back Picture-by-picture

While playing back recorded video at the recorded speed:

(1) Press the **PAUSE** button ③ for the picture-by-picture mode.

(2) There are two ways, by **PAUSE** button or by **JOG**, available to play in the picture-by-picture mode, but the **PAUSE** button ③ can only function in a forward direction; the other, **JOG** dial ㉑, can act in both a forward and a backward direction, as well as picture-by-picture.

A. By **PAUSE** button ③**:**
Press the **PAUSE** button ③ to display one frame/field of a picture at a time in the forward direction. **(When playing back video recorded by a multiplexer, each sequential press of the PAUSE button ③ will display each camera in sequence.)**

B. By **JOG** dial ㉑ **:**
Turn the **JOG** dial ㉑ clockwise to display one frame/field of a picture at a time in the forward direction. Turn the **JOG** dial ㉑ counterclockwise to display one frame/field of a picture at a time in the backward direction.

(3) Press the **PLAY** button ④ to return to the normal speed of playback.

3.3.5 Playback Recorded Video from an HDD of the mobile rack (for removable HDD model only)

To play back a recorded video from an HD2, take the following steps:

(1) Press the **Search** button ⑩ to enter the search mode.

(2) Press the "**^**" ⑫ and ⑬ "**v**" buttons to select a video; press the ⑪ "**<**" and ⑭ "**>**" buttons to flip over a page.

(3) Use the search function to access desired recorded video. For specific operation details please refer to the next section **3.4** (Search Operations).

3.3.6 Picture in Picture (PinP) Display Mode

While playing back recorded video, the display mode can be switched to **2** different PinP mode by pressing the **DISPLAY**

button ⑧ . This function is available only when the **MUX** option has been set to **OFF**.

Playback

Live
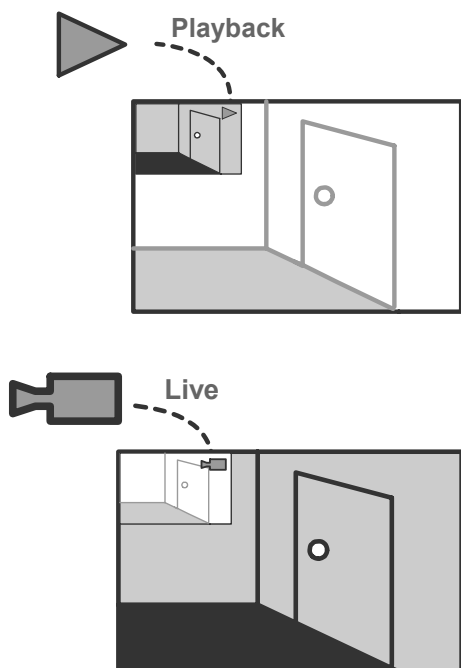
When the DVR is under PinP display mode, please use the "<", ">", "v", "^" ⑪ ~⑭ buttons to move the position of the small windows as your desire.
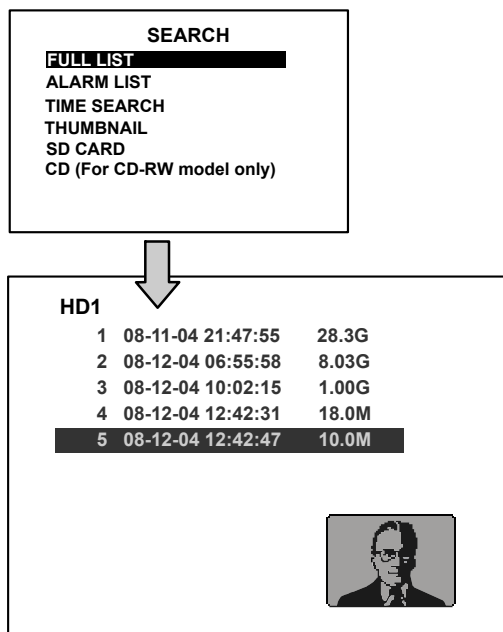
3.4 Search Operations

This section shows you how to access recorded video.

3.4.1 FULL LIST Search

Take the following steps to proceed with the full-list search function.

(1) Press the **Search** button ⑩ to enter the search mode.

(2) Select the **FULL LIST** and press the **Enter** button ⑮ to access the complete list of recorded video.

(3) Highlight the specific recorded video you require and press the **Enter** button ⑮ to display the selected video.

(Key Operation: Press the "^" ⑫ and "v" ⑬ buttons to select a video; press the ⑪ "<" and ⑭ ">" buttons to flip over a page.)

NOTE: T: Timer recording; R: External trigger recording; A: Alarm recording.
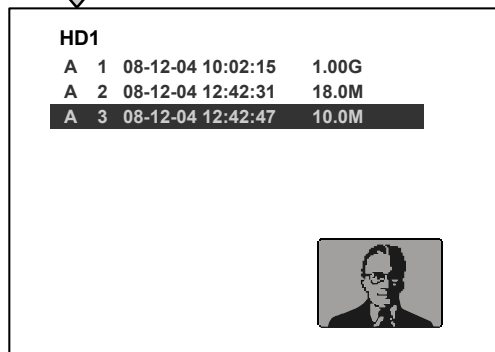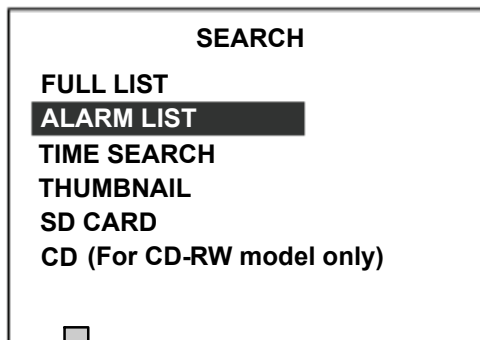
NOTE: The maximum number of index in the list, for a respective HDD, is 3000.

3.4.2 ALARM LIST Search

Take the following steps to proceed with the alarm-list search function.

(1) Press the **Search** button ⑩ to enter the search mode.

(2) Select the **ALARM LIST** and press the **Enter** button ⑮ to access the complete list of alarm-event recorded video.

(3) Highlight the specific recorded video you require and press the **Enter** button ⑮ to display the selected video.
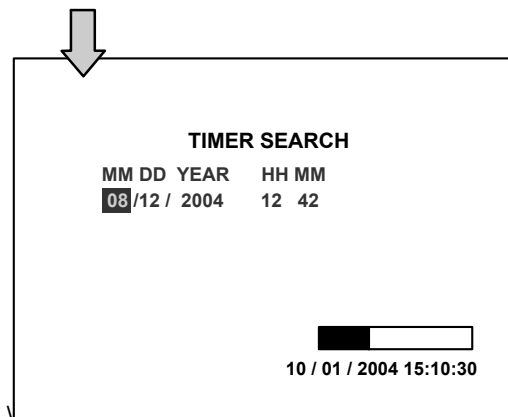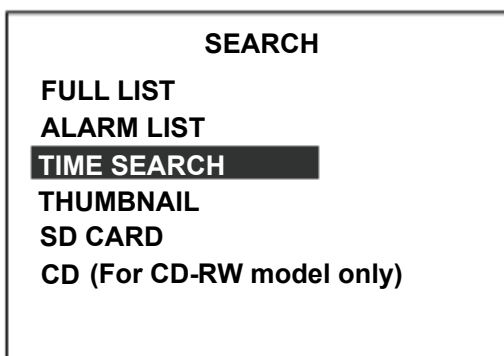
(Key Operation: Press the "^" ⑫ and "v" ⑬ buttons to select a video; press the ⑪ "<" and ⑭ ">" buttons to flip over a page.)

SEARCH

FULL LIST
ALARM LIST
TIME SEARCH
THUMBNAIL
SD CARD
CD (For CD-RW model only)

HD1

A	1	08-12-04 10:02:15	1.00G
A	2	08-12-04 12:42:31	18.0M
A	3	08-12-04 12:42:47	10.0M

3.4.3 TIME Search

Take the following steps to proceed with the time-list search function.

(1) Press the **Search** button ⑩ to enter the search mode.

(2) Select the **TIME SEARCH** and press the **Enter** button ⑮ to access the time-setting page.

(3) Set the time period you wish to search for the recorded video.

(4) Press the **Enter** button ⑮ to start searching and displaying the concerned image.

(5) If no video is found, please return to the time-setting page and repeat steps (3) and (4) again for another search.
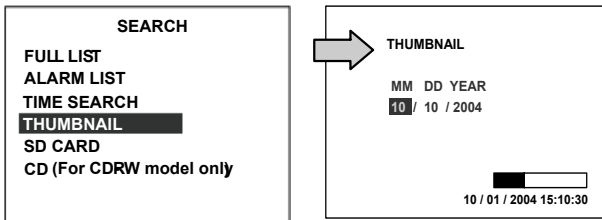
SEARCH

FULL LIST
ALARM LIST
TIME SEARCH
THUMBNAIL
SD CARD
CD (For CD-RW model only)

TIMER SEARCH

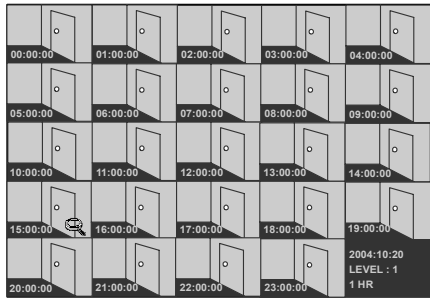| MM	DD	YEAR	HH	MM
08	/12 /	2004	12	42

10 / 01 / 2004 15:10:30

3.4.4 THUMBNAIL Search

Take the following steps to proceed with the thumbnail search function.

(1) Press the **Search** button ⑩ to enter the search mode.

(2) Select the **THUMBNAIL** and press the **Enter** button ⑮ to access the thumbnail page.

(3) Set the date you wish to search for the recorded video.

(4) Press the **Enter** button ⑮ to start searching and displaying the concerned image.

- You can set up by using the "<" ⑪ ">" ⑭ "^" ⑫ "v" ⑬ buttons to move focus.

- You can also set up by using the **Shuttle Ring** and the **Jog Dial** to move eye focus. ⟳ is the equal of the "<" button ⑪, ⟲ is the equal of the ">" button ⑭, ⟳ is the equal of the "^" button ⑫ and ⟳ is the equal of the "v" button ⑬.

(5) There are **5** levels of recording range modes to choose from: **1 Hour, 10 Minutes, 1 Minute, 10 Seconds** and **1 Second.** Select the specific field you require and press the **Enter** button⑮ to enter the next level. If you want to return to the previous level, please press the **Setup** button ⑨.

(6) On reaching the critical point at any level, the user can start playback by just clicking the **PLAY** button ④.

SEARCH

FULL LIST
ALARM LIST
TIME SEARCH
THUMBNAIL
SD CARD
CD (For CDRW model only

THUMBNAIL

MM DD YEAR
10 / 10 / 2004

10 / 01 / 2004 15:10:30

LEVEL **1** : Interval = 1 Hour

00:00:00 01:00:00 02:00:00 03:00:00 04:00:00
05:00:00 06:00:00 07:00:00 08:00:00 09:00:00
10:00:00 11:00:00 12:00:00 13:00:00 14:00:00
15:00:00 16:00:00 17:00:00 18:00:00 19:00:00
20:00:00 21:00:00 22:00:00 23:00:00

2004:10:20
LEVEL : 1
1 HR

LEVEL **2** : Interval = 10 Min.

15:00:00 15:10:00 15:20:00
15:30:00 15:40:00 15:50:00

2004:10:20
LEVEL : 2
10 MIN

LEVEL **3** : Interval = 1 Min

15:30:00 15:31:00 15:32:00 15:33:00
15:34:00 15:35:00 15:36:00 15:37:00
15:38:00 15:39:00

2004:10:20
LEVEL : 3
1 MIN

LEVEL **4** : Interval = 10 Sec.

15:35:00 15:35:10 15:35:20
15:35:30 15:35:40 15:35:50

2004:10:20
LEVEL : 4
10 SEC

LEVEL **5** : Interval = 1 Sec.

15:35:30 15:35:31 15:35:32 15:35:33
15:35:34 15:35:35 15:35:36 15:35:37
15:35:38 15:35:39

2004:10:20
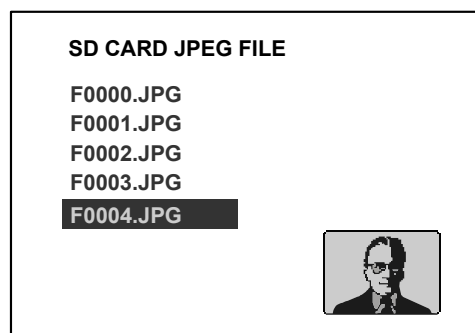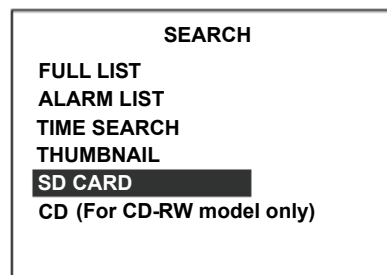LEVEL : 5
1 SEC

3.4.5 SD CARD Search

Take the following steps to proceed with the SD card search function.

(1) nsert an SD Card into the SD card slot of the rear unit.

(2) Press the **Search** button ⑩ to enter the search mode.

(3) Select the **SD CARD** and press the **Enter** button ⑮ to access the complete list of JPG files.

(4) Highlight the specific JPG file you require and press the **Enter** button⑮ to display the image.

(5) If you need another, please return to the SD card JPG file list page and repeat steps 3 and 4 again for another search.
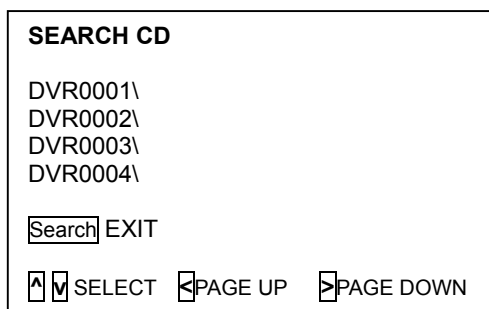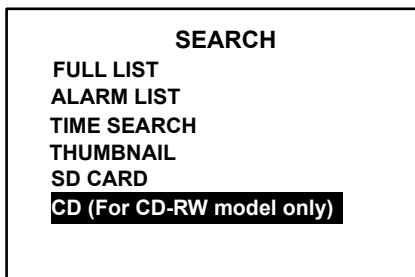
SEARCH

FULL LIST
ALARM LIST
TIME SEARCH
THUMBNAIL
SD CARD
CD (For CD-RW model only)

SD CARD JPEG FILE

F0000.JPG
F0001.JPG
F0002.JPG
F0003.JPG
F0004.JPG

NOTE: **To delete a JPG file in the SD card, please return to the SD CARD JPG FILE list page, and highlight the specific JPG file, press the Setup button ⑨, then select "Yes" to delete the image.**

3.4.6 CD Menu (For CD-RW model only)

Take the following steps to proceed with the CD search function.

(1) Place the disc in the tray.

(2) Press the **Search** button ⑩ to enter the search mode.

(3) Select the **CD** option and press the **Enter** button ⑮ to access the complete list of JPEG files.

(4) Highlight the specific JPEG file you require and press the **Enter** button⑮ to display the image.

(5) If you need another, please press the **Enter** button ⑮ to return to the **CD MENU** page and repeat step (4) again for another search.

```
                    SEARCH
    FULL LIST
    ALARM LIST
    TIME SEARCH
    THUMBNAIL
    SD CARD
    CD (For CD-RW model only)
```

⬇

```
    SEARCH CD

    DVR0001\
    DVR0002\
    DVR0003\
    DVR0004\

    Search  EXIT

    ∧ ∨ SELECT   < PAGE UP   > PAGE DOWN
```

("CD" STANDS FOR THE CD-ROM MODEL AND "BACKUP" IS FOR THE REMOVABLE HDD MODEL ONLY IN THE ITEM 6.)
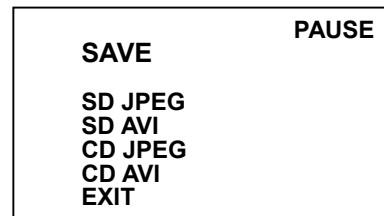
NOTE: **If by accident one selects a CD item and forgets to insert it: See the picture below for this status and please insert a CD or press the search button to exit the CD menu.**

```
    EMPTY
```
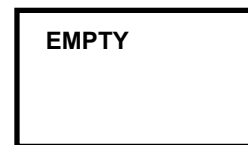
3.5 Backup Operations

3.5.1 CD ReWritable unit Backup Operations (FOR CD-ROM MODEL ONLY)

This device now includes a CD-RW unit.

```
                         PAUSE
    SAVE

    SD JPEG
    SD AVI
    CD JPEG
    CD AVI
    EXIT
```

(1) **SD JPEG:** Archive single image clips into an SD card, (please refer to section 3.5.3).

(2) **SD AVI:** Archive video of AVI clips into an SD card, (please refer to section 3.5.3).

(3) **CD JPEG:** You can archive a lot of single images in a CD disc by entering this item. Please follow the steps given below.

　i) Please insert the CD disc in its tray. You'll hear a signaling beep to tell you the disc is ready.

　ii) Play the video back to find your desired item. Press **PAUSE** when you find it.

　iii) Press the **Enter** button and select # 3 ("**CD JPEG**") and enter.

iv) You've entered the **CD JPEG** menu.

v) Select item 1(**"ADD"**) to add your image into the buffer.

```
                                    PAUSE
           SAVE/CD JPEG

      ADD
      EDIT
      BURN
      EXIT
```
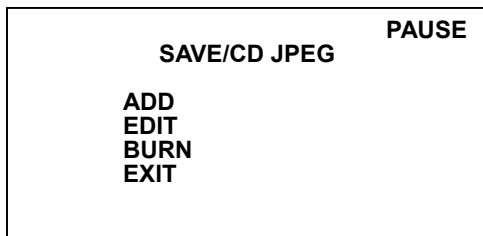
vi) Turn the jog dial or Play button to find the next image you want. Now repeat the last step again to add this image to the buffer. You can continue in this way indefinitely.

vii) If you now wish to edit your buffer, select item 2 (**"EDIT"**) in the **CD JPEG** menu. Now in the **EDIT** jpeg page, press " < ", " > ", " v "and " ∧ " buttons to review your selected images. As the images move, you can decide to delete or not delete any image you find unnecessary or not by pressing the **"Setup"** buttons to **"NO"** (meaning no deletions) or **"YES"** (meaning you're deleting a particular image). Press the **"Search"** button to exit this page.

viii) If your selection is complete, enter item 3 (**"BURN"**) in the **CD JPEG** menu. Give the device some time to complete this process.

ix) Press the eject button to open the CD tray, take out the CD disc, and enter it in a PC to view your selections.
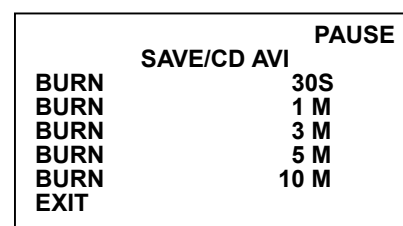
(4) **CD AVI:** You can archive a video in the CD

disc by entering this item.

Please follow the steps given below.

i) Please insert the CD disc in its tray. Hear that beeping signal to confirm your disc is ready.

ii) Play the video back to find your desired item. Press **PAUSE** when you want to start.

iii) Press the **Enter** button and select # 4 (**"CD AVI"**) and enter.

iv) You're in the **CD AVI** menu now.

v)
```
                                    PAUSE
                 SAVE/CD AVI
      BURN                    30S
      BURN                    1 M
      BURN                    3 M
      BURN                    5 M
      BURN                    10 M
      EXIT
```

Use the " v "and " ∧ "buttons to select the time length of your saved recording between "30 seconds", "1M", "3M", "5M" and "10M". Then enter this item to start burning your video in the CD disc.

vi) Press the eject button to open the CD tray, take out the CD disc, and enter it in a PC to view your video.
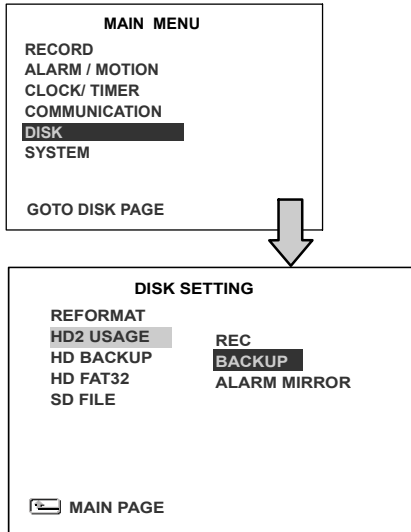
3.5.2 Mobile Rack HD Backup Operations (for removable HDD model only)

There are **3** ways available to duplicate the recorded video from HD 1 (Fixed HD) to HD 2 (Mobile Rack HD). Please take the following steps to proceed.

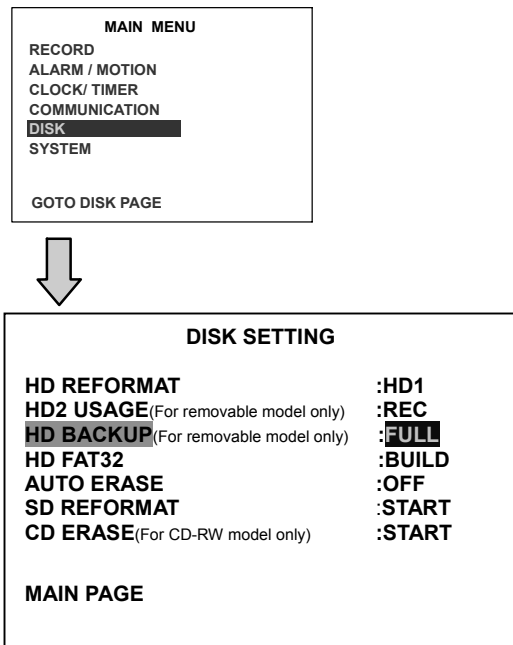**(1)   Set HD 2 to BACKUP first. Take the following steps.**

● Press the **Setup** button ⑨ to enter the setup mode and select **DISK**.

● Highlight **DISK** and press the **Enter** button ⑮ to enter the **DISK SETTING** page.
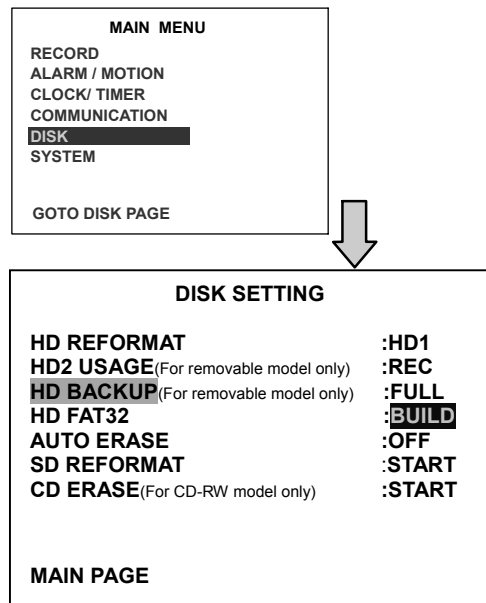
● Then set **HD 2 USAGE** to **BACKUP**.

```
                 MAIN  MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

      GOTO DISK PAGE
```

```
                 DISK SETTING

   REFORMAT
   HD2 USAGE         REC
   HD BACKUP         BACKUP
   HD FAT32          ALARM MIRROR
   SD FILE


      MAIN PAGE
```

(2) FULL: Duplicate all the recorded video from HD1 to HD2.

● On the **DISK SETTING** page, use the "**^**" ⑫ and "**v**" ⑬ buttons to highlight **BACKUP**, select **FULL,** then press the **Enter** button⑮ to proceed.

```
                 MAIN  MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

      GOTO DISK PAGE
```

```
                 DISK SETTING

   HD REFORMAT                        :HD1
   HD2 USAGE(For removable model only)   :REC
   HD BACKUP(For removable model only)   :FULL
   HD FAT32                           :BUILD
   AUTO ERASE                         :OFF
   SD REFORMAT                        :START
   CD ERASE(For CD-RW model only)        :START


   MAIN PAGE
```

ALARM: Duplicate all the alarm-event recorded video from HD 1 to HD2.

● Stay on the **DISK SETTING** page.

● Use the "**^**" ⑫ and "**v**" ⑬ buttons to highlight **BACKUP**; select **ALARM,** then press the **Enter** button ⑮ to proceed.

```
                 MAIN  MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

      GOTO DISK PAGE
```

```
                 DISK SETTING

   HD REFORMAT                        :HD1
   HD2 USAGE(For removable model only)   :REC
   HD BACKUP(For removable model only)   :FULL
   HD FAT32                           :BUILD
   AUTO ERASE                         :OFF
   SD REFORMAT                        :START
   CD ERASE(For CD-RW model only)        :START


   MAIN PAGE
```

SELECT: Duplicate a particular recorded video from HD1 to HD2.

● Stay on the **DISK SETTING** page.

● Use the "**^**" ⑫ and "**v**" buttons ⑬ to highlight **HD BACKUP,** select "**SELECT**" item and then press the **Enter** button ⑮ to list all the recorded video.

● Press the "**^**" ⑫ and "**v**" buttons ⑬ to select the desired clip and press the **Search** button ⑨ to mark it.

● After completing the selection, press the **Enter** button ⑮ to proceed.
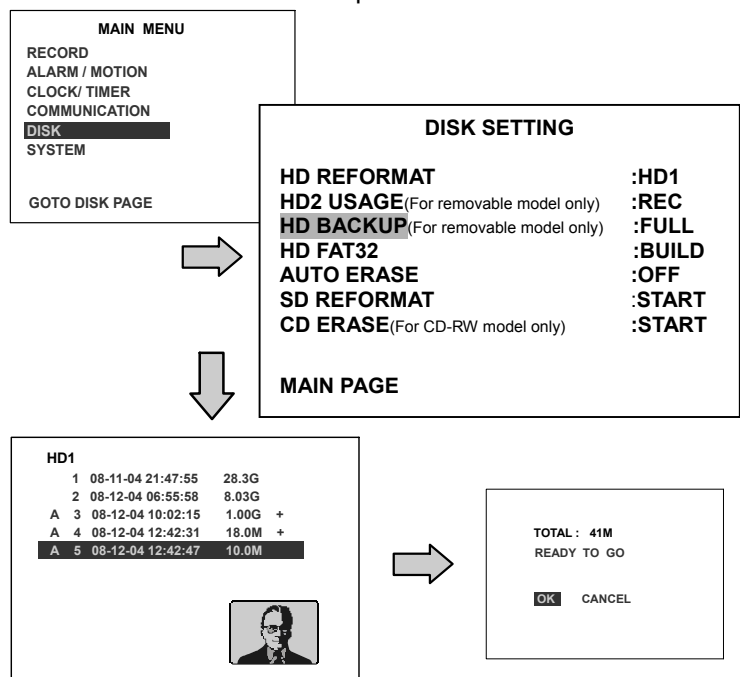
```
                 MAIN  MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

      GOTO DISK PAGE
```

```
                 DISK SETTING

   HD REFORMAT                        :HD1
   HD2 USAGE(For removable model only)   :REC
   HD BACKUP(For removable model only)   :FULL
   HD FAT32                           :BUILD
   AUTO ERASE                         :OFF
   SD REFORMAT                        :START
   CD ERASE(For CD-RW model only)        :START


   MAIN PAGE
```

```
   HD1
      1  08-11-04 21:47:55    28.3G
      2  08-12-04 06:55:58    8.03G
   A  3  08-12-04 10:02:15    1.00G  +
   A  4  08-12-04 12:42:31    18.0M  +
   A  5  08-12-04 12:42:47    10.0M
```

```
   TOTAL :  41M
   READY TO GO

   OK   CANCEL
```

3.5.3 SD Card Backup Operations

The SD card slot of the rear unit has four functions as shown below:

3.5.3.1 Archive Single image Clips into SD Card

Please take the following steps to archive a critical image in an SD card.

(1) Insert an SD Card into the SD card slot of the rear unit.

(2) Start playing back the recorded video. (When playing back recorded video made by a multiplexer, you must get into the multiplexing mode and display picture by picture in order to select the desired image for archiving. Press the **Monitor** button ⑯ to get into the multiplexing mode under this mode so that the light of the **Monitor** button ⑯ is off and the pictures are switching swiftly).

(3) Press the **PAUSE** button ③ to freeze the desired pictures.

(4) Press the **Enter** button ⑮ to save the image in the SD Card.

The quantity of pictures that can be stored depends on the SD card capacity. You can have the saved images printed out in any computer. The image is stored in the JPEG compressed format. If more than one clip is stored in an SD card, file names will be assigned in sequence as shown below.

> SAVE TO F0000.JPG
> SAVE TO F0001.JPG
> …
> SAVE TO F000N.JPG

3.5.3.2 Archive video of AVI Clips into SD Card

Please take the following steps to archive a critical video in an SD card.

(1) Insert an SD Card into the SD card slot of the rear unit.

(2) Start playing back the recorded video.

(3) Press the **PAUSE** button ③ to freeze the desired pictures.

(4) Press the **Enter** button ⑮ to save the video in the SD Card.

The quantity of video that can be stored depends on the SD card capacity. The image is stored in the AVI compressed format. If more than one clip is stored in an SD card, file names will be assigned in sequence as shown below.

> SAVE TO M0000.AVI
> SAVE TO M0001.AVI
> …
> SAVE TO M000N.AVI

NOTE:
●**The JPEG file format can be played and deleted in the DVR. Please refer to section 3.4.5.**
●**The AVI file format cannot. It can only be played in a card reader connected to a computer.**
●**The file format can be selected from the "SD FILE" item on the Setup Menu. Please refer to section 4.5 for more details.**

3.5.3.3 Backup the System setting info into SD Card.

The DVR offers a quick setup method by using an SD card. If a user wants to set many

DVR devices with the same settings, the DVR could save the whole setting in the SD card, then transfer it to another DVR.

```
            MAIN MENU
RECORD
ALARM / MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM

   GOTO SYSTEM PAGE
```

⬇

```
            SYSTEM
   OPERATION LOG
   MENU BACKGND
   BUZZER
   PASSWORD
   SETUP PWD
   DEFAULT
   SD / CD SETUP     SAVE
   VERSION           LOAD
   ⬒ MAIN PAGE
```
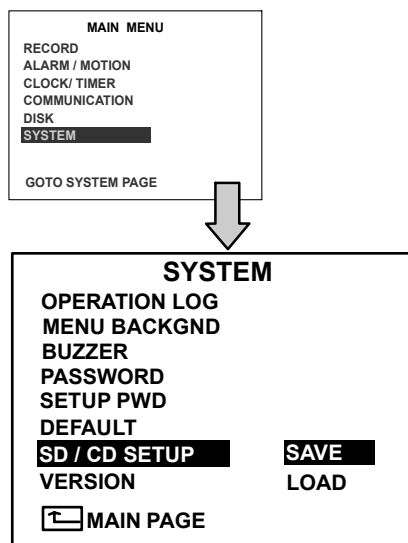
Note: The "CD SETUP" is for the CD-RW model only.

Save the whole setting into the SD card:

● Insert an SD card into the SD card slot.

● Press the **Setup** button ⑨ to enter the setup mode.

● Highlight **SYSTEM** and press the **Enter** button ⑮ to enter the **SYSTEM SETTING** page.

● Set **SD SETUP** to **SAVE**. Then the system setting info will auto save into SD card.

Transfer the system setting info of DVR to another:

● Insert the SD card which has stored the system setting info into the DVR.

● Press the **Setup** button ⑨ to enter the setup mode and select the **SYSTEM**.

● Highlight **SYSTEM** and press the **Enter** button ⑮ to enter the **SYSTEM SETTING** page.

● Then set **SD SETUP** to **LOAD**.

3.5.3.4 Updating System Software

Please refer to section **4.6** for more details.

3.6 Key Lock Operation

The Key lock operation protects the unit against unauthorized use by disabling the entire front panel controls. Simultaneously press these two ⑪ **"<"** and ⑭ **">"** buttons for at least 3 seconds to lock the unit; to release the **Key Lock**, simultaneously press these two buttons again.

⏻
Power Monitor Display Search Setup Enter ∨ ∧ < > Play Pause Stop Rec

⑪ ⑭
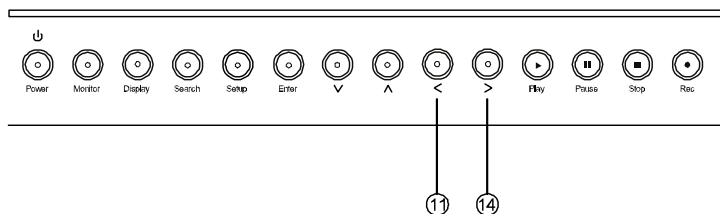
4. MENU SETUP

4. MENU SETUP

There are **6** categories for operation setting in the setup menu system as shown below. The following sections will instruct you step by step to configure the operation setting and state each menu's purpose and options. Press the **Setup** button ⑨ to access the setup menu. Once inside the menu system, the on-screen menu allows you to set up the key features of the unit. The functions of various buttons within the menu-setup mode are described in the paragraphs below.

KEY FUNCTIONS

Setup button ⑨ :

Press to enter the setup menu. Press again to exit the setup mode.

"^" ⑫ and **"v"** ⑬ buttons :

Press to select the desired item or entry for setting.

"<" ⑪ and **">"** ⑭ buttons :

Press to highlight the desired option or to select the context for setting.

Enter ⑮ button :

Press to enter the selected item and to save the setting.

Shuttle Ring ⑳ :

Turn to highlight the desired option or to select the context for setting.

Jog Dial ㉑ :

Turn to select the desired item or entry for setting.

4.1 REC Setting

```
            MAIN  MENU
   RECORD
   ALARM/ MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM


    GOTO REC PAGE
```
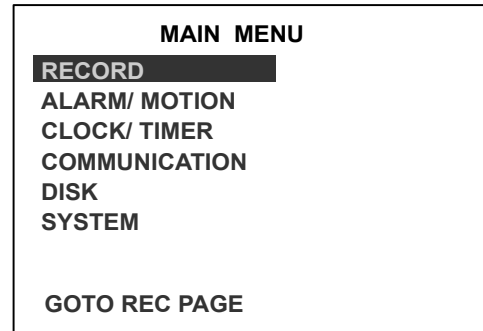
This page allows you to set the recording rate and recording quality, and enables you to continue recording when the disk is full.

```
            MAIN  MENU
   RECORD
   ALARM/ MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

   GOTO REC PAGE
```

```
            REC SETTING
   REC RATE          : 20 F/S
   REC QUALITY       : BEST
   DISK FULL         : REWRITE
   AUDIO             : OFF
   MULTIPLEXER       : ON

     MAIN PAGE
```
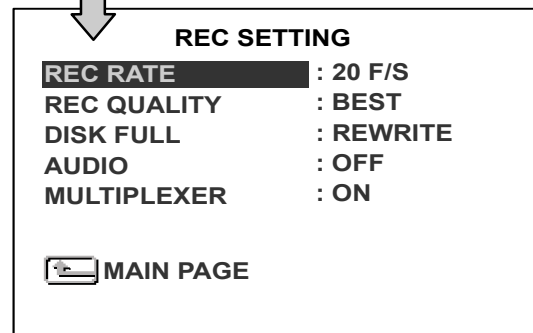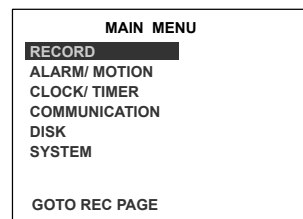
REC RATE :

This option is for adjusting the number of pictures recorded every second into a storage disk. The recording rate controls the frequency at which the number of video pictures can be recorded.

● For an NTSC unit there are 11 different recording rates you can select from: **60F/S (60 fields per second), 30F/S, 20F/S, 12F/S, 5.5F/S, 2.4F/S, 1.22F/S, 0.71F/S, 1 F/4S, 1F/6S,** and **1F/8S.**

● For a PAL unit there are 11 different recording rates you can select from: **50F/S (50 fields per second), 25F/S, 17F/S, 10F/S, 5.5F/S, 2.9F/S, 1.52F/S, 0.88F/S, 1 F/4S, 1F/6S,** and **1F/8S.**

MENU SETUP (continued)

Please refer to the table in section **3.1** for details.

NOTE: The 60 f/s (50 f/s for a PAL unit) recording rate can only function in a 352x240 (352x288 for a PAL unit) resolution.

REC QUALITY:

This option determines the image quality to be recorded. The DVR stores images in the compressed format and allows the image quality to be altered by the image size. There are 4 levels of image quality you can select from: **BEST**, **HIGH, STANDARD,** and **BASIC**. Selecting the BEST image for use provides higher-resolution recorded images, and normally takes up more storage space than a HIGH, STANDARD or BASIC image does.

DISK FULL:

This option determines the way to utilize storage media in case of a full disk.

REWRITE: When the hard disk is full, the device continues recording by displacing the old data.

STOP: When the hard -disk is full, the device will stop recording.

AUDIO:

This option determines the way to record sound if necessary.

OFF: Disables AUDIO recording.

11 KHz: Enables AUDIO recording.

22 KHz: Enables AUDIO recording.

NOTE: Audio function can only be activated at the following refresh rates in NTSC(PAL): 60(50), 30(25), 20(17), 10(10), 5.5(5.5) fields/sec.

MULTIPLEXER:

For optimum image recording please set this option to **ON** when the DVR is connected to a multiplexer for use. Set this option to **OFF** when it is only connected to a single camera or Quad processor.

4.2 ALARM / MOTION Setting

```
          MAIN  MENU
 RECORD
 ALARM / MOTION
 CLOCK/ TIMER
 COMMUNICATION
 DISK
 SYSTEM


  GOTO ALARM/ MOTION PAGE
```
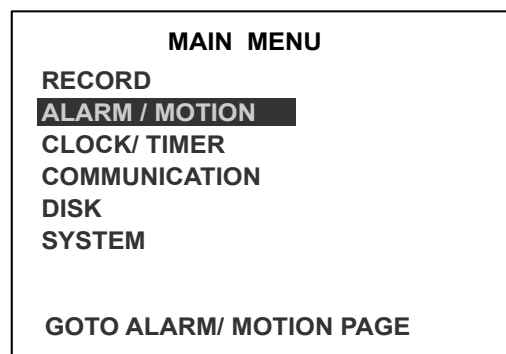
This menu allows users to program the configuration of alarm recording only when an alarm input is activated. The device will record as long as the alarm input is activated.

```
          MAIN  MENU
 RECORD
 ALARM / MOTION
 CLOCK/ TIMER
 COMMUNICATION
 DISK
 SYSTEM

 GOTO ALARM/ MOTION PAGE
```

```
          ALARM/ MOTION

 ALM OPERATION      : OFF
 REC RATE           : 30 F/S
 REC QUALITY        : BEST
 AUDIO              : OFF
 ALM TYPE           : NO
 ALM DURATION       : 0 SEC
 PRE-ALARM          : OFF
 MOTION SETTING

  ⌧  MAIN PAGE
```
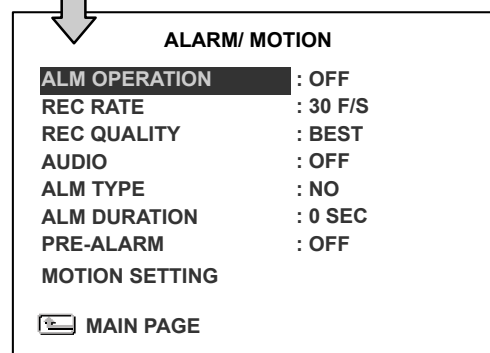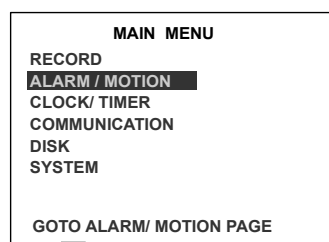
ALM OPERATION:

This option determines whether to activate / deactivate the alarm recording when it detects an alarm input.

ON: The device activates the alarm recording when it detects an alarm input.

OFF: The device ignores the alarm signal when it detects an alarm input.

REC RATE:

This option is for the purpose of adjusting the number of pictures recorded every second into a storage disk when an alarm input is activated. For an NTSC unit there are 5 different record speeds you can select from: **60F/S (60 fields per second), 30F/S, 20F/S, 12F/S,** and **REMAIN.** For a PAL unit there are 5 different record speeds you can select from: **50F/S (50 fields per second), 25F/S, 17F/S, 10F/S,** and **REMAIN.** If you select **REMAIN** for use, the device will record images at the same speed as set on the **REC** page.

REC QUALITY:

This option determines the image quality to be recorded when an alarm input occurs. There are 4 levels of image quality to choose from: **BEST, HIGH, STANDARD,** and **BASIC.** The table below shows the level of image quality with the corresponding compression ratio and image size.

REC Quality	Best	High	Standard	Basic
Image Size	48KB	32KB	21KB	16KB

AUDIO:

This option determines the way to record sound if necessary.

ON: Enables AUDIO recording.

OFF: Disables AUDIO recording.

NOTE: Audio function can only be activated at the following refresh rates in NTSC(PAL): 60(50), 30(25), 20(17), 10(10), 5.5(5.5) fields/sec.

ALM TYPE:

This option allows users to set a type of alarm input corresponding to the sensor signal in use.

NO: Normally Open. This is to be used with the type of alarm sensor whose contact remains open in normal conditions and closes in case of activation.

NC: Normally Closed. This is to be used with the type of alarm sensor whose contact remains closed in normal conditions and opens in case of activation.

ALM DURATION:

This option allows users to set alarms for a certain duration. You can select one of the six following options: **0 SEC, 30SEC, 1 MIN, 5 MIN, 10 MIN,** and **NON-STOP.**
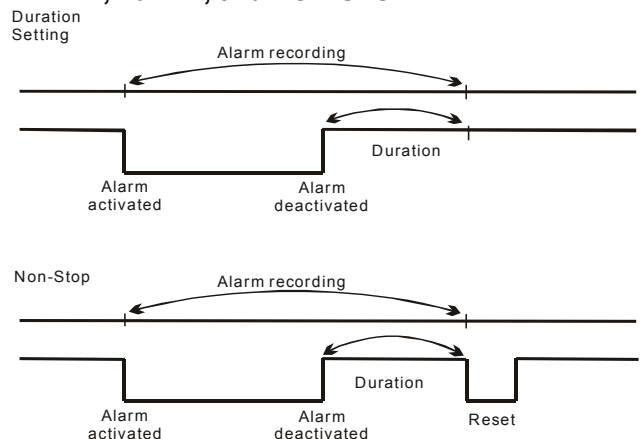
NOTE: Recording may be interrupted at the time of Alarm-in or Alarm-out.

LIVE images may be interrupted at the time of Alarm-out.

PRE- ALARM:

This option determines that images prior to an alarm will be recorded in the hard-disk drive. When an alarm is triggered the device will record the image prior to the alarm for 5 seconds (20 fields/sec).

ON: Enables this function.

OFF: Disables this function.

NOTE: If the device is already under recording mode before an alarm occur, the pre-alarm recording will not take effect.

MOTION SETTING:

The motion detection function is convenient for people without an alarm trigger input, but it can also used be with an alarm trigger input. If this function is enabled, object's movement will trigger the alarm recording just like the outside trigger signal. Before using the motion detection function, please turn the **ENABLE** option to **ON**, and set the **SENSITIVITY** (1 ~ 5) to a suitable value.

NOTE: The MOTION ENABLE option is not allowed set to ON when MULTIPLEXER option is set to ON in the RECORD page, it is because the motion detection function is for single camera only.

```
              MOTION SETTING
MOTION ENABLE      : ON
SENSITIVITY        : 3
REGION             : SET



   MAIN PAGE
```

↓

```
           SET MOTION REGION


   ( 30 , 40 ) - ( 99 , 99 )
```
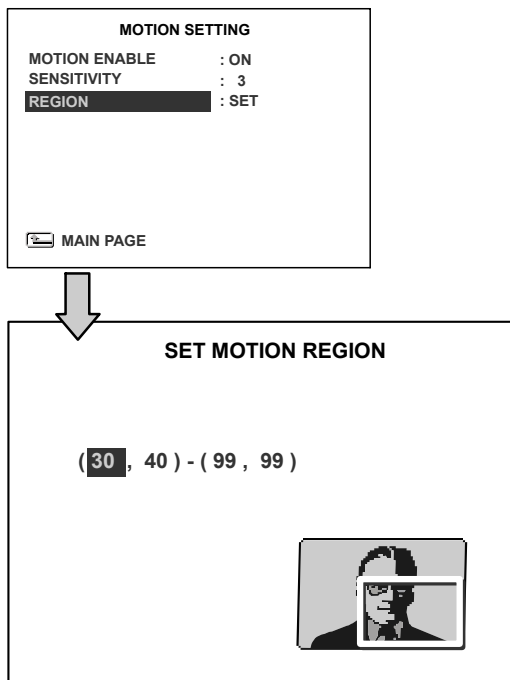
MOTION ENABLE:

This option enables / disables the motion detection.

ON: Enables the motion detection.

OFF: Disables the motion detection.

SENSITIVITY:

This option allows users to set the motion sensitivity. **1** is the most sensitive setting. **5** is the least sensitive setting.

REGION:

This option allows users to set the motion region.

4.3 CLOCK / TIMER Setting

```
           MAIN  MENU
RECORD
ALARM / MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM


 GOTO CLOCK/ TIMER PAGE
```
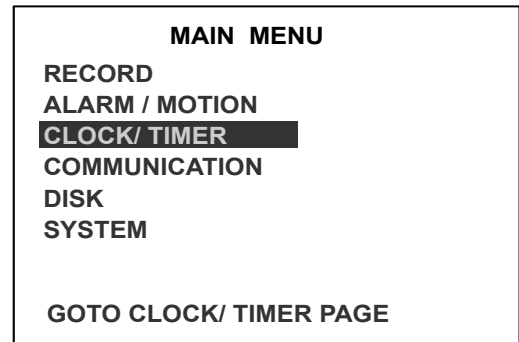
The DVR provides a weekly table consisting of two periods of time each day for scheduled recording. This option allows you to set the time each day when the DVR will start and stop recording.

```
           MAIN  MENU
RECORD
ALARM / MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM

 GOTO CLOCK/ TIMER PAGE
```

↓

```
           CLOCK/TIMER
CLOCK                  :SET
DAYLIGHT SAVING        :OFF
REC ENABLE             :OFF
TIMER                  :SET
TITLE                  :SET


 MAIN PAGE
```
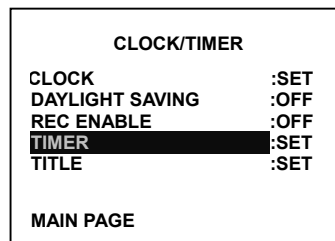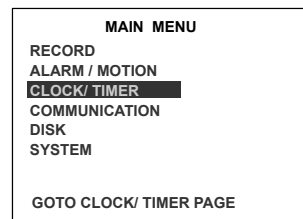
CLOCK:

This entry allows users to set the system time.

NOTE: Clock data is retained for about 3 months after the 15-hour power supply is used up (in the operate On mode).

DAYLIGHT SAVING:

This entry allows users to set the daylight saving time.

OFF: Disables the daylight saving time.

USA: Daylight saving time begins at 2:00 a.m. on the first Sunday of April. Time reverts to standard time at 2:00 a.m. on the last Sunday of October.

EUROPE (Except UK): Daylight saving time begins at 2:00 a.m. on the last Sunday of March. Time reverts to standard time at 2:00 a.m. on the last Sunday of October.

UK: Daylight saving time begins at 1:00 a.m. on the last Sunday of March. Time reverts to standard time at 1:00 a.m. on the last Sunday of October.

SET: to set the start and ending for the daylight saving time.

REC ENABLE:

This option enables/disables the programmed scheduled recording.

ON: Enables the scheduled recording.

OFF: Disables the scheduled recording.

TIMER:

This entry allows users to program the time each day when the DVR will start and stop recording. There are **2** time periods each day available for scheduling. The time is displayed in a 24-hour clock format. If there is a time overlapping showing between two continual time period settings, the device will automatically combine the two time-period settings into one.

```
   REC SCHEDULE
     START END   START END
S  00:00- 00:00  00:00- 00:00
M  00:00- 00:00  00:00- 00:00
T  00:00- 00:00  00:00- 00:00
W  00:00- 00:00  00:00- 00:00
T  00:00- 00:00  00:00- 00:00
F  00:00- 00:00  00:00- 00:00
S  00:00- 00:00  00:00- 00:00
      OK         CANCEL
   ◁ ▷ TO MOVE  ⌃ ⌄ TO CHANGE
```

4.4 COMMUNICATION Setting

```
           MAIN MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

   GOTO COMM PAGE
```
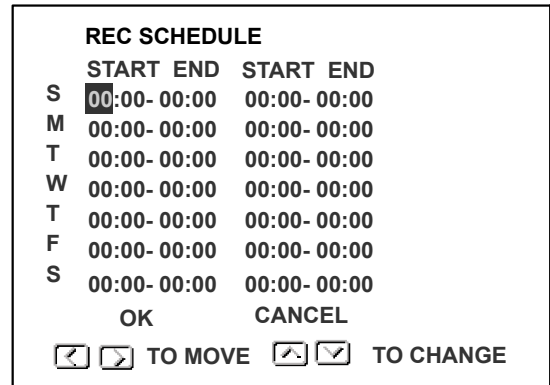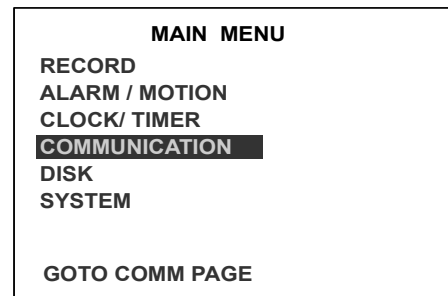
This option allows you to configure the statuses of the RS-232 / RS485 communication ports when connected to external devices, and the Ethernet communications settings. Please refer to **6.1** RS-232/RS485 Protocols and **5.** Network Functions for more details.

```
           MAIN MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

   GOTO COMM PAGE
```

```
           COMM SETTING

   COMM ID          : 01
   RS232            : ON
   RS485            : ON
   NET ENABLE       : ON
   NET DHCP         : ON
   NET IP           : SET
   NET ACCOUNT      : SET
   FTP SETTING

   ▭  MAIN PAGE
```
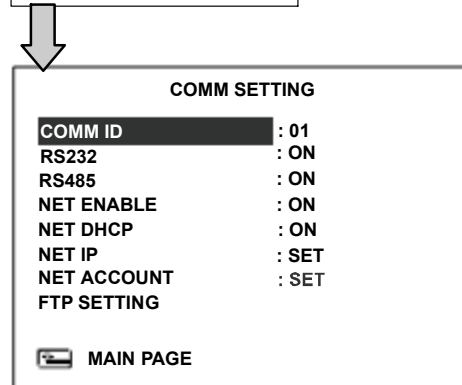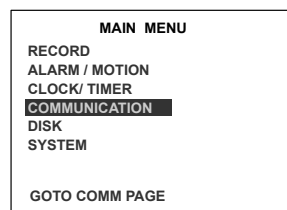
COMM ID:

Communication ID for the RS232 and RS485 communication ports. After the DVR receives a

RS232 or RS485 command, it checks if the <Dest ID> within the code is the same as the COMM ID, in which case the particular command can be accepted.

RS-232:

The RS-232 communication port can be either in an importing or exporting mode according to your applications.

ON: Enables the RS-232 communication port. When you wish the unit to be controlled by an external device, please select this entry for use.

OFF: Disables the RS-232 communication port.

RS-485:

The RS-485 communication port can be either in an importing or exporting mode according to your applications.

ON: Enables the RS-485 communication port. When you wish the unit to be controlled by an external device, please select this entry for use.

OFF: Disables the RS-485 communication port.

NET ENABLE:

This option enables or disables the Ethernet communication port.

OFF: Disables it.

ON: Enables it.

NET DHCP:

This option enables or disables the Ethernet communication port.

OFF: Disables it.

ON: Enables it.

NOTE: If provided with a DHCP server, the DVR can get an IP automatically by setting this option to ON.

NET IP:

This option is used to configure the Ethernet communication settings. This is required for the purpose of making a network connection. Please consult with a qualified MIS professional to configure it.

IP:	XXX.XXX.XXX.XXX
MASK:	XXX.XXX.XXX.XXX
GATEWAY:	XXX.XXX.XXX.XXX
HTTP PORT:	XXXX

NET ACCOUNT:

```
            COMM SETTING

    COMM ID          : 01
    RS232            : ON
    RS485            : ON
    NET ENABLE       : ON
    NET DHCP         : ON
    NET IP           : SET
    NET ACCOUNT      : SET
    FTP SETTING

       MAIN PAGE
```

```
            NET ACCOUNT

      USERNAME      PASSWORD

    ADMIN [admin      ] [9999]
     VIEW [view       ] [0000]


    SET NET ACCOUNT
```
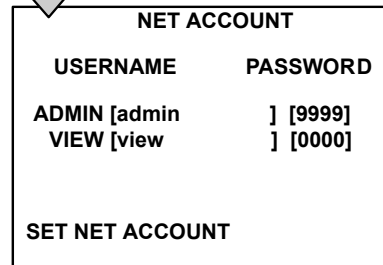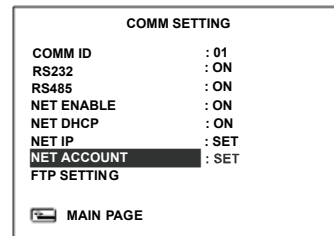
FTP SETTING:

This entry allows users to set the FTP File Transfer Protocol.

```
            COMM SETTING

    COMM ID          : 01
    RS232            : ON
    RS485            : ON
    NET ENABLE       : ON
    NET DHCP         : ON
    NET IP           : SET
    NET ACCOUNT      : SET
    FTP SETTING

       MAIN PAGE
```

```
            FTP SETTING

    ENABLE           : OFF
    REC MODE         : ALARM REC
    REC RATE         : 1F/ 1S
    FTP ACCOUNT      : SET




       MAIN PAGE
```

34
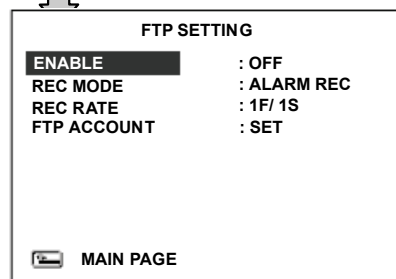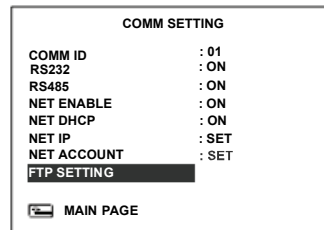
ENABLE:

This option is to select enable or disable for the FTP function.

ON: Enables it.

OFF: Disables it.

REC MODE:

This option determines the recording mode to be recorded when the FTP function occurs. There are 2 levels of recording mode to choose from: **ALARM REC** and **ALL REC.**

ALARM REC: Only to record the alarm-event recorded video.

ALL REC: To record all the recorded video.

REC RATE:

This option determines the recording rate to be recorded at when the FTP function occurs. There are 4 levels of recording rates to choose from: **1 F / 1 S, 1 F / 10 S, 1 F / 30 S** and **1 F / 60 S.**

FTP ACCOUNT:

This option is used to configure the FTP account settings. This is required for the purpose of making an FTP connection. Please consult with a qualified MIS professional to configure it.

```
                 FTP ACCOUNT

FTP IP              : 192.168.001.128
USER                : [dvr          ]
PASSWORD            : [00000000      ]
PATH                : [/dvrvideo     ]




     ⌨  MAIN PAGE
```
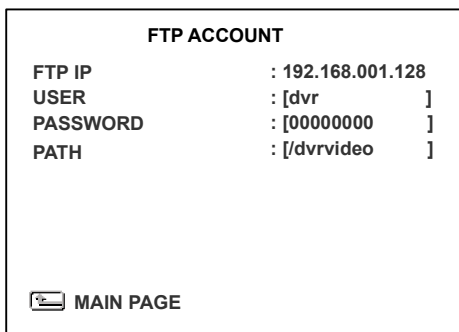
FTP IP

Every FTP server has to own an IP address to be identified on the network. Input the IP

address of the FTP server.

USER

Type in the FTP user name (Login Name).

PASSWORD

Enter the FTP password (Password).

PATH

Enter the upload path while connecting the FTP.

4.5 DISK Setting

```
              MAIN  MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM


    GOTO DISK PAGE
```

HD REFORMAT:

```
            MAIN  MENU
  RECORD
  ALARM / MOTION
  CLOCK/ TIMER
  COMMUNICATION
  DISK
  SYSTEM

  GOTO DISK PAGE
```

⬇

```
            DISK SETTING

  HD REFORMAT                          :HD1
  HD2 USAGE(For removable model only)  :REC
  HD BACKUP(For removable model only)  :FULL
  HD FAT32                             :BUILD
  AUTO ERASE                           :OFF
  SD REFORMAT                          :START
  CD ERASE(For CD-RW model only)       :START


  MAIN PAGE
```
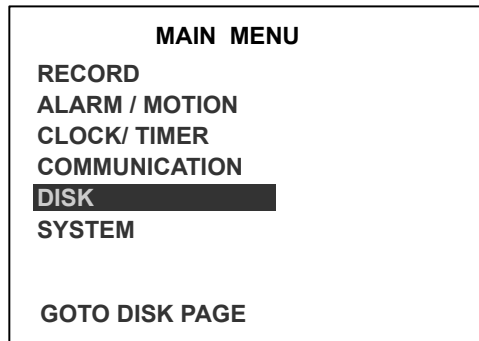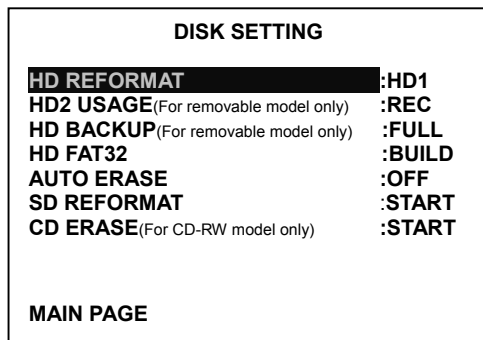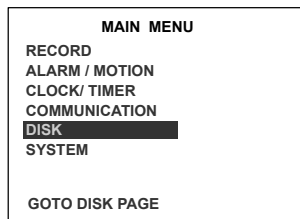
This option allows you to clear out all the data in the hard-disk drive. You will be required to enter the pre-set password before proceeding with clearing out the data. Enter the standard password "**9999**" if you don't set your individual

password. To set your individual password, please refer to section **4.6 System Setting** - **PASSWORD**.

HD 1 / 2: Clears out all the data stored in HD 1 and HD 2.

BACKUP HD: Clears out all the data stored in HD 2, which is set to the backup purpose only. (This function has to be proceeded with when the **HD 2 USAGE** option is set to **BACKUP**.)
(For the removable model only)

HD2 USAGE: (For the removable model only)

This option determines the way to utilize the hard-disk drive in the mobile compartment.

REC: Used for the regular recording hard-disk drive.

BACKUP: Used for data backup only, which will not be part of a regular recording hard-disk drive.

ALARM MIRROR: Used as a mirror for HD1: if HD1 records alarm data, the same data will be written to HD2 simultaneously.
(For the removable model only.)

HD BACKUP: (For the removable model only)

This function allows you to duplicate data from HD 1 to HD 2. Please set HD 2 as **BACKUP** first. (For operation details, please refer to section **3.5**)

FULL: Duplicates all the recorded video from HD1 to HD2.

ALARM: Duplicates all the alarm-event recorded video from HD 1 to HD2

SELECT: Duplicates a particular recorded video from HD1 to HD2.

HD FAT32:

This function builds the FAT32 file system on the hard disk, enabling the data on hard disks to be played back on a PC.

SD REFORMAT:

This option determines the format to save the important image files in the SD card.

JPEG: Archives images in the JPEG format to save a single picture in every file.

AVI: Archives images in the AVI format, to save a sequence of images in a file, the maximum limit being 300 images for every file. You can stop recording whenever you want, and if you don't, recording will automatically stop at the optimum of **300** images.

NOTE: To save images, please refer to section 3.5.3 for more details.

CD ERASE: (For CD-RW model only)

This item helps you erase your CD disc if it's rewritable.

4.6 SYSTEM Setting

```
          MAIN  MENU
   RECORD
   ALARM / MOTION
   CLOCK/ TIMER
   COMMUNICATION
   DISK
   SYSTEM

   GOTO SYSTEM PAGE
```
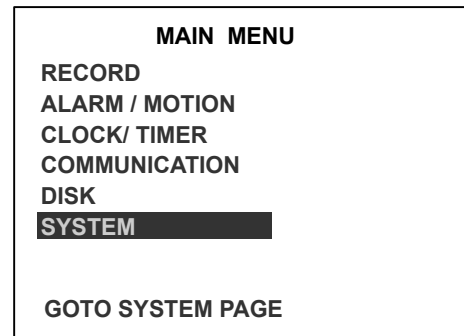
This page is used for accessing the history of the operation statuses, setting the password, resuming factory default, and determining the menu display background.

OPERATION LOG:

```
     MAIN  MENU                      SYSTEM
  RECORD                    OPERATION LOG   : ENTER
  ALARM / MOTION            MENU BACKGND    : 2
  CLOCK/ TIMER              BUZZER          : OFF
  COMMUNICATION             PASSWORD        : SET
  DISK                      SETUP PWD       : OFF
  SYSTEM                    DEFAULT         : LOAD
                            SD / CD SETUP   : SAVE
  GOTO SYSTEM PAGE          VERSION         : ENTER
                            ⏎ MAIN PAGE
```
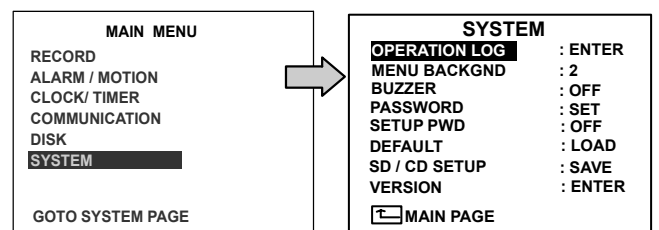
```
                                        ┌──────────────────────────────────────┐
                                        │            OPERATION LOG              │
                                        │  05/15/04 18:19:30    ON              │
                                        │  05/15/04 18:19:36    OFF             │
                                        │  05/15/04 18:23:10    ON              │
                                        │  05/15/04 18:23:50    REC             │
                                        │  05/15/04 18:25:05    STOP            │
                                        │  05/15/04 18:27:12    V-LOSS          │
                                        │  05/15/04 18:50:30    PLAY            │
                                        │  05/15/04 18:51:20    STOP-P          │
                                        │                                        │
                                        │ Ʌ V SELECT    < PAGE UP    > PAGE DOWN │
                                        └──────────────────────────────────────┘
```

This log shows the history of the operation statuses in chronological order. What the following entries represent is detailed below.

ON: Switches on the device.

OFF: Turns off the device.

REC: Starts recording.

STOP: Ceases recording.

STOP-P: Ceases playback.

PLAY: Shows recorded video.

V-IN: Video input is connected.

V-LOSS: Video loss occurs.

P-LOSS: Power interruption occurs.

A-IN: Detects an alarm input.

LOCK: Disables the entire front panel controls.

UNLOCK: Releases the key lock.

UPDATE: Updates system software.

Note: **The log keeps an operation history on a revolving basis because of a limit of 4000. When the log is full, the newly registered record of an operation will replace the existing records from the oldest one onwards.**

OSD LANGUAGE:

This option allows you to select the OSD language display as **English** or **Chinese**.

MENU BACKGND:

There are **3** levels of background color transparency you can choose from: level 1 is totally transparent, level 3 is opaque, and level 2 is between levels 1 and 3. The background color is used in the setup menu and search function.

BUZZER:

This option determines the embedded buzzer sounding a tone to signal the following situations. A tone lasts about two seconds.

ON: Enables buzzer.

OFF: Disables buzzer.

Situation
Alarm occurs
Video loss occurs
Disk is full
Load factory default
Buzzer is set to ON
Enables/disables the key lock function
Power on /off in a mobile rack HDD
Backup operation is complete
Timer activates/deactivates
Recording is switching between HDDs

PASSWORD:

This option allows you to set a password to prevent any unauthorized re-formatting of the hard disk drives or use by a network viewer. The standard password is "9999".

OLD PASSWORD: Enter the pre-set password (or the standard password if this is the initial setting) to access the password setting system.

NEW PASSWORD: Enter a 4-digit-number password of your choosing which will replace the pre-set password (or the standard password "9999").

SETUP PWD:

When this option is on, the user must pass the password check before entering the setup menu.

ON: Enables pass protection for the setup menu.

OFF: Disables pass protection for the setup menu.

DEFAULT:

This option allows you to reload the factory default setting. Please do note that the password would not be changed in the factory default setting.

SD SETUP:

The DVR offers a quick setup method by using an SD card. If the user wants to set up a lot of the same devices with the same settings, he can save the whole settings to an SD card, then transfer them to another DVR.

> **SAVE:** Saves the whole setting to the SD card.

> **LOAD:** Loads the whole setting from the SD card.

VERSION:

This item is in the setup menu revealing the network MAC, the BIOS version, software version, and the last updated date.

```
MAC    :   00:0C:0C:00:B1:30
BIOS   :   1.00
SW     :   1.02E
DATE   :   Apr 27 2005
```

5. NETWORK

5. NETWORK

5.1 Network Configuration

5.1.1 Cable Connections

Please follow the instructions below to connect your DVR to a computer or a network and to choose a proper RJ-45 cable configuration for connections.

Physical Spec. of RJ-45 Cable for Ethernet

Wire Type	Cat. 5
Connector Type	RJ-45
Max. Cable Length	30 m
Hub Wiring Configuration	Straight Through
PC Wiring Configuration	Cross Over

A. **Connect to a PC**

Use a crossover LAN cable to connect directly to a **PC.**

CROSSOVER CABLE PIN CONFIGURATION

RJ-45
TO PC LAN CARD
CROSSOVER CABLE
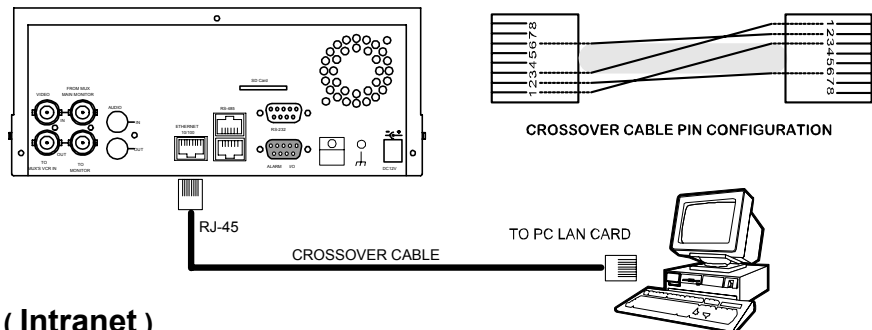
B. **Connect to a LAN Hub (Intranet)**

The RJ-45 PIN configuration for connecting with a LAN Hub is shown below.

TO PC LAN CARD

RJ-45

TO NETWORK

HUB
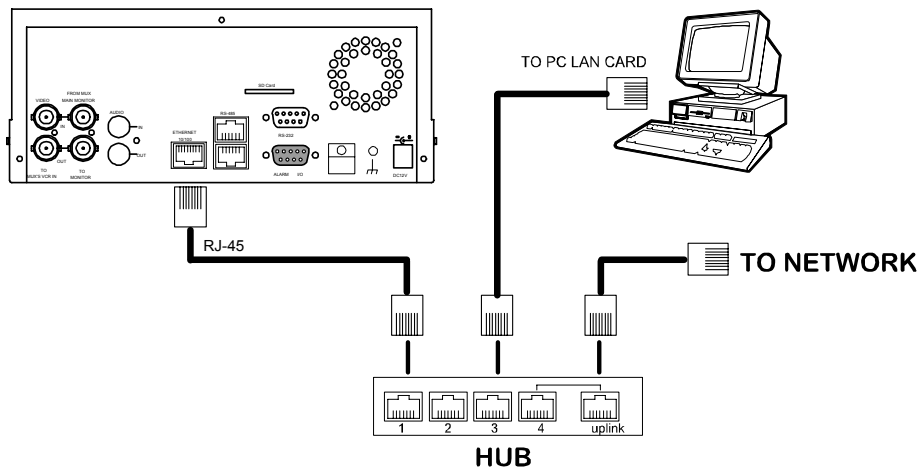
C. **Connect to WAN (Internet)**

The RJ-45 PIN configuration for connecting to a WAN is the same as that for connecting to a LAN.

CABLE/XDSL MODEM

LAN   WAN

RJ-45

TO ISP
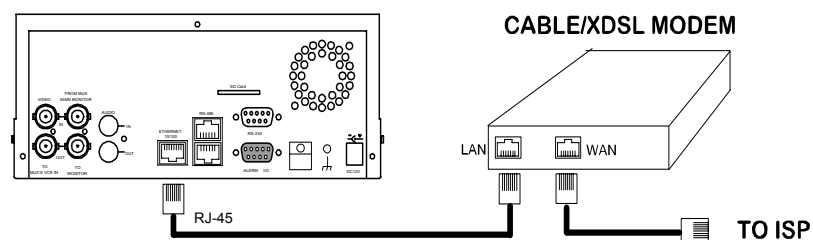
PIN NO.	PIN Assignment
1.	TX +
2.	TX -
3.	RX +
4.	Not Connected
5.	Not Connected
6.	RX -
7.	Not Connected
8.	Not Connected

RJ-45 socket

1 2 3 4 5 6 7 8
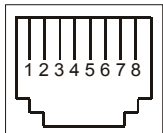
RJ-45 PIN configuration for LAN Hub

5.1.2 Configure Your DVR Network Settings

Upon network hardware connection, you need to activate the network function and configure the proper network settings of the DVR.

5.1.2.1 Enable DVR Network Function

```
            MAIN  MENU
RECORD
ALARM / MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM

GOTO COMM PAGE
```

```
            COMM SETTING

COMM ID              : 01
RS232                : ON
RS485                : ON
NET ENABLE           : ON
NET DHCP             : ON
NET IP               : SET
NET ACCOUNT          : SET
FTP SETTING

       MAIN PAGE
```
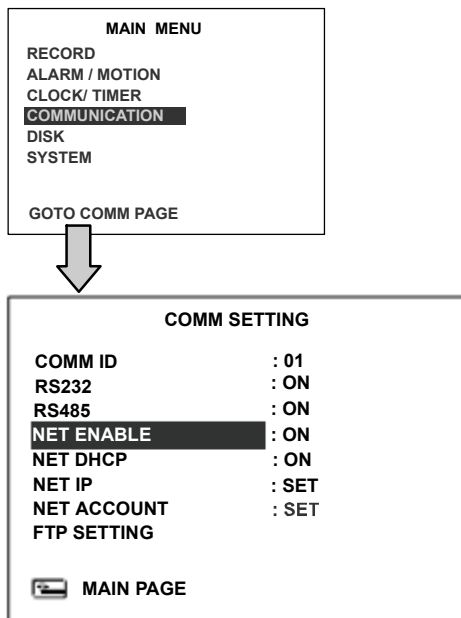
● Press the **Setup** button to enter the OSD MAIN MENU. Please use the **"<"** ⑪ and **">"** ⑭ **buttons** to highlight COMMUNICATION; then press the **Enter** button to enter the COMM SETTING page.

● Use the **"^"** ⑫ **"v"** ⑬ **buttons** to highlight NET ENABLE; select ON. Then press the **Enter** button to proceed.

5.1.2.2 Enable DHCP Function

```
            MAIN  MENU
RECORD
ALARM / MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM

GOTO COMM PAGE
```

```
            COMM SETTING

COMM ID              : 01
RS232                : ON
RS485                : ON
NET ENABLE           : ON
NET DHCP             : ON
NET IP               : SET
NET ACCOUNT          : SET
FTP SETTING

       MAIN PAGE
```
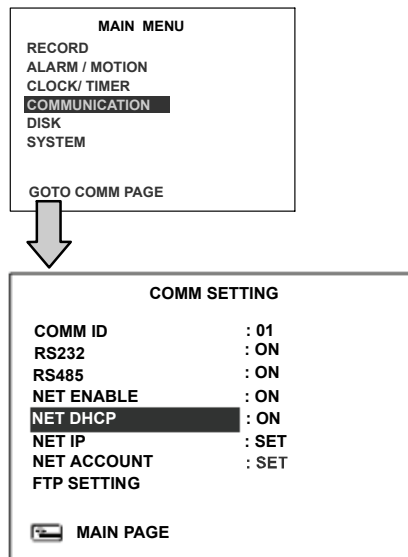
Use the **"^"** ⑫ and **"v"** ⑬ buttons to highlight NET DHCP; select ON.

NOTE: This function can only work if the LAN which the unit is connected to has a DHCP server. If the DHCP server is working, the DVR will obtain an IP address automatically from the DHCP server. In that case please skip section 5.1.2.3 (Set IP address) and follow section 5.1.3 (TCP/IP Communication Software).

5.1.2.3 Set IP Address

```
            MAIN  MENU
RECORD
ALARM / MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM

GOTO COMM PAGE
```

```
            ↓
┌─────────────────────────────────┐
│          COMM SETTING           │
│                                 │
│  COMM ID            : 01        │
│  RS232              : ON        │
│  RS485              : ON        │
│  NET ENABLE         : ON        │
│  NET DHCP           : ON        │
│  NET IP             : SET       │
│  NET ACCOUNT        : SET       │
│  FTP SETTING                    │
│                                 │
│  ▣  MAIN PAGE                   │
│                                 │
└─────────────────────────────────┘
```
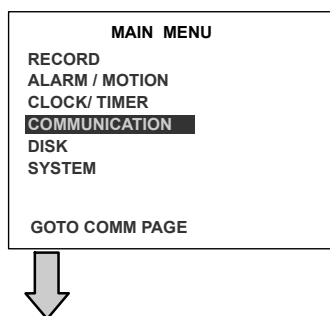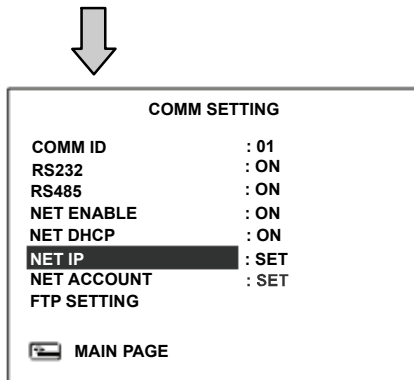
You don't need to set a NET IP for the unit if the LAN which the unit is connected to has a **DHCP server.** Otherwise, please follow the instructions given below:

Enter the NET IP page, and set the IP, MASK and GATEWAY. Then press the **Enter** button to proceed. The following is a sample setting.

IP:	**192.168.1.100**
MASK:	**255.255.255.0**
GATEWAY:	**0.0.0.0**
HTTP PORT:	**80**

NOTE:

1. When only one unit of the DVR is connected to a computer or LAN, you can freely assign an IP address for the DVR. For example, there is a range of DVR IP addresses from 192.168.1.1 to 192.168.1.255. You can pick one for use from the range of the IPs. It's not necessary to set MASK and GATEWAY; leave the settings as default.

When a DVR is connected to a WAN, you must acquire a unique, permanent IP address and correctly configure the MASK and GATEWAY settings according to your network architecture. If you have any questions regarding those settings, please contact a qualified MIS professional or your ISP.

2. Connecting to a network, each connected

DVR must be assigned a unique IP, which must be in the same class type as your network address. IP addresses are written as four sets of numbers separated by periods: for example, 192.168.0.1 Therefore, if the connected network is identified as Class C, for example, the first three sets of numbers of the DVR IP address must be the same as the network address. If the connected network is identified as Class B, the first two sets of numbers of the DVR IP address must be the same as the network address. If you have any questions regarding these settings, please contact a qualified MIS professional or your ISP.

5.1.3 TCP/IP Communication Setup

Follow the instructions below to install the TCP/IP communication program into your computer.

1. Click the **Start** Menu from your computer, and point to the **Control panel.**
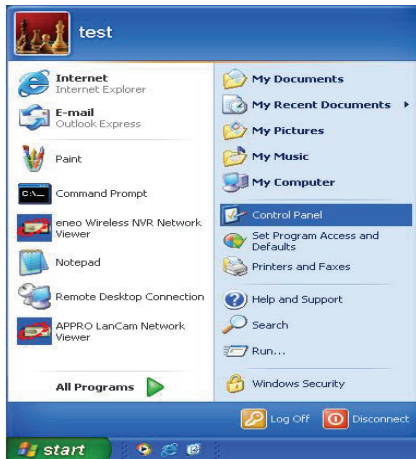
2. Click the **Network Connections** icon twice to enter the Network setting windows.
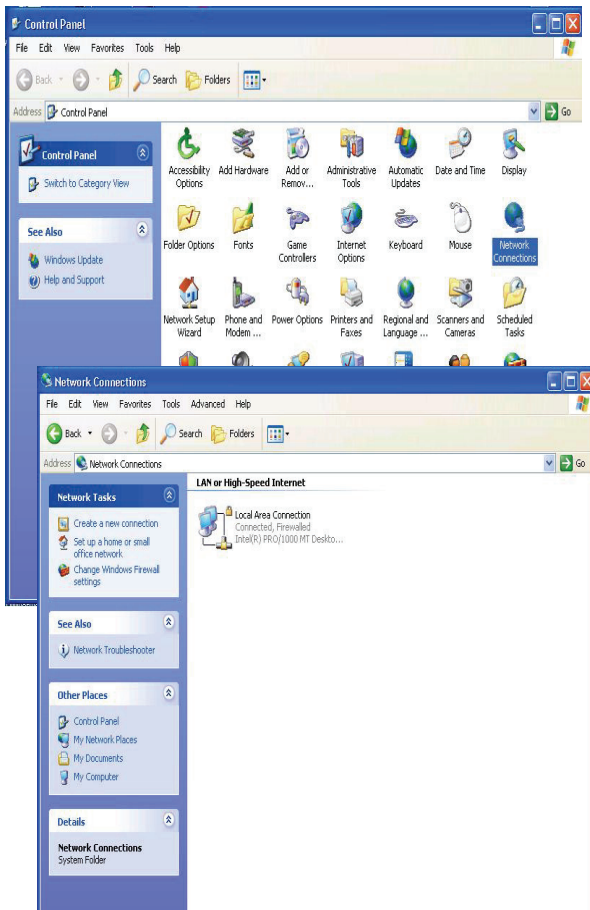
Point to the **Local Area Connection** and click the right bottom of the mouse. Click the **Properties** to enter the **Local Area Connection**.
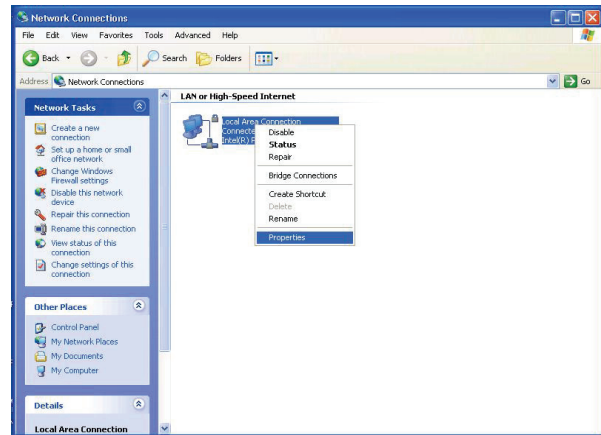
3. Click on the **Configuration** tag; check if the TCP/IC is included among the network component list. If the TCP/IP is included, please process step 5. If it is not included, please follow step 4 to install the TCP/IP.
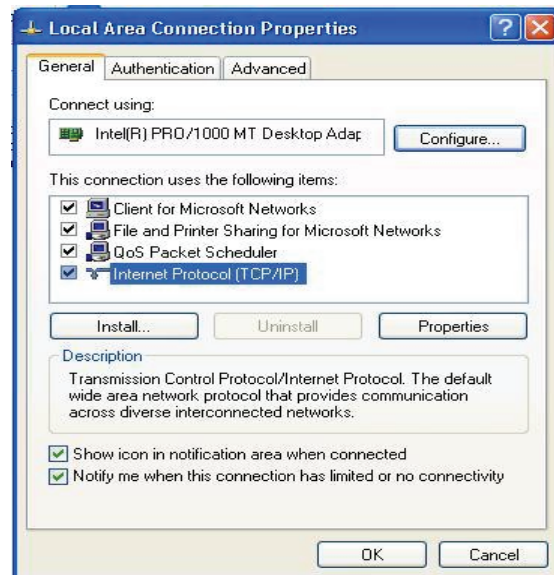
4. TCP/IP installation

During the installation, you will be requested to insert the windows XP CD ROM. After installation, the PC will be restarted.
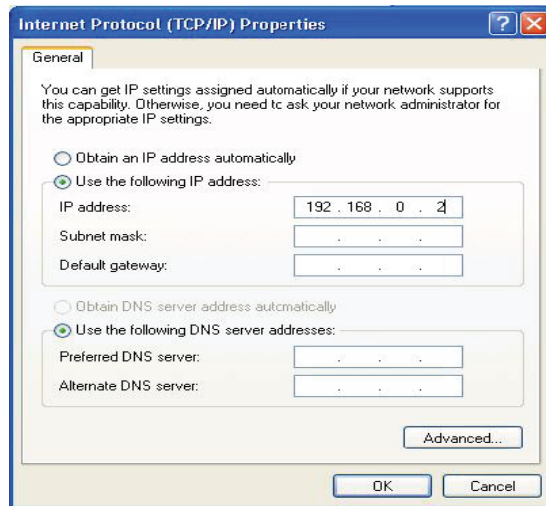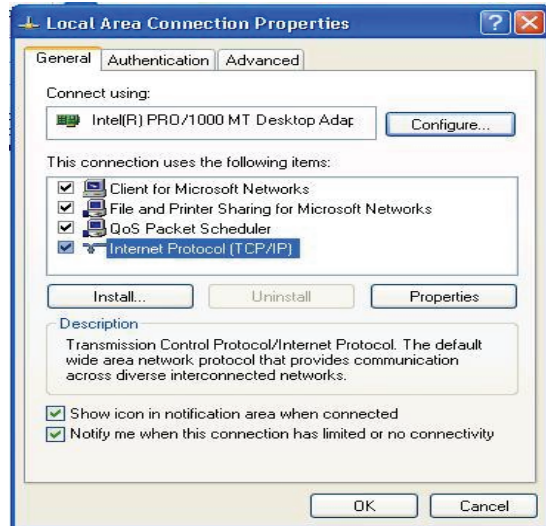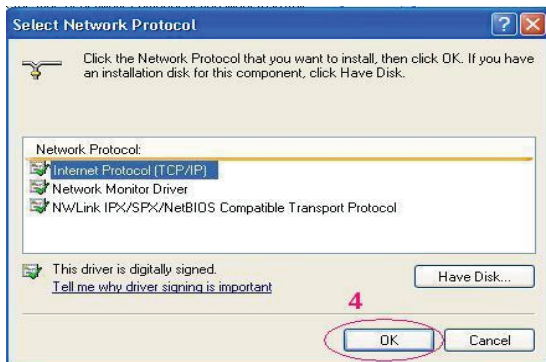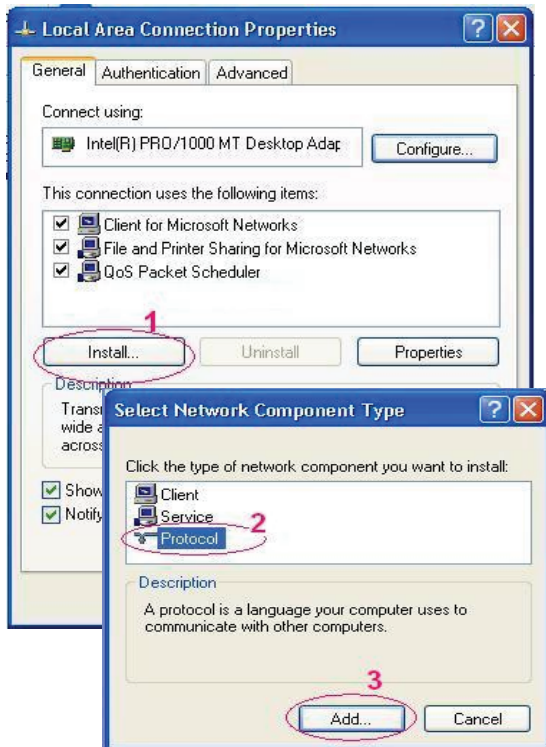
5. TCP/IP Configuration setting
- Click **Start → Control Panel → Network.Connections → Local Area Connection**
- Select **Internet Protocol (TCP/IP)**, and then click **Properties**.
- Before processing the DVR installation in a WAN, please make sure the Internet connection works properly. If not, please contact your ISP provider.

If you are using a DHCP server, please select "Obtain an IP address automatically". Any assigned the IP address for the connected DVRs must be in the same class type as the server. If there is no DHCP server, please select and specify an IP address and type in the IP address of your PC. This IP address must be different from the DVR IP but in the same class type.

NOTE: The IP address of a DVR in a network must be unique to itself as opposed to those of the other chosen PCs, but in the same class type.

5.1.4 Connection Testing

With the previous settings, follow the instructions below to ensure whether you have established the connection successfully.

1. Click <u>**Start → Command Programs**</u>

2. Type in <u>**ping 192.168.1.1**</u> then Enter. (See the sample screen below)

** This IP is the DVR IP address that is assigned for the connected DVR.
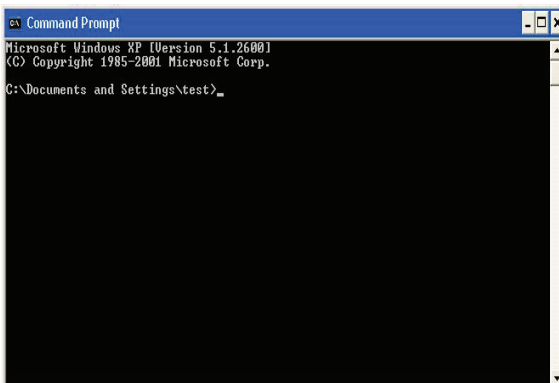
3. If you receive a response as in the sample screen below, the connection hasn't been successfully established. Please re-check all the hardware and software installation by repeating steps 1 to 5. If you still can't establish the connection after rechecking, please contact your dealer.
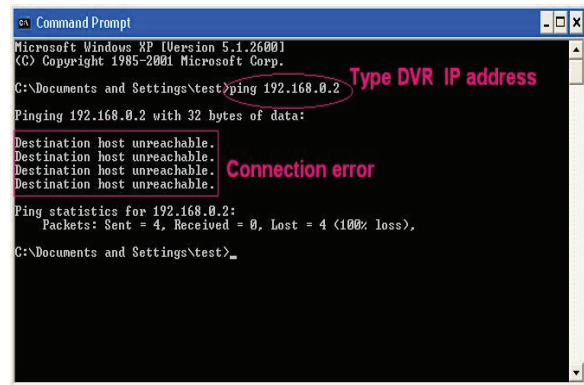
4. If you receive a response as in the sample screen below, you have successfully made the connection.
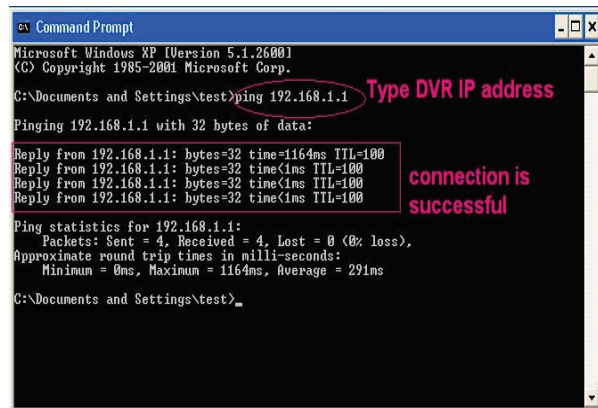
5.2 Network Viewer and Image Viewer

This section provides instructions for installing and using the Network Viewer and Image Viewer which are included with the DVR. The programs can be operated by a selected PC, which is equipped with the following requirements.

1. Intel Pentium 233MHz at least.
2. 32 MB RAM
3. Windows 95, 98, NT, and ME.
4. 4 MB Video card capable of 24-bit true-color display.
5. 5 MB free hard-disk space for software installation.
6. 10-base T network for LAN operation.

5.2.1 The Network Viewer

5.2.1.1 Introduction

The Network Viewer allows you to potentially access 16 units of the DVR from a remote desktop or a laptop in a TCP/IP networking environment. It can perform the following functions.

● View live images from the DVR.

● Store, search, and review recorded video from the DVR HDD.

● Change the regular record, event record, and timer properties.

Before you are ready to view images from a desktop, you need to have your DVR networked by obtaining a 10 base Ethernet cable (Standard RJ-45) to connect the DVR to your LAN/WAN. Now enter the main menu to set the IP address.

Physical specifications for Ethernet

Wire Type	Cat. 5
Connector Type	RJ-45
Max. Cable Length	30 m
Hub Wiring Configuration	Straight Through
PC Wiring Configuration	Cross Over

5.2.1.2 Installation

Install the Network Viewer from the supported CD.

1. Exit all applications currently running on the PC.
2. Insert the supported CD in the CD-ROM drive. The program will execute the installation automatically. Follow the on-screen instructions to proceed with the rest of the installation procedure as they appear.
3. After the installation is complete, pop up the **START** menu from your computer, and point to **Programs** / **1CH DVR Network Viewer** to open up the program selection page as shown below. Click the **1CH DVR Network Viewer** tag to start the **1CH DVR Network Viewer** program.

Install the Network Viewer for the ZIP file.

1. Save the ZIP file to your PC and extract the file to a designated directory, and open the extracted folder.
2. Double click on the **setup.exe** to execute the installation and then follow the on-screen instructions to proceed with the rest of the installation procedure as they appear.
3. After the installation is complete, pop up the **START** menu from your computer, and point to **Programs / 1CH DVR Network Viewer** to start the **1CH DVR Network Viewer** program.

NOTE: Please make sure the TCP/IP communication software has been properly set and configured on your computer. To check your TCP/IP settings, refer to the following.

10.1.3 View the DVR video from a remote PC

Once the Network Viewer is executed a Login will promptly appear. You must enter the default User Name: **admin**, password: **9999** in the respective spaces and click **OK** to log into the application.

.
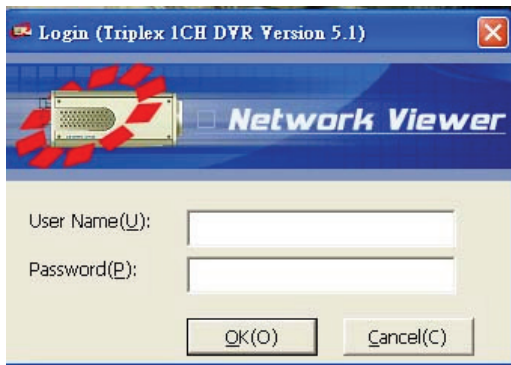
Follow the instructions below to use the Network Viewer to browse a DVR video from a remote location. Upon entering the Network Viewer, the connection box will appear as follows.

1. Click the **Find** tag to connect the whole DVR device in the LAN.
2. Choose a channel number from the Channel drop-down list.
3. Type in the user name: **admin** (the text box will only accept "admin" as the user name), and password: the same as the chosen DVR-3021 (4-digit numbers, which you set in the DVR unit).
4. Click the **Modify** tag to check the data in the Device List.
5. Please repeat steps 2 to 4 again if you wish to connect with another device.
6. Click the **Connect** tag to establish the connection between the devices and the computer. Click the **Login** tag to begin viewing images.

NOTE: Upon connection, the connection status box indicates the name and IP address of the selected device. If there's a failure to connect, a "Fail" message appears on the screen right after the User Name; otherwise an "OK" appears. To add more connections or units to the DVR, please repeat the above instructions.
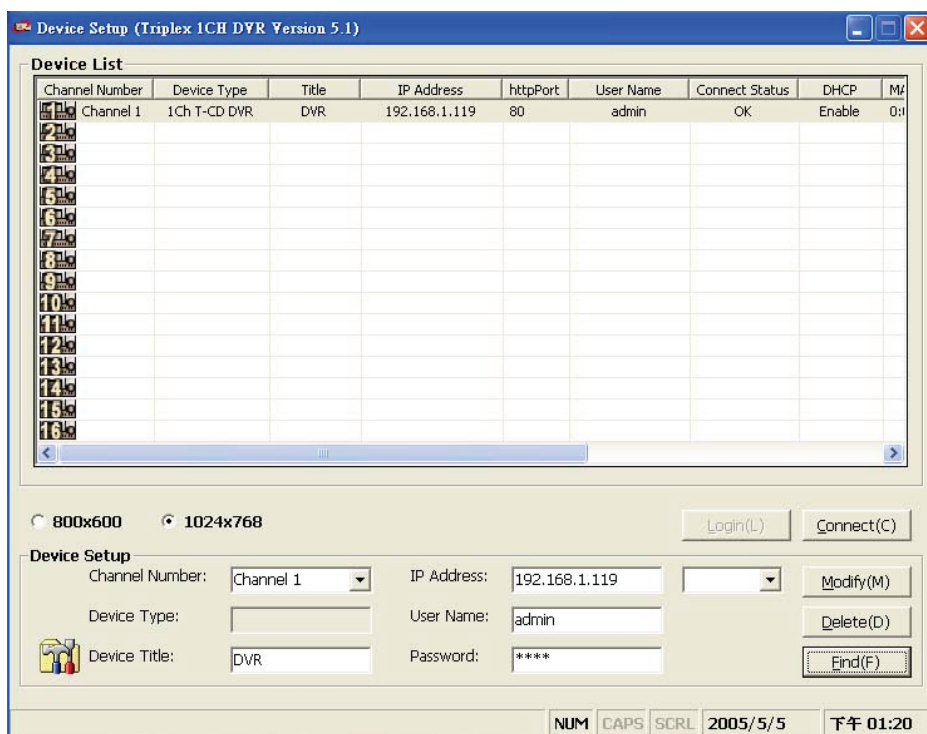
Functions	Description
Device List	Displays the entire list of connected devices if and as necessary. This list includes a lot of information about all the connected devices.
○ **800x600** ◉ **1024x768**	This option is to select the resolution of the Multi-device mode window.
Channel Number	Assigns a display location when you have multiple devices connected.
Device Type	Displays the device type.
Device Title	This blank allows you to assign a label to the chosen device.
IP Address	Type in the IP address, which you preset for the device.
User Name	This space allows you to assign a name to the chosen device.
Password	Type in the preset password for making a connection.
Add	Click to add the settings of a chosen device.
Modify	Click to change the settings of a chosen device.
Delete	Click to remove the connection of a chosen device.
Find	Click to find the connection of the entire DVR device in the LAN.
Connect	Click to establish the connection between the devices and the computer.
Login	Click to access the display page of the Network Viewer.

Multiple device mode

Once the connection has been established, click **Login** to enter the Multi-device mode window. (see the sample screen below). This window displays all the connected devices in the sequence which have been arranged when you established the connection.
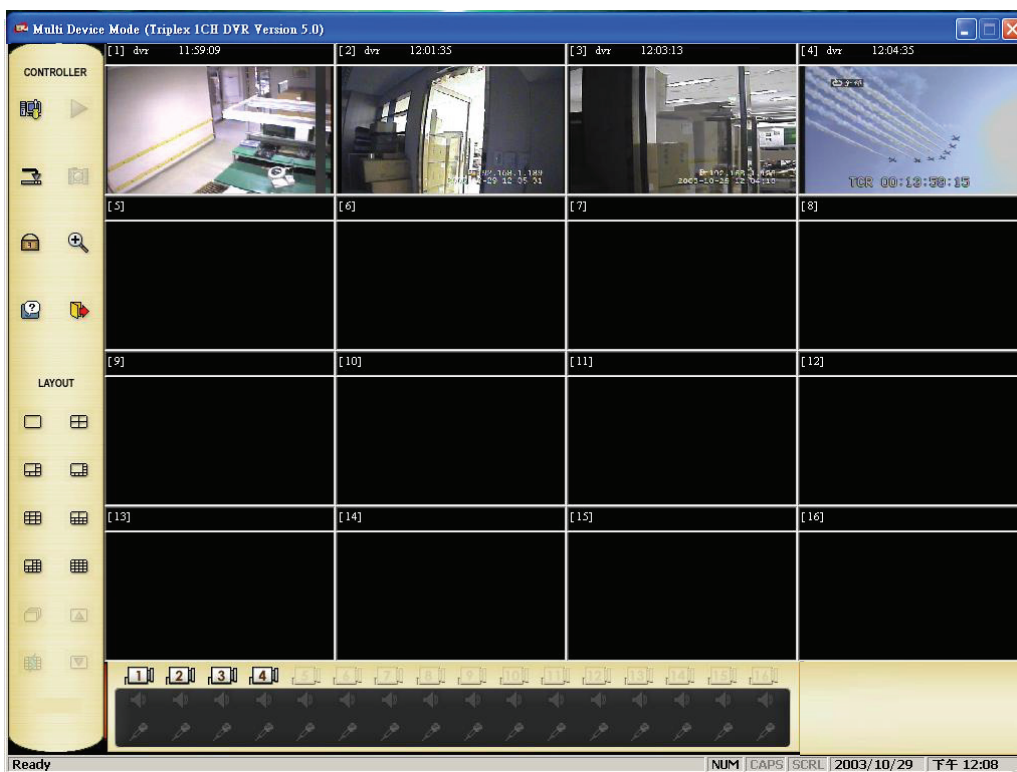
Function Buttons	Description
	The Split-Screen display function bar. This allows you to display the connected device in the multi-format screens of 1, 2x2, 5+1, 7+1,3x3, 12+1, and 4x4.
	Press to enter the PC SYSTEM SETUP window, which allows you to program the System Setup, Record Setup, and Alarm Setup.
	Press to enter the selected device (the Single-device display mode). Select this channel to enable this button.
	Click to minimize the Network Viewer into a PC system tray.
	Click to save viewed images in the local computer.
	Click to lock the system.
	Click to magnify a viewed image.
	Click to call the helper or assistant.
	Press to leave the Network Viewer program.
	The single sequence.
	The multi sequence.
	Click to page up.
	Click to page down.
	Click to enable the audio.
	Device title and image display area. Displays the title of each connected device and the time information of each displayed image in the top black bar.

Single device mode

Follow any one of the instructions below to get into the single device mode.

1. Select the desired device from the DEVICE LIST box on the Multi-device Mode. The ▶ button will enable. Click the button to view the image of the selected device and have access to certain functional operations of the device via the networ k (see the sample screen below).

Function Buttons	Description
	Playback function bar. ● Play- Click to a recorded video from the PLAY LIST. ● Pause- Click to freeze the image. ● Stop- Click to stop playing back the recorded video or cease recording. ● REC- Click to activate the recording function of the device. ● Step- Click to view images picture-by-picture.
	Click to return to the Multi-Device mode.
	Click to save a viewing image in the local computer.
	Press to enter the DEVICE SETUP window, to open the device setting page to add more devices for viewing, which allows you to program the Record Setting and Record Schedule.
	Click to lock the system.
	Channel selection box. Select a desired channel from the drop-down list; the Network Viewer will be able to display the other channels by turn.

MUX APPRO 16Ch	Multiplexer format list box. Select a MUX from the drop-down list, which is connected with the DVR, so the Network Viewer will be able to display cameras corresponding to the camera input of the Multiplexer. If your MUX isn't available, please select the **Other Multiplexer** option for use. The Viewer will display cameras in the thumbnail format. (Sequentially displaying images will appear one after another in the adjacent display window.)
4 06-16-03 15:53:11 5 06-17-03 08:04:44 6 06-17-03 08:14:29 7 06-25-03 16:45:48 8 06-27-03 17:18:41	Recorded video list box: This box allows you to access all recorded video which are stored in the HDD of the connected devices. To review a recorded video, just click an entry from the list and click the ▶ button. **PgUp/PgDn**: To scroll up and down the list.
10/29/2003 11:49:50 LIVE	DVR Status Box. This box indicates the selected device status. **PLAY**: The device is in the playback mode. **LIVE**: The device is in the live display mode. **WAIT**: The device is processing the command. **PAUSE**: Pauses the image.
TIME SEARCH 6 ÷ 30 ÷ 2003 ÷ 19 ÷ : 33 ÷ GO	This allows you to search a recorded video kept in the HDD of the device. Enter the MONTH/DAY/YEAR HOUR: MINUTE you wish to search and click GO to proceed.
▢ ⊞ ⊞ ⊡ ⊞ ⊞ ⊞ ⊞	Split-Screen display function bar: This allows you to display the selected device in multi-format screens of 1, 2x2, 5+1, 7+1,3x3, 12+1, and 4x4.
[1] 10/28/2003 11:19:51	Image display area. Displays the images of each camera and the title and time/date information on the top blue bar. Double click the image to view a full screen of the camera.
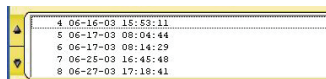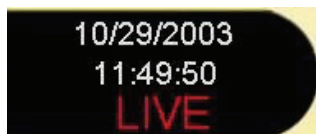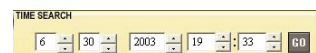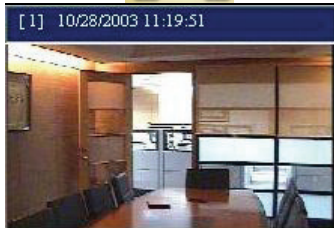
5.2.1.4 Change the Record & Timer Properties Via the Network

Follow the instructions below to reconfigure the record and schedule recording settings via the network.
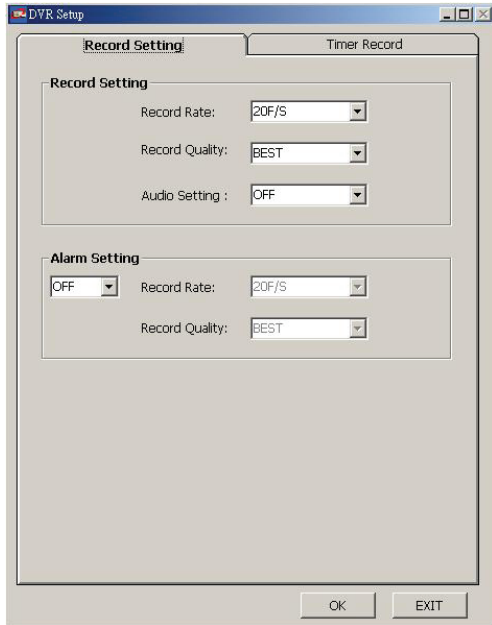
Set the regular record settings

    1. When in the single –device mode, click [icon] to enter the SETUP page, (see the sample screen as in A above)

    2. Select a desired recording rate and Quality from the corresponding drop-down list.

    3. Click the **OK** button to proceed.
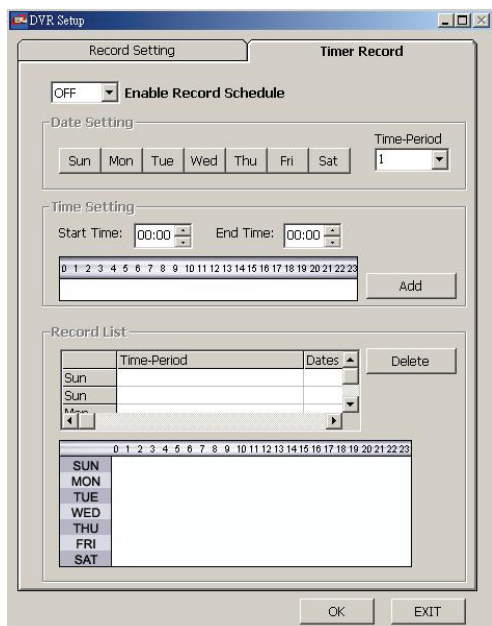
Set the Alarm record settings

    1. When in the single –device mode, click [icon] to enter the SETUP page (see the sample screen as in A above).

    2. Set **Alarm Setting** to **ON** to enable the drop-down list in the ALARM SETTING area.

    3. Select a desired recording rate and Quality from the corresponding drop-down list.

    4. Click the **OK** button to proceed.

Set the Record Schedule

    1. When in the single –device mode, click [icon] to enter the SETUP page (see the sample screen as in B above).

    2. Set the **Record Schedule** to **ON** to enable the **Record Schedule** setting area.

    3. Click the **Time-Period** button to set the schedule for recording for each day. Go to both the **Start Time** & **End Time** boxes, enter a specific **Hour: Minute** and click **Add** button to add to the **Record List**.

    4. When all required settings are completed, click **OK** to proceed.

## 5.2.1.5 Archive Images to the Computer
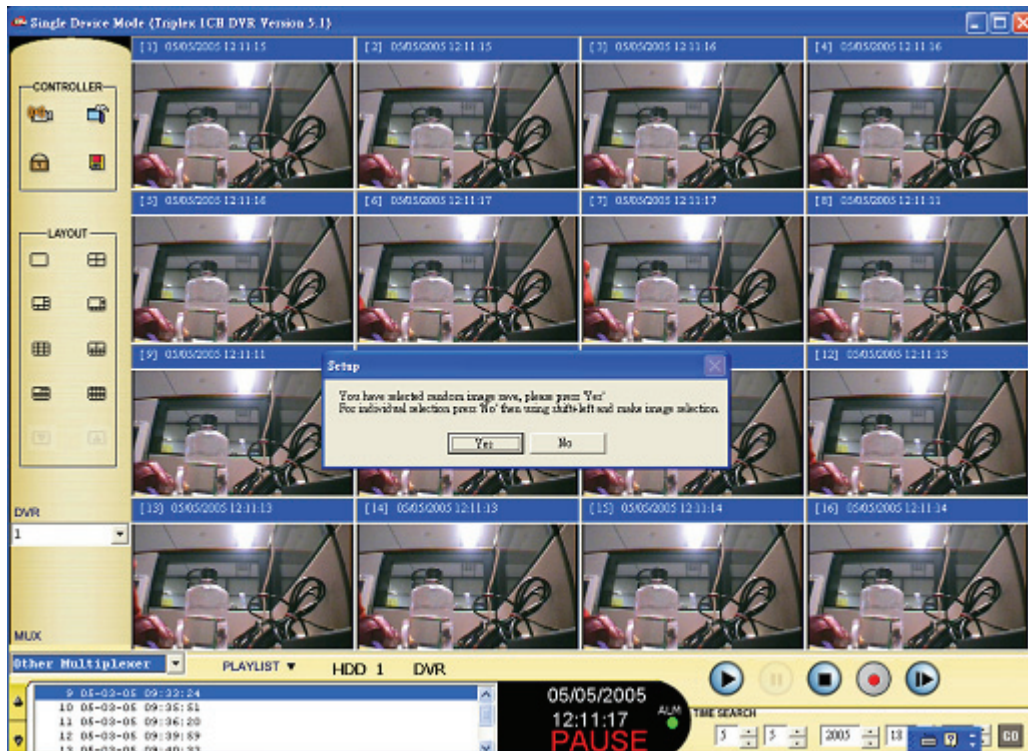
Playback images can be stored in a local PC in the JPEG format. Follow the instructions below to save the viewed images to your PC.

1. Press ![icon] to enter the following sample screen whenever it is in the pause of the playback mode.

2. For saving individual images choose **No** then press the shift key and click the left key of the mouse to select images. Press ![icon] again to save images (where the images will be stored in the folder of the C:\Program Files\ 1CH DVR Network Viewer automatically).

3. For saving random images, choose **Yes**. Select a folder in the computer for copying images in.

   Enter the number of images into the **Number Of Saving** box you wish to save in.

   Click the **Save** button; the program will automatically copy the displayed images into the designated folder. The images are saved

in the DVRxxx.jpg file name, which is displayed in the box on the right-hand side. To view a saved image, please follow the instructions in the next section to proceed.
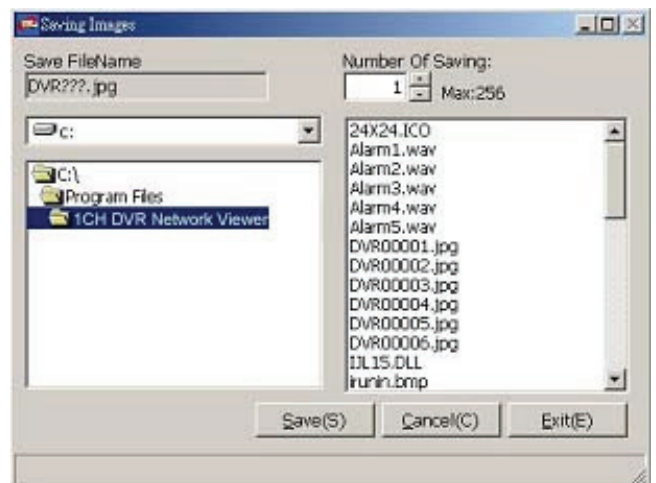
5.2.2 The Image Viewer

This is image integrity-protection software. It not only allows you to view an archived image from the SD card or HDD of a computer, but also protects an archived image from reproduction or interpolation. If an image isn't in the original format made by a DVR, the Image Viewer won't display the image and instead will send a warning message" **Wrong File, Can't Open**". Follow the instructions below to open an archived image from an SD card or a HDD.

1. Start the **Image Viewer** program (see a sample screen below). Select the folder containing image files from an SD card or a HDD.

2. Click the **PRINT** button to get a displayed image printed out from a printer.
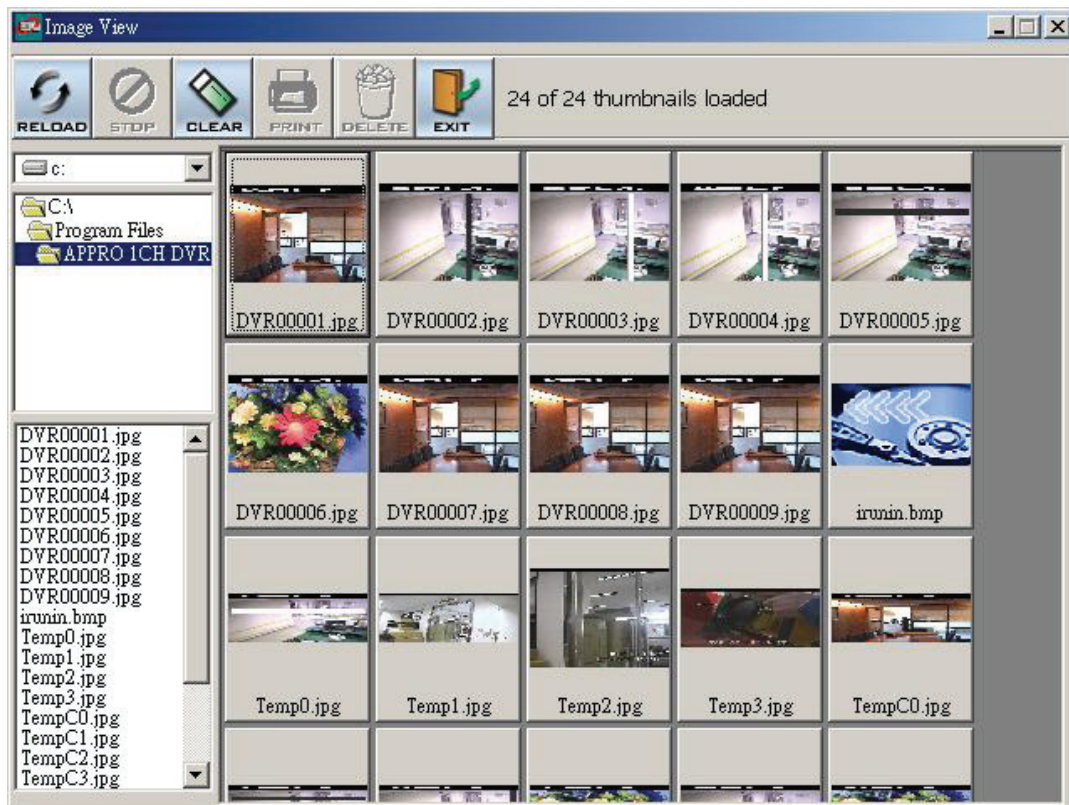
5.3 Microsoft Internet Explorer

This section provides instructions for using the Microsoft Internet Explorer.

5.3.1 Connecting the DVR

Start up the Microsoft Internet Explorer, and then follow the steps given below to connect the DVR:

1. Type in the URL address of the DVR into the URL block and press the "**Enter**" button to enter the login page. The default User Name and password are **admin** and **9999** respectively.

2. Enter the **User name** and **Password.**

3. Click the "**Login**" button and enter the home page of the DVR: both the user name and password must be provided correctly.

Browsing images from the DVR

The images from the DVR will be displayed on the home page while going online with the DVR. There are some buttons provided on the bottom of the home page for further setting.

Recorded video list box. This box allows you to access all recorded video, which are stored in the HDD of the connected devices. To review a recorded video, simply select an entry from the list and click the ▶button.
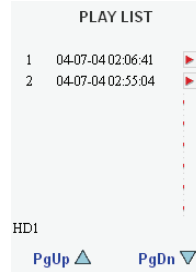
PgUp/PgDn: Enables you to scroll up and down the list.

Time & Status Box. This box indicates the device status.

This allows you to search a recorded video stored under the "Date" entry of the device. Enter the YEAR/ MONTH/DAY HOUR: MINUTE you wish to search and click the GO button to proceed.

5.3.2 Change Record / Alarm Setting

Please follow the steps given below to change the Record / Alarm setting through the network as and when necessary.

1. Click the [Setup] button on the home page to enter the Record / Alarm setting page.
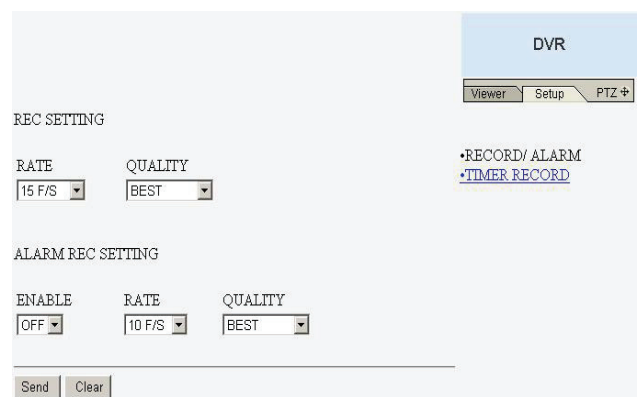
2. Adjust the Record / Alarm setting, including "REC rate", "REC quality", "ALARM REC enable", "ALARM REC rate", and "ALARM REC quality" as and when necessary.
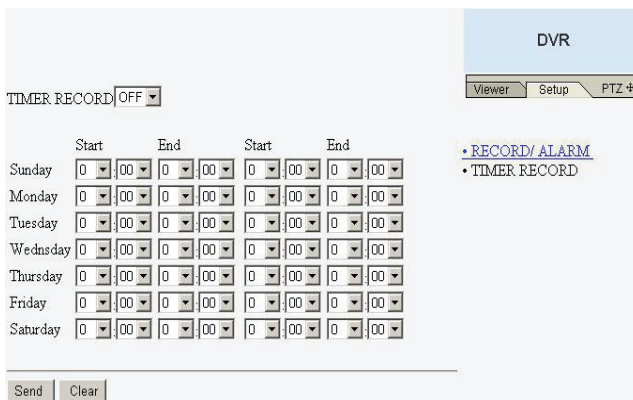
3. Click the [Send] button to submit the new

Option Buttons	Description
STOP	Click to stop playing back the recorded video.
PLAY	Click to a recorded video from the PLAY LIST.
PAUSE	Click to freeze the image.
REC	Click to activate or stop the recording function of the device.
LOG OUT	Click to leave the home page of the DVR.
Setup	Press to enter the SETUP window, and open the device setting page in order to add more devices for viewing. This allows you to program the Record Setting and Record Schedule.
Viewer	Press to enter the IMAGE window and open the device home page for viewing.
PTZ +	Click to open the control panel and remote-control the pan/tilt/zoom function of a live camera within a local network or the Internet.

Record / Alarm setting.

4. Click the [Viewer] button to return to the home page while the new image setting acts on the images to effect the desired changes instantly. (If the setting has not been changed by the above steps, any (re)entry to the home page will find images in their earlier or original setting.)

5.3.3 Change Timer Record Setting

1. Click the [Setup] button on the home page to enter the Record / Alarm setting page.

2. Click the •TIMER RECORD connection on the Record / Alarm setting page to enter the Timer Record setting page.

3. Set the **TIMER RECORD** to **ON** to enable the

TIMER RECORD function.

4. There are two time-periods available for scheduling each day. The Timer Record setting page allows users to program the time each day that the DVR will start and stop recording. The time is displayed in a 24-hour clock format. If there is a time overlap showing between two continual time-period settings, the device will automatically combine the two time-period settings into one combined time-period setting.

5. Click the [Send] button to submit the new Timer Record setting.

6. Click the [Viewer] button to return to the home page while the new image setting acts on the images to effect the desired changes instantly. (If the setting has not been changed by the above steps, any (re)entry to the home page will find images in their earlier or original setting.)

5.3.4 Pan / Tilt / Zoom Setting

Click the PTZ⊕ button on the main page to open the Speed Dome Controller page. Then select a proper Speed Dome model on the left hand side. The function varies for different Speed Domes models. Here is an example.
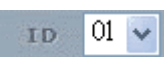

1. Click the button to control the Zoom setting on the Speed Dome Controller.

2. The right-hand set, , has four buttons, each of which, upon being clicked, will turn the camera all the way, without stopping, in one of the four designated directions. The fifth button, in the center, will stop the camera at any point you prefer.

3. The left-hand set of buttons, , has four buttons, each of which, upon being clicked, will move one short step only in any of the four designated directions.

4. Select a Speed Dome device ID from the drop-down list on the Speed Dome Controller. The Controller will be able to display the ID entries by turn.

5.

Each of the ten buttons under 'Set' is connected with a specific position and angle of either panning or tilting of the camera. Click each button to activate its particular position and angle. Press the button under "Preset" to turn the camera angle by angle in the set positions.

Each of the ten buttons on the "Clear" row can be clicked to delete the corresponding "Set" button above it. For example, if you wish to de-activate 'Set' button #4, please click 'Clear' button #4 to delete its corresponding 'Set' counterpart.

Each of the ten buttons designated 'Go to' can be clicked to view the particular corresponding angle of the position in which it is set.

6.
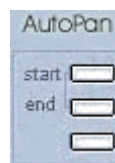
The 'AutoPan' section has three buttons. The 'Start' and 'End' buttons fix the two points of any panning movement you select. The third or bottom button sets the chosen movement in the play mode.
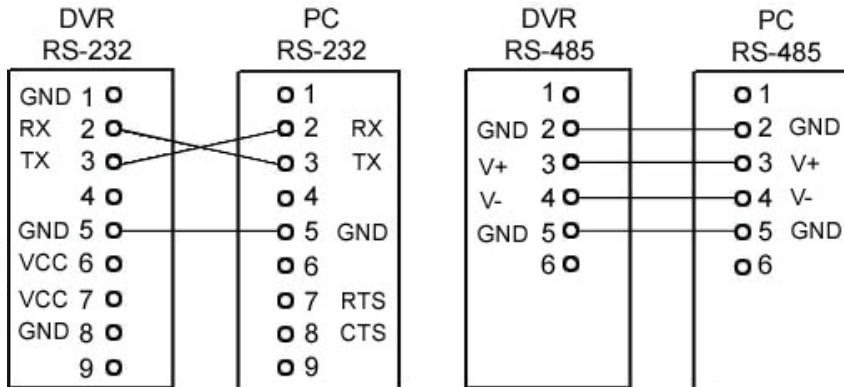
6. MISCELLANEOUS

6.1 RS-232 & RS-485 Setup & Protocol

6.1.1 RS232 & RS485 Setup

Use a Null Modem cable (the standard RS-232 9 Pin Cable with Pin 2 and Pin 3 exchanged, see pin configuration chart below for details) to connect the COM 1 on the rear panel of the DVR to a PC.

Set the **RS-232** option to **ON** in the **COMMUNICATION** page of the setup menu.

Set the PC communication parameters: 9600 bps, No Parity, 8 Data Bits, 1 Stop Bit.

6.1.2 Communication Protocol

6.1.2.0 General Command Format

<Lead Code = 0x41>, < Dest ID >, < Src ID >, <Main category >, <Second category >, {<Number of parameters>, <Parameter 1>, <Parameter 2> ..,} <End Code= 0x4f>

Lead Code   = 0x41

Dest ID   = 0x01

Src ID   = 0x20

Main Category = 0x01   Keys and Signals

              = 0x02   Command

Second Category   = 0x01 Handshake

                    = 0x02 Request Time/Set Time

                    = 0x06 Request System State

                    = 0x0b Time Search

                    = 0x10 Request HDD Info

                    = 0x11 Request REC Position

                    = 0x12 Playback Immediately

End Code= 0x4f

MISCELLANEOUS

6.1.2.1 Keys and signals (Main Category = 0x01)

PC message: <0x41>, <0x01>, <0x20>, <0x01>, <Key Value>, <0x4f>

< The value of a specific front panel key >

	DEC	HEX	
KEY_PLAY	1	0x01	
KEY_STOP	3	0x 03	
KEY_PAUSE	4	0x 04	
KEY_REC	6	0x 06	
KEY_SETUP	7	0x 07	
KEY_ENTER	8	0x 08	
KEY_SEARCH	10	0x 0A	
KEY_DISPLAY	11	0x 0B	
KEY_UP	13	0x 0D	
KEY_DOWN	14	0x 0E	
KEY_LEFT	15	0x 0F	
KEY_RIGHT	16	0x 10	
KEY_MONITOR	36	0x 24	
JOG_L	128	0x 80	
JOG_R	129	0x 81	
KEY_SHUTTLE_L8	130	0x 82	(-100x, -1/16x)
KEY_SHUTTLE_L7	131	0x 83	(-100x, -1/16x)
KEY_SHUTTLE_L6	132	0x 84	(-30x, -1/8x)
KEY_SHUTTLE_L5	133	0x 85	(-16x, -1/8x)
KEY_SHUTTLE_L4	134	0x 86	(-8x, -1/4x)
KEY_SHUTTLE_L3	135	0x 87	(-4x, -1/4x)
KEY_SHUTTLE_L2	136	0x 88	(-2x, -1/2x)
KEY_SHUTTLE_L1	137	0x 89	(-1x, -1/2x)
KEY_SHUTTLE_CT	138	0x 8A	
KEY_SHUTTLE_R1	139	0x 8B	(2x, 1/2x)
KEY_SHUTTLE_R2	140	0x 8C	(4x, 1/2x)
KEY_SHUTTLE_R3	141	0x 8D	(8x, 1/4x)
KEY_SHUTTLE_R4	142	0x 8E	(16x, 1/4x)
KEY_SHUTTLE_R5	143	0x 8F	(30x, 1/8x)
KEY_SHUTTLE_R6	144	0x 90	(100x, 1/8x)
KEY_SHUTTLE_R7	145	0x 91	(100x, 1/16x)
SIGNAL_REC_IN	163	0x A3	
SIGNAL_ALARM_RESET	165	0x A5	
SIGNAL_REC_OUT	169	0x A9	

SIGNAL_ALARM_IN	189	0x BD
SIGNAL_ALARM_OUT	209	0x D1

6.1.2.2 COMMAND (Main Category=0x02)

A. Handshake (Second Category=0x01)

PC request: <0x41>, <0x01>, <0x20>, <0x02>, <0x01>, <0x00>, <0x4f>

DVR Response: <0x41>, <0x20>, <0x01>, <0x02>, <0x08>, <0x00>, <0x4f>

B. Request Time (Second Category=0x02)

PC Request: <0x41>, <0x01>, <0x20>, <0x02>, <0x02>, <0x00>, <0x4f>

DVR Response: <0x41>, <0x20>, <0x01>, <0x02>, <0x02>, <0x07>, <7 Time
Value >, <0x4f>

The following case is an illustration of **< 7 Time Value>**

2004/06/20 17:05:00 = <0xD4>, <0x07>, <0x06>, <0x14>, <0x11>, <0x05>, <0x00>

C. Set Time (Second Category=0x02)

PC Request: <0x41>, <0x01>, <0x20>, <0x02>, <0x02>, <0x07>, < 7 Time Value >,
<0x4f>

The following case is an illustration of **< 7 Time Value>**

2004/06/20 17:05:00 = <0xD4>, <0x07>, <0x06>, <0x14>, <0x11>, <0x05>, <0x00>

DVR Act: Changing the time and date.

D. Request State (Second Category=0x06)

PC Request: <0x41>, <0x01>, <0x20>, <0x02>, <0x06>, <0x00>, <0x4f>

DVR Response: <0x41>, <0x20>, <0x01>, <0x02>, <0x06>, <0x01>, <System
State = 0..>, <0x4f>

Description of <System State>:

STATE_STOP	0
STATE_PLAY	3
STATE_SETUP	6
STATE_SEARCH	7
STATE_BACKUP	15

E. Time Search (Second Category=0x0b)

PC message: <0x41>, <0x01>, <0x20>, <0x02>, <0x0b>, <0x06>, <6 Bytes Date/Time>,
<0x4f> where < 6 bytes Date/Time >, = year (2 bytes, =LowByte + HighByte*256),
month (1 byte), day (1 byte), hour (1 byte), min (1 byte)

Example: to search 06/12/2004 17:00 the Date/Time = <0xd4>, <0x07>, <0x06>,
<0x0c>, <0x11>, <0x00> where 2004= 212(=0xd4) + 7(=0x07) *256

F. Request HDD Info (Second Category=0x10)

PC message: <0x41>, <0x01>, <0x20>, <0x02>, <0x10>, <0x00>, <0x4f>

DVR Response: <0x41>, <0x20>, <0x01>, <0x02>, <0x10>, <0x32>, <0x00>,
<0x00>, <48 Bytes Data> <0x4f>

<48 Bytes Data>=4 HDD Status(Primary Master/Slave, Secondary Master/Slave)

Every HDD use 12 Bytes=

> #0   :HDD Exist (if = 1)
>
> #1   :Active HDD (if = 1)
>
> #2   :Current HDD for REC (if = 1)
>
> #3   :Current HDD for PLAY (if = 1)
>
> #4…#7   :Capacity
>
> #8.. #11   :REC/PLAY Position

G. Request REC Position (Second Category=0x11)

PC message: <0x41>, <0x01>, <0x20>, <0x02>, <0x11>, <0x00>, <0x4f>

REC Mode

DVR Response: <0x41>, <0x20>, <0x01>, <0x02>, <0x11>, <0x08>, <HDD#>,

<0x0>, <4 Bytes REC Position>, <2 Bytes Image NO.>, <0x4f>

Get HDD#, REC Position and Image NO. used in **Playback Immediately** command

Non REC Mode

DVR Response ERROR: <0x41>, <0x20>, <0x01>, <0x02>, <0x11>, <0x01>, <0x45>,

<0x4f>

H. Playback Immediately (Second Category=0x12)

PC send: <0x41>, <0x01>, <0x20>, <0x02>, <0x12>, <0x0a>,<HDD#>, <0x0>,

<0x0>, <0x0>,<4 Bytes REC Position>, <2 Bytes Image NO.>, <0x4f>

On Success

DVR Response: <0x41>, <0x20>, <0x01>, <0x02>, <0x12>, <0x00>, <0x4f>

On **Error**

DVR Response ERROR: <0x41>, <0x20>, <0x01>, <0x02>, <0x12>, <0x01>,

<0x45>, <0x4f>

6.2 Hard Disk Installation

Usually the unit comes with one hard-disk drive installed in compartment HD 1, which is default-configured as a master. The jumper settings configuration of the installed hard-disk drives for the unit and compatible drives which can be used with this unit are listed in the table below. To install two hard disk drives in compartment HD 1 and HD 2, please take the following steps. (For removable model only)

The jumper settings of hard-disk drives for the system

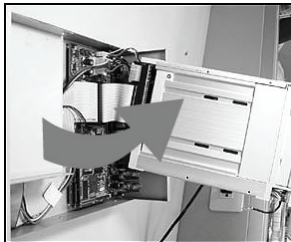|	Location	Jumper
IDE 1	Compartment HD 1	Master
IDE 2	Compartment HD 2	Master

6.2.1 Built-in hard disk
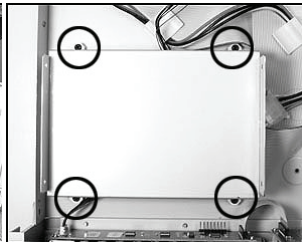
1.
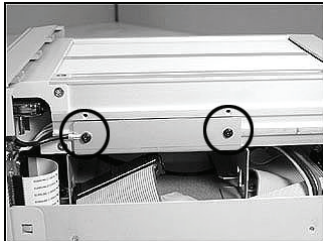
Unscrew all the **4** mounting screws on the mobile rack of the unit and detach it.

2.   **3.**

Carefully lift the mobile rack to a vertical position.

Unscrew the secured screws to detach the hard disk rack.
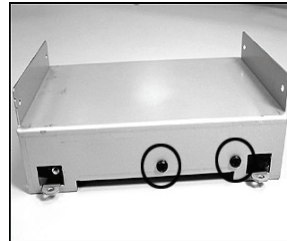
4.   **5.**

Setting the jumper of your hard disk driver: The way to set the jumper of the drive varies between manufacturers; please refer to the instructions on the driver to set the jumpers in the **master** position.
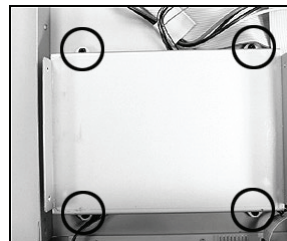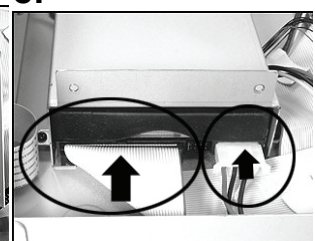
Place the hard disk in the rack.

6.

Secure the driver in the rack using **4** mounting screws in the side-mounting holes. Please don't tighten the screws too much, otherwise that may damage the driver.
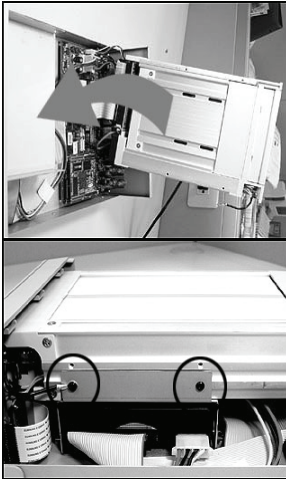
7.   **8.**

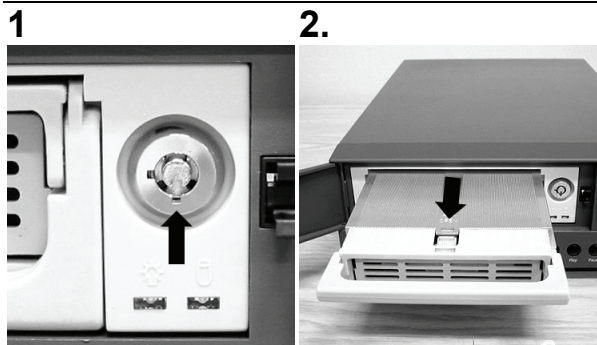Screw the rack into the device, tightening in all the **4** screws.

Attach the interface connector and the power connector to the drive. Please note the red lining of the IDE cable and the red wire of power cable must line up side by side.

9.

Place the mobile rack back onto the device and screw in all the **4** screws.

6.2.2 Mobile Rack (FOR REMOVABLE HDD MODEL)

1	**2.**	**3.**	**4.**
Make sure that the key is unlocked.	Pull the active handle outward to detach the carrier body from the mobile rack.	Slide the top cover backward and remove.	Setting the jumper of your hard disk driver. The way to set the jumper of the drive varies between manufacturers; please refer to the instructions on the driver to set the jumpers in the master position.

5

Attach the interface connector and the power connector to the drive. Please note the red lining of the IDE cable and the red wire of power cable must line up side by side.
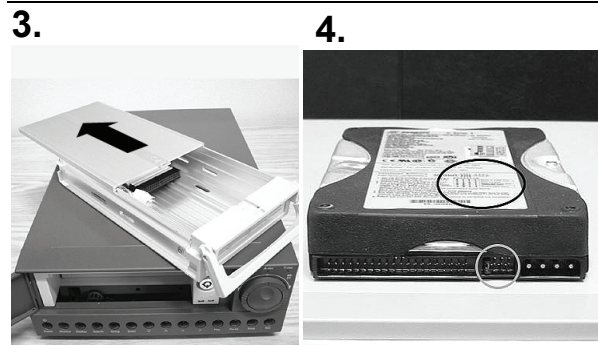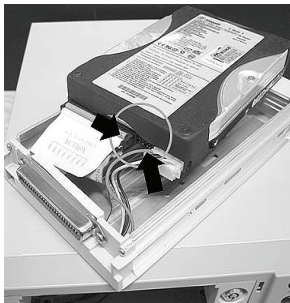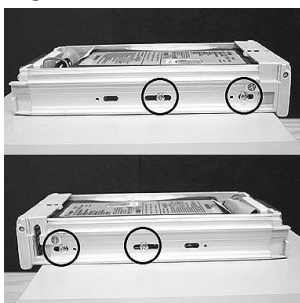
6

Place the HDD inside the mobile rack. Use four of the provided screws.

11

Lock the Key.

7
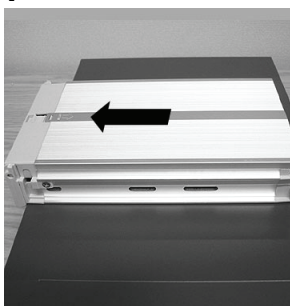
Place the top cover back on the carrier body by sliding it forward.

8
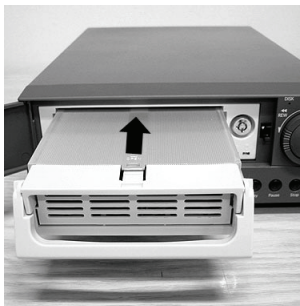
Slide the carrier body back in the mobile rack.

9

Push the carrier body further into the mobile rack until fully inserted.

10

Push the active-handle inward.

6.3 System Default

SETUP MENU

RECORD
ALARM/ MOTION
CLOCK/ TIMER
COMMUNICATION
DISK
SYSTEM

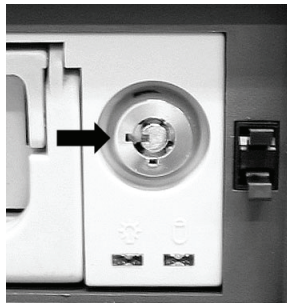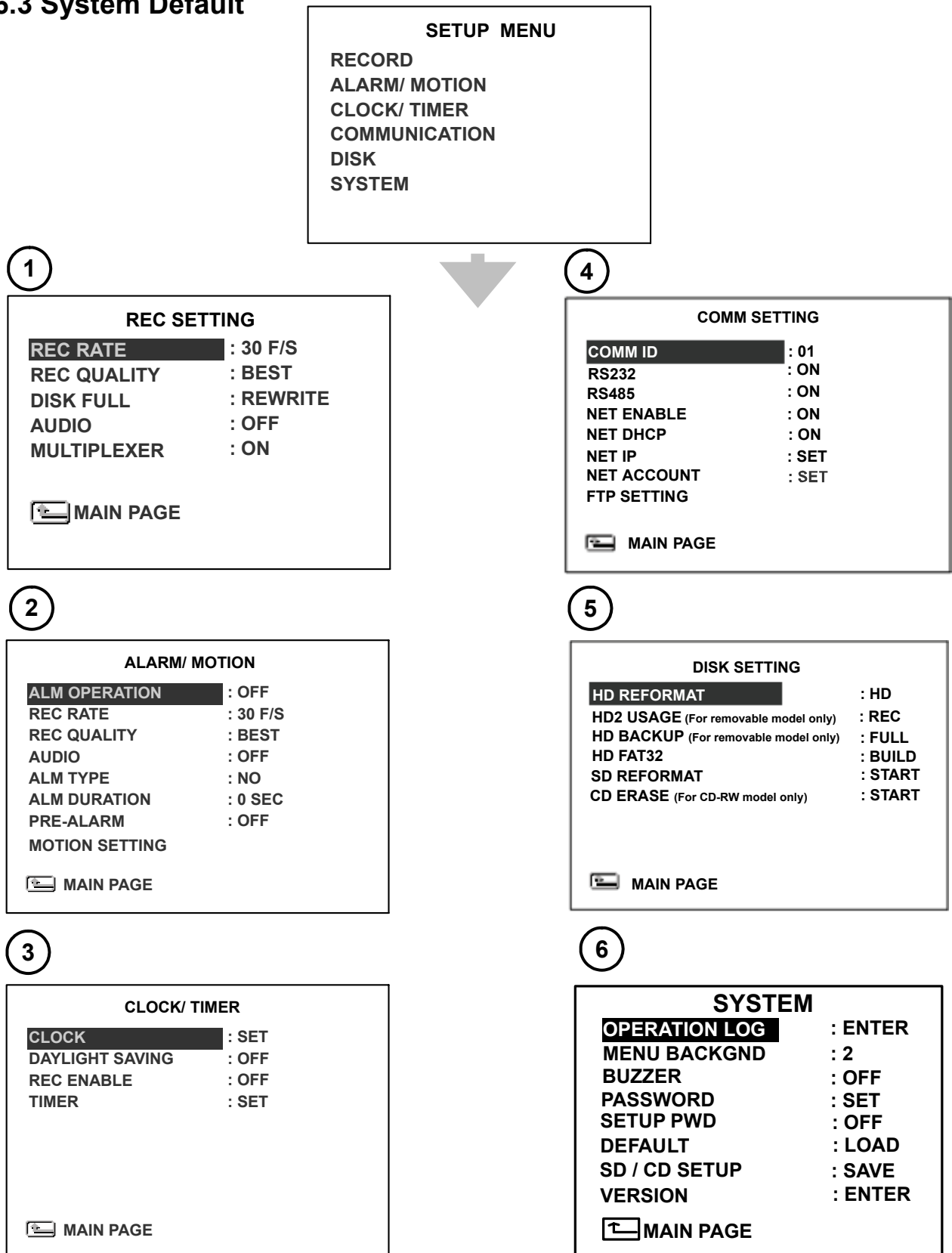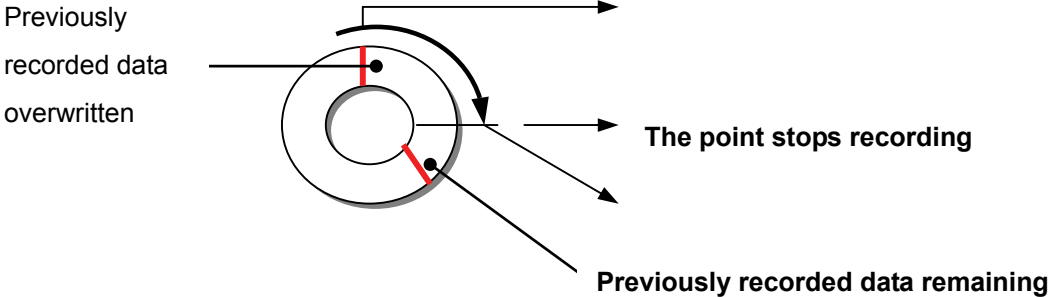**① REC SETTING**

REC RATE	: 30 F/S
REC QUALITY	: BEST
DISK FULL	: REWRITE
AUDIO	: OFF
MULTIPLEXER	: ON

▭ MAIN PAGE

② ALARM/ MOTION

ALM OPERATION	: OFF
REC RATE	: 30 F/S
REC QUALITY	: BEST
AUDIO	: OFF
ALM TYPE	: NO
ALM DURATION	: 0 SEC
PRE-ALARM	: OFF
MOTION SETTING	

▭ MAIN PAGE

③ CLOCK/ TIMER

CLOCK	: SET
DAYLIGHT SAVING	: OFF
REC ENABLE	: OFF
TIMER	: SET

▭ MAIN PAGE

④ COMM SETTING

COMM ID	: 01
RS232	: ON
RS485	: ON
NET ENABLE	: ON
NET DHCP	: ON
NET IP	: SET
NET ACCOUNT	: SET
FTP SETTING	

▭ MAIN PAGE

⑤ DISK SETTING

HD REFORMAT	: HD
HD2 USAGE (For removable model only)	: REC
HD BACKUP (For removable model only)	: FULL
HD FAT32	: BUILD
SD REFORMAT	: START
CD ERASE (For CD-RW model only)	: START

▭ MAIN PAGE

⑥ SYSTEM

OPERATION LOG	: ENTER
MENU BACKGND	: 2
BUZZER	: OFF
PASSWORD	: SET
SETUP PWD	: OFF
DEFAULT	: LOAD
SD / CD SETUP	: SAVE
VERSION	: ENTER

▭ MAIN PAGE

6.4 O.S.D Message

No.	O.S.D Message	Meanings
1	NO DISK	No hard-disk detected after power activated.
2	BATTERY LOW	Suggest change the battery and reset the system time.
3	LOADING	System Boot up.
4	VIDEO LOSS	Video loss.
5	VIDEO IN	Video input source.
6	KEY LOCKED	Key lock function is on.
7	KEY UNLOCKED	Key lock function is off.
8	n1 OF n2 ITEMS PROGRESS n3 %	BACKUP n1/n2 NOW.
9	BACKUP COMPLETE	Backup complete.
10	HD2 SPACE NOT ENOUGH	HD2 has not enough space for backup.
11	NO ENTRY FOR BACKUP	No backup is possible.
12	BACKUP INCOMPLETE	Backup incomplete, since the user has pressed the STOP button to stop it.
13	NOT FOUND	The system cannot find a video in the Search function.
14	END	Playback of recorded video has reached the end point.
15	DISK FULL	Hard-disks are full; this happens only when the DISK FULL item in the setup menu is set to STOP.
16	EMPTY	The user presses the PLAY button or uses the SEARCH function, but no video can be played.
17	SET TO NTSC, PLS RESTART	System has to be set to NTSC, please reboot (PAL is similar).
18	SOFTWARE UPDATE	Software update.
19	PLEASE RESTART	The system should be rebooted after the software has been updated.
20	NO DISK	The user has pressed the Save key without putting in an SD card, or there is a disk error.
21	DATA NOT CONTINUOUS	The system finds data in installed HDs cannot be used contiguously. Suggest you remove HD2 from the system.
22	DISK ATTACHED	HD2 has been attached.
23	DISK REMOVED	HD2 has been removed.
24	FAN STOPPED	The chassis fan has stopped for over 30 seconds.
25	HDn ERROR AT xxxxx	There has been a hard-disk error during recording, where n is the hard-disk number and xxxxx is the hexadecimal location.
26	NOT PRESENT	When the user tries to clear a disk that was not attached in the setup menu.
27	SAVE TO DISK	Start saving to the JPEG file.
28	SAVE TO Fnnn. JPG	Saving to Fnnn. JPG (where nnn= 0..999)
29	SAVE OK	Save to the JEPG is ok.
30	SD CARD WRITE PROTECTION	An SD card is write-protected; or, there is an error.

6.5 Time Index Table

HD1

1	12-02-03 12:20:55
2	12-02-03 13:30:33
3	01-30-04 16:00:34
⋮	
3000	02-03-04 16:00:56

3000 Indexes

HD1

1	12-02-03 12:20:55
2	01-30-04 16:00:34
⋮	
2999	02-03-04 16:00:56
3000	02-08-04 17:30:58

3000 Indexes

Previously recorded data overwritten

The point stops recording

Previously recorded data remaining
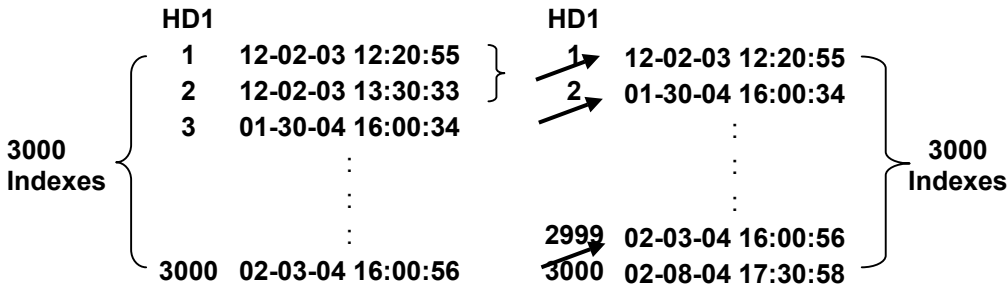
The DVR will generate a **Time Index Table** indicating recorded data is kept in a particular HDD. This allows individually selected recorded data to be displayed via the alarm list search and full list search. The maximum number of lists, for a given HDD, is **3000**. When the list of any given HDD is used up and the disk is not full, the unit will still use the rest of the space for recording. In such a case, an index for the recent recorded data will be generated and the index of the next oldest data will be erased so that the list does remain 3000 in total. And the next oldest data will be kept in the index of the corresponding oldest data. For any newly-recorded data, this approach will be applied until the disk becomes full.

In the rewrite recording mode, when the archived hard disk drive is full, the DVR will start overwriting the oldest data recorded. As the previous recorded data is being overwritten by the recent recording, the indicating time index of that data will be changed corresponding to the starting time of the remaining session. The index of the session will be deleted from the table when it is fully overwritten.
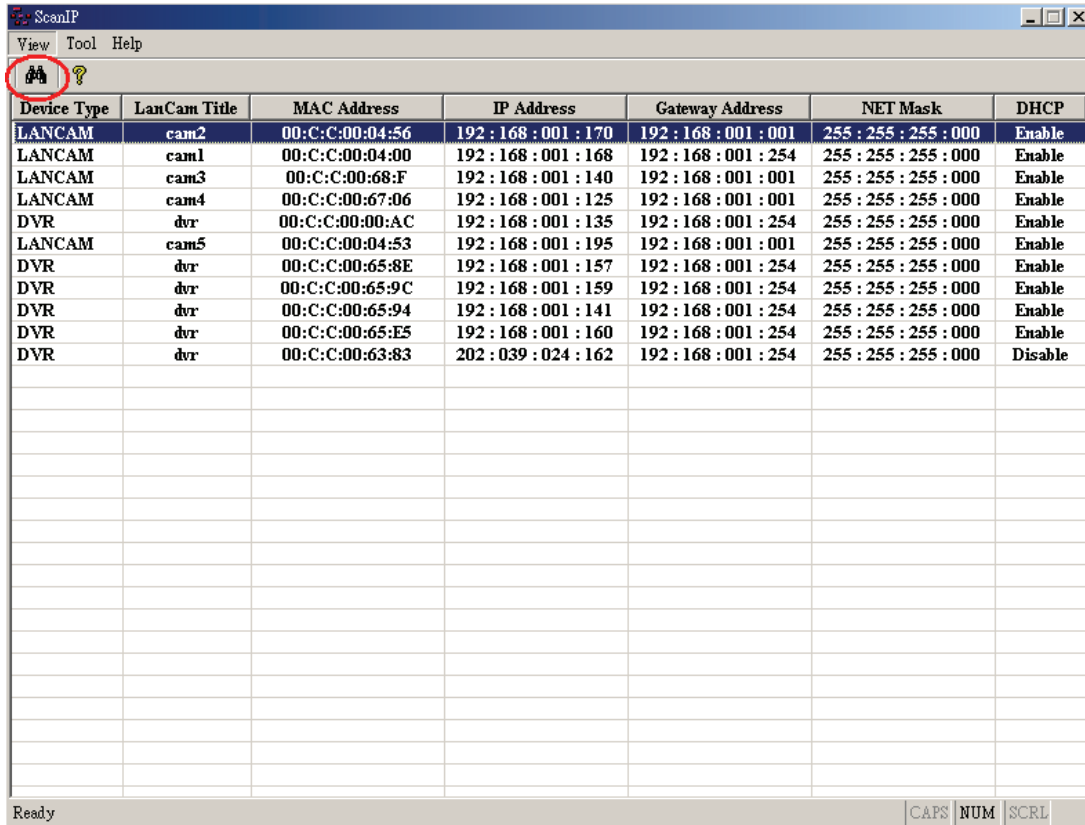
6.6 Specifications

Model Number	IV-110TX-SN	IV-110TX-SN-CD
Resolution	NTSC: 720 x 240 pixels ; PAL: 720 x 288 pixels	
Video In	Composite Video In (BNC) x 1, Multiplexer Monitor In (BNC) x 1	
Video Out	Composite Video Out (BNC) x 1, Multiplexer Monitor Out (BNC) x 1	
Audio In/Out	Line In / Out (RCAx2), 16 bits, 11 KHz / 22KHz	
Storage Media	> 600 GB / 1 Fixed HDD, 1 Removable HDD	>300Gb / 1 Fixed HDD
Compression	MJPEG	
Memory Card	SD Card (JPEG / AVI)	
Archive	Hot Swappable Removable HD / SD Card	CD-RW / SD Card
Watermark	Digital Signature	
Recording Rate	NTSC: 60 ips (720x240); PAL:50 ips(720x288)	
Image Size	Best(48KB) / High(32KB) / Standard(21KB) / Basic(16KB)	
Recording Mode	Schedule / Manual / Alarm / Circular	
Alarm Recording	Event / Pre-Alarm / Post Alarm	
Pre-Alarm Recording	100 pictures	
Playback Speeds	Frame Stepping, 1/16x,1/8x,1/4x,1/2x,1x,2x,4x,8x,16x,30x,100x	
Record Search	Alarm / Time / Event list / Filter(thumbnail) / SD card	Alarm / Time / Event list / Filter(thumbnail) / SD card / CD
OSD Language	English / Chinese(T)	
Set-up Menu	Multi-layer / Network setting	
Log list	2000 records	
Alarm In/Out	1 Alarm Input / 1 Alarm Output	
Built-in Buzzer	Yes	
Motion Detection	Yes	
Communication Port	RS-232, RS-485, and Ethernet Port	
Network Interface	Ethernet (RJ-45 10/100 base-Tx) x 1	
Network Protocol	TCP/IP, DHCP, HTTP, UDP, FTP, PPP	
Software Upgrade	Upgrade via Memory Card(SD Card)	
Password Protection	Operation / Menu Setup / Remote Access	
Network Capabilities	Archives images as JPEG formats, Decords multi-brand multiplexers, Remote-control live or recorded images	
Power Supply (AC adapter)	Input: 100V-240V, 50 Hz/60 Hz; Output: DC12V max 5A	
Dimensions	Half-size mountable 220 mm x 94 mm x 340 mm EIA 19" 2U	
Weight	About 3.9 kg	
Operation Temperature	5° C ~ 40° C (41° F ~ 104° F)	
Regulation	FCC, CE	
Accessories Provided	AC Adapter x 1	
	Instruction manual x 1	
	Power cord x 1	
	CD x 1	
	Screw (#6-32UNC) x 4	N/A
	Key x 2	N/A

*Design and specifications subject to change without notice.

6.7 Compatible Multiplexer Devices

Manufacturer	Model	N/P	Channel	COLORS	Work with DVR	Decode by VIEWER
APPRO	MPX-9004, 9104	NTSC / PAL	4Ch	Color, B/W	√	√
	MPX-9019, 9119	NTSC / PAL	9Ch	Color, B/W	√	√
	MPX-9016, 9116	NTSC / PAL	16Ch	Color, B/W	√	√
ATV	DPX9	NTSC / PAL	9 Ch	Color	√	√
	DPX16	NTSC / PAL	16Ch	Color	√	√
DM	SPC2/D/N/04M	NTSC / PAL	4Ch	Color	√	√
	SLDX16C	NTSC / PAL	16Ch	Color	√	√
WVC	MPX-C9D	PAL	9Ch	Color	√	√
	MPX-C16D	PAL	16Ch	Color	√	√
	TPX-C1600T	PAL	16Ch	Color	√	√
DYNACOLOR	D7291	NTSC / PAL	9Ch	Color	√	√
	D7261	NTSC / PAL	16Ch	Color	√	√
	D7260	NTSC / PAL	16Ch	Color	√	√
ENEO	VBM-7001	PAL	4Ch	B/W	√	√
	VCM-7001	PAL	4Ch	Color	√	√
	VCMD-5016	PAL	16Ch	Color	√	√
HISHARP	DX72	NTSC / PAL	16Ch	Color	√	√
IBT	CX904	NTSC / PAL	4Ch	Color	√	√
	CX916	NTSC / PAL	16Ch	Color	√	√
KOBI	K-69C-4	NTSC / PAL	4Ch	Color	√	√
	K-69C-9	NTSC / PAL	9Ch	Color	√	√
	K-69C-16	NTSC / PAL	16Ch	Color	√	√
MultiView	MV 14CD	NTSC / PAL	4Ch	Color	√	√
	MV 19CD	NTSC / PAL	9Ch	Color	√	√
	MV 116CD	NTSC / PAL	16Ch	Color	√	√
PELCO	Duplex 9CH	PAL	9Ch	Color	√	√
	Duplex 16CH	PAL	16Ch	Color	√	√
PROVIDEO	RMX-4CD	NTSC	4Ch	Color	√	√
	RMX-9CD	NTSC	9Ch	Color	√	√
	RMX-16CD	NTSC	16Ch	Color	√	√
ROBOT	MV16e	NTSC	16Ch	B/W	√	√
	MV96p	NTSC	16Ch	Color	√	√
	MV99p	PAL	9Ch	Color	√	√
Santec	4channel	PAL	4Ch	Color, B/W	√	√
	9channel	PAL	9Ch	Color, B/W	√	√
	16channel	PAL	16Ch	Color, B/W	√	√
SANYO	MPX-CD163	PAL	16Ch	Color	√	√
Sensormatic	RV2216	NTSC	16Ch	Color	√	√
TOSHIBA	JK-MX16	NTSC	16Ch	Color	√	√
Vantage	VDX04	PAL	4Ch	Color, B/W	√	√
	VDX09	PAL	9Ch	Color, B/W	√	√
	VDX16	PAL	16Ch	Color, B/W	√	√
Videoline	S9104	NTSC / PAL	4Ch	Color	√	√
	S9119	NTSC / PAL	9Ch	Color	√	√
	S9116	NTSC / PAL	16Ch	COLOR	√	√

6.8 ScanIP

Follow the instructions below to use the ScanIP software to search the DVR devices in a local network.

1. Click the ![binoculars icon] button to discover the connection of the all-type device in the LAN. The **Device List** will display the connection of the all-type device.

2. Select the desired device of the DVR from the **Device List**.

3. Click the desired device to show the window while the DVR information acts to display the desired changes instantly.

4. Do you want to execute an auto search for free IP?
   If and when you want to auto search the free IP, select "Yes" or "No". If clicked "Yes" the software will provide the "Free IP Address" boxes on the right side of the window. If you click "No", these address boxes will not show.
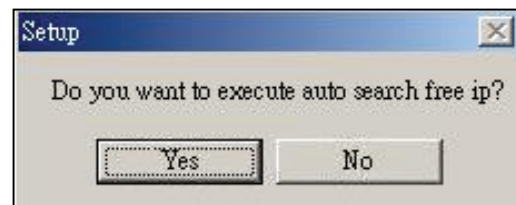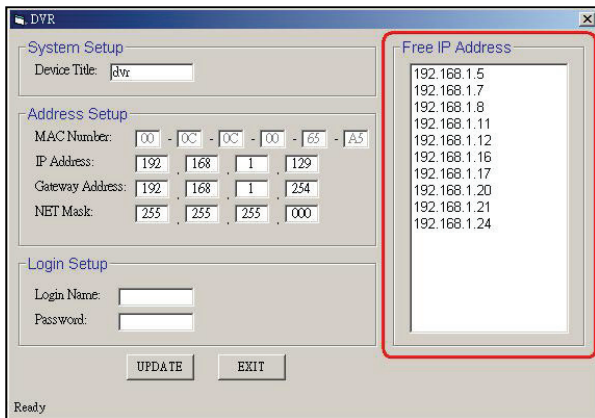

5. Manual insertion of "Free IP Address".
   If you have clicked "No", please manually type in insertions as required against the "Free IP Address", "Gateway Address", and "NET Mask". Follow each insertion you make by typing in the "Login Name" and "Password", and click "UPDATE" to send your alterations to the DVR.
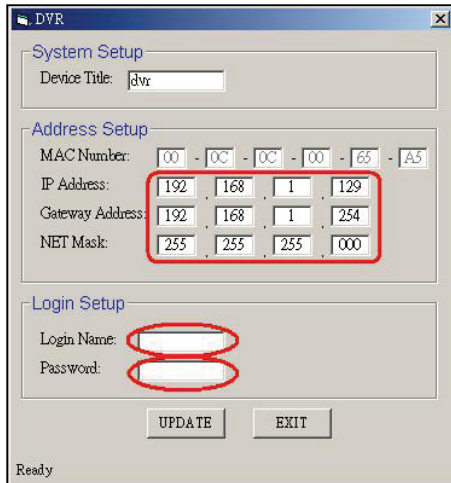
6. Auto search "Free IP Address".

   If you clicked "Yes" the "Free IP Address"

   box will appear on the right.

7. Select and double click any of the addresses

   in the "Free IP Address" box on the right to

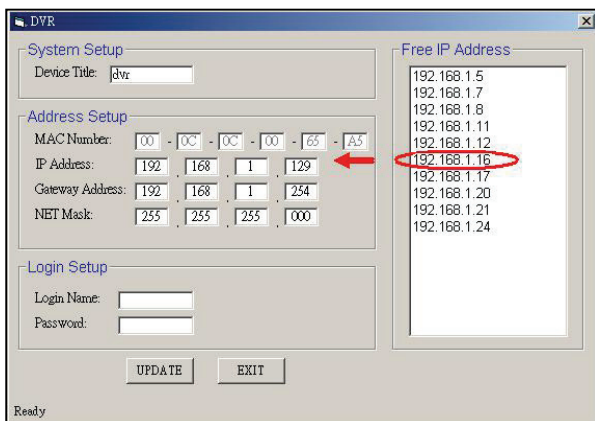   enter it into an IP Address on the left.

8. To change any IP address, type in the new

   address in the "Free IP Address" box on

   the right as well as the device "Login

   Name" and "Password" in their respective

   blanks at bottom left, then click "UPDATE",

   and the new address will automatically be

   sent to the device.
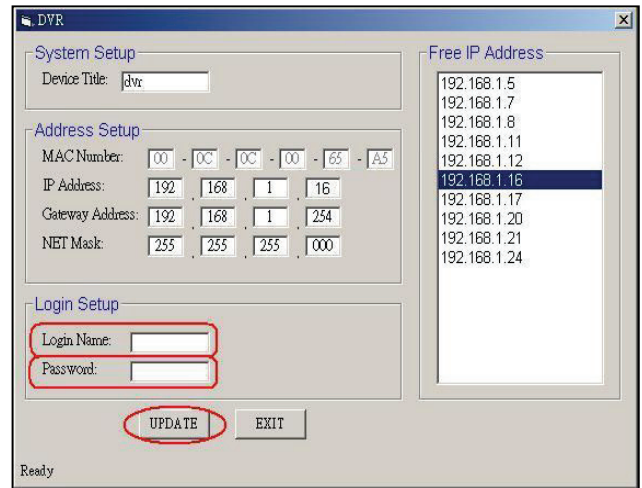
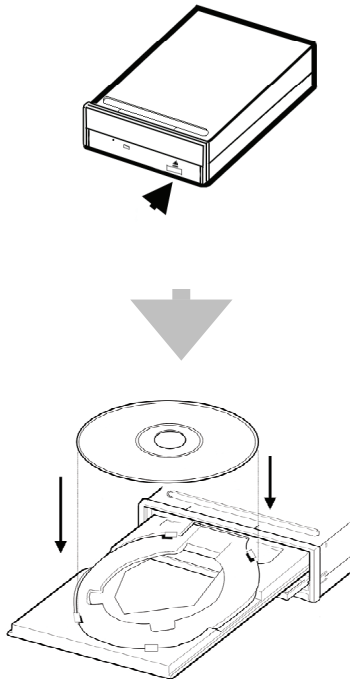9. Click "Exit" at bottom right to shut the device.

APPENDIX 1. – Using CD Discs (FOR CD-RW MODEL ONLY)

Please note that when using CD-ROM, CD-R and CD-RW discs, do not write or stick anything on the surface as this could cause an error in recording or the data on the disc may be damaged.

Inserting Disc

1. Please press the eject button.
2. Please place the disc in the tray.

NOTE: When using a 12 cm disc please place it in the center of the caddy where you are able to see the larger position specifically for the 12 cm disc. When using an 8 cm disc please place it in the center of the caddy where you can see the position for the 8 cm disc. Please place the printed side up. Never place two discs in the caddy at the same time.

3. Please do not touch the surface of the disc where it has been recorded.
4. To insert the caddy please press the insert / eject button and hold the caddy lightly at the middle of its front and push gently to insert.

Ejecting The Disc

1. Press the eject button.
2. Carefully lift out the disc.
3. Press the eject button, or lightly touch the center of the tray and the tray will automatically reenter its position within the CD - RW recorder.

Caution: After the tray has been ejected and the disc has been retrieved from the caddy or put in the caddy, insert the tray in its original position to avoid the accumulation of dust or miscellaneous items inside the caddy, or else the pick up head may be affected when it needs to remain clean for effective reading of the data.

Emergency Eject Button

The device has an emergency eject button, which allows for manual retrieval of the disc in case the machine needs repair, or there is a cut in the power supply. In the above circumstances use the following method to eject the disc.

1. The power supply has been cut.
2. Press the emergency eject button with a needle (a paper clip, etc. can also be used) and the tray will immediately eject.
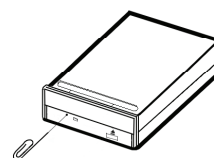
3. Press the front of the tray or lightly and gently pull the tray out with two fingers.
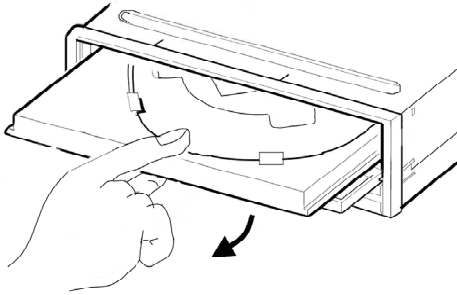
Caution

When you use either a CD-RW or a CD-ROM, please pay heed to the following.

1. At the time of installation: As suggested in your specifications, please do not install in an unstable position or in one that causes vibrations.

2. Do not install in high humidity, direct sunlight, or damp conditions.

3. Do not use near magnetic fields, or place near a television or a radio signal as the performance of the device may be affected.

4. Do not open to try to repair, as the laser may be harmful.

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