ID**VIEW**

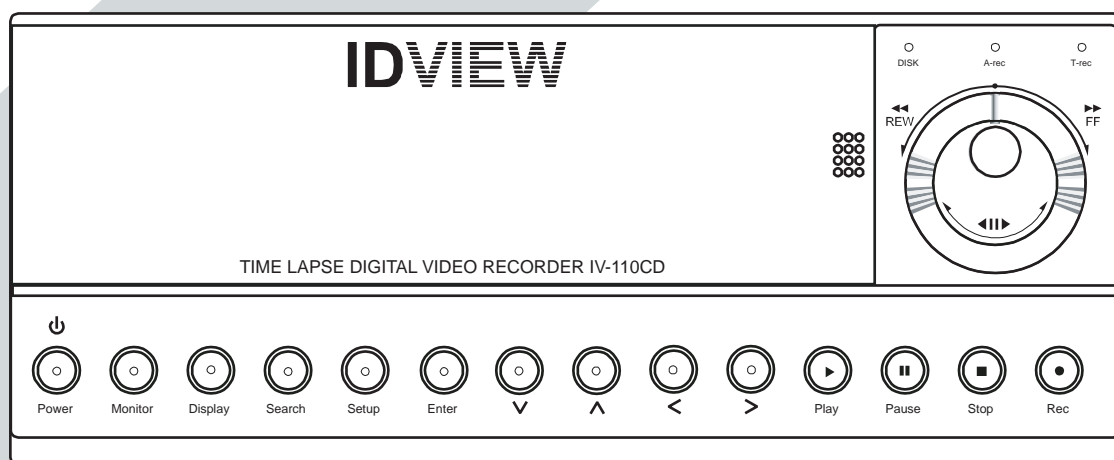## DIGITAL VIDEO RECORDER
IV-110CD-SN

Installation &
Operating Manual

http://www.idviewcctv.com

ID**VIEW**

○ DISK   ○ A-rec   ○ T-rec

◄◄ REW   FF ►►

TIME LAPSE DIGITAL VIDEO RECORDER IV-110CD

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

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.

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 cord.

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

CAUTION

Danger of explosion if the Lithium battery (RTC Battery) is incorrectly replaced.

🚫 Danger of explosion if 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.

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 to 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.

Table Of Contents

1. PRODUCT FEATURES

1.1 Product Introduction

This DVR, IV-110CD-SN, 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, quick access video recording by time and event, the upgradeable software of the system, 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

∗   Stores video in hard-disk drives instead of VCR tapes.

∗   Maximum 2 hard-disk drive capability. (One removable)

∗   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 port.

∗   Remote control via RS-232, RS-485 and Ethernet ports

∗   Power interruption recovery.

∗   Operation-status record log.

∗   Distributing live and recorded images through TCP/IP network environment.

∗   Audio function included

∗   Built-in SD card slot for copying image to SD card

∗   Support DHCP protocol.

2. DESCRIPTION OF THE FRONT/REAR VIEW

2.1 Front View
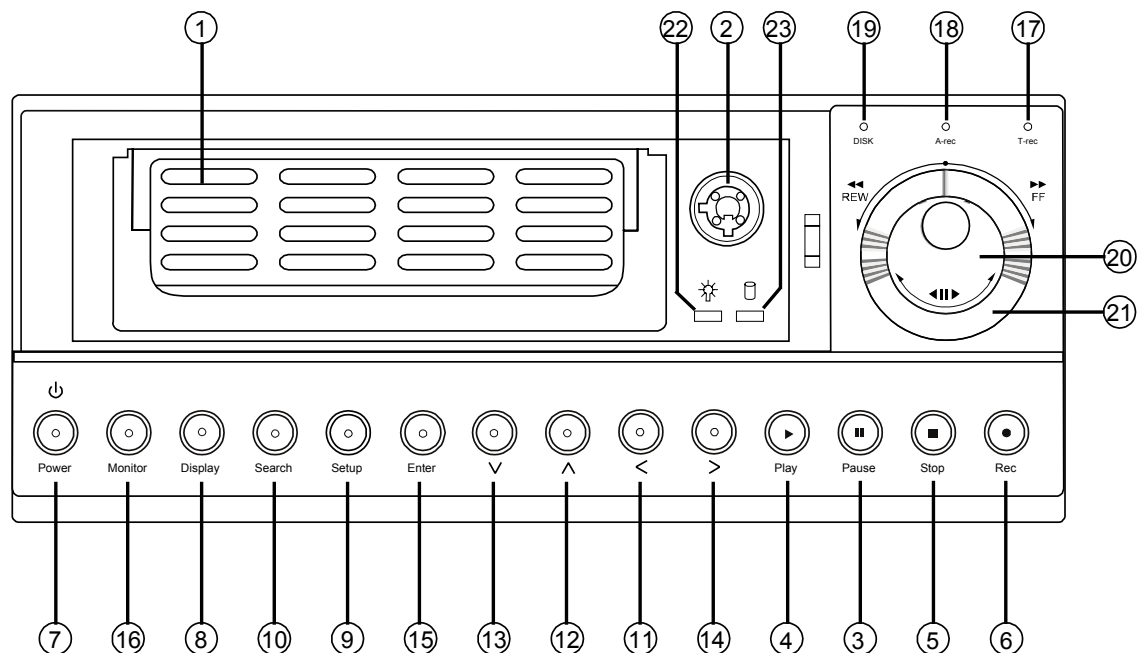
① **Hard-disk drive compartment.**

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. (Illuminate green in PAUSE mode.)

④ **PLAY** button:

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

⑤ **STOP** button:

Press to stop playing back a recorded video or recording video into a hard disk. (Illuminate green in STOP mode.)

⑥ **REC** button:

Push to start recording video into a hard disk while in the live display mode.(Illuminate red in 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 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 simultaneously again.

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 at disk-full status.

⑳ **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.

㉑ **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.

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.

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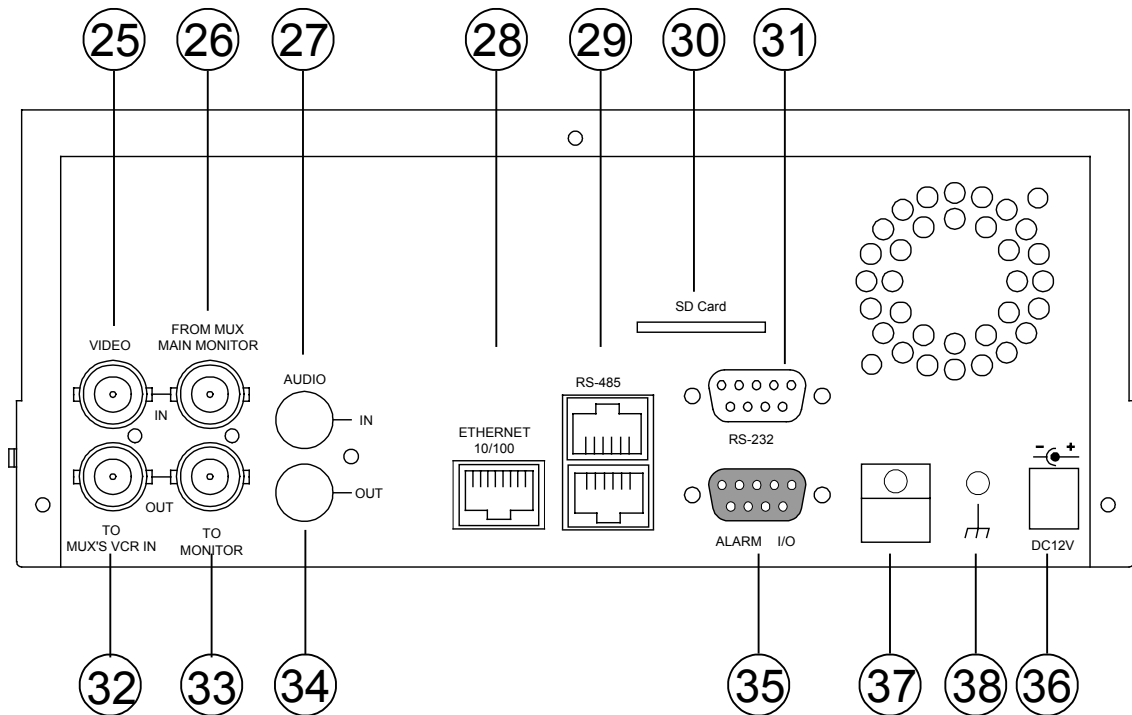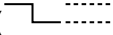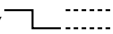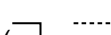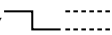
(25) **VIDEO IN** Connector: This BNC connector is used to connect the video output from a camera or a MUX to the DVR.

(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 one 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 expand the storage capacity.

(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 **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** 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 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 chassis terminal.

2.3 ALARM In/Out
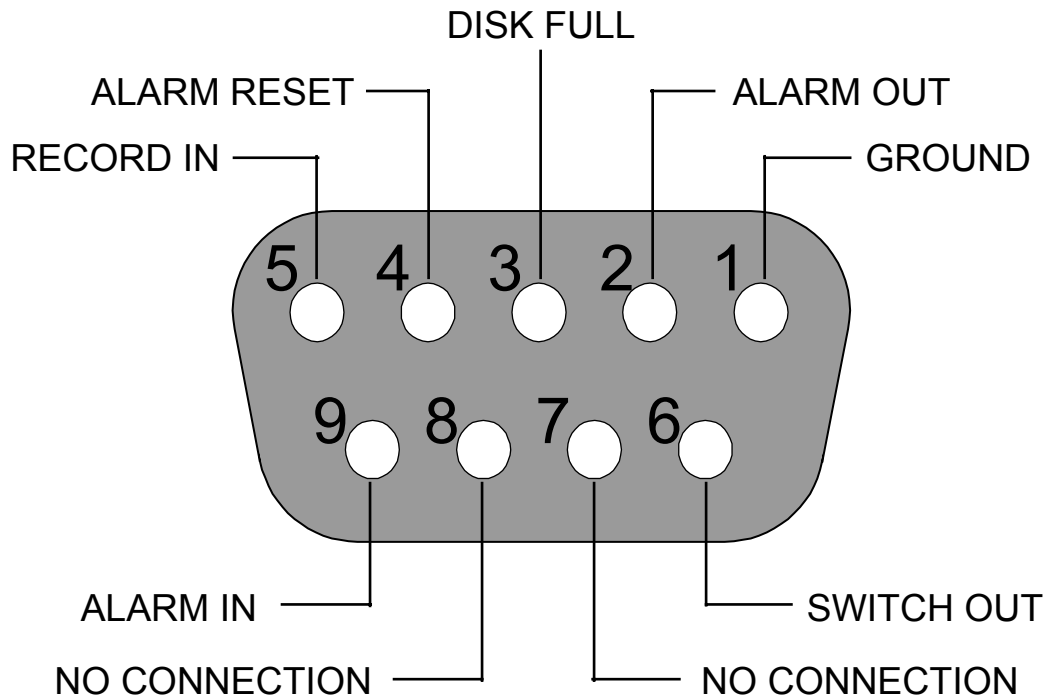
THIS FIGURE IS LOOKED FROM THE REAR VIEW

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 trigger 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 use 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))

3. INSTALLATION

Please follow the instructions and the diagram below to set up the system.

3.1 Basic Connection

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 5.1 MULTIPLEXER option)

Camera

Monitor
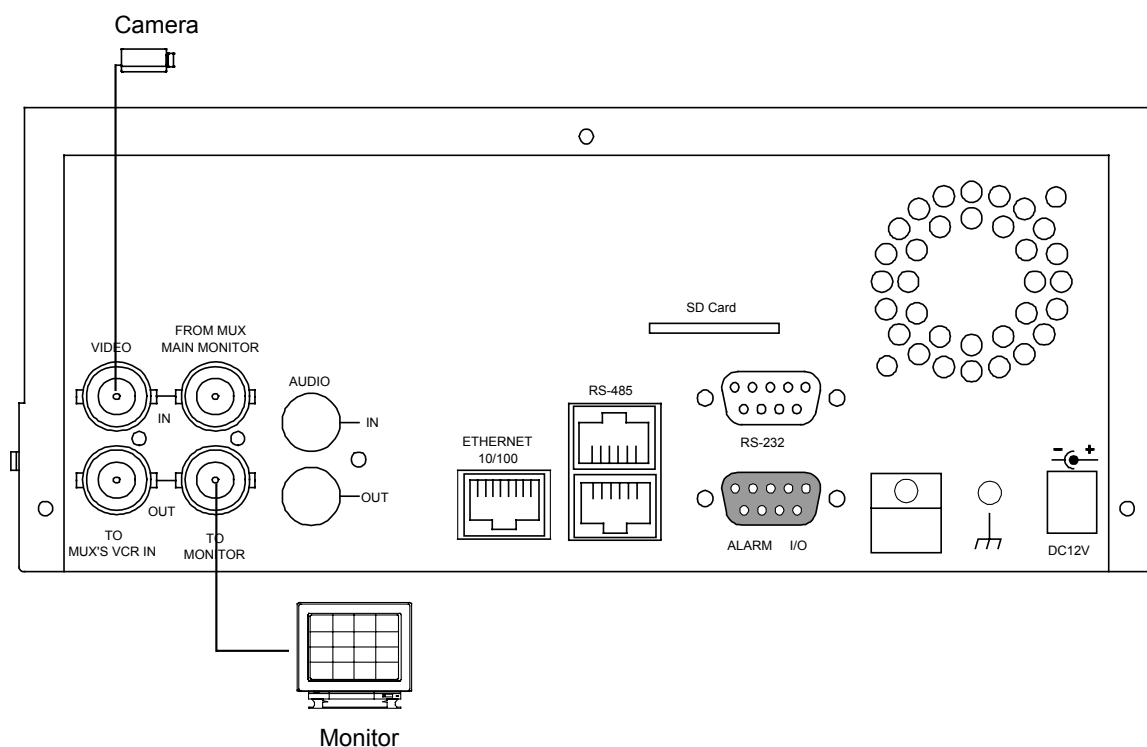
CONNECTING WITH A MULTIPLEXER

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 5.1 MULTIPLEXER option)

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 5.1 MULTIPLEXER option)

Multiplexer

Trig In

S-video

VCR Monitor Audio

in

IN

out

OUT

PC

VIDEO

FROM MUX
MAIN MONITOR

AUDIO

IN

IN

OUT

OUT

TO
MUX'S VCR IN

TO
MONITOR

SD Card

ETHERNET
10/100

RS-485

RS-232

ALARM I/O

DC12V

Video in

Audio in

Monitor

GROUND

| 5 | 4 | 3 | 2 | 1 |
| 9 | 8 | 7 | 6 | |

SWITCH OUT

Quad

S-video

VCR Monitor Audio

in

IN

out

OUT

PC

VIDEO

FROM MUX
MAIN MONITOR

AUDIO

IN

IN

OUT

OUT

TO
MUX'S VCR IN

TO
MONITOR

SD Card

ETHERNET
10/100

RS-485

RS-232

ALARM I/O

DC12V

Video in

Audio in

Monitor

ATTACHING AN EXTERNAL DEVICE TO DVR

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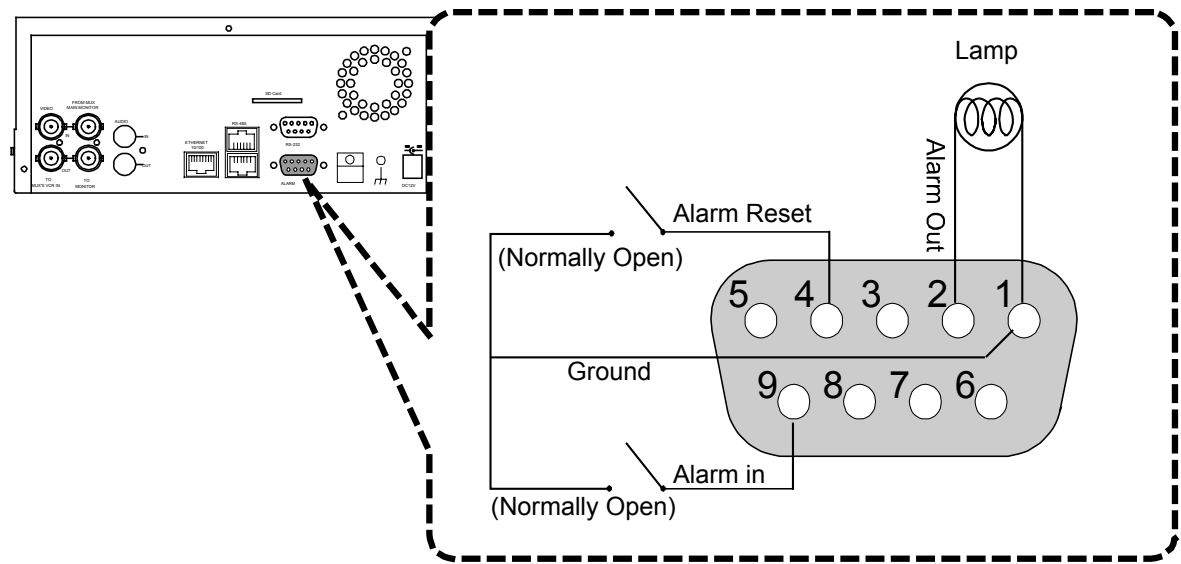
3.2 Hard-Disk Drive Installation

The DVR is equipped with two compartments of hard disk drive. 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 5.5) before proceed recording function. The jumper-settings arrangement of installed hard-disk drives for the system (Table 3.2 A.) is shown in the tables below.

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
Seagate	ST380020A/P	80GB	5400 RPM
	ST340810A/P	40GB	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

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.

3.3 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 **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 time, date, and an indicating bar of capacity status on a monitor as shown next.

Default display

(Capacity Used)   (Capacity Remaining)

        09- 05-2003   16:13:02
            (Date)   (System Time)
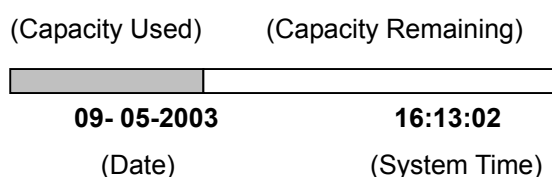
Press the **Display** button ⑧ once; the DVR will display the following sample message plus the default display. Press the **Display** button ⑧ again; the unit will not display any OSD message. Press the button one more time to back to the default display.

Table 3.3 A.

1+ 2: 59G	12.4 HR 🕐 ((•))
QUALITY: BEST	NTSC
RATE: 6 HR	20 F/S
MUX : OFF	9K 🔊
HD P SIZE	POS
📀1 Y 20 G	39.5% P
2 Y 39 G	0.0% R
IP : 192 . 168 . 1 . 90	
	▭
09- 05-2003 16:13:02	

Description of Table 3.3 A

(1+2: 59G): Total capacity of installed hard disk, 59 GB

(12.4 HR): Total 12.4 hour recording time available

(🕐 **):** Timer record activated

((•)) **):** Alarm record 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

(📀**):** Indicate which HDD is activated

(9K): The image file size

(HD): Hard disk Compartment

(P): Y   Hard disk installed;   **.**   No hard disk installed

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

(POS): Percentage of system;   **R:** Recording; **P:** Playback

(IP : 192 . 168 . 1 . 90): Setting of the Ethernet communication,192.168.1.90

(◈**):** External signal

(📀**X):** Cannot operate at now

3.4 Updating System Software

If the system software of the IV-110CD-SN needs to be upgraded, please take the following steps to safely update it.

> **Important: Before carrying out the following procedures, please ensure the SD card is working and the file of system software is intact**

1. Turn off the DVR.
2. Insert the SD card into the built-in SD slot of the unit.
3. Hold down the ⑫ **Up** and ⑬ **Down** buttons simultaneously, and then turn on the unit.
4. Keep holding down the buttons until the IV-110CD-SN sounds a tone and display the message " **XXXXXX   BYTES READ**" Now the IV-110CD-SN 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 the procedure 1~5. the unit, however, not being able to power 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 5.6 VERSION option)
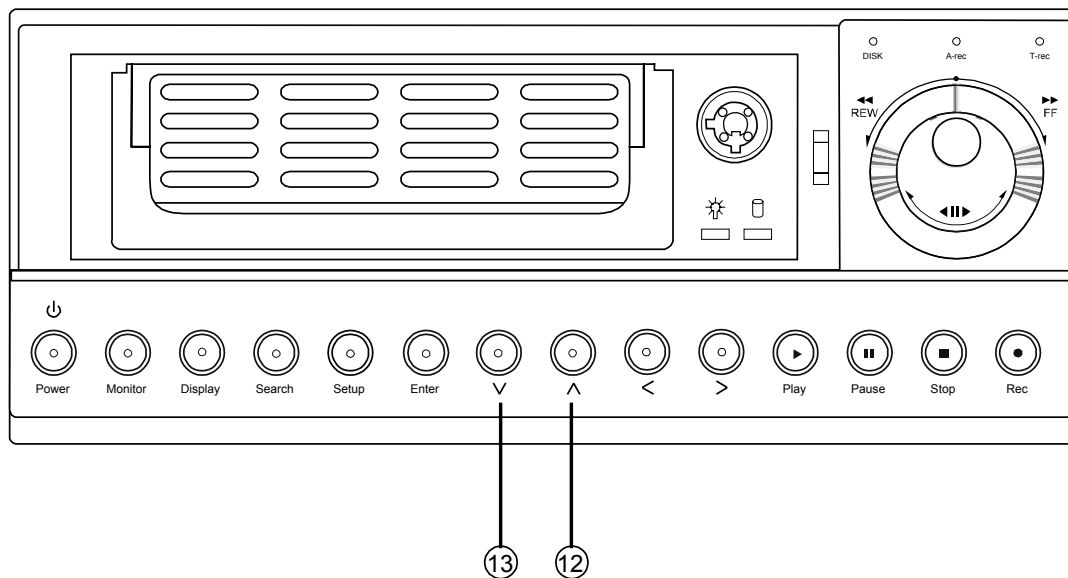
> **Warning: Don't Interrupt the process while the unit is updating itself and proceed with a SD card containing with no system software of the unit, which would cause the unit hang on.**

4. BASIC OPERATIONS

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

4.1 Configuring Recording Settings

Recording Time settings (Recording Rate and Picture Quality Setting)

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 drive(s) in operation, please calculate the recording time using the table below in accordance with your requirement. For a 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).

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 methods detailed below.

(1) If an IDVIEW 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 IDVIEW. Please, Connect the SW. OUT terminal in 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		**Possible Recording Time HDD=20GB (hour)**									
Image Quality	**BEST**	3.7	4.5	6.7	11.1	23.9	52.1	95.2	149.7	544.7	816	1087.3
	HIGH	4.5	5.6	8.3	13.8	29.7	63.9	114.9	177.3	680.9	1020	1359.1
	STANDARD	5.6	7.5	11.1	18.3	39	82.7	145.1	217.5	907.9	1360	1812.2
	BASIC	7.5	11.3	16.5	27.1	56.9	116.9	196.6	281.1	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 ON)												
Audio OFF		Possible Recording Time HDD=20GB (hour)										
Image Quality	**BEST**	3.7	4.5	6.7	11.3	24.8	56.5	110.7	192.1	544.7	816	1087.3
	HIGH	4.5	5.6	8.4	14.1	31.0	70.6	138.4	240.1	680.9	1020	1359.1
	STANDARD	5.6	7.5	11.3	18.8	41.4	94.1	184.6	320.2	907.9	1360	1812.2
	BASIC	7.5	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		Possible Recording Time HDD=20GB (hour)										
Image Quality	**BEST**	3.7	4.5	8.9	13.2	26	54	96.8	151	547	818.3	1089.5
	HIGH	4.5	5.6	11.1	16.5	32.2	66.2	116.9	178.9	683.8	1022.8	1361.9
	STANDARD	5.6	7.5	14.7	21.8	42.3	85.5	147.4	219.2	911.7	1363.8	1815.9
	BASIC	7.5	11.3	21.8	32.5	61.6	120.7	199.4	283.1	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

NTSC (MUX OFF)												
Audio OFF		Possible Recording Time HDD=20GB (hour)										
Image Quality	**BEST**	3.7	4.5	9	13.5	27.1	58.7	113	194.4	547	818.3	1089.5
	HIGH	4.5	5.6	11.3	16.9	33.9	73.4	141.2	243	683.8	1022.8	1361.9
	STANDARD	5.6	7.5	15	22.6	45.2	97.9	188.3	324	911.7	1363.8	1815.9
	BASIC	7.5	11.3	22.6	33.9	67.8	146.9	282.5	486	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		Possible Recording Time HDD=20GB (hour)										
Image Quality	**BEST**	3.8	4.5	6.7	11.1	19.7	36.3	67.2	108.2	454.3	680.4	906.4
	HIGH	4.5	5.7	8.4	13.9	24.7	45.2	82.7	131.2	573.9	859.4	1145
	STANDARD	5.7	7.7	11.4	18.8	33.1	60	107.5	166.6	778.9	1166.4	1553.9
	BASIC	7.7	11.4	16.7	27.4	47.7	84.9	147.4	219.9	1147.8	1718.9	2290
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**	3.8	4.5	6.7	11.3	20.3	38.4	74.5	128.8	454.3	680.4	906.4
	HIGH	4.5	5.7	8.5	14.2	25.6	48.5	94.2	162.7	573.9	859.4	1145
	STANDARD	5.7	7.7	11.6	19.3	34.8	65.8	127.8	220.8	778.9	1166.4	1553.9
	BASIC	7.7	11.4	17.1	28.5	51.3	97	188.4	325.5	1147.8	1718.9	2290
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

16

PAL (MUX OFF)											
Audio ON		**Possible Recording Time HDD=20GB (hour)**									
Image Quality	**BEST**	3.8	4.5	8.9	13.2	21.8	38.3	69	109.8	456.6	682.6	908.7
	HIGH	4.5	5.7	11.2	16.7	27.4	47.7	84.9	133.1	576.7	862.3	1147.8
	STANDARD	5.7	7.7	15.1	22.4	36.6	63.2	110.3	168.8	782.7	1170.3	1557.8
	BASIC	7.7	11.4	22	32.5	52.6	82.9	150.9	222.5	1153.5	1724.6	2295.7
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**	3.8	4.5	9	13.5	22.6	40.6	76.8	131.1	456.6	682.6	908.7
	HIGH	4.5	5.7	11.4	17.1	28.5	51.3	97	165.6	576.7	862.3	1147.8
	STANDARD	5.7	7.7	15.5	23.2	38.7	69.7	131.7	224.7	782.7	1170.3	1557.8
	BASIC	7.7	11.4	22.8	34.2	57.1	102.7	194.1	331.2	1153.5	1724.6	2295.7
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 3.3 system information for more details.)

NOTE: No audio function at the refresh rate in NTSC: 60 fields/sec ~ 30 fields/sec, 1/4 fields/sec ~ 1/8 fields/sec.
No audio function at the refresh rate in PAL: 50 fields/sec ~ 25 fields/sec, 1/4 fields/sec ~ 1/8 fields/sec.

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

** : For NTSC and Mux Off Mode, recording rate 20F/S would be actually 15 F/S, 12F/S would be actually 10 F/S, 5.5 F/S would be actually 5F/S.
For PAL and Mux Off Mode, recording rate 17F/S would be actually 12.5 F/S, 10F/S would be actually 8.3 F/S, 5.5 F/S would be actually 5F/S.
(This adjustment is to avoid image shaking during playback at the same speed)

4.2 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.

4.2.1 Manual Recording

When the DVR is in live display mode, take the following steps to start recording:

(1) In live display, press the **REC** button ⑥ to record video into a hard disk drive with the corresponding programmed recording settings. The monitor should display a flashing **REC** message and the **REC** button ⑥ will light up indicating the DVR is in the recording status.

(2) Press the **STOP** button ⑤ to stop recording any time.

(3) To access just recorded video, please refer to section 4.4 for more details.

4.2.2 Timer Recording

Timer recording provides two 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 and stop recording according to the programmed schedule. Please take the following steps to program the scheduled recording.

(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 the settings.

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

(8) Press the **STOP** button ⑤ during the scheduled recording to stop it at 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 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.
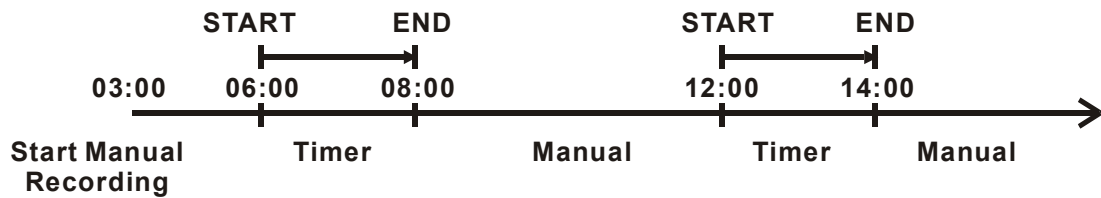
```
              START        END              START      END
                |————————▶|                   |—————————▶|
  03:00     06:00      08:00               12:00      14:00
────●———————————●————————●———————————————————●————————●————————————▶
 Start Manual         Timer          Manual         Timer      Manual
  Recording
```

```
        MAIN MENU                              MAIN MENU

RECORD                                RECORD
ALARM                                 ALARM
CLOCK / TIMER                         CLOCK / TIMER
COMMUNICATION                         COMMUNICATION
DISK                                  DISK
SYSTEM                                SYSTEM



GOTO CLOCK / TIMER PAGE               GOTO CLOCK / TIMER PAGE
```

⇩   ⇩

```
        CLOCK / TIMER                          CLOCK / TIMER

CLOCK               : SET             CLOCK               : SET
REC ENABLE          : OFF             REC ENABLE          : OFF
TIMER               : SET             TIMER               : SET




⊞  MAIN PAGE                          ⊞  MAIN PAGE

SET REC SCHEDULE                      TIMER REC ENABLE
```

⇩

```
        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
```
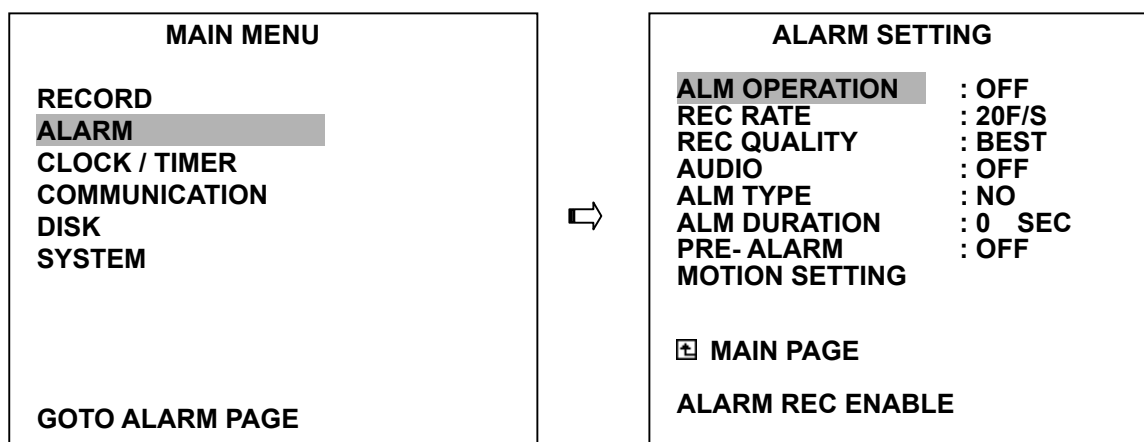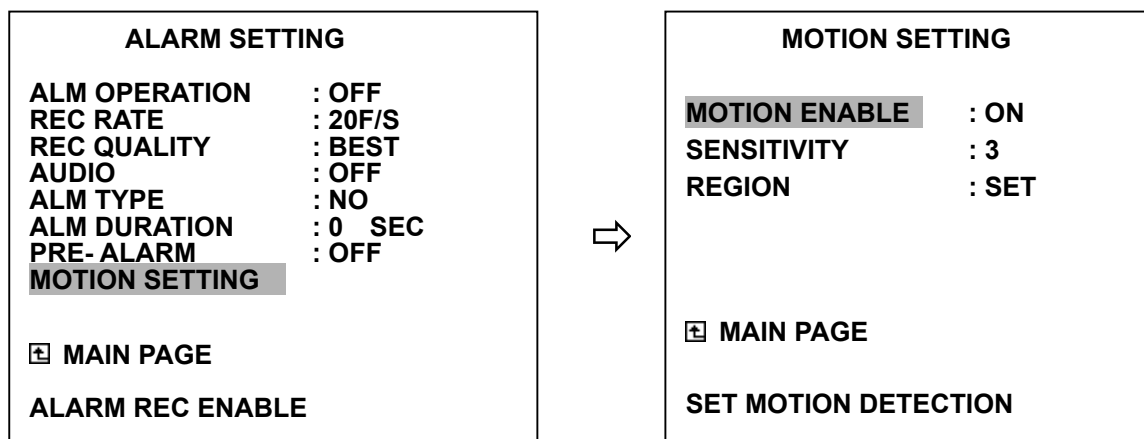
4.2.3 Alarm Recording

Take the following steps to activate the programmed alarm recording. For **ALM OPERATION**, **REC RATE**, **REC QUALITY**, **AUDIO**, **ALM TYPE**, **ALM DURATION**, and **PRE-ALARM** settings, please refer to section 5.2 for more details.

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

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

(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 the alarm recording, set **ALM OPERATION** to **ON**. To deactivate it, set **ALM OPERATION** to **OFF**.

```
        MAIN MENU                                ALARM SETTING

    RECORD                          ALM OPERATION      : OFF
    ALARM                           REC RATE           : 20F/S
    CLOCK / TIMER                   REC QUALITY        : BEST
    COMMUNICATION                   AUDIO              : OFF
    DISK                   ▷        ALM TYPE           : NO
    SYSTEM                          ALM DURATION       : 0   SEC
                                    PRE- ALARM         : OFF
                                    MOTION SETTING

                                     ⊞ MAIN PAGE

    GOTO ALARM PAGE                 ALARM REC ENABLE
```

(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 according to the video sources.

```
       ALARM SETTING                            MOTION SETTING

    ALM OPERATION    : OFF          MOTION ENABLE      : ON
    REC RATE         : 20F/S
    REC QUALITY      : BEST         SENSITIVITY        : 3
    AUDIO            : OFF          REGION             : SET
    ALM TYPE         : NO
    ALM DURATION     : 0   SEC
    PRE- ALARM       : OFF   ▷
    MOTION SETTING

     ⊞ MAIN PAGE                     ⊞ MAIN PAGE

    ALARM REC ENABLE                SET MOTION DETECTION
```

4.2.4 Externally triggered Recording

By connecting the **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"**. Please refer to section 2.3 for more details.

NOTE: The status of recording operations when an alarm takes place are 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
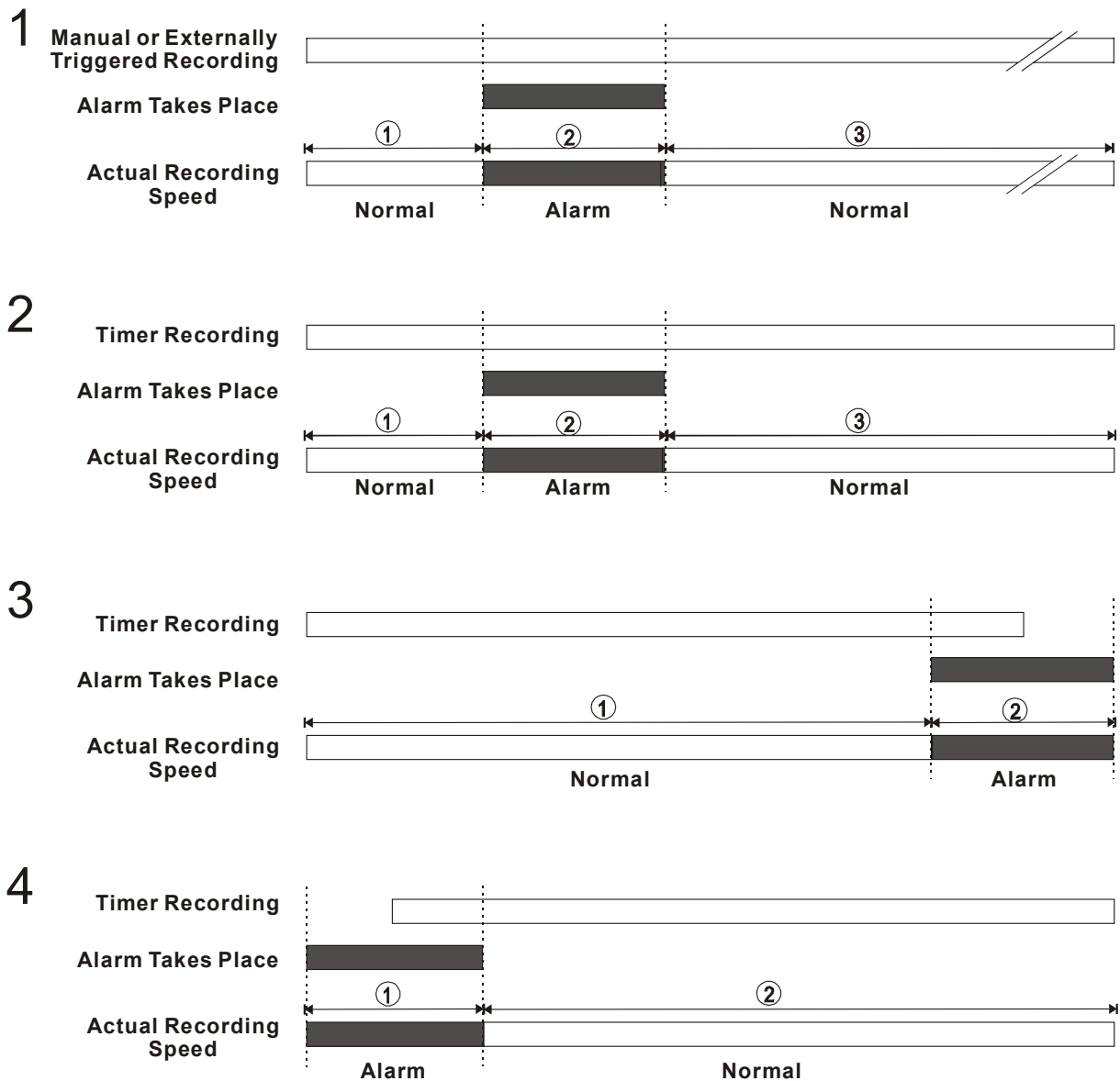
4.3 Playback Operations

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.

Operation Status

A. From REC mode to Playback mode

(In live mode, directly press the **PLAY** button ④ to play a latest recorded video)

REC→〔**STOP**〕→〔**PLAY**〕………………………………   Play the latest recorded file

┈┈┈▶〔Play to the end of the file〕…Show the ending message (use search functions

or rewind to replay the file if required)

┈┈┈▶〔**STOP**〕→〔**PLAY**〕…………Play the file from the stop position

B. Search to play back a particular recorded video

Search→〔**PLAY**〕…………………………………… Play a selected file

┈┈┈▶〔Play to the end of the file〕…………Show the ending message (Search again or rewind

to replay the file if required)

┈┈┈▶〔**STOP**〕→〔**PLAY**〕…………………Play the file from the stop position

C. Play Back From The Oldest Data

〔Stop: Press the "**STOP**" button for three seconds〕→〔**PLAY**〕..play back from the beginning of the

HDD recorded data

4.3.1 Fast Forward/Reverse

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

While playing back recorded video at 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.

Reverse: 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.

* You can also operate by using "<" button ⑪ and ">" button ⑭.

NOTE: When 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 at 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.

4.3.2 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.

* You can also operate by using "<" button ⑪ and ">" button ⑭.

4.3.3 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.

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.)**

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.

4.3.4 Play Back Recorded Video from a HDD of the mobile rack

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

(1) Press the **Setup** button ⑨ to enter the setup menu.

(2) Select **DISK** and press the **Enter** button ⑮ to enter the **DISK SETTING** page.

(3) Set the **HD2 USAGE** to **REC** and then exit the setup menu.

(4) Use the search function to access desired recorded video. For specific operation details please refer to the next section 4.4 (Search Operations).

4.4 Search Operations

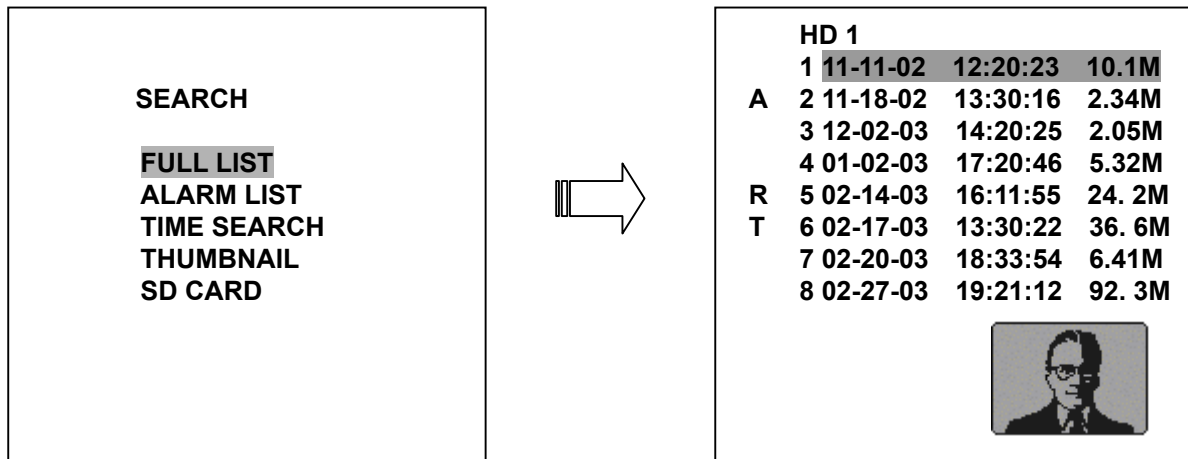This section shows you how to access recorded video.

4.4.1 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 of your requirement and press the **Enter** button ⑮ to display the selected video.

(Key Operation: Press the ⑫ "^" and ⑬ "v" 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
```

⟹

```
HD 1
    1 11-11-02   12:20:23   10.1M
A   2 11-18-02   13:30:16   2.34M
    3 12-02-03   14:20:25   2.05M
    4 01-02-03   17:20:46   5.32M
R   5 02-14-03   16:11:55   24. 2M
T   6 02-17-03   13:30:22   36. 6M
    7 02-20-03   18:33:54   6.41M
    8 02-27-03   19:21:12   92. 3M
```

**NOTE: T: Timer recording; R: External trigger recording; A: Alarm recording.**

NOTE: The maximum number of lists, for a respective HDD, is 3000.

4.4.2 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 of your requirement and press the **Enter** button⑮ to display the selected video.

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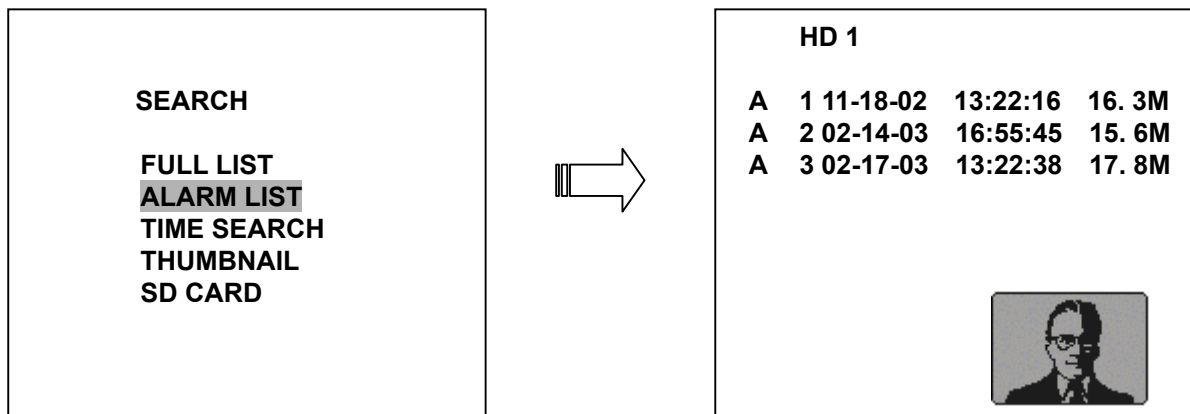
4.4.3 TIME Search

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.
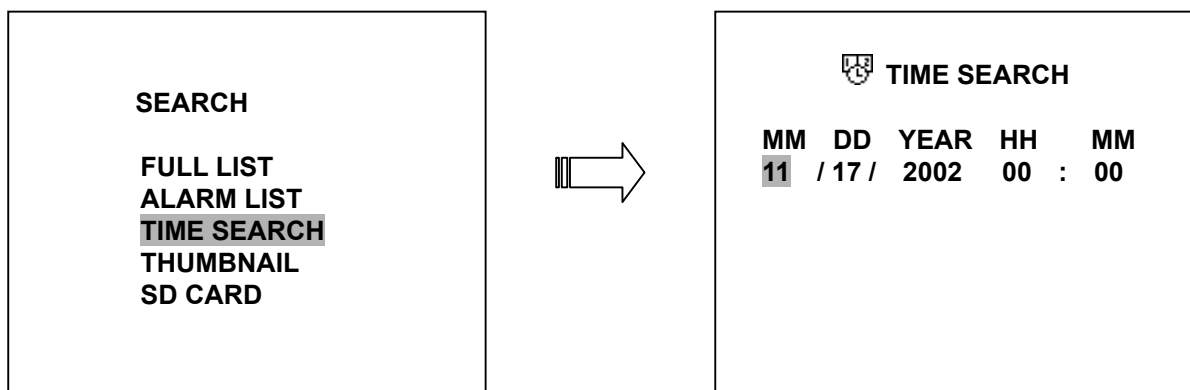
4.4.4 THUMBNAIL Search

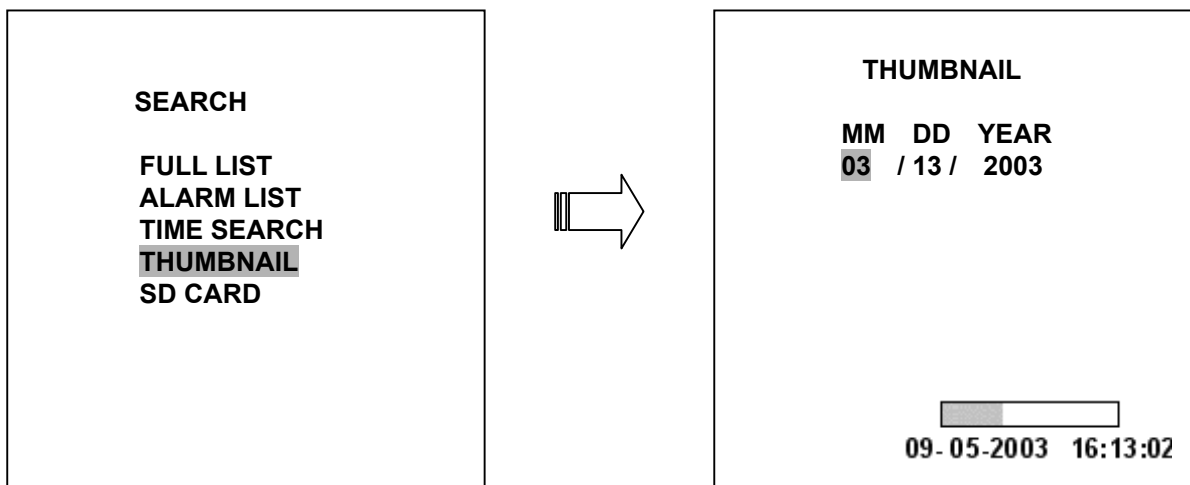Take the following steps to proceed with the thumbnail search function.

(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 "<" button ⑪, the ">" button ⑭, the "**∧**" button ⑫ and the "v" button ⑬ to move eye focus.

 ● You can also set up by using the **Shuttle Ring** and the **Jog Dial** to move eye focus. $\circledcirc$ is the equal of the "<" button ⑪, $\circledcirc$ is the equal of the ">" button ⑭, $\circledcirc$ is the equal of the "**∧**" button ⑫ and $\circledcirc$ 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 of your requirement and press the **Enter** button⑮ to enter the next level. If you want to return the previous level, please press the **Setup** button ⑨

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

4.4.5 SD CARD Search

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

(1) Insert a 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 of your requirement 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.
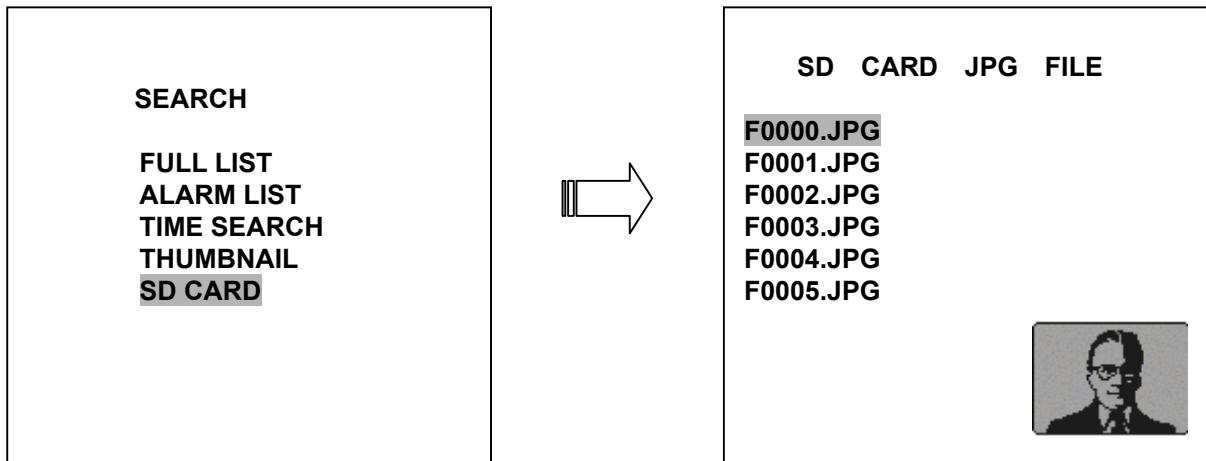
NOTE: If you would like to delete JPG file in the SD card, please return to **SD CARD JPG FILE** list page and highlight the specific JPG file of your requirement and press the **Setup** button⑨ and then select the **"Yes"** to delete the image.
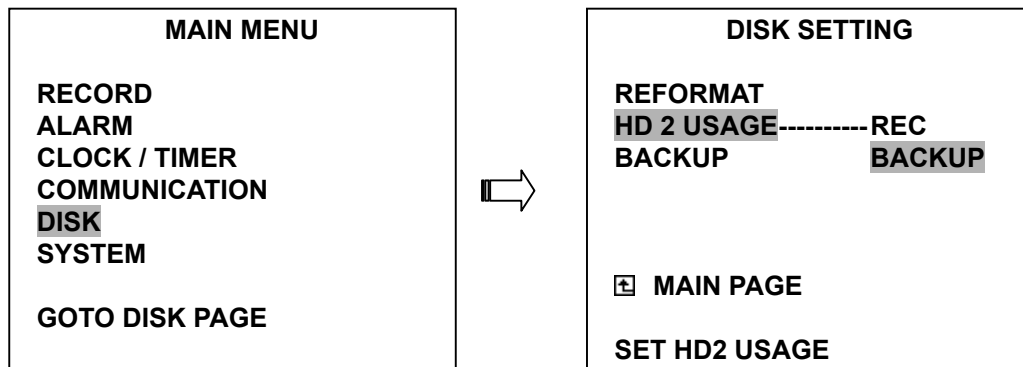
4.5 Backup Operations

4.5.1 Mobile Rack HD Backup Operations

There are three 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.
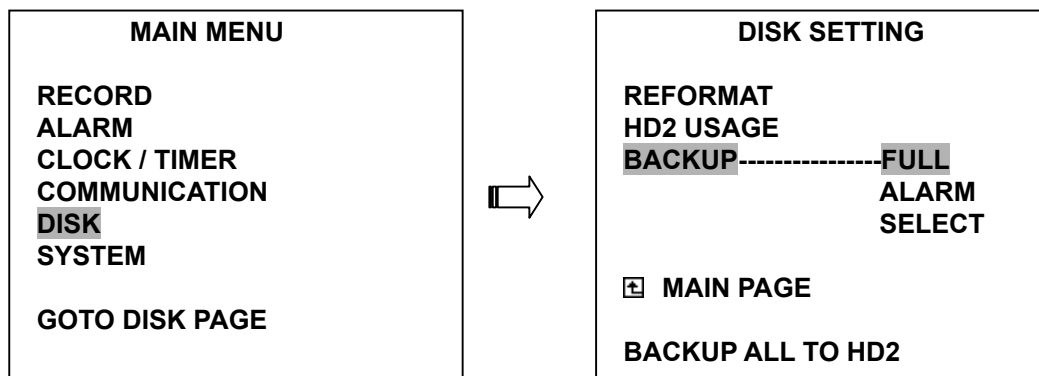
(1) Set HD 2 to BACKUP first. Take the following steps.

- Press the **Setup** button ⑨ to enter the setup mode and select the **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
   CLOCK / TIMER
   COMMUNICATION
   DISK
   SYSTEM

   GOTO DISK PAGE
```

⇨

```
          DISK SETTING

   REFORMAT
   HD 2 USAGE----------REC
   BACKUP              BACKUP


   ⊞ MAIN PAGE

   SET HD2 USAGE
```

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

- Stay on the **DISK SETTING** page.
- Use the **"^"** and **"v"** buttons, ⑫ and ⑬, to highlight **BACKUP**, select **FULL,** then press the **Enter** button ⑮ to proceed.

```
           MAIN MENU

   RECORD
   ALARM
   CLOCK / TIMER
   COMMUNICATION
   DISK
   SYSTEM

   GOTO DISK PAGE
```

⇨

```
          DISK SETTING

   REFORMAT
   HD2 USAGE
   BACKUP---------------FULL
                        ALARM
                        SELECT

   ⊞ MAIN PAGE

   BACKUP ALL TO HD2
```

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

- Stay on the **DISK SETTING** page.
- Use the **"^"** and **"v"** buttons, ⑫ and ⑬, to highlight **BACKUP**; select **ALARM,** then press the **Enter** button ⑮ to proceed.

```
        MAIN MENU                      DISK SETTING

RECORD                          REFORMAT
ALARM                           HD2 USAGE
CLOCK / TIMER                   BACKUP---------------FULL
COMMUNICATION                                       ALARM
DISK                                                SELECT
SYSTEM
                                ⊞ MAIN PAGE

GOTO DISK PAGE                  BACKUP ALARM TO HD2
```
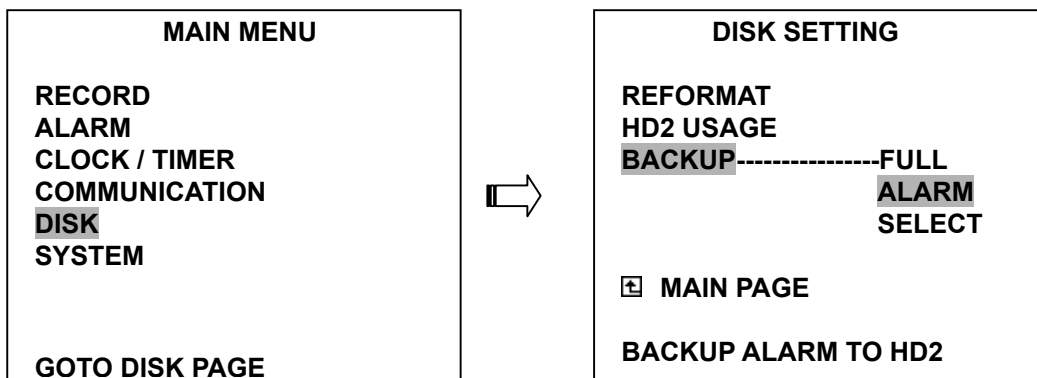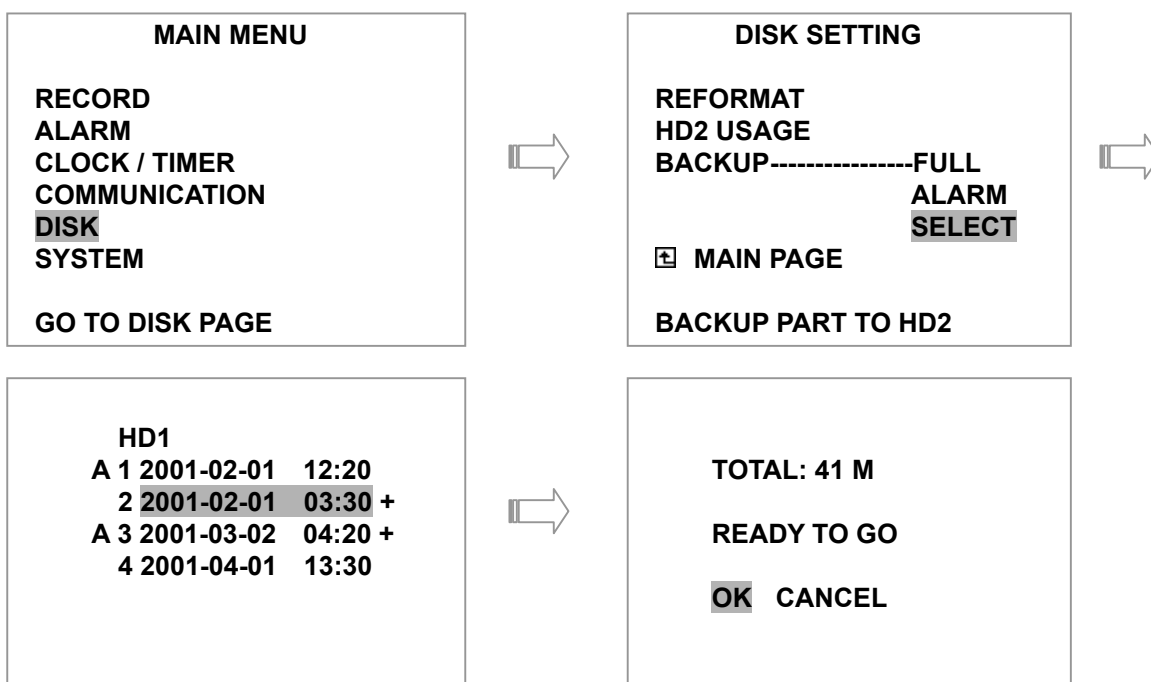
SELECT: Duplicate a particular recorded video from HD1 to HD2.

- Stay on the **DISK SETTING** page.
- Use the **"^"** and **"v"** buttons, ⑫ and ⑬, to highlight **BACKUP,** select **SELECT** and then press the **Enter** button ⑮ to list all the recorded video.
- Press the **"^"** and **"v"** buttons, ⑫ and 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                      DISK SETTING

RECORD                          REFORMAT
ALARM                           HD2 USAGE
CLOCK / TIMER                   BACKUP---------------FULL
COMMUNICATION                                       ALARM
DISK                                                SELECT
SYSTEM
                                ⊞ MAIN PAGE

GO TO DISK PAGE                 BACKUP PART TO HD2
```

```
    HD1
  A 1 2001-02-01   12:20                TOTAL: 41 M
    2 2001-02-01   03:30 +
  A 3 2001-03-02   04:20 +              READY TO GO
    4 2001-04-01   13:30
                                        OK   CANCEL
```

NOTE: If the capacity of HD 2 is not sufficient to store all selected video, a warning message "HD2 SPACE NOT ENOUGH" will be displayed on the screen. Please, insert a larger capacity of hard-disk drive and start the process all over again.

4.5.2 Secure Digital Card (SD Card) Backup Operations

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

1. **Archive Single image Clips into SD Card**

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

    (1) Insert a 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. It depends on SD card capacity how many pictures can be stored. 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 a SD card, file names will be assigned in sequence as shown below.

    <p align="center">SAVE TO J0000.JPG</p>
    <p align="center">SAVE TO J0001.JPG</p>
    <p align="center">…</p>
    <p align="center">SAVE TO J000N.JPG</p>

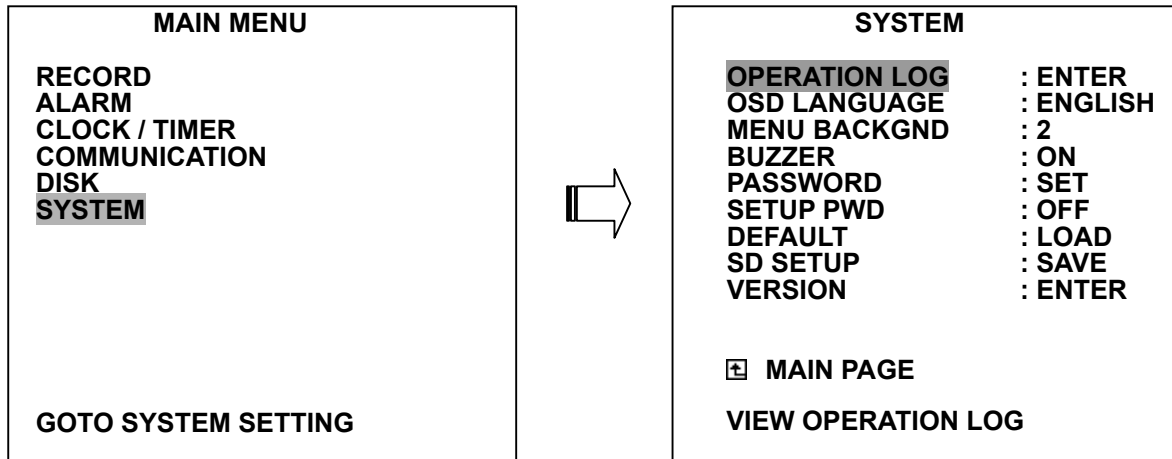2. **Backup the System setting info into SD Card.**

    The IV-110CD-SN offers a quick setup method by using a SD card.   If a user wants to set many IV-110CD-SN devices with the same settings, the IV-110CD-SN could save the whole setting in the SD card, then transfer it to another DVR.

    Save the whole setting into the SD card:

    - Insert a SD card into the SD card slot.
    - 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.
    - 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**.

MAIN MENU		SYSTEM	
RECORD		**OPERATION LOG**	**: ENTER**
ALARM		**OSD LANGUAGE**	**: ENGLISH**
CLOCK / TIMER		**MENU BACKGND**	**: 2**
COMMUNICATION		**BUZZER**	**: ON**
DISK		**PASSWORD**	**: SET**
SYSTEM	⇨	**SETUP PWD**	**: OFF**
		DEFAULT	**: LOAD**
		SD SETUP	**: SAVE**
		VERSION	**: ENTER**
		⊞ **MAIN PAGE**	
GOTO SYSTEM SETTING		**VIEW OPERATION LOG**	

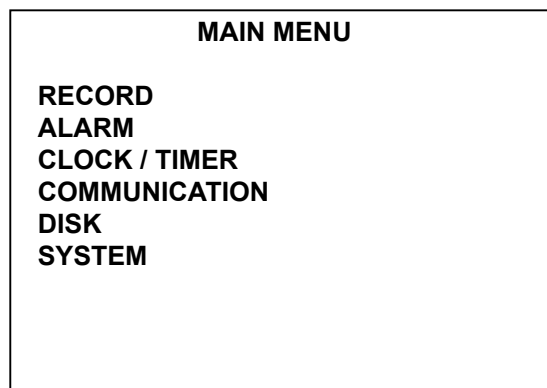**3. Updating System Software (Please refer to section 3.4 for more details.)**

4.6 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 (as shown below) for at least 3 seconds to lock the unit; to release the **Key Lock**, simultaneously press these two buttons again.
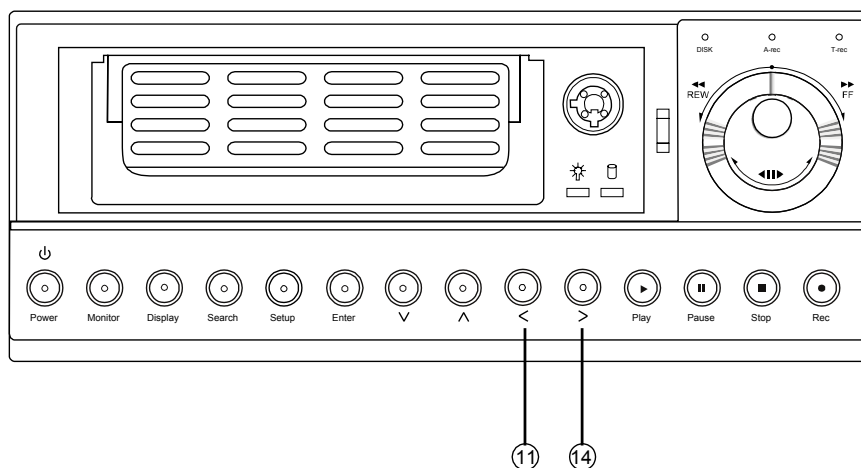
5. MENU SETUP

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.

```
                 MAIN MENU

        RECORD
        ALARM
        CLOCK / TIMER
        COMMUNICATION
        DISK
        SYSTEM



```

KEY FUNCTIONS

Setup button ⑨ :

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

"^" "v" buttons ⑫ and ⑬ :

Press to select the desired item or entry for setting.

"<" ">" buttons ⑪ and ⑭ :

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

Enter button ⑮ :

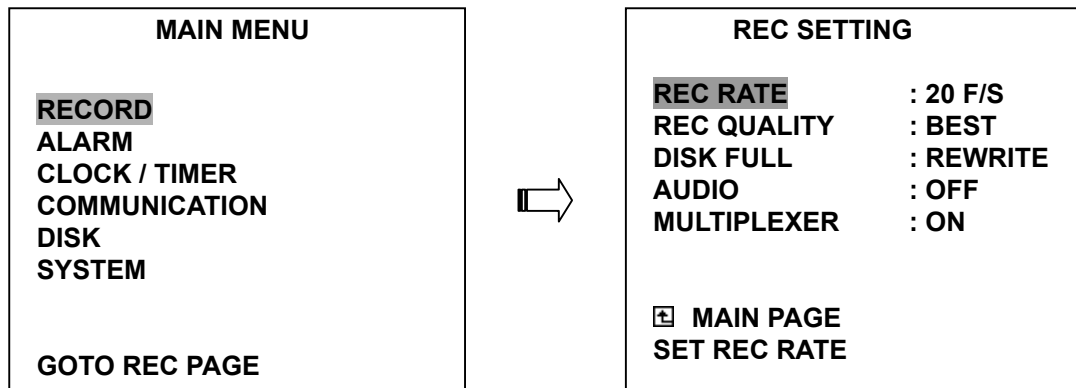Press to enter the selected item and to save the setting.

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.

5.1 REC SETTING

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           |        |        REC SETTING          |
|                             |        |                             |
|  RECORD                     |        |  REC RATE        : 20 F/S   |
|  ALARM                      |        |  REC QUALITY     : BEST     |
|  CLOCK / TIMER              |        |  DISK FULL       : REWRITE  |
|  COMMUNICATION       ▯⇨     |        |  AUDIO           : OFF      |
|  DISK                       |        |  MULTIPLEXER     : ON       |
|  SYSTEM                     |        |                             |
|                             |        |  ⊞ MAIN PAGE                |
|  GOTO REC PAGE              |        |  SET REC RATE               |
+-----------------------------+        +-----------------------------+
```

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 a 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.** Please refer to the table in section 4.1 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.

ON: Enables AUDIO recording.

OFF: Disables AUDIO recording.

NOTE: Audio function can only be activated in the following refresh rate in NTSC(PAL):
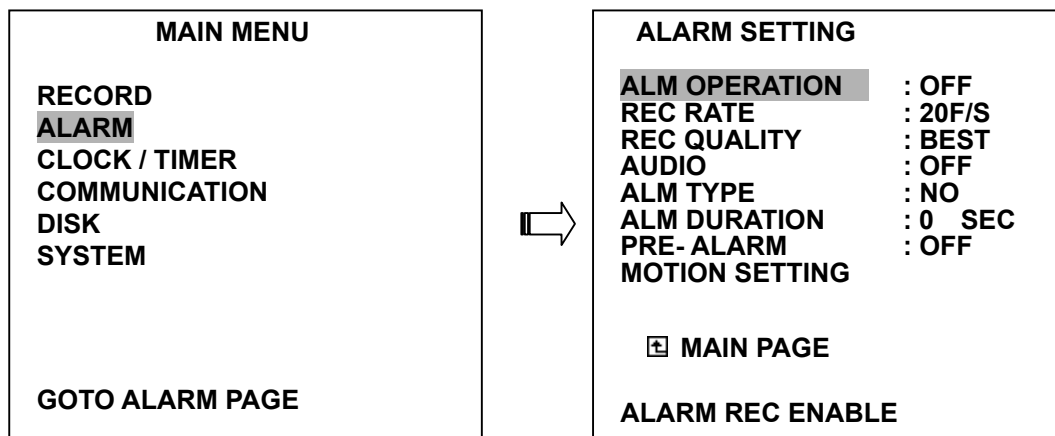
20(17), 12(10), 5.5(5.5), 2.4(2.9), 1.22(1.52), 0.71(0.88) fields/sec

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.

5.2 ALARM SETTING

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                          ALARM SETTING

  RECORD                           ALM OPERATION    : OFF
  ALARM                            REC RATE         : 20F/S
  CLOCK / TIMER                    REC QUALITY      : BEST
  COMMUNICATION                    AUDIO            : OFF
  DISK              ▯⟹            ALM TYPE          : NO
  SYSTEM                           ALM DURATION     : 0   SEC
                                   PRE- ALARM       : OFF
                                   MOTION SETTING

                                      ⊞ MAIN PAGE

  GOTO ALARM PAGE                  ALARM REC ENABLE
```

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 a 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.

Image Quality	Compression Ratio			
	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 in the following refresh rate in NTSC(PAL):
20(17), 12(10), 5.5(5.5), 2.4(2.9), 1.22(1.52), 0.71(0.88) 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.**
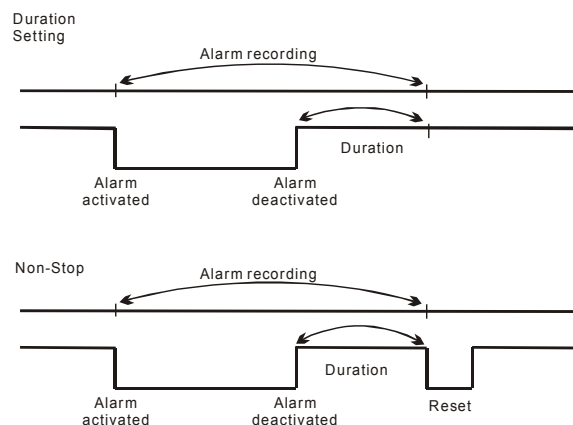
NOTE: Recording may be interrupted at the time of Alarm-in or Alarm-out.
LIVE images may be interrupted at the time of Alarm-out.

PRE- ALARM:

This option determines that images prior to an alarm occurs 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 alarm occur, the pre-alarm
        recording would not take effect.

MOTION SETTING:

The motion detection function is convenient for the people without alarm trigger input, but also can used with alarm trigger input at the same time. If this function is enabled, the object movement would trigger the alarm recording just like the outside trigger signal. Before using the motion detection function, please turn the **ENABLE** option as **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
        (in REC SETTING page) is set to ON, it is because the motion detection function is
        for single camera only.

<table>
<tr><td>

MOTION SETTING

MOTION ENABLE   **: ON**
SENSITIVITY   **: 3**
REGION   **: SET**

MAIN PAGE

ENABLE MOTION DETECTION

</td><td>

SET MOTION REGION

(30 , 30) – (90 , 70)

</td></tr>
</table>

MOTION ENABLE:

This option enables / disables the motion detection.

ON: Enables the motion detection.

OFF: Disables the s 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.

5.3 CLOCK / TIMER

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 that the DVR will start and stop recording.

```
         MAIN MENU                      CLOCK / TIMER

   RECORD                        CLOCK              : SET
   ALARM                         REC ENABLE         : OFF
   CLOCK / TIMER                 TIMER              : SET
   COMMUNICATION
   DISK
   SYSTEM
                                 ⊞ MAIN   PAGE
   GOTO TIMER   PAGE
                                 TIMER REC ENABLE
```
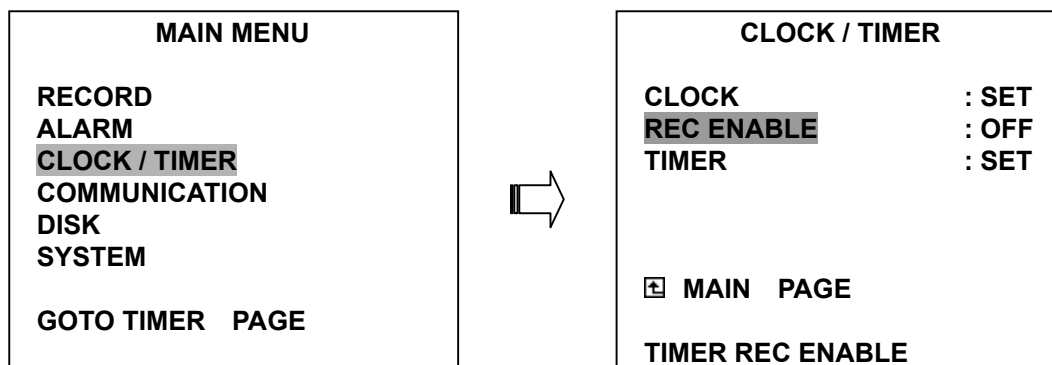
CLOCK:

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 (Operate On mode).

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 that the DVR will start and stop recording. There are two 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 combined time-period setting.

```
       REC SCHEDULE                    REC SCHEDULE

    START END    START END         START   END    START END
   S :06:00-16:00  12:00-18:00     S :06:00-18:00   00:00-00:00
```
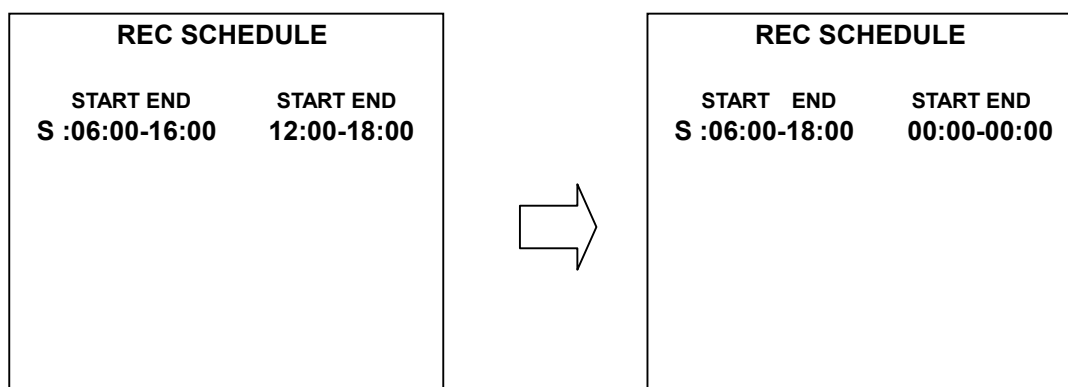
5.4 COMMUNICATION

This option allows you to configure the status of the RS-232 communication port when connected to an external device, and the Ethernet communications settings. (Please refer to the RS-232 Protocol and Network Function for more details)

```
┌─────────────────────────┐          ┌─────────────────────────┐
│       MAIN MENU         │          │      COMM SETTING       │
│                         │          │                         │
│   RECORD                │          │   COMM  ID      : 01    │
│   ALARM                 │          │   RS232         : ON    │
│   CLOCK / TIMER         │          │   RS485         : ON    │
│   COMMUNICATION         │    ⇨     │   NET ENABLE    : OFF   │
│   DISK                  │          │   NET DHCP      : OFF   │
│   SYSTEM                │          │   NET IP        : SET   │
│                         │          │   FTP SETTING           │
│                         │          │                         │
│                         │          │   ⊞ MAIN PAGE          │
│     GOTO COMM PAGE      │          │   SET RS232  /  RS485  ID│
└─────────────────────────┘          └─────────────────────────┘
```
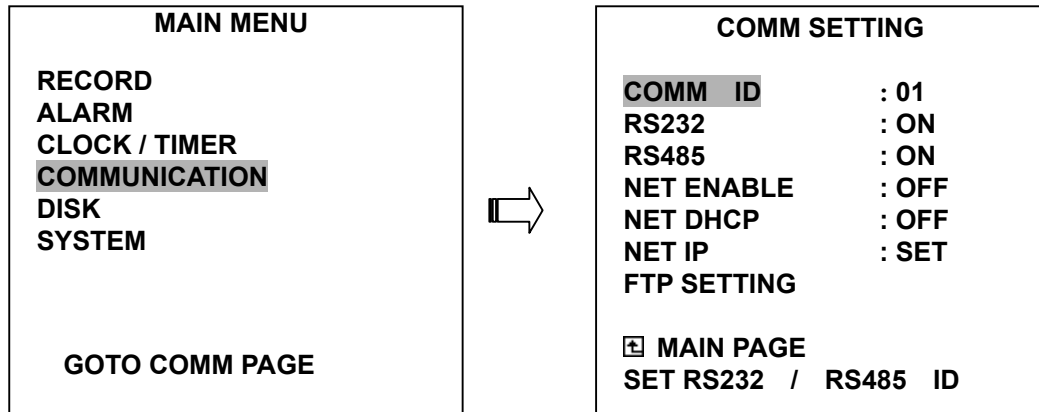
COMM ID:

Communication ID for RS232 and RS485 communication. After the IV-110CD-SN 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 accept.

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 selects either enable or disable for the Ethernet communication port.

> **OFF:** Disables it.
>
> **ON:** Enables it.

NET DHCP:

This option selects enable or disable for the DHCP communication function.

    OFF: Disables it.

    ON: Enables it.

NOTE: If provided with a DHCP server, the IV-110CD-SN 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

FTP SETTING:

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

```
          COMM SETTING                              FTP SETTING

   COMM   ID        : 01                     ENABLE            : OFF
   RS232            : ON                      REC MODE          : ALARM REC
   RS485            : ON                      REC RATE          : 1 F / 1 S
   NET ENABLE       : OFF        ⟹           ACCOUNT           : SET
   NET DHCP         : OFF
   NET IP           : SET
   FTP SETTING

   ⊞ MAIN PAGE                                ⊞ MAIN PAGE
   NAS FTP RECORDING                          SET   FTP    ON / OFF
```
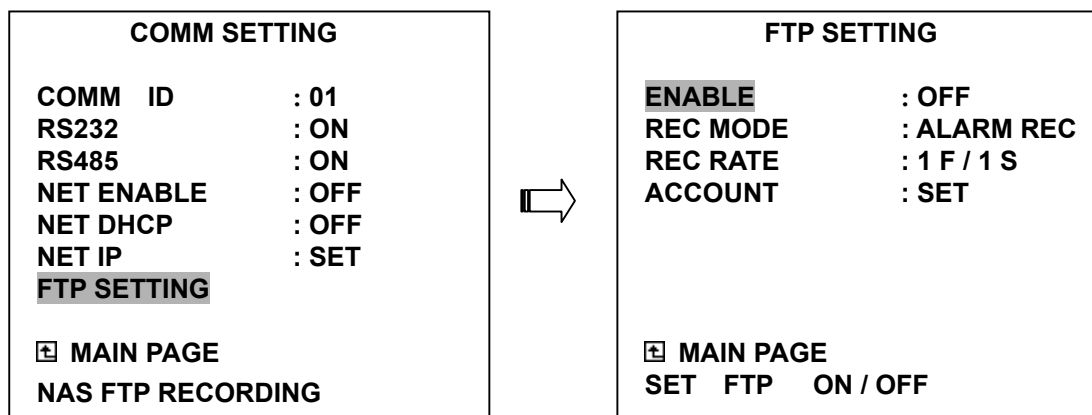
    ENABLE:

        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: **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.**

ACCOUNT:

This option is used to configure the FTP account settings. This is required for the purpose of making a 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    ]
```

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 : Input the FTP user name (Login Name).

PASSWORD : Input the FTP password (Password).

PATH : Input the upload path while doing the FTP.

5.5 DISK SETTING

```
┌─────────────────────────────┐         ┌─────────────────────────────┐
│          MAIN MENU          │         │         DISK SETTING        │
│                             │         │                             │
│      RECORD                 │         │  REFORMAT       : HD 1   2   │
│      ALARM                  │         │  HD 2 USAGE     : REC        │
│      CLOCK / TIMER          │         │  BACKUP         : FULL       │
│      COMMUNICATION          │   ⇨     │                             │
│      DISK                   │         │                             │
│      SYSTEM                 │         │  ⊞ MAIN PAGE                │
│                             │         │                             │
│      GOTO DISK PAGE         │         │  DISK REFORMAT/CLEAR        │
│                             │         │                             │
└─────────────────────────────┘         └─────────────────────────────┘
```
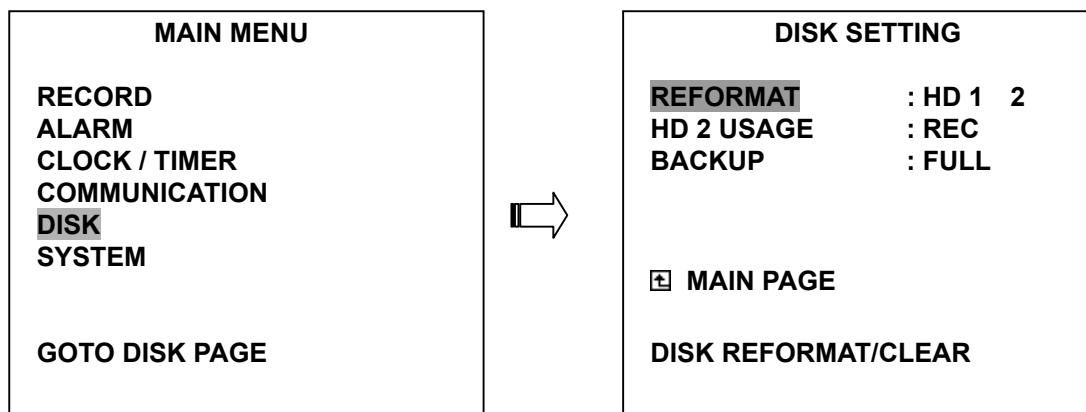
REFORMAT:

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 5.6 **PASSWORD** option.

> **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 backup purpose only. (This function has to be proceeded with when the **HD 2 USAGE** option is set to **BACKUP**.)

HD2 USAGE:

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

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

NOTE: When you wish to play back a recorded video from a HD2, this option must be set to REC. For more details, please refer to section 4.3.4.

BACKUP:

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 4.5.1)

> **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.

5.6 SYSTEM

This page is used for accessing the history of the operation status, setting the password, resuming factory default, and determining the menu display background.

```
┌────────────────────────────┐          ┌────────────────────────────────┐
│        MAIN MENU           │          │           SYSTEM               │
│                            │          │                                │
│  RECORD                    │          │  OPERATION LOG    : ENTER      │
│  ALARM                     │          │  OSD LANGUAGE     : ENGLISH    │
│  CLOCK / TIMER             │          │  MENU BACKGND     : 2          │
│  COMMUNICATION             │    ⇨     │  BUZZER           : ON         │
│  DISK                      │          │  PASSWORD         : SET        │
│  SYSTEM                    │          │  SETUP PWD        : OFF        │
│                            │          │  DEFAULT          : LOAD       │
│                            │          │  SD SETUP         : SAVE       │
│                            │          │  VERSION          : ENTER      │
│                            │          │                                │
│                            │          │  ⊞  MAIN PAGE                  │
│  GOTO SYSTEM SETTING       │          │  VIEW OPERATION LOG            │
└────────────────────────────┘          └────────────────────────────────┘
```
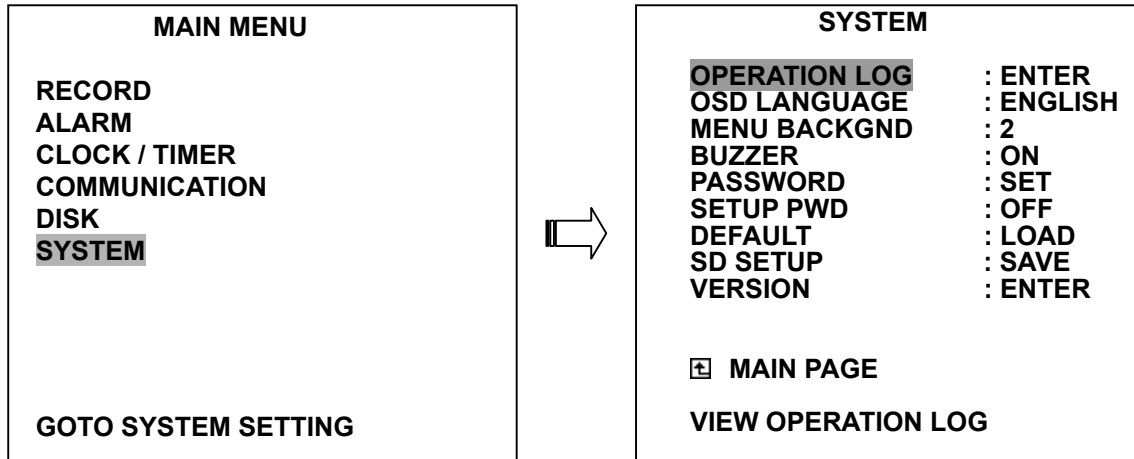
OPERATION LOG:

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

ON: Powers up the device.

OFF: Powers off the device.

REC: Starts recording.

STOP: Ceases recording.

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.

```
┌────────────────────────────────┐
│                                │
│   05/15/03   18:19:32 ON       │
│   05/15/03   18:19:32 OFF      │
│   05/15/03   18:19:32 REC      │
│   05/15/03   18:19:32 STOP     │
│   05/15/03   18:19:32 PLAY     │
│   05/15/03   18:19:32 V-IN     │
│   05/15/03   18:19:32 V-LOSS   │
│   05/15/03   18:19:32 P-LOSS   │
│                                │
└────────────────────────────────┘
```

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

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 level 1 and 3. The background color is used in 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 long.

    ON: Enables buzzer.

    OFF: Disables buzzer.

Situation
Alarm occurs
Video loss occurs
Disk is full
Load factory default
Buzzer set to ON
Enable/disable key lock function
Power on /off mobile rack HDD
Backup operation complete
Timer activate/deactivate
Recording switching between HDD

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, user must pass the password check before entering the setup menu.

    ON: Enables it.

    OFF: Disables it.

DEFAULT:

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

SD SETUP:
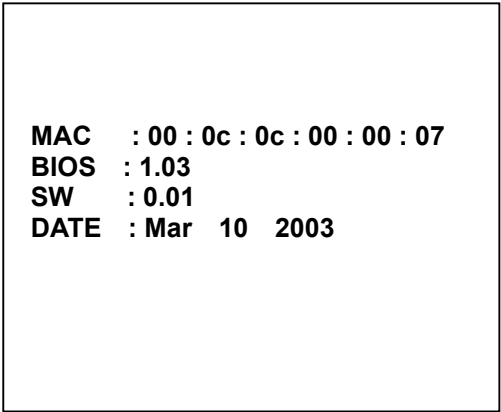
The IV-110CD-SN offers a quick setup method by using a SD card.   If the user wants to set up many a number of the same devices with the same settings, he can save the whole settings to a SD card, then transfer to another DVR.

     SAVE: Saves the whole setting to the SD card.

     LOAD: Loads the whole setting to the SD card.

VERSION:

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

```
MAC    : 00 : 0c : 0c : 00 : 00 : 07
BIOS   : 1.03
SW     : 0.01
DATE   : Mar   10   2003
```

6. RS-232 & RS-485 Protocol

6.1 Setup

6.1.1 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.
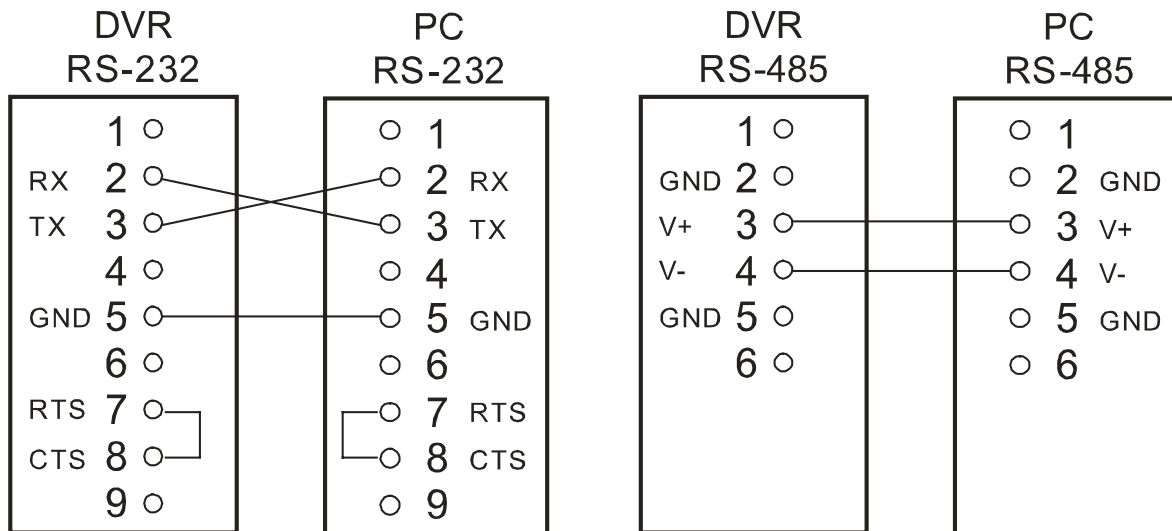
6.1.2 Set the **RS-232** option to **ON** in the **COMMUNICATION** page of the setup menu.

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

6.2 Communication Protocol:

6.2.0 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

End Code= 0x4f

The different command types and their corresponding parameters are as follows:

6.2.1 Keys and signals

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

< The value of a specific front panel key >

KEY_PLAY	1
KEY_STOP	3
KEY_PAUSE	4
KEY_POWER	5
KEY_REC	6
KEY_SETUP	7
KEY_ENTER	8
KEY_SEARCH	10
KEY_DISPLAY	11
KEY_UP	13
KEY_DOWN	14
KEY_LEFT	15
KEY_RIGHT	16
KEY_MONITOR	36
JOG_L	128
JOG_R	129
KEY_SHUT_L8	130
KEY_SHUT_L7	131
KEY_SHUT_L6	132
KEY_SHUT_L5	133
KEY_SHUT_L4	134
KEY_SHUT_L3	135
KEY_SHUT_L2	136
KEY_SHUT_L1	137
KEY_SHUT_CT	138
KEY_SHUT_R1	139
KEY_SHUT_R2	140
KEY_SHUT_R3	141
KEY_SHUT_R4	142
KEY_SHUT_R5	143
KEY_SHUT_R6	144
KEY_SHUT_R7	145
SIGNAL_REC_IN	163
SIGNAL_ALARM_RESET	165
SIGNAL_REC_OUT	169
SIGNAL_ALARM_IN	189

6.2.2 COMMAND Types

6.2.2.0 Command (Main Category=0x02)

6.2.2.1 Handshake (Second Category=0x01)

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

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

6.2.2.2 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>**

2001/06/20 17:05:00 = <0xD1>, <0x07>, <0x06>, <0x14>, <0x11>, <0x05>, <0x00>

6.2.2.3 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>**

2001/06/20 17:05:00 = <0xD1>, <0x07>, <0x06>, <0x14>, <0x11>, <0x05>, <0x00>

DVR Act: Changing the time and date.

6.2.2.4 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_REC	1
STATE_PREREC	2
STATE_PLAY	3
STATE_MENU	4
STATE_PLAYIDLE	5
STATE_SETUP	6
STATE_SEARCH	7
STATE_BACKUP	13
STATE_NET_PLAY	23

6.2.2.5 Time Search (Second Category=0x0b)

PC send: <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 06/12/2002 17:00 the Date/Time =

<0xd2>,<0x07><0x06>,<0x0b>,<0x11>,<0x00> where 2003= 210(=0xd3) + 7(=0x07) *256

NOTE: The DVR accepts RS-232 time search commands only under the live or playback Mode.

7. IDE 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.

The jumper settings of hard-disk drives for the system

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

7.1 Built-in hard disk

1.
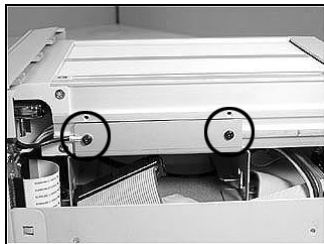
1. Unscrew all the mounting screws on the mobile rack of the unit and detach it.

2.   3.
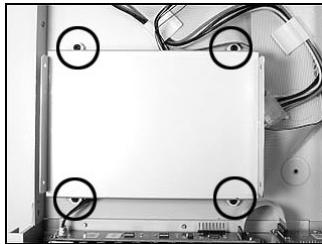
2. Carefully lift the mobile rack to a vertical position.

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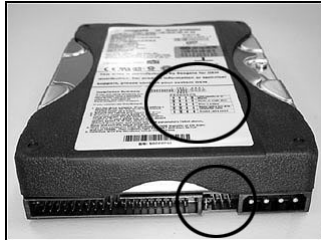
4.   5.

4. 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. Place the hard disk in the rack.

6.
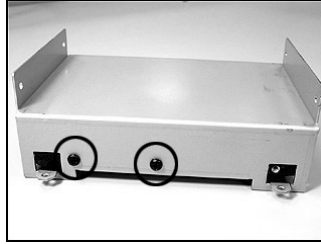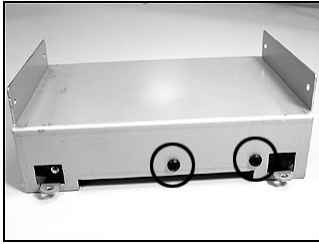
6. Secure the driver in the rack using two mounting screws in both the side-mounting holes. Please don't tighten the screws too much, otherwise that may damage the driver.
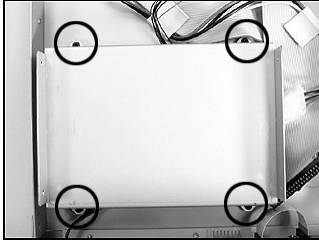
7. 8.
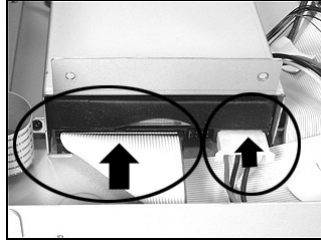
7. Screw the rack into the device, screwing in all the four screws.

8. 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.

10.
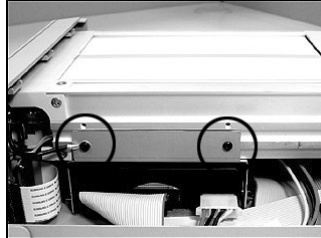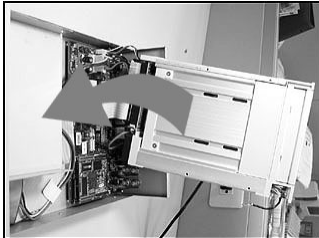
Place the mobile rack back onto the device and screw it in.

7.2 Mobile Rack

1. Make sure that the key unlocked.

2. Pull the active-handle outward to remove the carrier body away from the mobile rack
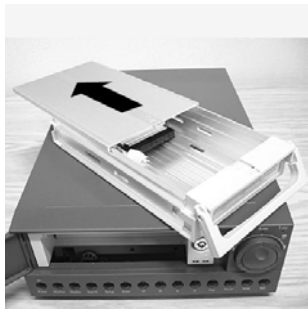
3. Slide the top cover backward and remove.

4. 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.
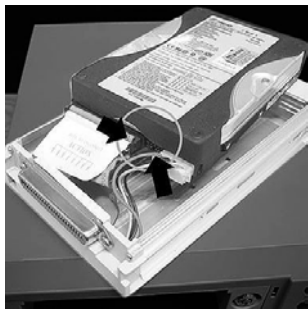
5. Attach the interface connector and the power connector to the drive. Please note the red lining of the IDE cable and the red wire of power cable must line up side by side.
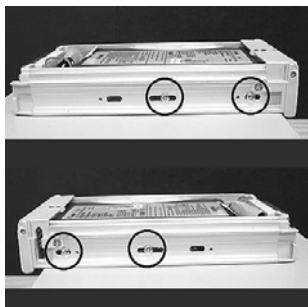
6. Place the HDD inside mobile rack, Use four of the provided screws.
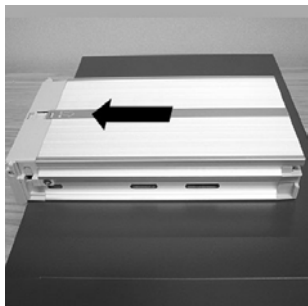
7. Place the top cover back to the carrier body by sliding forward to secure.
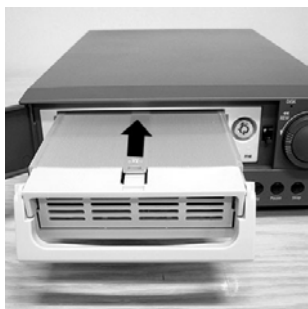
8. Slide the carrier body back in the mobile rack.

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

10. Push the active-handle inward.

11. Lock the Key.

8. System Default

MAIN MENU		REC SETTING	
RECORD		REC RATE : 20 F/S	
ALARM		REC QUALITY : BEST	
CLOCK / TIMER	⇨	DISK FULL : REWRITE	
COMMUNICATION		AUDIO : OFF	
DISK		MULTIPLEXER : ON	
SYSTEM			
		⊞ MAIN PAGE	
GOTO REC PAGE		SET REC RATE	

MAIN MENU

RECORD
ALARM
CLOCK / TIMER
COMMUNICATION
DISK
SYSTEM

GOTO ALARM PAGE

⇨

ALARM SETTING

ALM OPERATION   : OFF
REC RATE   : 20F/S
REC QUALITY   : BEST
AUDIO   : OFF
ALM TYPE   : NO
ALM DURATION   : 0   SEC
PRE- ALARM   : OFF
MOTION SETTING

⊞ MAIN PAGE

ALARM REC ENABLE

MAIN MENU

RECORD
ALARM
CLOCK / TIMER
COMMUNICATION
DISK
SYSTEM

GOTO CLOCK / TIMER PAGE

⇨

CLOCK / TIMER

CLOCK   : SET
REC ENABLE   : OFF
TIMER   : SET

⊞ MAIN   PAGE

TIMER REC ENABLE

```
        MAIN MENU                      COMM SETTING

RECORD                         COMM   ID        : 01
ALARM                          RS232           : ON
CLOCK / TIMER                  RS485           : ON
COMMUNICATION                  NET ENABLE      : OFF
DISK                           NET DHCP        : OFF
SYSTEM                         NET IP          : SET
                               FTP SETTING


                                ⊞  MAIN PAGE

GOTO COMM PAGE                 SET RS232 / RS485   ID
```

```
        MAIN MENU                      DISK SETTING

RECORD                         REFORMAT        : HD 1   2
ALARM                          HD 2 USAGE      : REC
CLOCK / TIMER                  BACKUP          : FULL
COMMUNICATION
DISK
SYSTEM



                                ⊞  MAIN PAGE

GOTO DISK PAGE                 DISK REFORMAT/CLEAR
```

```
        MAIN MENU                          SYSTEM

RECORD                         OPERATION LOG   : ENTER
ALARM                          OSD LANGUAGE    : ENGLISH
CLOCK / TIMER                  MENU BACKGND    : 2
COMMUNICATION                  BUZZER          : ON
DISK                           PASSWORD        : SET
SYSTEM                         SETUP PWD       : OFF
                               DEFAULT         : LOAD
                               SD SETUP        : SAVE
                               VERSION         : ENTER


GOTO SYSTEM SETTING             ⊞  MAIN PAGE

                               VIEW OPERATION LOG
```

9. 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 a 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 is 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	Save to Fnnn. JPG (where nnn= 0..999)
29	SAVE OK	Save to the JEPG is ok.
30	SD CARD WRITE PROTECT	A SD card is write-protected; or there is an error

10. Network Viewer and Image Viewer

This section provides instructions for installing and using the Network Viewer, and Image Viewer, which are included with the IV-110CD-SN. The programs can be operated by a selected PC equipped with the following requirements.

1. Intel Pentium 233MHz at least.
2. 32 MB RAM
3. Window 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.

10.1 The Network Viewer

10.1.1 Introduction to Network Viewer

The Network Viewer allows you to potentially access 16 units of the IV-110CD-SN from a remote desktop or a laptop in a TCP/IP networking environment. It can perform the following functions.

● View live images from the IV-110CD-SN
● Store, search, and review recorded video from the IV-110CD-SN 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 IV-110CD-SN networked by obtaining a 10 base Ethernet data cable (Standard RJ-45) to connect the IV-110CD-SN to your LAN/WAN. Now enter the main menu to set the IP address.
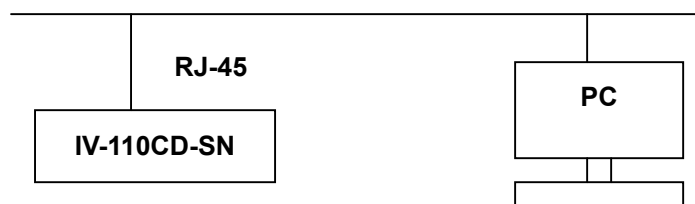
RJ-45 PIN configuration for Ethernet

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
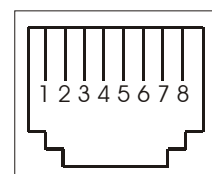
Physical specification for Ethernet

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

NOTE: For more details on network connections, please refer to the following document.

10.1.2   Install the Network Viewer in your PC

Install the Network Viewer from the supported CD-R.

1. Exit all applications currently running in the selected 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
   /   Network Viewer** to open up the program selection page as shown below. Click the **Network Viewer**
   tag to start the **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.

2. Open the extracted folder (DVR). The folder contains 5 files.

3. Click on the icon to execute the installation and then follow the on-screen instructions to
   proceed with the rest of the installation procedure as they appear.

4. After the installation is complete, pop up the **START** menu from your computer, and point to **Programs
   / Network Viewer** to start the **Network Viewer** program.

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

10.1.3 View the IV-110CD-SN video from a remote PC

Once Network View is executed a Login prompt will appear, you must enter the default User Name: admin, password: 9999 into the respective field and click on OK to log into the application.

Follow the instructions below to use the Network Viewer to browse a IV-110CD-SN video from a remote location. Upon entering the Network Viewer, the connection box will appear as follows.

1. Click the **Find** tag to connection of the all DVR device in the LAN.
2. Choose a channel number from the Channel drop-down list.
3. Type in the user name: **admin** (it only accept user name as admin), and password: same as the chosen IV-110CD-SN (4-digit no., 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 for another desire.
6. Click the **Connect** tag to establish the connection between the devices and the computer. Click the **Login** tag to begin viewing images.
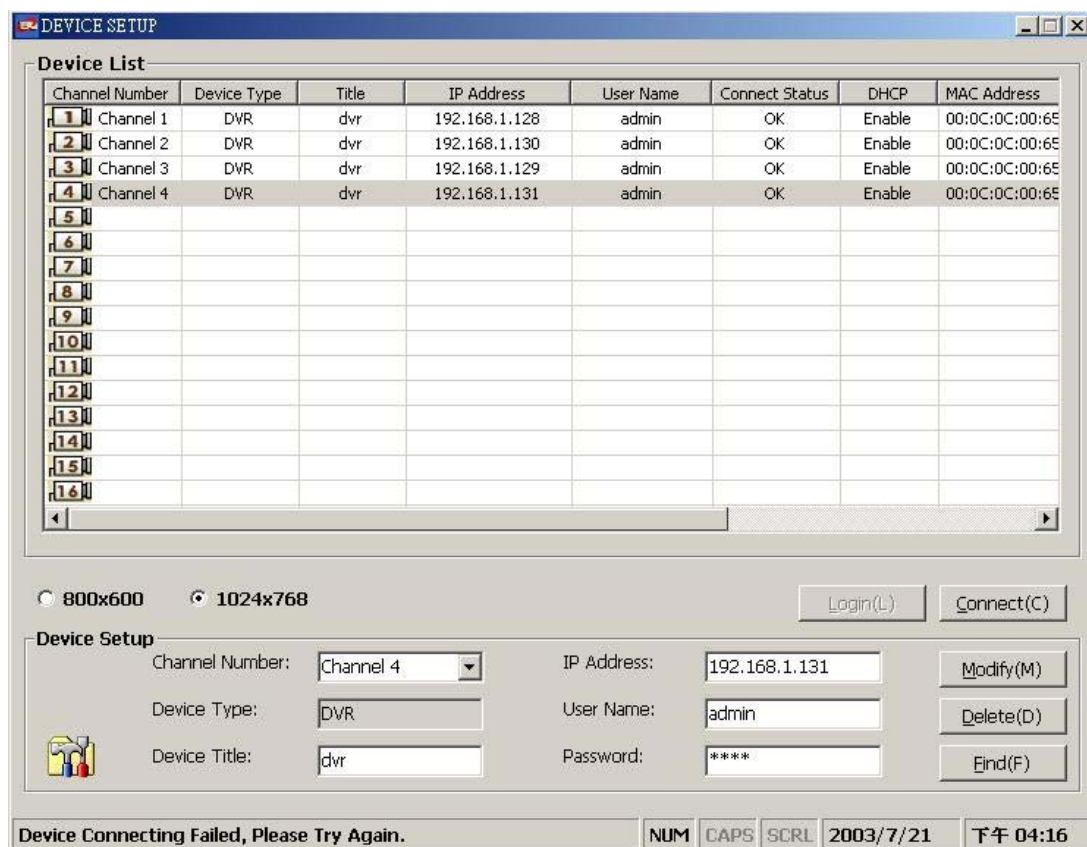
NOTE: Upon connection, the connection status box indicates the name and IP address of the selected device. If there's a failure to connect, a "Fail" message appears on the screen right after the device IP address; otherwise an "OK" appears. To add more connections or units to the IV-110CD-SN, please 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 all 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.

Viewing images

View all the connected devices

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 has been arranged when you established the connection.
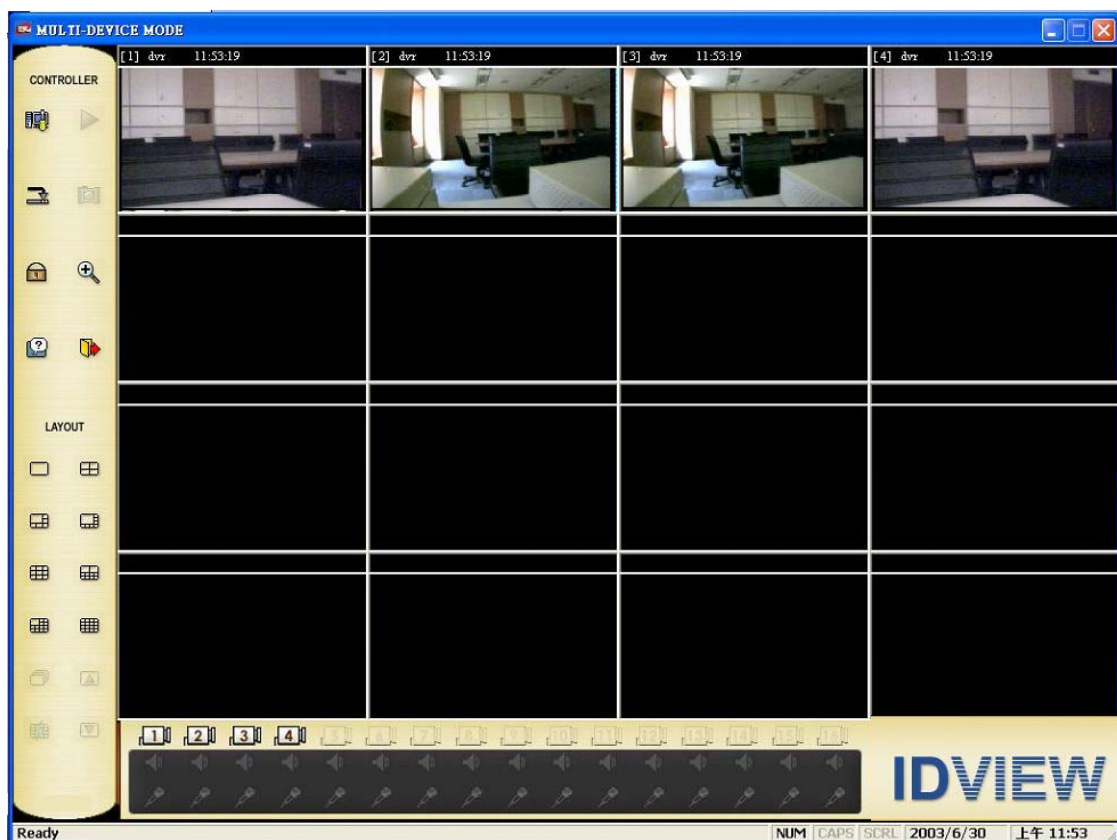
| Function Buttons	Description
	The Split-Screen display function bar. This allows you to display the connected device in the multi-format screens of 1, 2x2, 5+1, 7+1,3x3, 12+1, and 4x4.
	Press to enter the PC SYSTEM SETUP window, which allows you to program the System Setup, Record Setup, and Alarm 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.

View single device

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 network. (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 Other Multip ▼	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 in 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.
20030704 10:57:45 PLAY	IV-110CD-SN 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] 2003/07/2317:38:28 TCR 00:16:01:27	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.
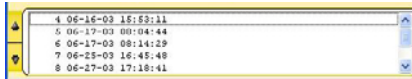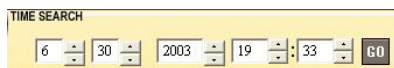
10.1.4 Change the Record & Timer Properties Via the Network

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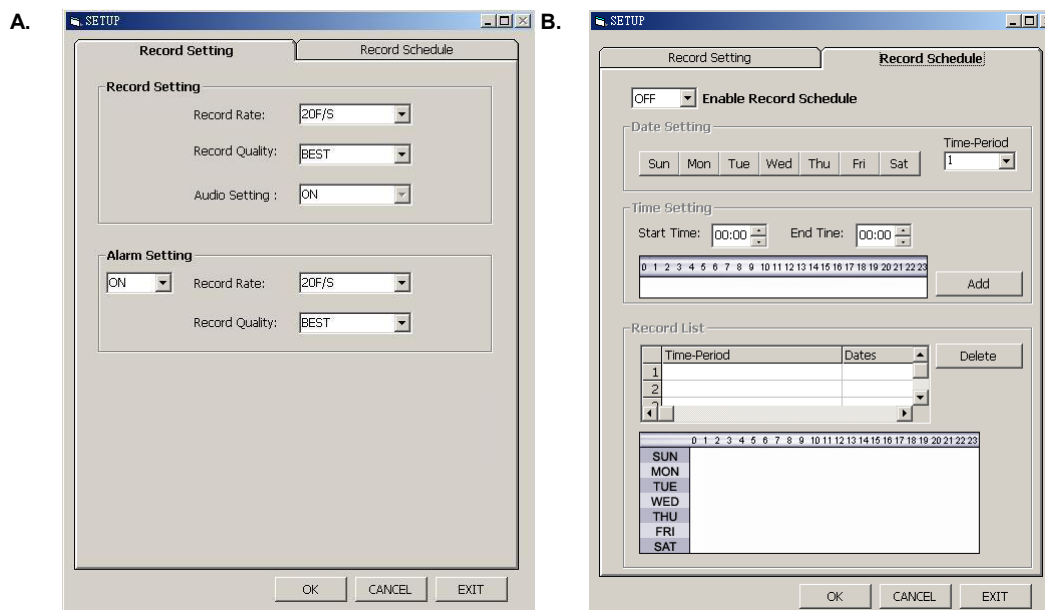
Set the regular record settings

1. When in the single –device mode, click   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** tag to proceed.

Set the Alarm record settings

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

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

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

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

Set the Record Schedule

1. When in the single –device mode, click   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.

10.1.5 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 in the playback mode.
2. Select a folder in the computer for copying images in.
3. Enter the number of images into the **NUMBER OF SAVING** box you wish to save in.
4. Click the **SAVE** tag; 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.
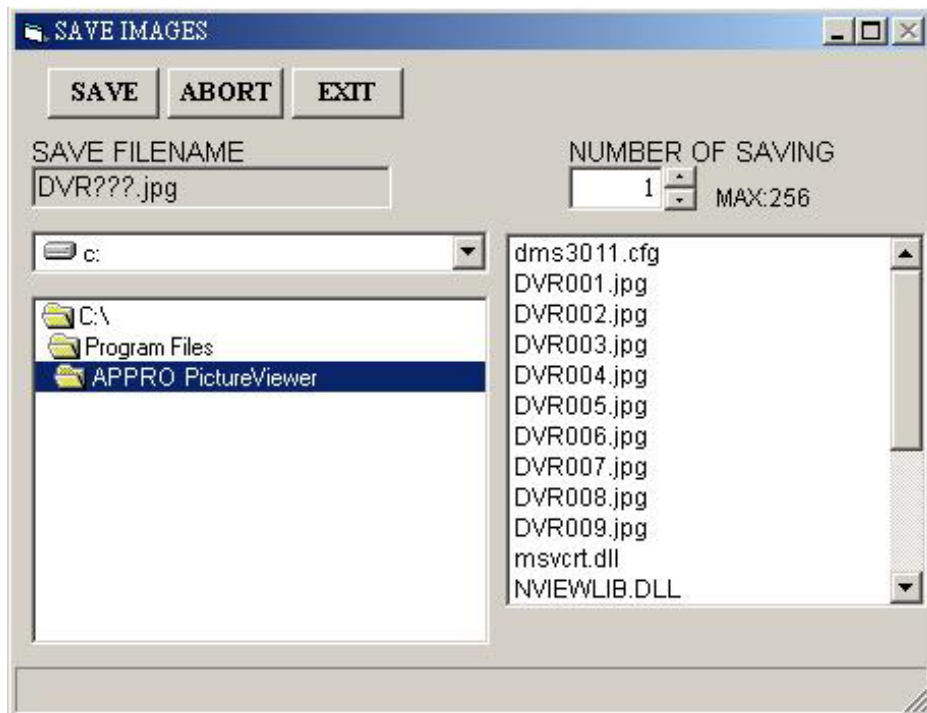
10.2 The Image Viewer

This is image integrity-protect 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 IV-110CD-SN, 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 a SD card or a HDD.

1. Pop up the **START** menu from your computer, and point to **Programs**/ **Network Viewer** to open up the program selection page. Click the **Image Viewer** tag to start the **Image Viewer** program. (See a sample screen below.)

2. Click the **PRINT** tag to get a displayed image printed out from a printer.
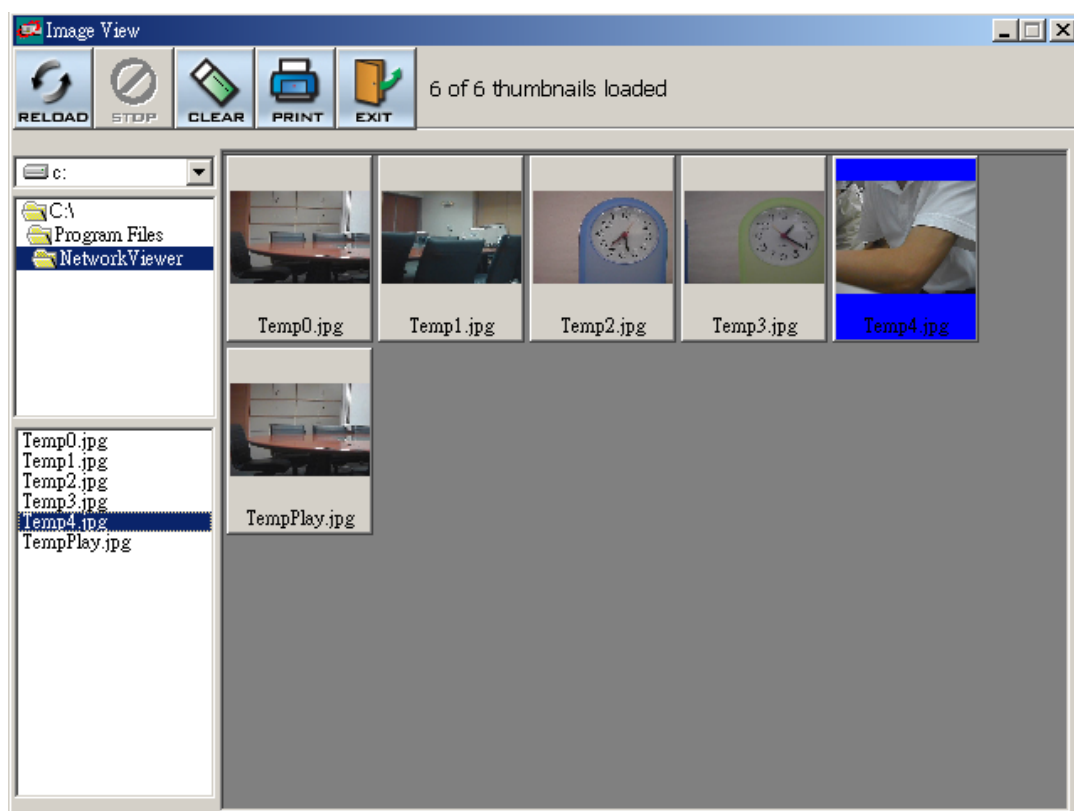
11. Index Table

The following description details how the DVR manages an index table issue.

The DVR will generate a time index table indicating recorded data is kept in a particular HDD. This allows to individually selecting 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.

	HD1			HD1		
	1	12-02-02 12:20:55		1	12-02-02 12:20:55	
	2	12-02-02 13:30:33		2	01-30-03 16:00:34	
	3	01-30-03 16:00:34			:	
3000 LISTS		:			:	3000 LISTS
		:		2999	02-03-03 16:00:56	
	3000	02-03-03 16:00:56		3000	02-08-03 17:30:58	
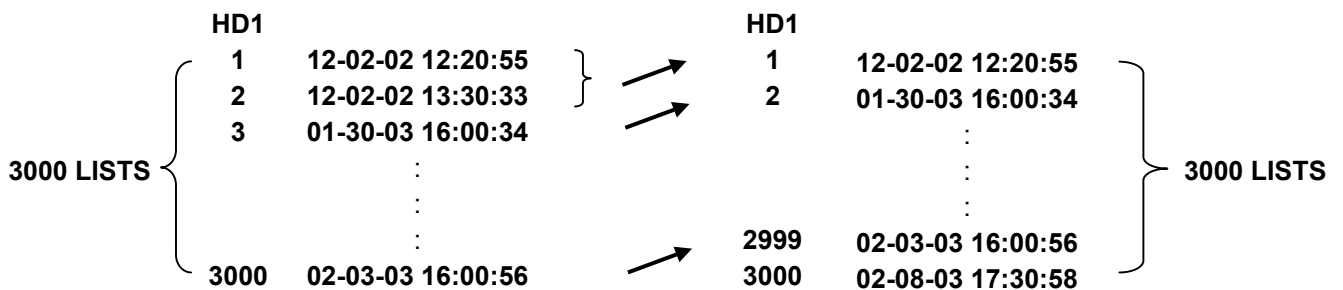
In the rewrite recording mode, when the archived hard disk drive is full, the DVR will start overwriting the oldest data recorded. As the previous recorded data was partially overwritten by the recent recording, the indicating time index of that data will be changed corresponding to the starting time of the remaining session. The index of the session will be deleted from the table when it is fully overwritten.

Previously recorded data overwritten

The point stops recording

Previously recorded data remaining
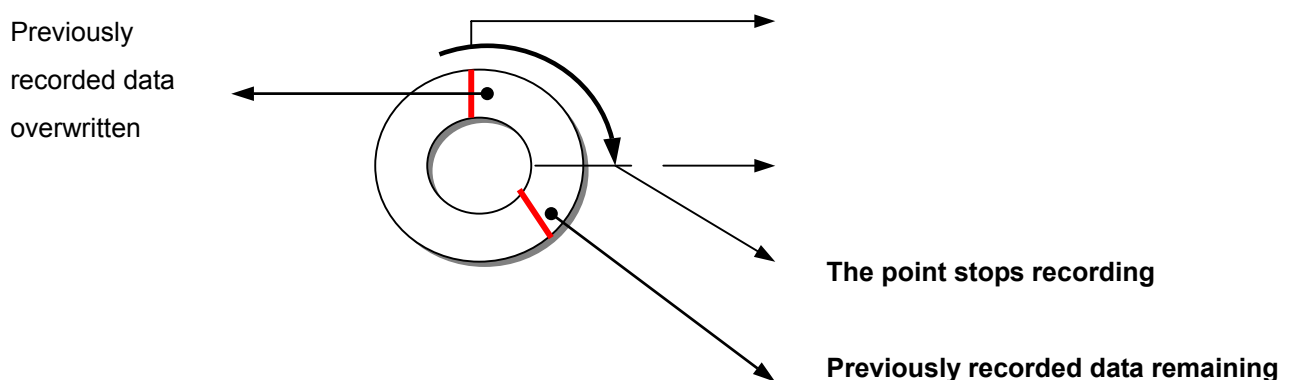
12. Network Configuration

12.1 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 specification 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

12.1.1 Connect to a computer

Use a crossover LAN cable to connect directly to a computer.
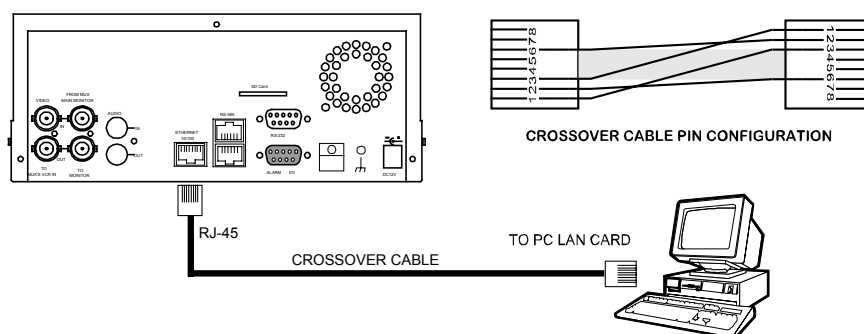
12.1.2 Connect to a LAN Hub (INTRANET)

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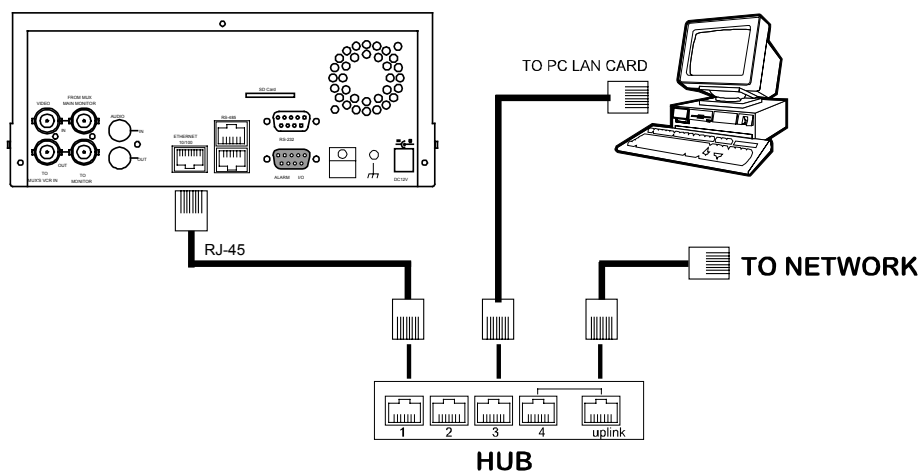
RJ-45 PIN configuration for LAN Hub

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
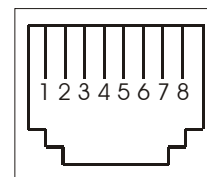
12.1.3 Connect to WAN (INTERNET)

The RJ-45 PIN configuration for connecting to a WAN is the same as connecting to a LAN.
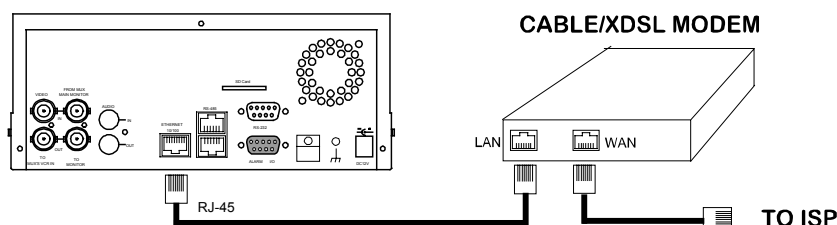
12.2 Configure Your DVR Network Settings

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

12.2.1 Enable DVR Network Function

| MAIN MENU | COMM SETTING |

```
MAIN MENU

RECORD
ALARM
CLOCK / TIMER
COMMUNICATION
DISK
SYSTEM




GOTO COMM PAGE
```

```
COMM SETTING

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

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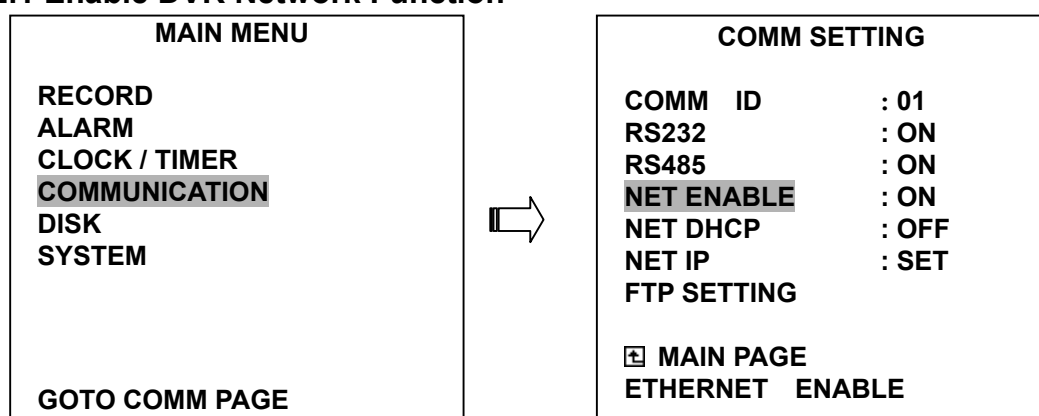
- Press the **Setup** button to enter the OSD MAIN MENU. Please use the **"<" ">" buttons** ⑪ and ⑭ to highlight COMMUNICATION; then press the **Enter** button to enter the COMM SETTING page.

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

12.2.2 Enable DHCP Function

- Use the "**^**" and "**v**" buttons ⑫, and ⑬, to highlight NET DHCP; select ON. Then press the **Enter** button to proceed.

```
          MAIN MENU                          COMM SETTING

     RECORD                              COMM   ID          : 01
     ALARM                               RS232               : ON
     CLOCK / TIMER                       RS485               : ON
     COMMUNICATION                       NET ENABLE          : ON
     DISK                         ⇨      NET DHCP            : ON
     SYSTEM                              NET IP              : SET
                                         FTP SETTING

                                         ⊞ MAIN PAGE
     GOTO COMM PAGE                      SET ETHERNET DHCP
```
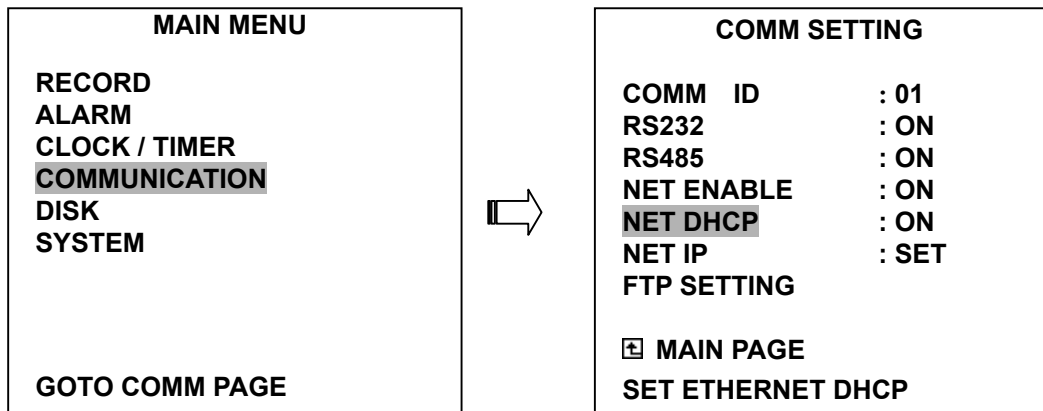
NOTE: This function can only work if the LAN which the unit is connected to has a DHCP server. If the DHCP server is working, the DVR will obtain an IP address automatically from the DHCP server. In that case please skip the section 2.3 (Set IP address) and follow section 3. (TCP/IP Communication Software).

12.2.3 Set IP Address

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:

```
          MAIN MENU                          COMM SETTING

     RECORD                              COMM   ID          : 01
     ALARM                               RS232               : ON
     CLOCK / TIMER                       RS485               : ON
     COMMUNICATION                       NET ENABLE          : ON
     DISK                         ⇨      NET DHCP            : ON
     SYSTEM                              NET IP              : SET
                                         FTP SETTING

                                         ⊞ MAIN PAGE
     GOTO COMM PAGE                      SET ETHERNET
```
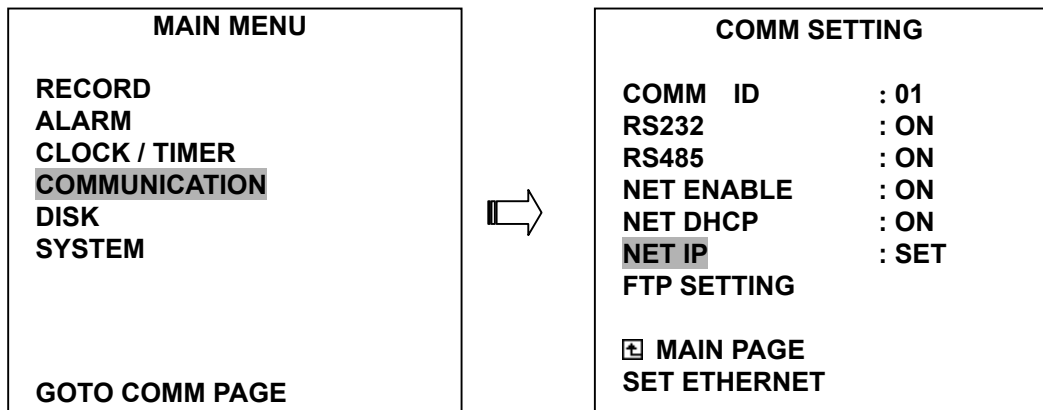
Use the "**^**" and "**v**" buttons ⑫, and ⑬, to highlight the NET IP. Press the **Enter** button to enter the NET IP page

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

    IP: 192.168.0.1

    MASK: 255.255.255.0

    GATEWAY: 0.0.0.0

NOTE: 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 192.168.0.1 to 192.168.0.255. You can pick one for use from the range of the IP. 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.

NOTE: When 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.

12.3 TCP/IP Communication Software

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

- Click the **Start** Menu from your computer, and point to the **Settings/Control panel.**
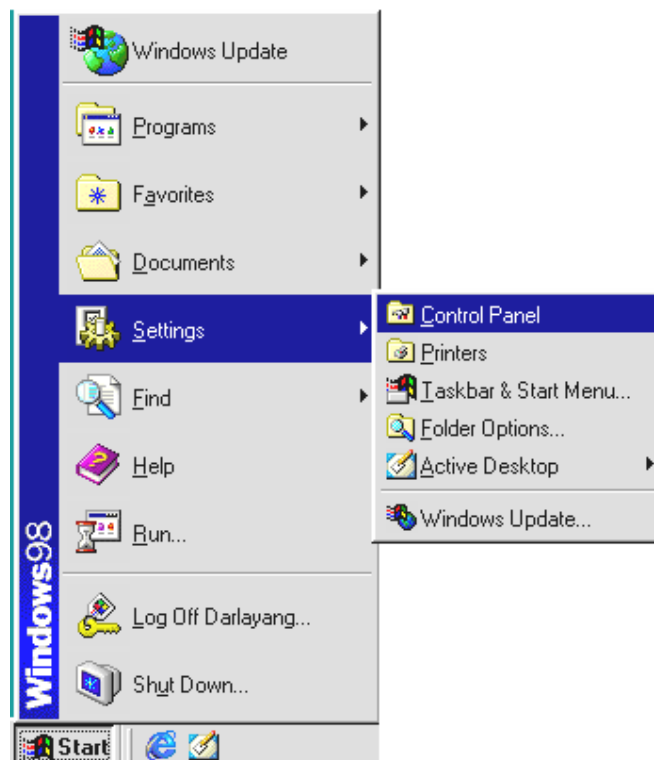
● Click the **NETWORK** icon twice to enter the **NETWORK** setting windows.
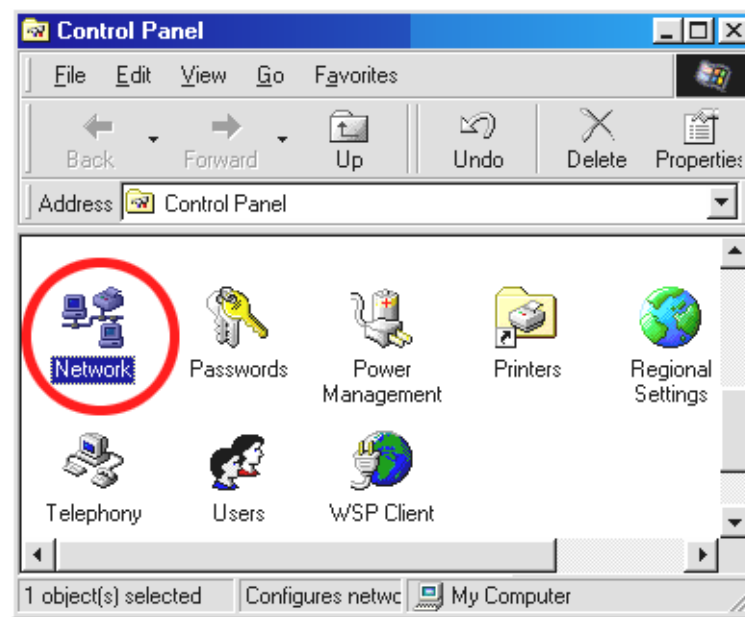
● Click on the **Configuration** tag; check if the TCP/IC is included among the network components list. If the TCP/IP is included, please process step 5. If it is not included, please follow step 4 to install the TCP/IP.
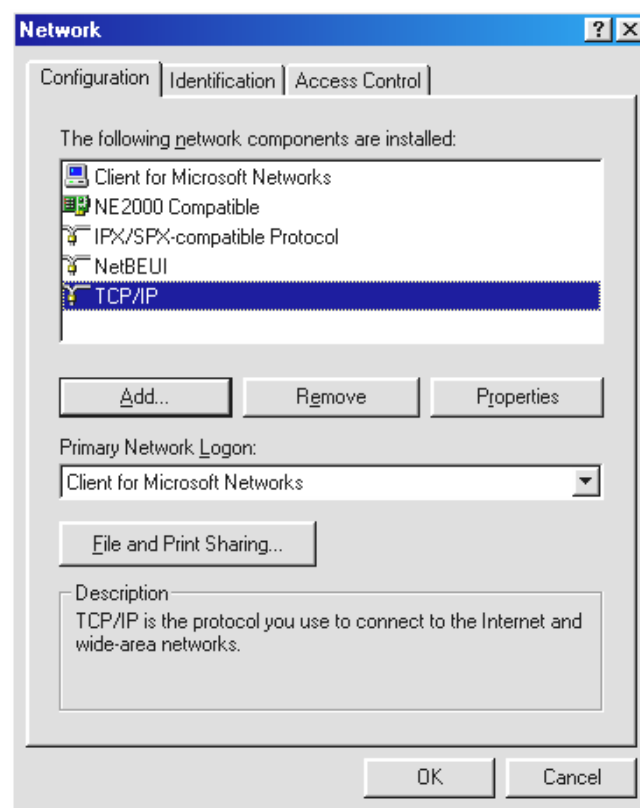
12.4 TCP/IP installation
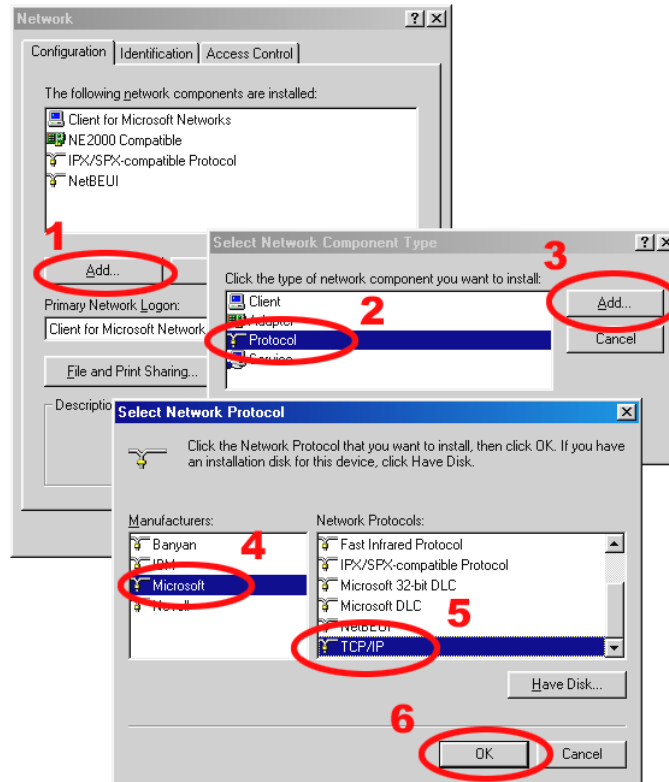
During the installation, you will be requested to insert the windows 98 CD ROM. After installation, the PC will be restarted.

12.5 TCP/IP Configuration setting

- Click **Start → Settings → Control Panel → Network**.
- Select **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.
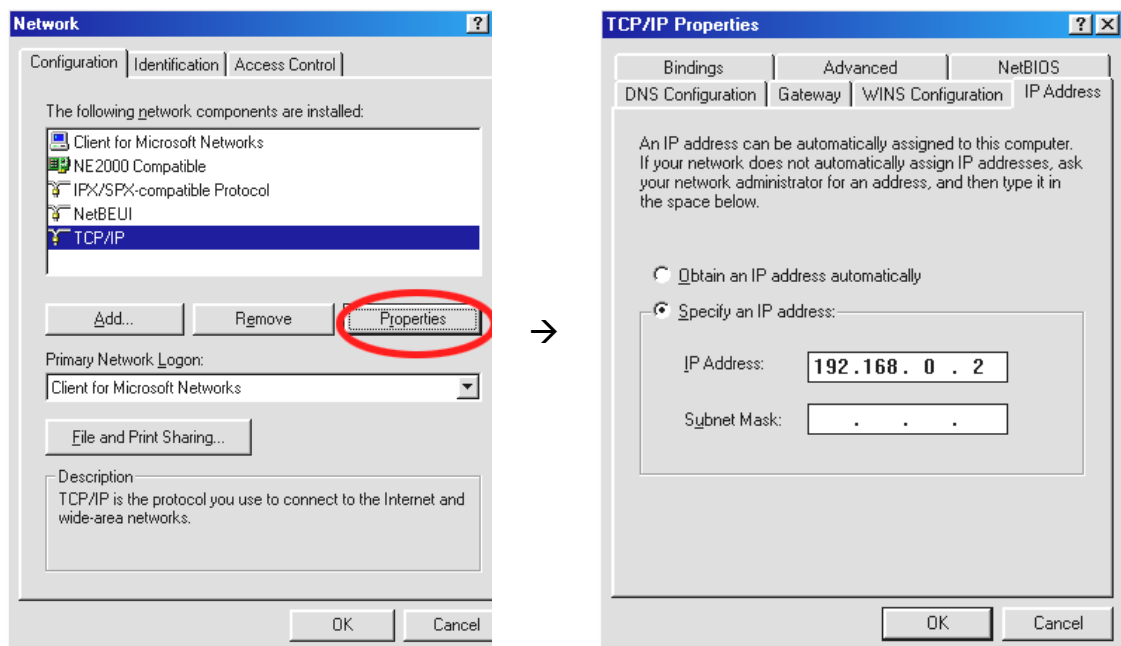
If you are using a DHCP server, please select **Obtain an IP address automatically**. Any assigned IP address for the connected DVRs must be in the same class type as the server. If there is no DHCP server, please select **specify an IP address** and type in the IP address of your PC. This IP address 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

12.6 Connection Testing

With the previous settings, follow the instructions below to ensure whether you have established the connection successfully.
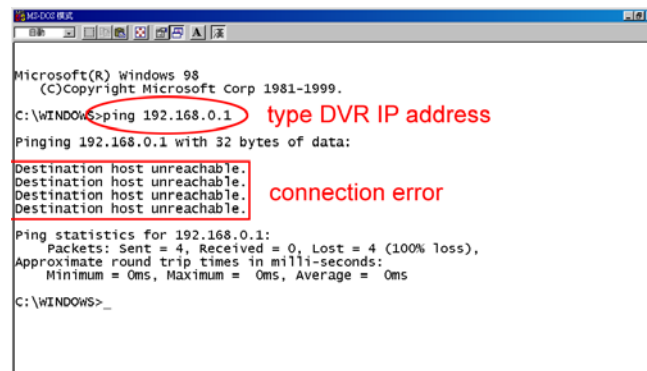
- Click **Start → Programs → MS-DOS Prompt**
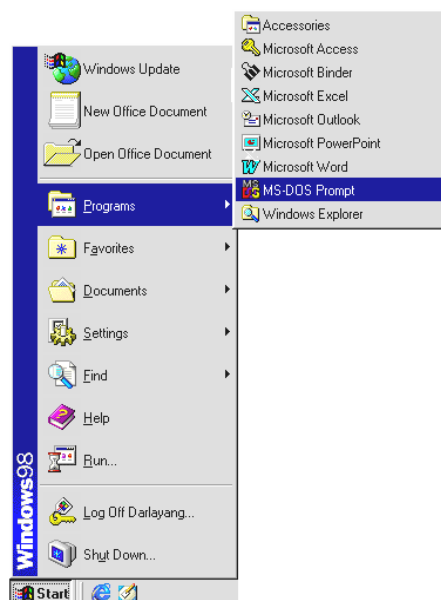
- Type in **ping 192.168.0.1** then Enter. (See the sample screen below)
  *** This IP is the DVR IP address that is assigned for the connected DVR in step 2.*
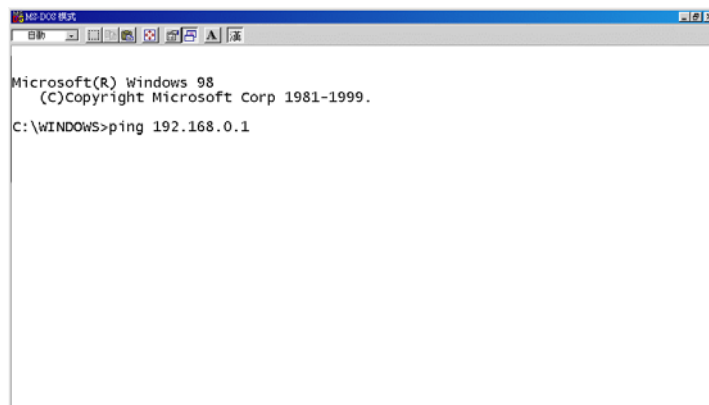
- If you receive a response as in the sample screen below, the connection hasn't been successfully established. Please re-check all the hardware and software installation by repeating steps 1 to 5. If you still can't establish the connection after rechecking, please contact your dealer.
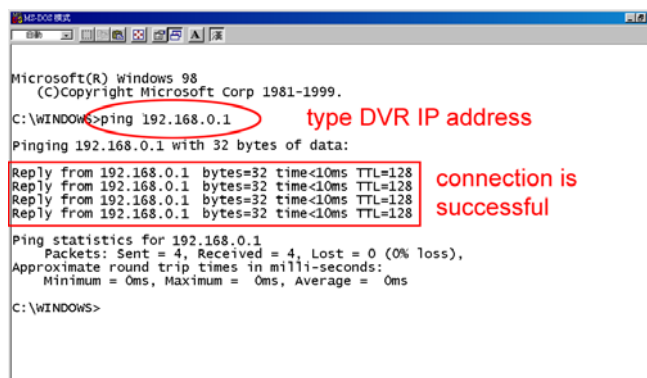
- If you receive a response as in the sample screen below, you have successfully made the connection.

13. SPECIFICATIONS

Model Number	Smart network DVR, IV-110CD-SN	
Image System	NTSC	PAL
Resolution	720 x 240 pixels 352 x 240 pixels	720 x 288 pixels 352 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, 8 kHz	
Storage Media	> 320 GB / 1 Fixed HDD, 1 Removable HDD	
Compression	MJPEG	
Memory Card	SD Card	
Archive	Hot Swappable Removable HD	
Watermark	Digital Signature	
Recording Rate	30 ips (720x240) 60 ips (352x240)	25 ips (720x288) 50 ips (352x288)
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	
OSD Language	English / Chinese(T)	
Set-up Menu	Multi-layer / Network setting	
Log list	4000 records	
Alarm In/Out	1 Alarm Input / 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) or RS-232	
Password Protection	Operation / Menu Setup / Remote Access	
Network Capabilities	Archive image as JPEG formats, Multi-brand multiplexer decoding, Remote live or recorded images	
Power Supply (AC adapter)	Input: 100V-240V, 50 Hz/60 Hz; Output: DC12V max 5A	
Dimensions	220 mm x 94 mm x 340 mm EIA 19" 2U Half Size Mountable	
Weight	About 3.9 kg	
Operation Temperature	5° C ~ 40° C (41° F ~ 104° F)	
Regulation	FCC, CE	
Provided Accessories	AC Adapter x 1	
	Instruction manual x 1	
	Power cord x 1	
	CD-R x 1	
	Screw (#6-32UNC) x 4(see P.56), Screw (M3) x 8(not in use)	
	Key x 2	

*Design and specifications subject to change without notice.

14. Compatible Multiplexer Drives

| Manufacturer	Model	N/P	Channel	COLORS	Decode by DVR	Decode by VIEWER
APPRO	MPX-9004, 9104	NTSC / PAL	4CH	COLOR, B/W	**OK**	**OK**
APPRO	MPX-9019, 9119	NTSC / PAL	9CH	COLOR, B/W	**OK**	**OK**
APPRO	MPX-9016, 9116	NTSC / PAL	16CH	COLOR, B/W	**OK**	**OK**
ATV	DPX9	NTSC / PAL	9CH	COLOR	**OK**	**OK**
ATV	DPX16	NTSC / PAL	16CH	COLOR	**OK**	**OK**
DM	SPC2/D/N/04M	NTSC / PAL	4CH	COLOR	**OK**	**OK**
DM	SLDX16C	NTSC / PAL	16CH	COLOR	**OK**	**OK**
WVC	MPX-C9D	PAL	9CH	COLOR	**OK**	**OK**
WVC	MPX-C16D	PAL	16CH	COLOR	**OK**	**OK**
WVC	TPX-C1600T	PAL	16CH	COLOR	**OK**	**OK**
DYNACOLOR	D7291	NTSC / PAL	9CH	COLOR	**OK**	**OK**
DYNACOLOR	D7261	NTSC / PAL	16CH	COLOR	**OK**	**OK**
DYNACOLOR	D7260	NTSC / PAL	16CH	COLOR	**OK**	**OK**
ENEO	VBM-7001	PAL	4CH	B/W	**OK**	**OK**
ENEO	VCM-7001	PAL	4CH	COLOR	**OK**	**OK**
ENEO	VCMT-8016	NTSC / PAL	16CH	COLOR	**OK**	**OK**
HISHARP	DX72	NTSC / PAL	16CH	COLOR	**OK**	**OK**
IBT	CX904	NTSC / PAL	4CH	COLOR	**OK**	**OK**
IBT	CX916	NTSC / PAL	16CH	COLOR	**OK**	**OK**
KOBI	K-69C-4	NTSC / PAL	4CH	COLOR	**OK**	**OK**
KOBI	K-69C-9	NTSC / PAL	9CH	COLOR	**OK**	**OK**
KOBI	K-69C-16	NTSC / PAL	16CH	COLOR	**OK**	**OK**
MultiView	MV 14CD	NTSC / PAL	4CH	COLOR	**OK**	**OK**
MultiView	MV 19CD	NTSC / PAL	9CH	COLOR	**OK**	**OK**
MultiView	MV 116CD	NTSC / PAL	16CH	COLOR	**OK**	**OK**
PELCO	Duplex 9CH	PAL	9CH	COLOR	**OK**	**OK**
PELCO	Duplex 16CH	PAL	16CH	COLOR	**OK**	**OK**
PROVIDEO	RMX-4CD	NTSC	4CH	COLOR	**OK**	**OK**
PROVIDEO	RMX-9CD	NTSC	9CH	COLOR	**OK**	**OK**
PROVIDEO	RMX-16CD	NTSC	16CH	COLOR	**OK**	**OK**
ROBOT	MV16e	NTSC	16CH	B/W	**OK**	**OK**
ROBOT	MV96p	NTSC	16CH	COLOR	**OK**	**OK**
ROBOT	MV99p	PAL	9CH	COLOR	**OK**	**OK**
Santec	4channel	PAL	4CH	COLOR, B/W	**OK**	**OK**
Santec	9channel	PAL	9CH	COLOR, B/W	**OK**	**OK**
Santec	16channel	PAL	16CH	COLOR, B/W	**OK**	**OK**
SANYO	MPX-CD163	PAL	16CH	COLOR	**OK**	**OK**
Sensormatic	RV2216	NTSC	16CH	COLOR	**OK**	**OK**
TOSHIBA	JK-MX16	NTSC	16CH	COLOR	**OK**	**OK**
Vantage	VDX04	PAL	4CH	COLOR, B/W	**OK**	**OK**
Vantage	VDX09	PAL	9CH	COLOR, B/W	**OK**	**OK**
Vantage	VDX16	PAL	16CH	COLOR, B/W	**OK**	**OK**
Videoline	S9104	NTSC / PAL	4CH	COLOR	**OK**	**OK**
Videoline	S9119	NTSC / PAL	9CH	COLOR	**OK**	**OK**
Videoline	S9116	NTSC / PAL	16CH	COLOR	**OK**	**OK**

APPENDIX 1. –SCANIP

Follow the instructions below to use the SCANIP software to search the DVR devices from a local location.

1. Click the 🔍 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 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 auto search 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.
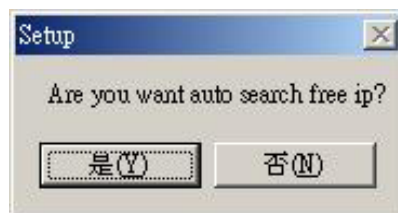
5. Manual insertion of "Free IP Address".

   If you have clicked "No", please manually type in insertions as required in 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.

RMN040200160v1.4