
Instruction Manual

1 Channel Mobile

Digital Video Recorder

Model MVR1020



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About this manual

This is the instruction manual for 1 Channel Mobile DVR, Model MVR1020.

This manual describes how to install and operate the MVR1020 and provide information regarding specifications and features of this product.

Please be sure to read this manual and follow the instructions when installing the MVR1020.

If you have any questions or problems installing, please contact Clover Electronics at 877-327-5000.

1. Unpacking

When unpacking the DVR Unit, please be cautious not to drop, throw or hit with force. This may cause damage to the product that could lead to malfunctions.

Before Installation please check if the following objects are included.

- ❖ 1 Channel Mobile DVR unit
- ❖ Remote Controller & Batteries
- ❖ Instruction Manual
- ❖ CF Card Viewer CD
- ❖ CF Card Reader (Optional)
- ❖ Power Cable
- ❖ Mounting Bracket
- ❖ External IR Receiver (Optional)



1 CH Mobile DVR



CF Card Reader
(Optional)



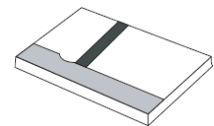
Remote
Controller



Batteries



CD-Rom



Manual



Power Cable



Ext. IR Receiver
(Optional)



Screws



Mounting
Brackets

※ If any of the above items are missing please contact Clover Electronics.

2. Features

- ❖ Duplex (Record / Play-back)
- ❖ Real Time Full Display mode
- ❖ High Quality and Easy to install & control
- ❖ Stand Alone Type (Non-PC, Non-OS)
- ❖ On Screen Display
- ❖ Built-in Time / Date Generator
- ❖ Event lists of 990
- ❖ Motion and Alarm detection recording
- ❖ Quick Search: by Date & Time / Recording Lists
- ❖ CF Card Overwrite
- ❖ MJPEG Compression
- ❖ Remote Control

3. Specifications

System		NTSC	PAL
Video Signal	Input	Composite 1Vp-p @ 75 Ohm, RCA(1CH)	
	Output	Composite 1Vp-p @ 75 Ohm, RCA(1CH)	
Audio	Input/Output	2 RCA(1CH Input, 1CH Output)	
	Recording Mode	Mono PCM	
Display	Display Frame	30 FPS	
	Display Resolution	720×480	720×576
	Screen Split Mode	Full	
Recording	Video Compression	M-JPEG codec core	
	Display Resolution	720×480/360×480	720×576/360×576
	Recording Method	Continuous, Event(Motion/Alarm)	
	Recording Speed	30 FPS	25 FPS
	Image Full Size	3 ~ 25 KB	4 ~ 27 KB
	Storage	MLC, SLC type of CF Card supported	
Playback	Search	Search by Date/Time, Recording Lists	
Alarm Control	External Alarm Input	Alarm Input : Terminal Block	
	Alarm Output	Alarm Output : Terminal Block	
Others	Remote Control	IR Remote Control	
	Power	9V~ 40V / 1A (Locking Wafer Type)	
	Dimension(mm)	123.5 × 88 × 29 mm	
	Weight	0.9Lbs	

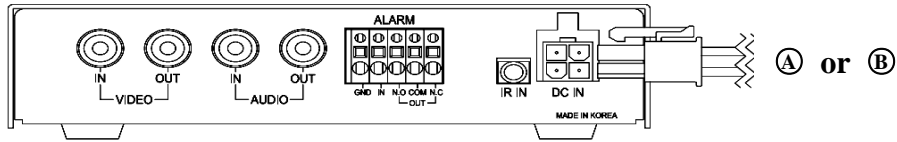
4. Installation

4-1. What to do before Installation

- ❖ Make sure all the required hardware is available.
 - 1 Channel Mobile DVR unit (requires installing a CF Card)
 - Camera (including power for camera unit)
 - TV or Composite monitor
- ❖ Connect a camera to the DVR unit and the DVR unit to the monitor (video output device).
- ❖ Connect DC power from vehicle to the DVR --- pay attention to the polarity (Refer to section 4-2 for more information).
- ❖ Confirm live video is displayed on the monitor before proceeding to the next step.
- ❖ Select the Setup Menu and set the current date and time
- ❖ Set values for required options such as motion detection, etc.

4-2. How to Connect DC power to DVR unit

(Rear View)



4-2-1. When Installing the DVR in a Vehicle

Cut out the DC jack on the provided DC power wires as shown in Fig.4-1, and then connect wires as follows.

GROUND: Connect the **BLACK** colored wire to vehicle's chassis (Do not connect it to the gas tank or the airbag area).

DC 9V TO 40V (HOT): Connect the **RED** colored wire to the DC power line that supplies DC 12V or DC 24V when ignition switch is in the "ON" position.

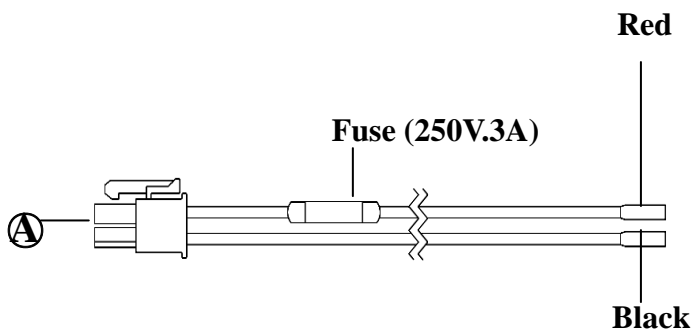


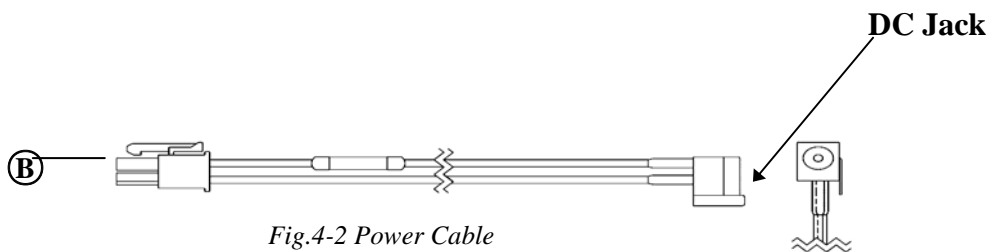
Fig.4-1 Power Cable

CAUTION

Connect the 4 pin connector with 2 wires in polarity to the power in jack on the rear panel after connecting Ground and Hot (B+) as mentioned above.

4-2-2. When Using the DVR for Security Purpose

- Connect the 4pin connector with 2 wires in polarity to the power in jack on the rear panel of the DVR.
- Connect DC 12V or DC24V, 3A AC adapter (not supplied: Switching Power Supply, center: +, outer: ground) to the DC jack on the provided DC power wires shown in Fig.4-2.



4-3. How to Install the Mounting Bracket for DVR

- Unscrew 2-locking screw knobs and 4 screws on both sides of the DVR.
- Attach the mounting bracket onto both sides of DVR and secure them with the screws (See Fig. 4-3).
- If necessary, install the DVR with the mounting brackets to proper place in your vehicle.

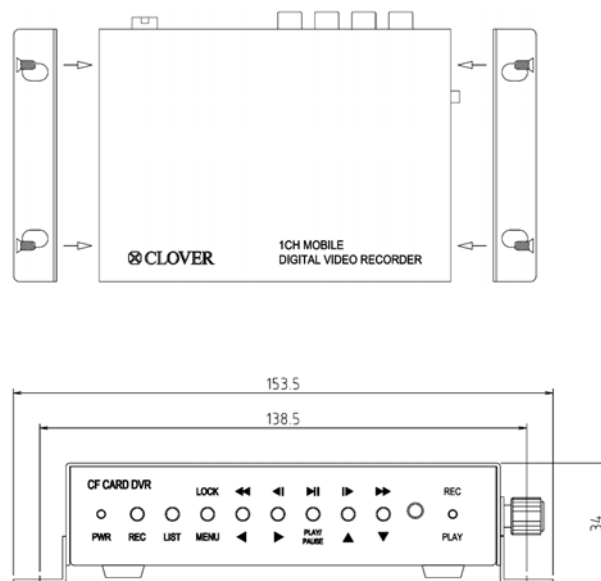


Fig.4-3 Installation of mounting bracket

CAUTION

Do not install the mounting bracket for DVR to the gas tank or airbag area.

4-4. Installation Check Lists

- ❖ Is the camera installed at the right position?
- ❖ Is the camera cable connected to the input?
- ❖ Is the audio cable connected to the input?
- ❖ Is the system set on a stable location?
- ❖ Is the system set on a stable location by mounting bracket?
- ❖ Is the placement of the system clear from any elements such as water, excess dust, direct sunlight, magnetic field, gas, oil and etc...
- ❖ Is the system located away from temperatures beyond 32°F ~ 122°F
- ❖ Is the location of the DVR unit away from the reach out of children?
- ❖ Are the batteries inserted correctly in the remote controller?
- ❖ Is the video output cable connected to the correct jack?
- ❖ Are all components (Camera, DVR) connected to the correct power supply?

CAUTION

Turn off the POWER when removing or inserting the Compact Flash Card (CF Card) to the DVR.

4-5. Controls and Connectors on the DVR

4-5-1. Front

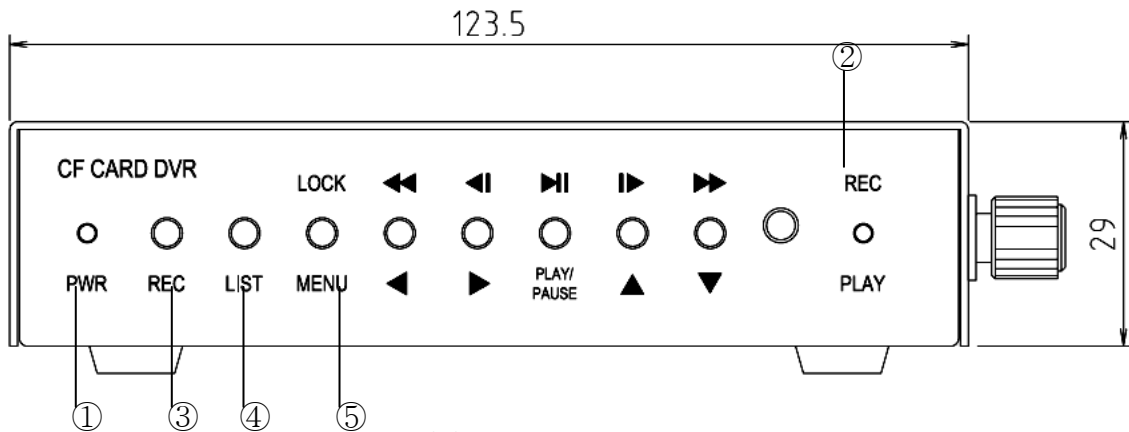


Fig.4-4 Front View

- 1) PWR LED: Red light is lit when the power is ON
- 2) REC & PLAY LED: Green light will be blinking when the system is in the recording or replaying mode, turn off during live mode.
- 3) REC Button: Press this button to start recording. To stop recording, press this button again.
- 4) LIST: Recording lists (up to 990 lists) will display when this button is pressed. Press this button again to exit.
- 5) MENU / LOCK / ESC / STOP
 - MENU & ESC: Display on screen Menu or escape to screen.
 - STOP: To stop replaying.
 - LOCK: Press and hold this button for 3 seconds to lock the system.

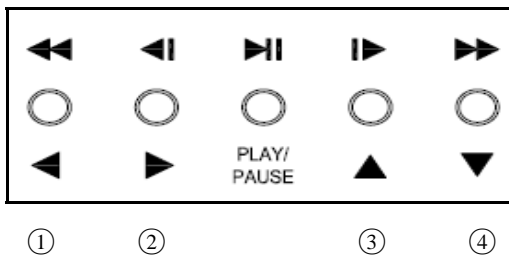
When the system is locked, all the buttons and remote controller doesn't work. Press and hold this button for 3 seconds again to unlock. Refer to the next screen showing the lock icon.

Lock Icon



Fig.4-5 Lock Icon

6) ARROW Buttons:



- ① Used as Left and Rewind (x16) Key
- ② Used as Right and previous Frame Key
- ③ Used as Up and next Frame Key
- ④ Used as Down and fast Forward (x16) Key

4-5-2. Rear

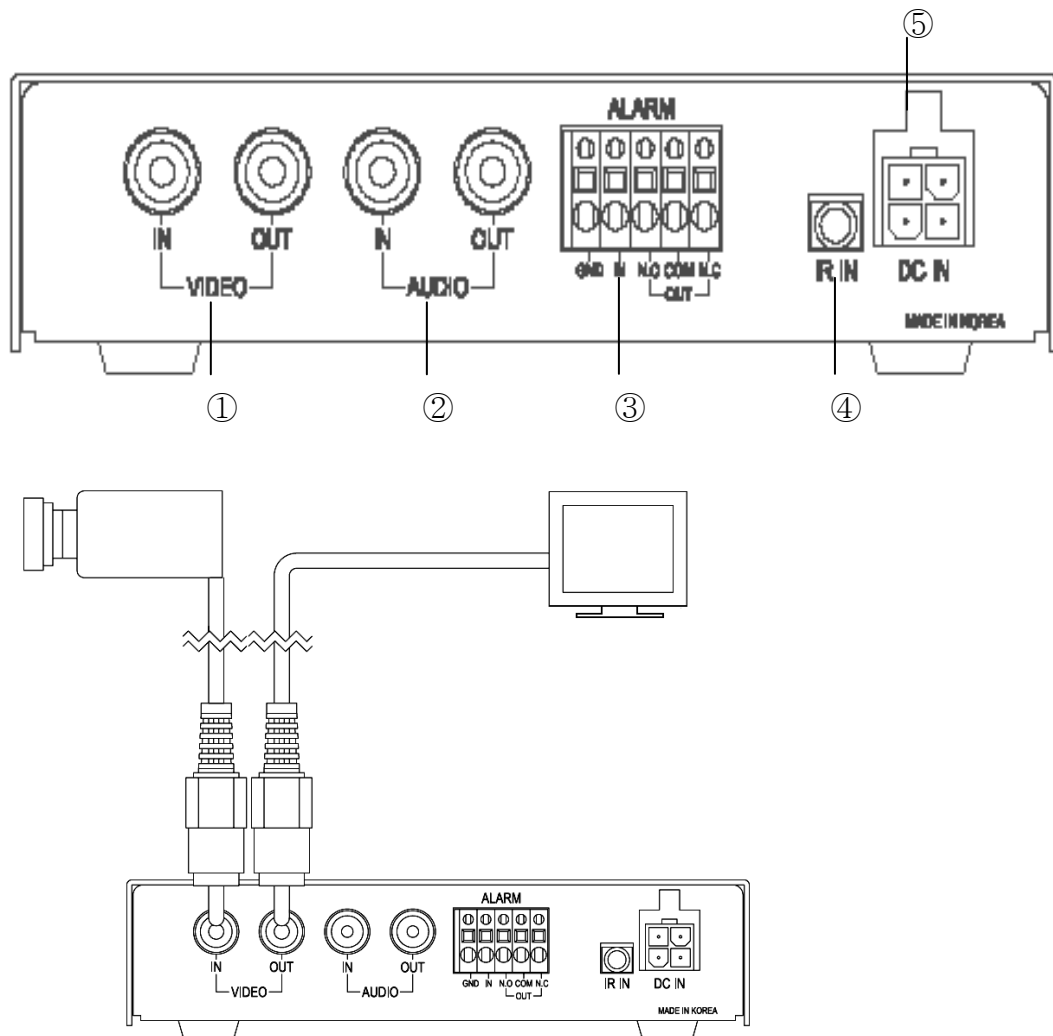


Fig.4-6 Rear View

1) Video IN/OUT

Connect a camera to the Video Input (RCA Connector) and a monitor to the Video Output (RCA Connector) on the rear panel of the unit as shown in Fig.4-6.

2) Audio IN/OUT

If necessary, connect a microphone to the Audio Input (RCA Connector) and a speaker to the Audio Output (RCA Connector) on the rear panel of the unit.

3) Alarm IN/OUT

Connect a Normally Open (N.O.) sensor to the Alarm Input and a Normally Open (N.O.) sensor or Normally Close (N.C.) sensor to the Alarm Output depending on your application.

4) IR Remote Control Extender (Optional)

Plug the IR remote control extender to the jack in order to extend the remote control distance.

5) 4-pin Power Connector

Refer to section 4-2.

4-6. Remote Controller



The functions of keys listed below are not available on this model.

- ① USB & CDRW key
- ② Numeric keys
- ③ Far & Near key
- ④ PT/ZF key

Fig.4-7 Remote Controller

Refer to section 4-5-1 on how to operate.

5. HOW TO OPERATE

5-1. General Operation

You can operate the functions of the system by using the buttons located on the front panel of the DVR unit, as well as the remote controller.

The system status is indicated by either the LED lights or the monitor.

5-2. Running for the First Time (Initializing)

When you turn on the power for the first time, the screen will be shown as below.

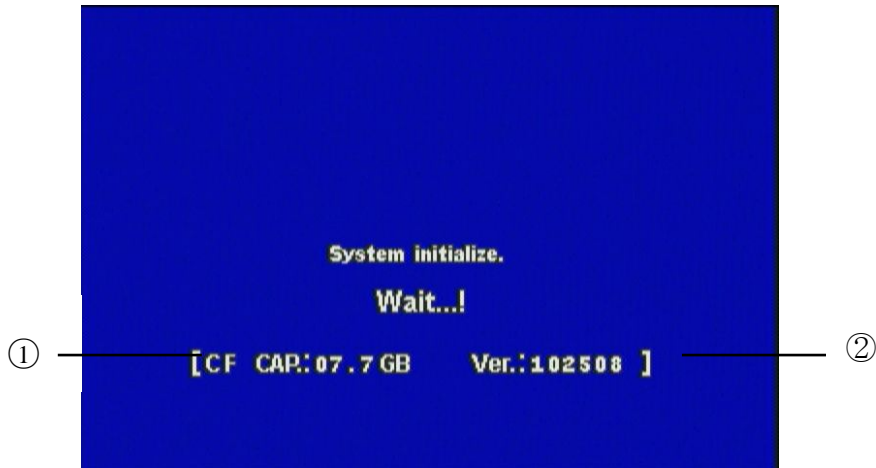


Fig.5-1Initializing

- ① : Displays CF Card capacity available for recording.
- ② : Displays firmware version.
- ③ : Displays the date and time on the top of screen.

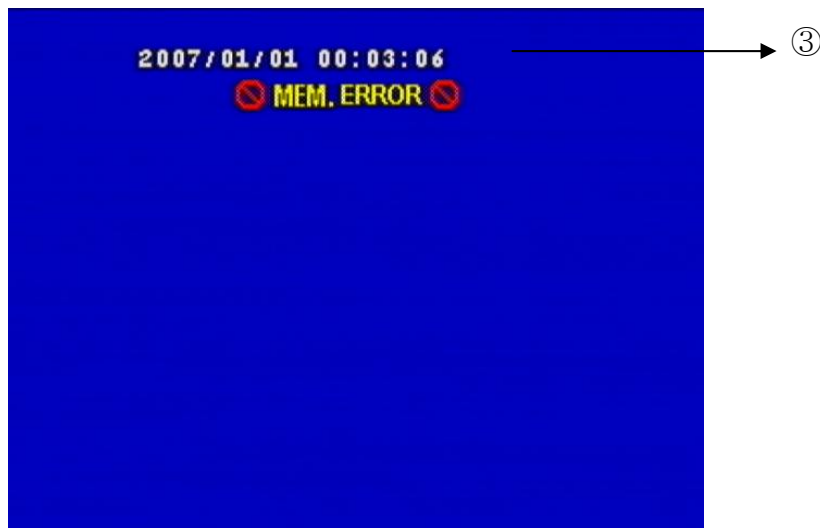


Fig.5-2 Error Message

Note

If a CF Card is not in the DVR, the error message “MEM. ERROR” will display on the screen as shown Fig. 5-2.

5-3. Live Mode



- ① Current time/date
- ② CF Card use
- ③ Recording Icon
- ④ Motion & Alarm Icon



④

Fig.5-3Live Mode

5-4. Setup

- Press the MENU button on the front panel or the remote controller to setup the menus, the screen shown in Fig.5-4 will be displayed.
- Press the MENU button again to return to the previous menu.

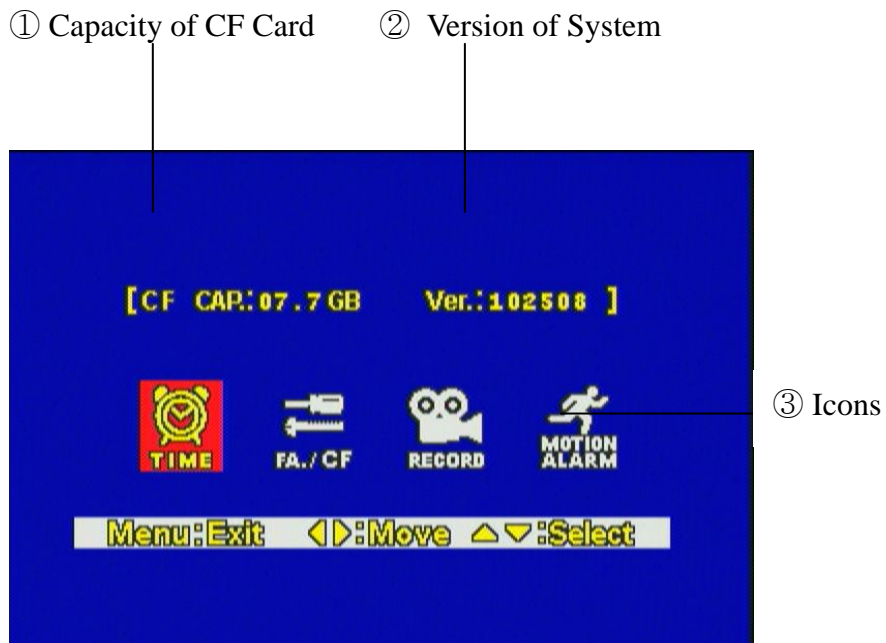


Fig.5-4 Menu Icons

- Choose one of menus by using the ◀▶ button and press the ▼ or ▲ button to setup the menus.

5-4-1. Time/Date

- Choose the TIME menu by using the ◀▶ button.
- Press the ▼ or ▲ button, the TIME/DATE menu shown in Fig. 5-5 will display.



Fig.5-5 Time/Date Menu

- Select the values (year/month/date/hour/minute) by using the ◀▶ button, change the values with the ▼ or ▲ button. Selected values (or items) will be highlighted in yellow.

Display

- Select the DISPLAY in the Time/Date menu by using the ◀▶ button and select YES or NO with the ▼ or ▲ button.
- If “YES” is selected, time and date will be displayed on the top of the screen, but if “NO” is selected, it won’t be displayed.

Date Format

There are three kinds of formats to display the time and date.

- MM / DD / YYYY: for U.S.A.
- YYYY / MM / DD: for Asian countries.
- DD / MM / YYYY: for European countries.

- Select the DATE FORMAT in the Time/Date menu by using the ◀▶ button and select the date format with the ▼ or ▲ button.

5-4-2. FA./CF

- Choose the FA./CF menu by using the ◀▶ button.
- Press the ▼ or ▲ button, the FA./CF menu shown in Fig. 5-6 will display.



Fig.5-6 FA./CF Menu

Factory Set

- Select the FACTORY SET in the FA./CF menu by using the ◀▶ button and select YES or NO with the ▼ or ▲ button. Selected item will be highlighted in yellow.
- Select “YES” and then press the PLAY button on the front panel or the remote controller for factory default settings.

CF Format

- Select the CF FORMAT in the FA./CF menu by using the ◀▶ button and select YES or NO with the ▼ or ▲ button. Selected item will be highlighted in yellow.
- Select “YES” and then press the PLAY button on the front panel or the remote controller for formatting the Compact Flash (CF) Memory Card.

Note

Formatting on the new CF Card or the used one should be performed in the live mode before recording.

REC List Clear

- Select the REC LIST CLEAR in the FA./CF menu by using the ◀▶ button and select YES or NO with the ▼ or ▲ button. Selected item will be highlighted in yellow.
- Select “YES” and then press the PLAY button on the front panel or the remote controller for deleting the recording lists.

5-4-3. Record

- Choose the RECORD menu by using the ◀▶ button.
- Press the ▼ or ▲ button, the RECORD menu shown in Fig. 5-7 will display.



Fig.5-7 Record Menu

Fig.5-7 Record Menu

Quality

- Select the QUALITY in the RECORD menu by using the ◀▶ button and select one of recording qualities among High+, High, Middle, Low and Low- with the ▼ or ▲ button. Selected item will be highlighted in yellow.

The higher the level selected (e.g. High+), the better display quality is but the larger the data becomes.

Speed

- Select the SPEED in the RECORD menu by using the ◀▶ button and select one of recording speed among 30FPS, 15, 7.5, 5, 2.5, 1.5, 1 and 0.5 with the ▼ or ▲ button. Selected item will be highlighted in yellow.

The more the frames selected (e.g. 30FPS), the better real time display is but the larger the data becomes.

Audio

- Select the AUDIO in the RECORD menu by using the ◀▶ button and select YES or NO with the ▼ or ▲ button. Selected item will be highlighted in yellow.

Event REC Time

- Select the EVENT REC TIME (Event Recording Time by Alarm or Motion Detection) in the RECORD menu by using the ◀▶ button and select an event recording time (1 to 99 seconds) with the ▼ or ▲ button. Selected item will be highlighted in yellow.

Resolution

- Select the RESOLUTION in the RECORD menu by using the ◀▶ button and select 720 x 480 or 360 x 480 with the ▼ or ▲ button. Selected item will be highlighted in yellow.

CF ID

- Select the CF ID in the RECORD menu by using the ◀▶ button and setup an ID for CF Cards by using the ▼ or ▲ button. Selected item will be highlighted in yellow.



Fig.5-8 CF Card ID in the playback mode

5-4-4. Motion/Alarm

- Choose the RECORD menu by using the ◀▶ button.
- Press the ▼ or ▲ button, the MOTION/ALARM menu shown in Fig. 5-9 will be displayed.

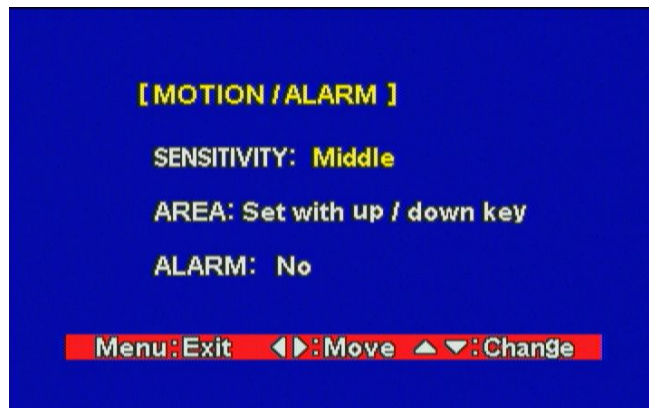


Fig.5-9 Motion/Alarm Menu

Sensitivity

- Select the SENSITIVITY in the MOTION/ALARM menu by using the ◀▶ button and select one of sensitivities among Very high, High, Middle, Low and Very low with the ▼ or ▲ button. Selected item will be highlighted in yellow.

Area

- Select the area in the MOTION/ALARM menu by using the ◀▶ button and press the ▼ or ▲ button to open the window for motion detection area setup.
- When the window for motion detection area setup as shown in Fig.5-10 is displayed on the screen, press the LIST button on the front panel or the remote controller for choosing all the motion detection areas. The symbol, “O” will be displayed, and it represents motion detection areas. The symbol, “X” represents cleared motion detection areas.

Press the LIST button again to clear all the areas.

- Press the ◀▶ button and ▼ or ▲ button to setup motion detection area on the specific region.
- Press the MENU button to return to the previous menu.



Fig.5-10 Motion Detection Area Setup

Alarm

- Select the Alarm in the MOTION/ALARM menu by using the ◀▶ button and select YES or NO with the ▼ or ▲ button. Selected item will be highlighted in yellow.

5-5. Recording

There are four kinds of recording available in this system.

- Manual recording: Continuous recording
- Alarm recording: Recording by alarm sensors
- Motion recording: Recording by motion detection
- Alarm & Motion recording: Recording by alarm sensors and motion detection simultaneously.

5-5-1. Manual (Continuous) Recording

The user can manually start recording the video footage by pressing the REC (Recording) button on the front panel or the remote controller.

The manual recording will start recording only if the alarm and motion detection are not set. The recording icon will be displayed on the top of the screen as shown in Fig.5-11.



Fig.5-11 Manual Recording Icon

5-5-2. Alarm Recording

The system will automatically start recording only when an alarm is activated.

- Select “YES” on the ALARM in the MOTION/ALARM menu (See section 5-4-4 for more details).
- **Press REC button on the front panel or the remote controller.**

5-5-3. Motion Recording

The system will automatically start recording only when motions of object are detected.

- Setup the AREA (motion area) in the MOTION/ALARM menu (See section 5-4-4 for more details).
- **Press REC button on the front panel or the remote controller.**

5-5-4. Alarm & Motion Recording

Refer to section 5-5-2 and 5-5-3.

- Fig.5-12 shows that any of alarm or motion detection is not activated and the icons in white on the bottom of screen are displayed.
- Fig.5-13 shows that alarm and motion are activated and the icons in red on the bottom of screen are displayed.



Fig.5-12 Manual Recording Icon



Fig.5-13 Alarm/Motion Recording Icon

5-6. Playback

The screen shown in Fig.5-14 will appear if the PLAY button on either the front panel or the remote controller is pressed in the live mode.

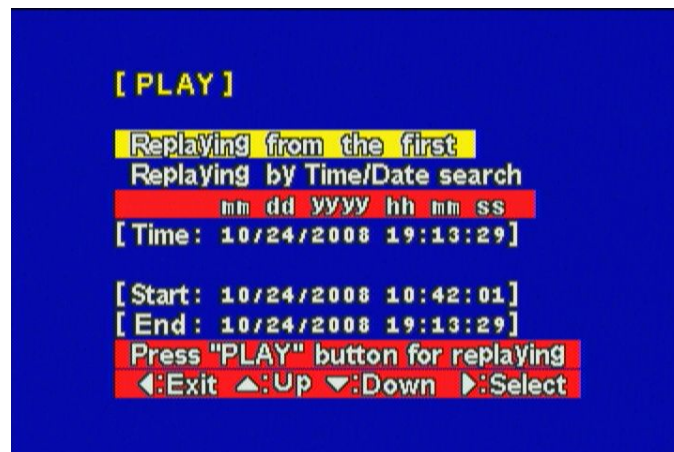


Fig.5-14 Screen in Playback Menu

5-6-1. Replaying from the first

- In order to replay from the first recording time, select the REPLAYING FROM THE FIRST in the PLAY menu as shown in Fig.5-14 by using the ◀▶ button.
- Press the PLAY button to playback (See Fig.5-15).
- Press the ◀ button or the MENU button to exit.

5-6-2. Replaying by Time/Date Search

- In order to replay by time/date search, select the REPLAYING by Time/Date Search in the PLAY menu as shown in Fig.5-14 by using the ◀▶ button.
- To set the Playback Start Time, select year, month, day, hour, minute and second on the TIME (e.g.: [2008/11/10 10:57:19]) with the ◀▶ button and press the ▼ or ▲ button to select the Time/Date. Selected item will be highlighted in yellow.
- Press the PLAY button to playback (See Fig.5-15).
- To exit, press the ◀ button twice or the MENU button.

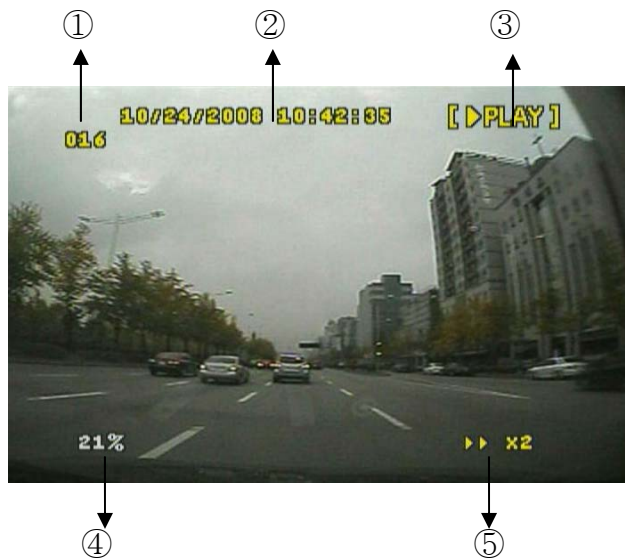


Fig.5-15 Replaying Screen

- ① CF Card ID
- ② Time & Date
- ③ Playback Status: Playback or Pause
- ④ CF Card used rate
- ⑤ Playing Speed: Up to 16 times

5-6-3. Search by Recording Lists

- Press the LIST button on the front panel or the remote controller, up to 990 recording lists will be displayed as shown in Fig. 5-16.
- Select one of the lists by using the ◀▶ button, the selected list will be highlighted in yellow.
- Press the PLAY button to playback. If the CF Card contains the corresponding recording list, the system will start replaying. But if it doesn't, the message of "Out of Range" in red will be displayed on the screen, and then the system will automatically start replaying from the first recording time.
- Switch the page for recording lists by pressing the ▼ or ▲ button.

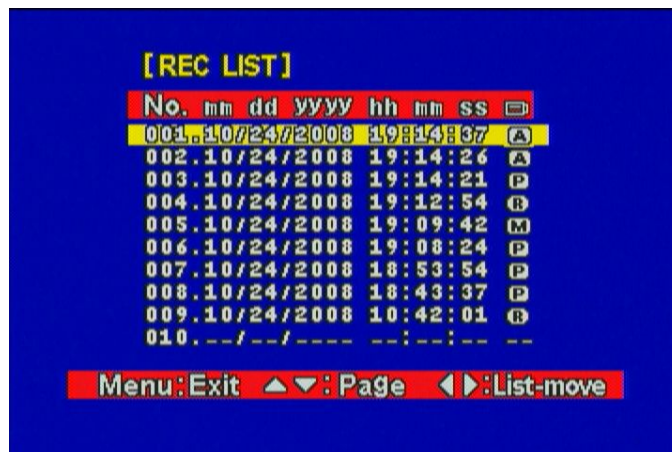


Fig.5-16 Recording Lists

The abbreviations on the end of the lists represent as below, respectively.

- A: Alarm Recording
- P: Power on
- M: Motion Recording
- R: Manual Recording

6. VIEWER

6-1. CF Card Viewer Installation

Install the program in your PC by using the supplied CD as follows.

- Start the Operating System (Windows XP/VISTA).
- Insert the program CD into CD-ROM drive.
- Open My Computer, and then select CD-ROM drive.
- Double click Setup.Exe. The software installation will begin.

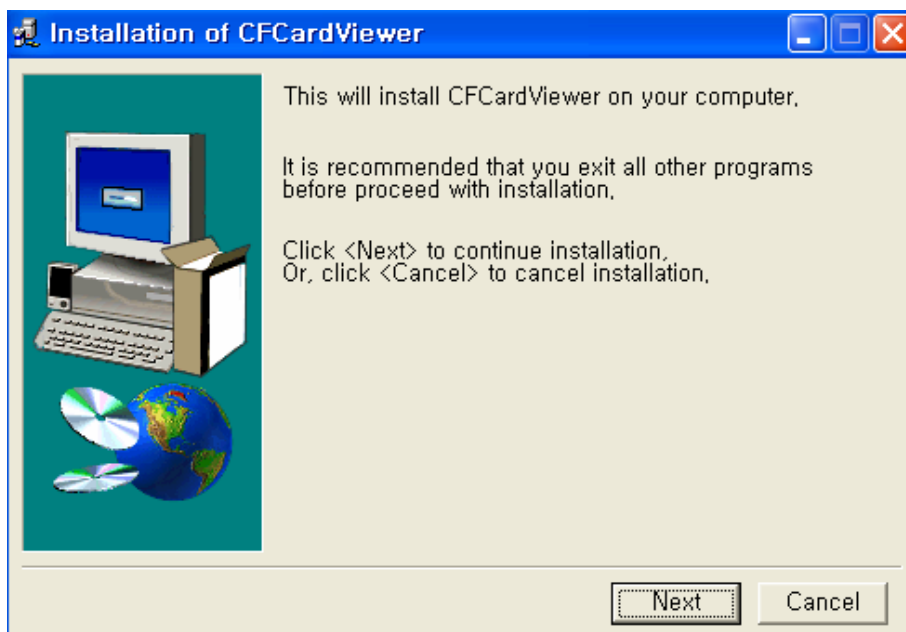


Fig.6-1 Installation of CFCard Viewer

- Click "NEXT" button in Fig.6-1.

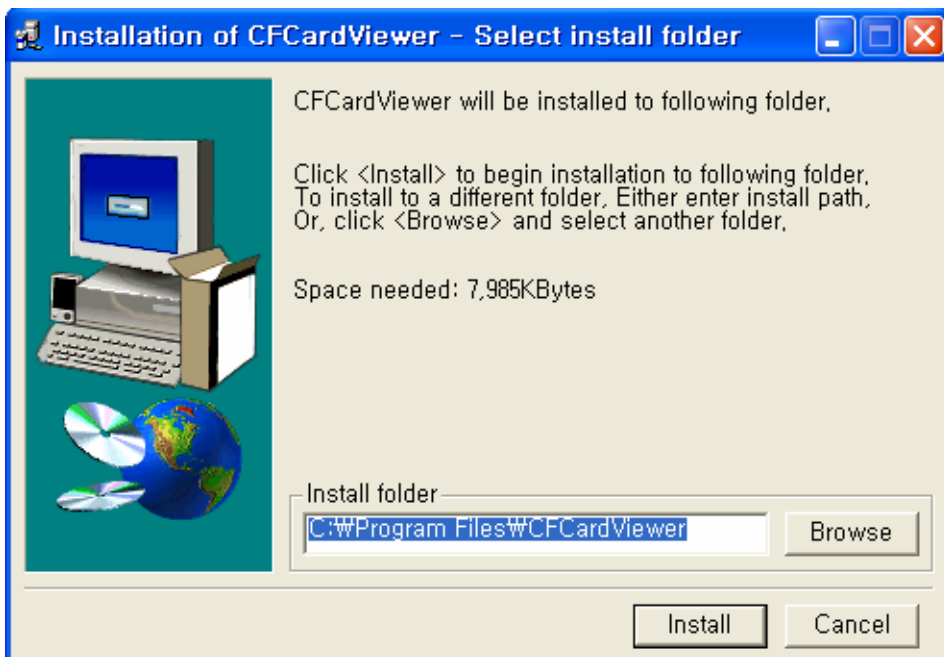


Fig.6-2 Installation of CFCard Viewer

- Click "Install" button in Fig.6-2 for installation.

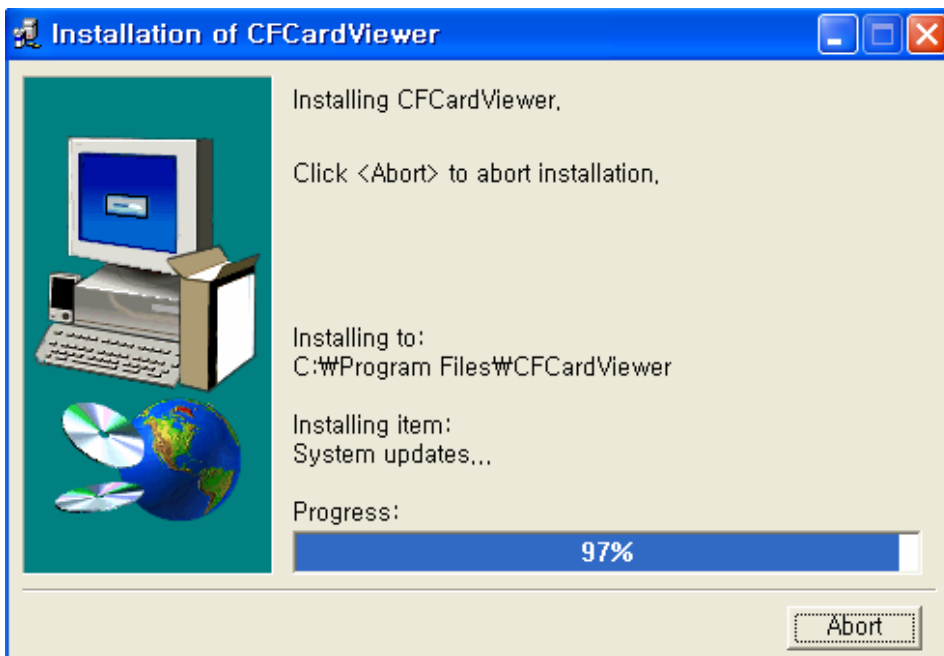


Fig.6-3 Installation of CFCard Viewer

- Click "Abort" button in Fig.6-2 to abort installation.
- Skip to next step for installation.

After installing, the CFCardViewer shown in Fig.6-4 will be displayed on the screen.

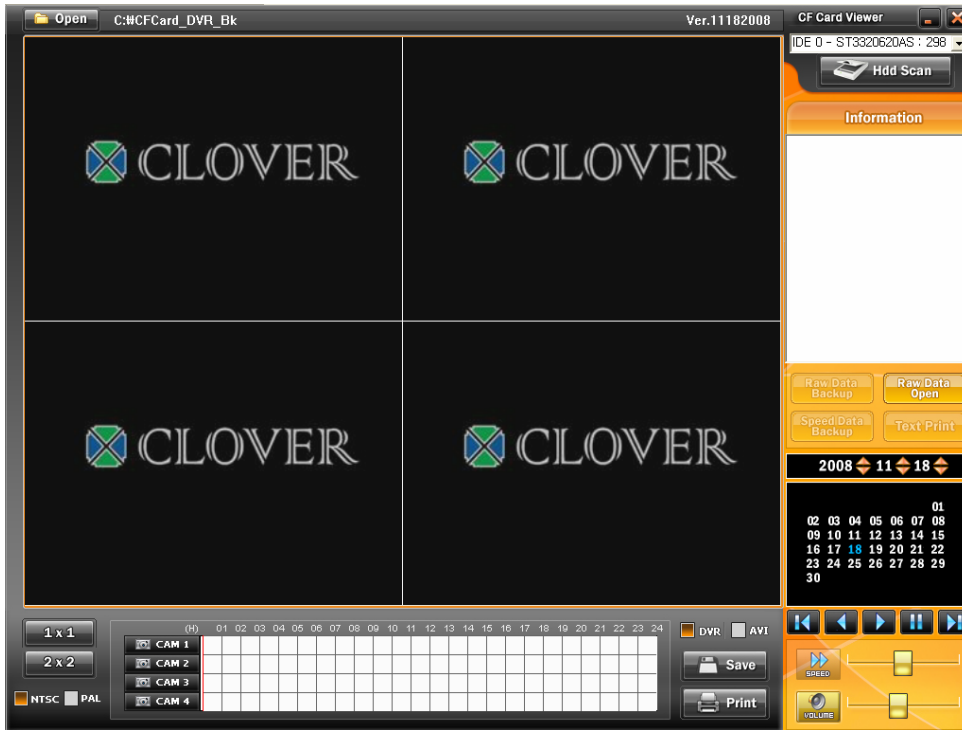


Fig.6-4 Installation of CFCard Viewer

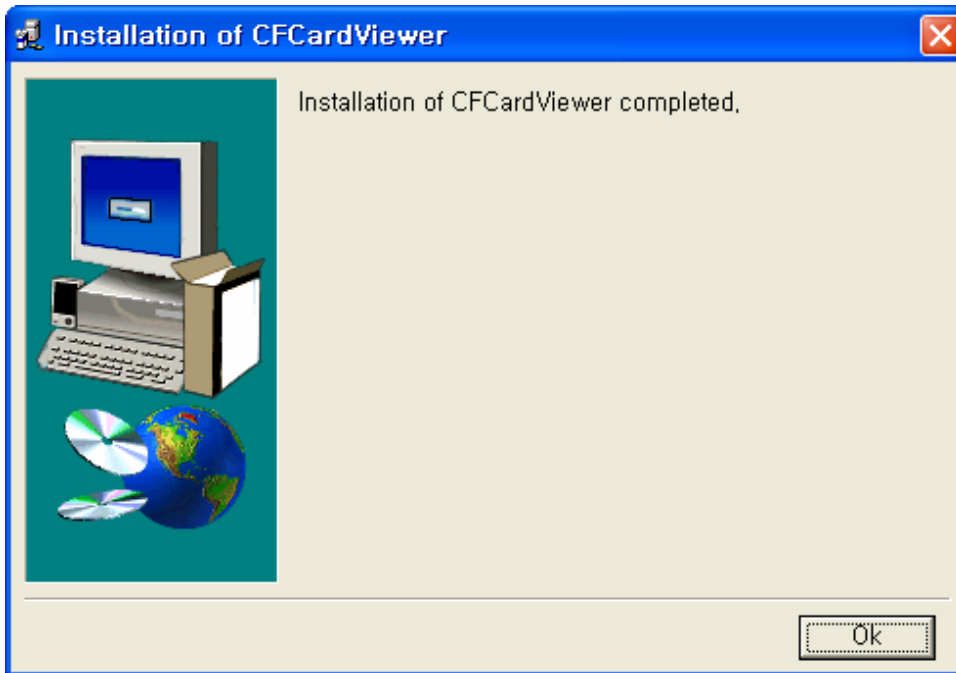


Fig.6-5 Installation of CFCard Viewer Completed

The Icon of CFCard Viewer will be created on the desktop as shown in Fig.6-6.



Fig.6-6 Icon for CFCard Viewer


6-2. CFCard Viewer

By CFCard Viewer you can view the recorded data, save it to a PC and convert it to AVI file format.

- Insert the CFCard that contains the record data to the provided USB 2.0 Card Reader.
- Connect the provided USB cable to the USB 2.0 Card Reader and PC.
- Double click the Icon of CFCard Viewer on the desktop, and then the screen shown in Fig.6-7 will be displayed.



Fig.6-7 CFCard Viewer

- Click the USB device (CFCard) on the upper right hand corner of the screen to select (See Fig.6-8).
- To exit, click  on the upper right hand corner of the screen, press ESC or ALT+F4 button on your key board.

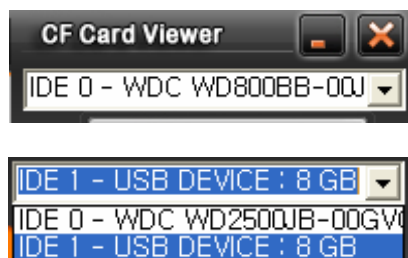


Fig.6-8 Selection of USB device (CFCard)

6-2-1. Playback







- After selecting the USB device (CF Card), click the DVR as shown in Fig.6-9.
- Select the Date (year/month/day) on the calendar by clicking the highlighted character in blue that contains the recorded data.
- Click the  button to playback.



Fig.6-9 Selection of DVR Button

Control Buttons to Playback

-  : Click Play button to start playback.
-  : Click Reverse Play button to begin reverse playback.
-  : Click Pause button to pause.
-   : Click these buttons to view the previous frame or the next frame in still image.

Playing Speed Control: Adjust play speed up to 5 times by clicking the slider and dragging it or clicking the bar. Move the slider to the center of the bar for normal playing speed (See Fig.6-10).



Fig.6-10 Playing Speed Control

Adjust Audio Volume: Click the VOLUME button in Fig.6-11, and then adjust audio volume by clicking the slider and dragging it or clicking the bar. It is available at the normal playing speed.

Click the VOLUME button again to make it “Mute”.

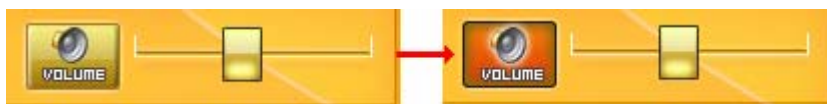


Fig.6-11 Audio Volume

6-2-2. Backup

- Click the Save button shown in Fig.6-12 while the system is in the playback mode (Refer to section 6-2-1).
- The current images on the screen will be saved in the CFCard_DVR_BK folder (C:\CFCard_DVR_BK)



Fig.6-12 Selection of DVR/Save Button

6-2-3. AVI File Converting

- Click the AVI and Save button shown in Fig.6-13 while the system is in the playback mode (Refer to section 6-2-1).
- The AVI file will be saved in the CFCard_DVR_BK folder (C:\CFCard_DVR_BK).
- To play, double-click one of the AVI files (Open Windows Explorer – click My computer – click “C” drive – click CFCard_DVR_BK folder).



Fig.6-13 Selection of AVI/Save Button

6-2-4. Image Capture in JPEG File

- Right-click on the screen of the CF Card Viewer, and then the pop-up screen will be displayed as shown in Fig.6-14.
- Click “Cam 01 Image” on the pop-up screen to save the Ch 1 image in the CFCard_DVR_BK folder (C:\CFCard_DVR_BK) in JPEG file format.
- To view, double-click one of the JPEG files (Open Windows Explorer – click My computer – click “C” drive – click CFCard_DVR_BK folder).

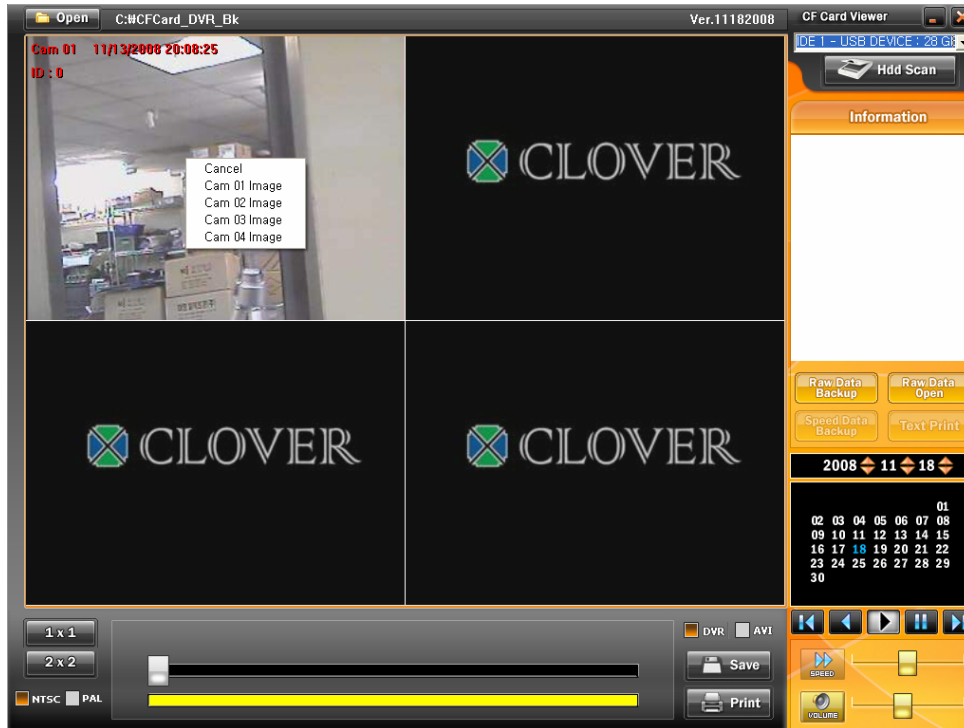


Fig.6-14 Pop-up Screen

6-2-5. Print Button

- Click the Print button shown in Fig.6-15 on the CF Card Viewer, and then the print window (See Fig.6-16) that contains current printing time, record time and CF Card ID will display.
- Press the Print button in Fig.6-16 to print out the current images.



Fig.6-15 Print Button

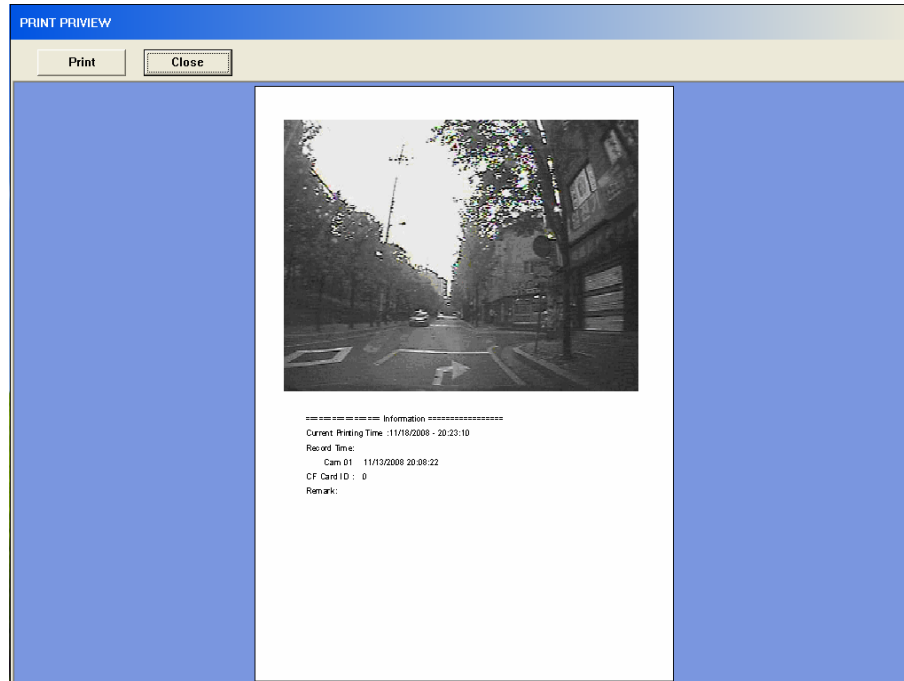


Fig.6-16 Print Window

6-2-6. Other Buttons



- To display a full screen, click “1 x 1” button or double-click on one of split screens.
- To display split screens, click “2 x 2” button or double-click on a full screen.



- Select NTSC or PAL by clicking depends on your country’s broadcasting system (NTSC in U.S.A.).

6-3. Raw Data Backup

Raw Data Backup is to save all the recorded data or partial data that stored in CF Card in your PC.


- Click the USB device (CFCard) on the upper right hand corner of the CFCard Viewer to select (See Section 6-2 for more details).
- Click the Raw Data Backup button shown in Fig.6-17 if you wish to save all the recorded data in your PC, and then the saving progressive bar along with percentage will appear as shown in Fig.6-18.
- If you wish to save a part of the whole recorded data, select the starting time by clicking on the yellow bar that represents the whole recorded data as shown in Fig.6-19 and set the ending time by right-clicking on it (See Fig.6-20), and then click the Raw Data Backup button.
- The recorded data will be saved in the CFCard_DVR_BK folder (C:\CFCard_DVR_BK).
- **To play,**
 - Click the “Raw Data Open” in Fig.6-17, and then the Raw Data Backup Files will be displayed (See Fig.6-21).
 - Click one of the files, and then click “Open” button in Fig.6-21.
 - Click the  button to playback.



Fig.6-17 Raw Data Backup/Open button

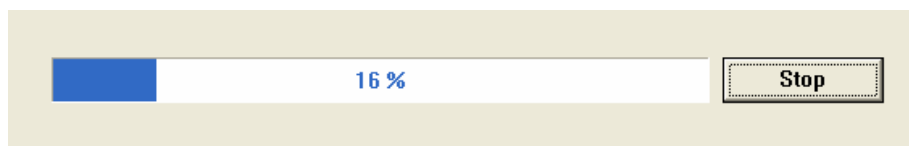


Fig.6-18 Saving progressive bar

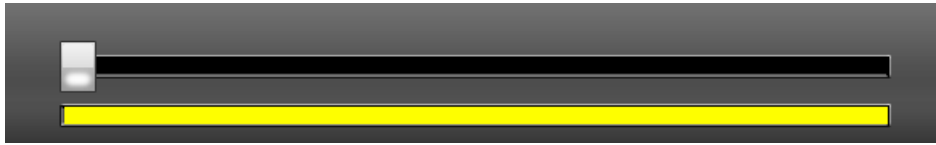


Fig.6-19 Whole Record Data



Fig.6-20 Set the Starting/Ending time

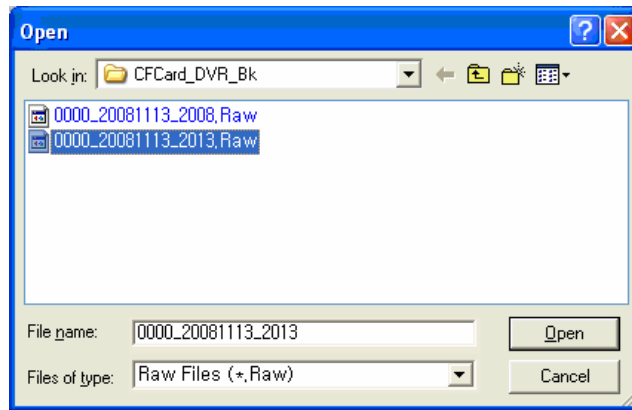


Fig.6-21 Raw Backup Files

6-3-1. Other Buttons



The above buttons are not available on this version.

6-4. Backup Viewer

- Double click the Icon of Backup Viewer on the desktop, and then the screen shown in Fig.6-22 will be displayed.

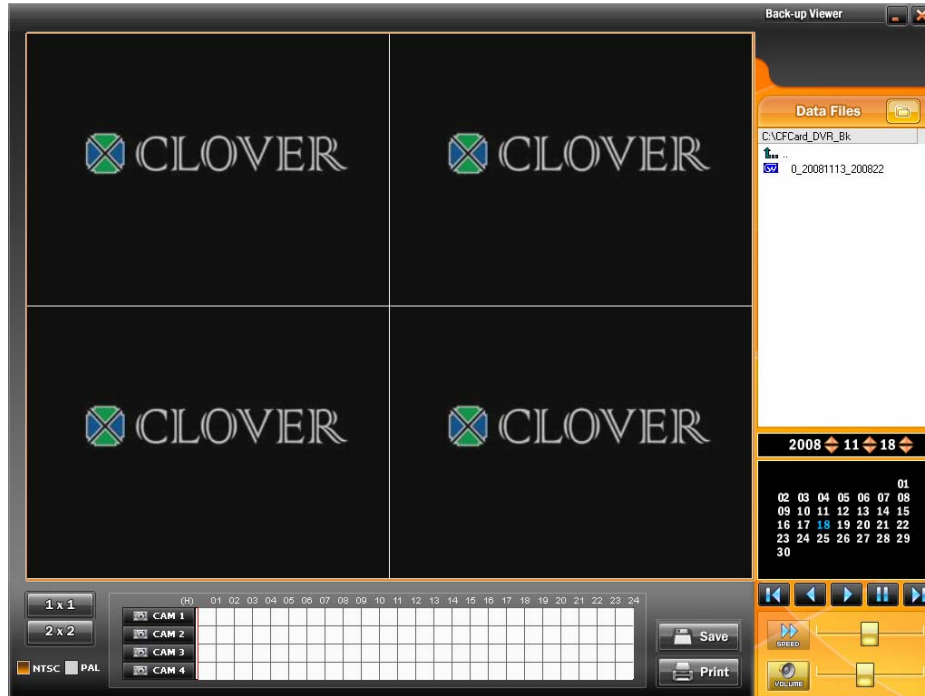


Fig.6-22 Backup Viewer

To playback, click one of the backup files and drag & drop to one of split screens as shown in Fig.6-23.

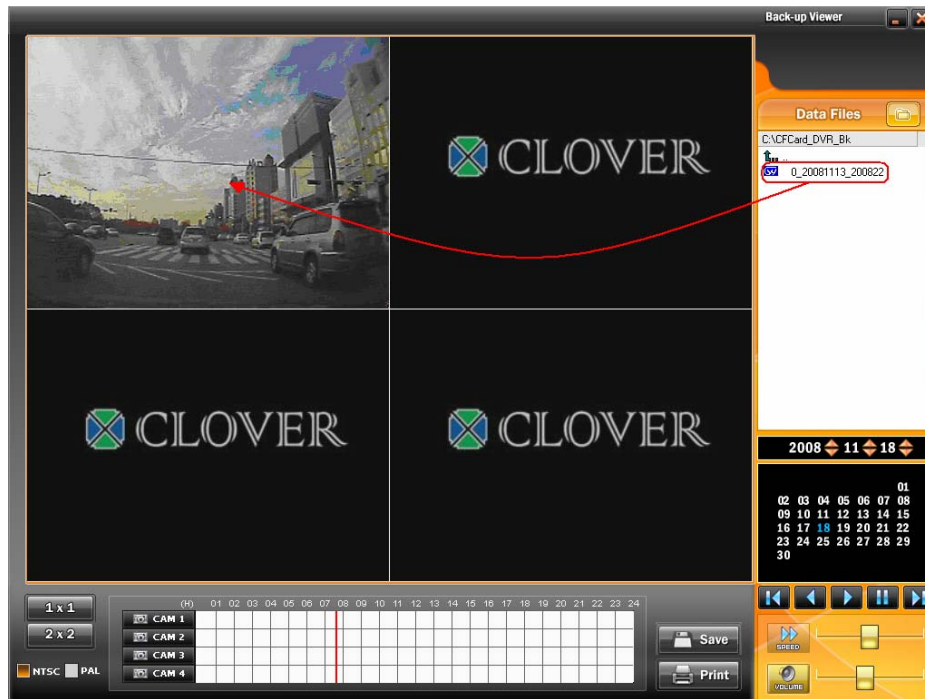


Fig.6-23 Click one file and Drag & Drop to CH 1

APPENDIX

1. Recording Time Table

1.1 Recording Resolution: 720 x 480, Recording Time: Minutes

CF Card	1 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	9	12	15	17	21
15	18	23	28	34	41
7.5	35	44	55	66	79
5	51	66	82	99	118
2.5	99	126	158	190	226
1.5	171	219	274	329	391
1	267	341	427	512	609
0.5	507	648	811	973	1157

CF Card	4 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	39	50	63	75	89
15	75	95	119	143	170
7.5	145	186	233	279	332
5	216	277	346	415	494
2.5	415	531	664	797	948
1.5	719	921	1151	1381	1643
1	1120	1433	1792	2150	2559
0.5	2128	2723	3404	4085	4861

CF Card	8 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	71	100	124	146	172
15	142	182	227	273	324
7.5	277	354	443	531	632
5	412	527	659	790	941
2.5	790	1012	1265	1518	1806
1.5	1370	1753	2192	2630	3130
1	2133	2730	3413	4095	4874
0.5	4053	5188	6484	7781	9260

CF Card	16 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	141	199	246	290	341
15	283	363	452	545	645
7.5	554	708	886	1062	1264
5	824	1054	1318	1580	1882
2.5	1580	2024	2552	3022	3612
1.5	2740	3502	4312	5260	6250
1	4265	5460	6825	8150	9904
0.5	8120	10250	12854	15640	18520

1-2. Recording Resolution: 360 × 480, Recording Time: Minutes

CF Card	1 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	16	20	25	30	35
15	30	39	49	59	68
7.5	59	76	86	115	133
5	88	113	142	171	198
2.5	172	220	277	333	386
1.5	294	376	473	568	659
1	457	591	745	894	1037
0.5	891	1153	1452	1743	2021

CF Card	4 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	67	86	108	130	151
15	128	124	206	247	287
7.5	249	319	402	482	559
5	371	474	598	717	832
2.5	723	925	1165	1398	1622
1.5	1233	1578	1988	2386	2768
1	1920	2482	3128	3753	4353
0.5	3743	4841	6099	7319	8490

CF Card	8 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	125	160	201	242	280
15	243	312	392	471	546
7.5	475	607	765	918	1065
5	706	903	1138	1366	1584
2.5	1376	1762	2220	2663	3090
1.5	2348	3006	3788	4545	5272
1	3657	4728	5958	7149	8293
0.5	7130	9220	11618	13941	16172

CF Card	16 GB				
Frame/Sec.	High+	High	Middle	Low	Low-
30	250	320	405	485	560
15	485	620	762	910	1085
7.5	955	1214	1512	1832	2124
5	1412	1806	2275	2655	3862
2.5	2744	3525	4445	5223	6180
1.5	4690	6012	7492	9092	10254
1	7210	9420	11862	14526	16543
0.5	14260	18446	23264	27864	32540

Note

- Recording Times differ widely depending on environment, camera quality, settings and so on.
- We recommend you use CF Cards manufactured by SansDisk, Sony and Laxar.
Speed should be 300X or higher, if the speed is lower than 300X, some errors may occur in the recording process.

2. Limited 1 Year Warranty

This warranty gives the original purchaser specific legal rights and you may also have other rights, which may vary from state to state. If our products do not function because of any defect in material or workmanship, we will repair it for free for 1 year on parts and labor from the date of original purchase. This warranty does not cover modification, abuse, incidental or consequential damages unless the state of owner's residence specially prohibits limitations on incidental or consequential damages.

3. How to obtain Factory Service

- * Original purchaser must fill out the warranty card and mail it to the factory with the model number, serial number and the date of purchase.
- * We will repair or replace, and return the system to the owner under this limited warranty.
- * Please pack the system carefully and securely using the original packing materials, and send it prepaid and insured to: 13073 E. 166th St, Cerritos, CA 90703.
- * Please include a check for \$15.00 to cover the cost of return postage and handling. If the system is returned within the warranty period, please include a proof of purchase. If the system is out of warranty, you will receive an estimate of the repair cost for your approval before repair work will be started.