Vehicle 4-CH DVR System
USER MANUAL

3G Module

Without 3G Module

2013   AUG V1.4

■→ **Optional**

4CH | H.264 | 120fps NTSC | 100fps PAL | | Audio | ALARM

-20~+65℃ (inside vehicle) | DC 8V~28V | Extending IR Lead | 3D G-Sensor | 3G 3G Module | GPS | CF

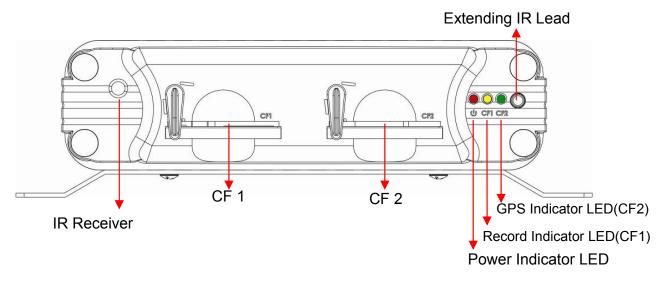# Index

A. Product Features

- Max. up to 4 CH vehicle cameras, can take record for inside and outside the vehicle.
- Video output for live view, playback with monitor.
- H.264 Compression format.
- Recording format：D1 and CIF.
- Build-in single channel microphone.
- Quick Search Overall Event Log.
- The full recording time and date can be showing in the monitor directly.
- Auto-Record after memory card Plug-in and Power Supplied.
- Data Store in CF card for better safety and anti-vibration performance.
- 4 sets of alarm input ports, built-in buzzer.
- Support Record Video with audio, video, G-sensor and GPS data at the same time.
- Optional for 3G module, control the driving status and data at any time.

B. Specification

Item		Description	
Video Format		NTSC	PAL
Video Input		4CH Input BNC/ Harness Connector	
Audio Input		1CH Input / Harness Connector	
Video Output		1CH Output BNC / Harness Connector	
Audio Output		1CH Output RCA / Harness Connector	
Alarm Input		4 Alarm Input	
Alarm Output		Buzzer	
Display Mode		Full Screen, 4 Split	
Display Resolution		720 x 480	720 x 576
Recording Resolution	D1	720 x 480	720 x 576
	CIF	360 x 240	360 x 288
Recording Frame		Max. 120 FPS	Max. 100 FPS
Compression Format		H.264 Technology	
Operation System		Embedded Linux Kernel	
Triplex		Record / Playback / Backup	
Recording Mode		Schedule Recording	
Schedule Recording		15/30/60/120 Minutes	
LED Indicator		Power, Recording(CF1), GPS(CF2)	
Event Mode		Alarm Trigger / Video Loss	
Playback Mode		Normal Speed x1/Fast Forward/Fast Rewind	
		Search Function: Time / Event	
Network		3G Module (optional)	
GPS		GPS (optional)	
Storage Type		CF Card	
Backup Device		PC VIEWER	
Firmware Update		USB	
Multi-Language		English / Traditional Chinese / Others (Customizable)	
G Sensor		G Sensor	
Operation		IR Remote Controller (Extending IR Lead)	
Power Supply		DC 8V~ 28V	
Dimension		214mm x 160mm x 58mm (W x D x H)	
Weight		0.92kg (including CF card)	
Operation Temperature		-20°C~65°C (inside vehicle)	
Accessories	Standard	Main Machine, Remote Control, Card Reader, 3M Extending IR Lead, 3 Pin Power Cable, Harness Plug for Video Input , Alarm Cable, Driver CD, Quick Guide ★. Build-in 3G: Antenna, 1.5M Extension Antenna Cord	
	Optional	3G Module, G-Mouse, SD Card	
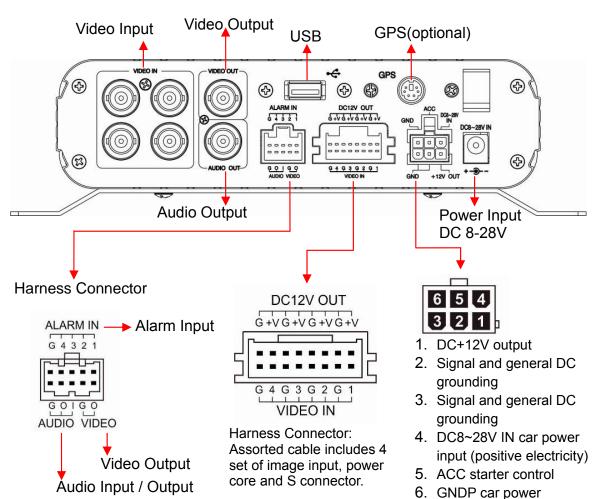
C. Product Appearance

Front Panel

Extending IR Lead

CF 1

CF 2

GPS Indicator LED(CF2)

IR Receiver

Record Indicator LED(CF1)

Power Indicator LED

Rear Panel

★TYPE1: without 3G module

Video Input

Video Output

USB

GPS(optional)

Audio Output

Power Input
DC 8-28V

Harness Connector

ALARM IN → Alarm Input

Video Output

Audio Input / Output

DC12V OUT

Harness Connector:
Assorted cable includes 4
set of image input, power
core and S connector.

1. DC+12V output
2. Signal and general DC
   grounding
3. Signal and general DC
   grounding
4. DC8~28V IN car power
   input (positive electricity)
5. ACC starter control
6. GNDP car power
   grounding(negative
   electricity)

Wiring Diagram

A. Alarm input / Audio input/output

Alarm input

(Alarm trigger off signal +12~28V**)**
1. alarm input 1
2. alarm input 2
3. alarm input 3
4. alarm input 4
5. ground wire

Audio output/input
1. ground wire
2. Audio output
3. ground wire
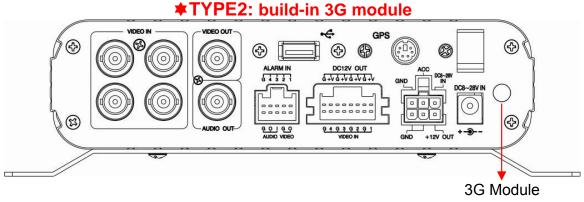4. Audio input

B. Harness Connector DC12V OUT / VIDEO IN

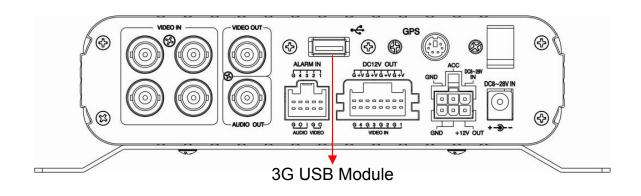1. video input 1
2. video input 2
3. video input 3
4. video input 4

C. Power input/output
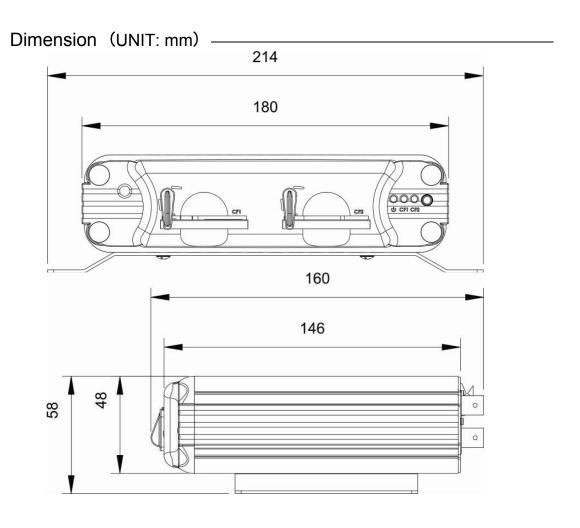
1. DC+12V output
2. Signal and general DC grounding
3. Signal and general DC grounding
4. DC8~28V IN car power input (positive electricity)
5. ACC starter control
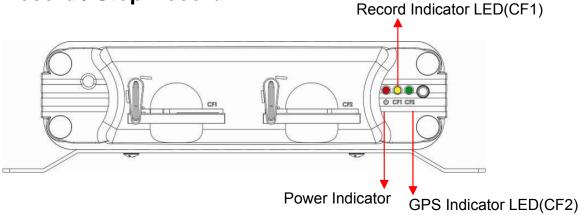6. GNDP car power grounding (negative electricity)

★TYPE2: build-in 3G module

3G Module

★TYPE3: with 3G USB dongle

3G USB Module

Dimension （UNIT: mm）

D. Record / Stop-Record

Record Indicator LED(CF1)

Power Indicator   GPS Indicator LED(CF2)

1. Power on / Record

Turn on the power, and it will take approximately 40 seconds to boot up. During the recorder booting up, the CF card indicator LED will start flashing as the recording is in progress.

Light indicator:

- Red light: light on, means power on; light off, means no power/power off.
- Yellow light: light flashing, means CF take recording; light off means non-recording.
- Green light: light off means GPS not ready, light on means GPS positioning ready.

★**Remark: While using playback function in DVR, it cannot take live recording at that time.**

2. Power off/Stop recording:

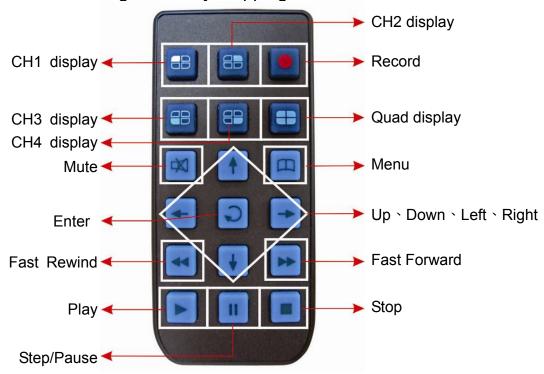Power off also stop recording, at then you can take out CF card to read the recorded files.

⚠ **Note**

(1) Before using the memory disk, please format the disk first using the software player in the CD-ROM. If not, device will automatically erase all data in the memory disk before recording.

(2) All memory disks have limited lifespan. Please regularly watch videos on PC and check the memory disk to ensure proper functioning.

E. System Operating Instruction

Vehicle DVR system provides two operational methods: IR remote controller and PC software application.
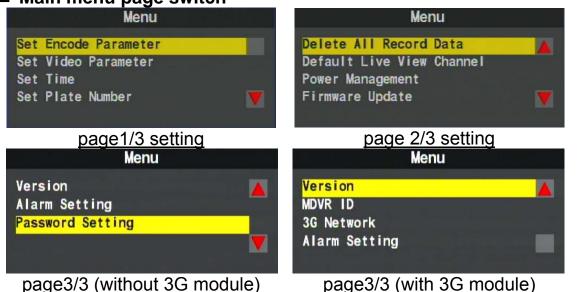
1. Through IR Remote Controller Instruction

1.1 As following is the key mapping table for IR Remote controller:

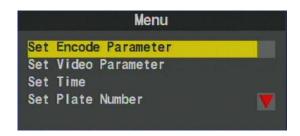1.2 DVR OSD menu operation and IR remote controller key mapping chart
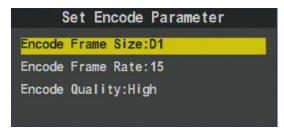
■ **Main menu page switch**

page1/3 setting

page 2/3 setting

page3/3 (without 3G module)

page3/3 (with 3G module)

◆IR Remote controller Instruction
 (1) Select Item: [up/down/left/right]
 (2) Change setting for selected item: [up/down/left/right]
 (3) Change setting for Bar item：[Enter]
 (4) Full Screen display for each CH: [CH1~CH4]
 (5) Open OSD menu, back to previous page：[menu]
 (6) Quad display ：[Quad]
 (7) Enter playback mode ：[play]
 (8) Stop Play/exit playback mode：[Stop]
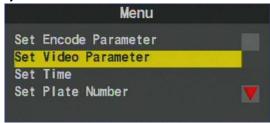 (9) Suspend recording:[Pause]

■ **System Setup instruction**
(1) Set Encode Parameter

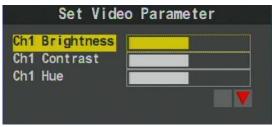| Menu	Set Encode Parameter
Set Encode Parameter	Encode Frame Size:D1
Set Video Parameter	Encode Frame Rate:15
Set Time	Encode Quality:High
Set Plate Number ▼	

◆ IR Remote controller operating instruction
  (1) Can be selected Resolution/Record frame rate /Recording quality from up/down key on remote controller.
  (2) Left key→ Change parameter.
  (3) Right key→ Back to pervious parameter.
◆ Items Setting
  (1) Encode Frame Size (Res.): D1 / CIF
  (2) Encode Frame Rate: 5/15/20/25/30
      (D1 max. 15 / CIF max. 30)
  (3) Encode Quality: Low/Normal/High

(2) Set Video Parameter

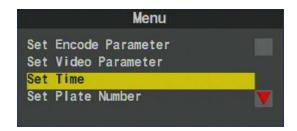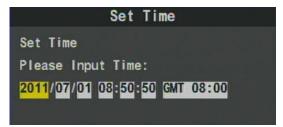| Menu	Set Video Parameter
Set Encode Parameter	Ch1 Brightness
Set Video Parameter	Ch1 Contrast
Set Time	Ch1 Hue
Set Plate Number ▼	▼

◆ IR remote controller operating instruction
  (1) Up/Down key→ Select current channel for setup

(2) Left/Right key→ Set brightness/contrast/hue for current channel (Left key→ To reduce)/ (Right key→ To increase)

◆ Item Setting
(1) Brightness: (Left key→ to reduce)/ (Right key→ to increase)
(2) Contrast: (Left key→ to reduce)/ (Right key→ to increase)
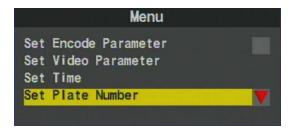(3) Hue: (Left key→ to reduce Hue)/ (Right key→ to increase Hue)

(3) Set Time

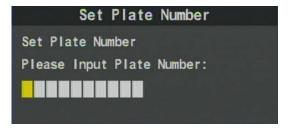| Menu	Set Time
Set Encode Parameter	Set Time
Set Video Parameter	Please Input Time:
Set Time	2011/07/01 08:50:50 GMT 08:00
Set Plate Number	

◆ IR Remote controller operating instruction
(1) Up key→ Plus one , Down key→ Reduce one.
(2) Left key→ Left one space, Right key→ Right one space.

(4) Set Plate Number

Menu	Set Plate Number
Set Encode Parameter	Set Plate Number
Set Video Parameter	Please Input Plate Number:
Set Time	
Set Plate Number	

◆ IR Remote controller operating instruction
(1) Up key→ Numbers plus one or alphabetical order to increase.
(2) Down key→ Number reduce one or alphabetical order to reduce
(3) Left key→ Left one space.
(4) Right key→ Right one space.

(5) Delete All Record Data (Format Disk)

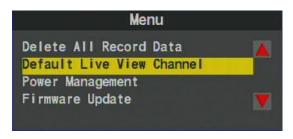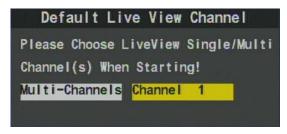| Menu	Delete All Record Data
Delete All Record Data ▲	Delete All Record Data
Default Live View Channel	Warring! Are you sure?
Power Management	No Yes
Firmware Update ▼	

(1) Delete All Record Data

Use right key or left key to select the selection then click "enter" to confirm.

★**Caution! All data will be deleted when you click "Yes".**

(6) Default Live View Channel Display

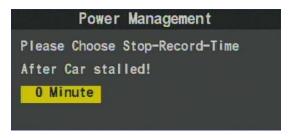| Menu	Default Live View Channel
Delete All Record Data ▲	Please Choose LiveView Single/Multi
Default Live View Channel	Channel(s) When Starting!
Power Management	Multi-Channels Channel 1
Firmware Update ▼	

(1) Select the default live view CH after startup: Item selected will be default live view display mode after DVR booting completed.

(2) On this page, Use left key or right key to select Quad display (Multi-CH) or CH 1 Display, then press "enter" to confirm.
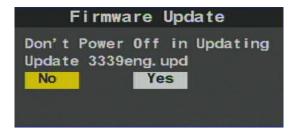
(7) Power Management

Menu	Power Management
Delete All Record Data ▲	Please Choose Stop-Record-Time
Default Live View Channel	After Car stalled!
Power Management	0 Minute
Firmware Update ▼	

(1) Power Management: Setup Extended Record period after Engine shutdown.

(2) Use IR Remote controller for setting, Click Left key to move one space for selecting time for delay-recording, then press enter key to confirm.(The delay-recording period can be 0,5,10,15,20 minutes)

(8) Firmware Update

(1) During firmware update, please do not power off; after finished the DVR will reboot automatically.

(2) When update firmware, Using left/right button on remoter controller to select Yes/No for update, then press enter button to confirm.

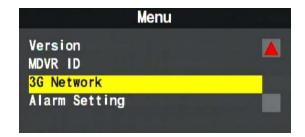★ **Must use CF card for firmware update.**

(9) Check Firmware Version

(1) To check current firmware version, please select version and press enter key.

★ **Check the current firmware version first before firmware upgraded.**

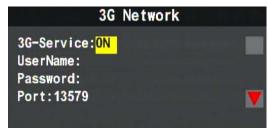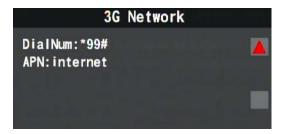## (10) Check MDVR ID Information (Only available when DVR with specific 3G module)

(1) If you need to check current MDVR ID information, please click MDVR ID and press enter key on remote controller.

★**Check the current MDVR ID version is the newest version first before start 3G information setup.**

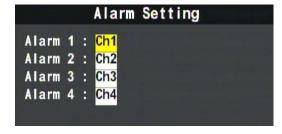**(11) 3G Networking Setting (Only available when DVR with specific 3G module)**

Menu	3G Network
Version ▲	3G-Service:ON ■
MDVR ID	UserName:
3G Network	Password:
Alarm Setting ■	Port:13579 ▼

3G Network	3G Network
Server:61.221.66.200 ▲	DialNum:*99# ▲
▼	APN:internet ■

(1) When enable the 3G networking function, Press the right/left key on remote controller first to select 3G ON/OFF, then press "confirm" key to save the change.

★ **After setup finished, press the up/down key to check information about 3G network settings are properly.**
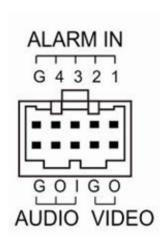
(12) Alarm setup

Menu	Alarm Setting
Version ▲	Alarm 1 : Ch1
MDVR ID	Alarm 2 : Ch2
3G Network	Alarm 3 : Ch3
Alarm Setting ■	Alarm 4 : Ch4

(1) When the alarm is triggered, the screen should display which CH is triggered. Press the right/left button on remote controller to select channel, then press the "confirm" key set the channel.

★**Check the explanation of back panel, in order to facilitate triggering alarm information setting.**

★Alarm system works only after finishing both hardware and software setting.

Ex. It could apply to switch CH to full screen mode for driver when backward of parking or using turn signals to prevent blind corners.

1 CH ⟶ Input reverse signal

G ⟶ It could connect with the second and third black wire.(share ground wire with automobile)

★When the alarm is triggered, the screen switch to full display which CH is triggered. And It will return to quad display when alarm is finished.
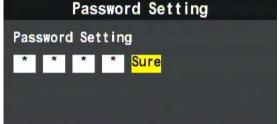

Normal Statue

Alarm Mode

(13)   Password Setting (3G version without this function)

(1) Set password protected on machine： It required to enter
the password before setting, playback, formatting…
implement relevant actions.

(2) Use remote controller keys to change setting, Click Left key
to move one space for selecting number for password, then
click up/down key to enter the number, after finished, click
"enter" key to confirm. (You can select number 0~9 for the
password. If you don't need the password function, please
enter a blank and click "enter" key to confirm.

★**If the Player software does not set the playback
password; then when click "playback" button on the
remote controller, it will enter playback file directly of
the menu page**

★**When finished entering a password and move to next
password location, the former one will show a " *
"symbol in order to protect password information.**

■ LIVE Display

(1) Select CH1~CH4 to full display mode; If you want to return to quad display, please press quad key.

(2) On Live view mode, click "menu' to enter OSD menu or click 'Play" to enter playback mode.

★ **If it shows the "G" mark on Upper right screen, it means GPS positioning successes.**

■ Playback mode
Use remote controller to enter playback menu.

(1) Select CH1~CH4 as full display for each CH; If you want to return to quad display, please press quad key.
(2) On Playback mode, please click "stop" to exit the playback mode.
(3) Press pause key to pause video stream.
(4) On Pause mode, Press the play key to continue play recording file.
(5) Press stop key on remote controller to exit playback screen.

2. Through Carbox Player on PC Site

(1) Use CF card to playback directly

Execute the CarBox2.exe [icon] from CD-ROM , the display as showing below. Click [▶] Play button to select memory card; or click open file [folder icon] to choose the files from memory card or hard disk, and then double-click the file you want to play. Under playing mode the [▶] play key will switch to [❚❚] pause key.

★**Caution: It needs to install DirectX 9.0 or above before running CarBox2 software.**

■ Viewer Interface Schematic
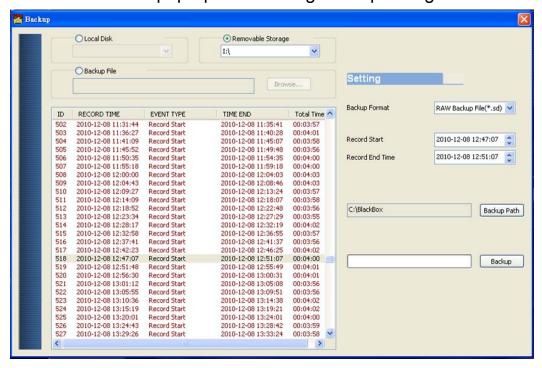
★<u>**GPS Coordinate, Speed and Google Map (select models with 3G modules)**</u>
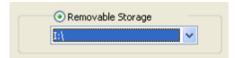
a. Control Interface Description

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1	⏮	Previous File
2	◀‖	Previous Frame
3	◀	Backward Play
4	‖	Pause
5	■	Stop
6	▶	Play
7	‖▶	Next Frame
8	⏭	Next file
9	💾	Open folder, select file.
10	⚙	Disk backup. Select the backup path for file storage.
11	🌐	Google Map
12	📁	Configuration
13	✂	Snapshot
14	🛠	Tool, CF card format, language setting.

● Hard Disk Backup 💾
Review footage on the CF card through PC, Click" 💾",
then it will pop-up as following backup dialogue windows.
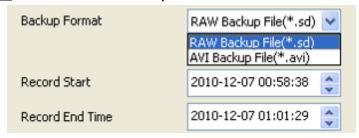
Step 1. Select the CF card drive no.

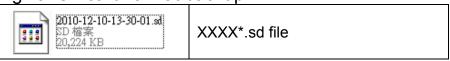Step 2. Select the recorded file which you want to backup

ID	RECORD TIME	EVENT TYPE	TIME END	Total Time
1	2010-11-13 06:23:32	Record Start	2010-12-07 00:54:20	570:30:48
2	2010-12-07 00:55:04	Record Start	2010-12-07 00:57:54	00:02:50
3	2010-12-07 00:58:38	Record Start	2010-12-07 01:01:29	00:02:51
4	2010-12-07 01:02:14	Record Start	2010-12-07 01:05:05	00:02:51
5	2010-12-07 01:05:49	Record Start	2010-12-07 01:08:40	00:02:51
6	2010-12-07 01:09:24	Record Start	2010-12-07 01:12:15	00:02:51

Step 3. Select the Backup Format
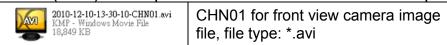
Backup format:
(1)Original CF card format backup.

	XXXX*.sd file

(2)AVI File(*.avi) backup when take this format as backup.

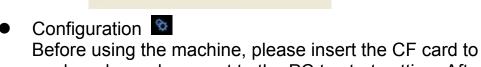|	CHN01 for front view camera image file, file type: *.avi

★caution: The difference between original CF card format file and AVI file is that AVI file contains only video and audio data but lose the GPS coordinates, speed and G-sensor data. As a result, we would recommend to do the backup by original CF card format.

Step 4. Backup Path: Select your backup destination.
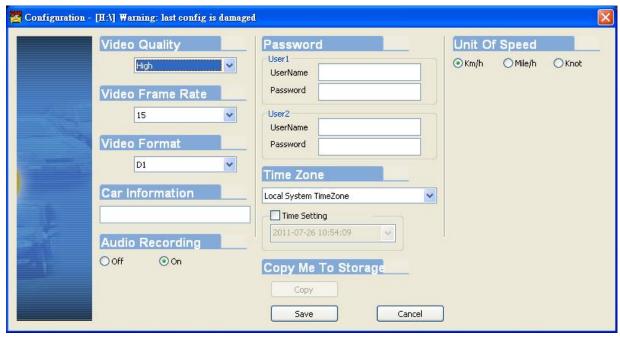(e.g.: C:\BlackBox)

Step 5. Backup: Click 'backup' to start saving the file to your
specified destination

● Configuration
Before using the machine, please insert the CF card to
card reader and connect to the PC to start setting. After
setting, you can insert the card back to DVR and start
recording.

1	Video Quality		Select the video Quality: High/ Normal / Low
2	Video Frame		Set the recording frame rate for the camera (2、4、6、8、10、15、20、25、30)
3	Video Format		video signal format D1/CIF
4	Car Information		You can input the driver's name or license number here to identify people's identity. Suitable for company or group using.

5	Audio Recording	Audio Recording ○ Off ◉ On	Audio recording on or off.
6	Password	Password ☐ Using Password Input Confirm	This function can encrypt the data and prevent others from accessing. Maximum letters:15 letters. Example: 123456789123456 After setting the password up, you have to input password every time for playing the files, modify the setting, formatting the memory card etc. ★ Note: Please check if you have set capital letters for your password and save your password well in other place to prevent from missing.
7	Speed unit	Unit Of Speed ◉ Km/h ○ Mile/h ○ Knot	You can set up the speed unit here. Km/h: kilometer per hour Mile/h: mile per hour Knot: knot per hour ★ Note：1 KM=0.6214 mile, 1 mile=1.6093KM, 1 Knot =1.853KM
8	Time zone	Time Zone Local System TimeZone	Time Zone: GMT (GPS auto time correction)

● Snapshot

While playing the recorded file, you can use this function to snapshot the picture and save it into your PC. Default saving path for snapshot picture will be in x:\IBoxPlayer/Snapshot folder.
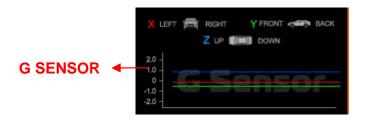
File type: .bmp

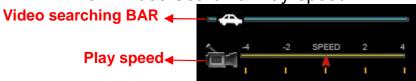b. Latitude & Longitude Coordinates

c. G Sensor
   G-sensor: Detect & record G-force data.

(1) X: The G-force from left & right of the car.
(2) Y: The G-force from front & back of the car.
(3) Z: The G-force from upside & downside of the car

d. Speed Meter

e. Video Search & Play Speed

Video searching BAR ←

Play speed ←

(1) Video Searching: You can use the mouse to drag the bar to search the video quickly.
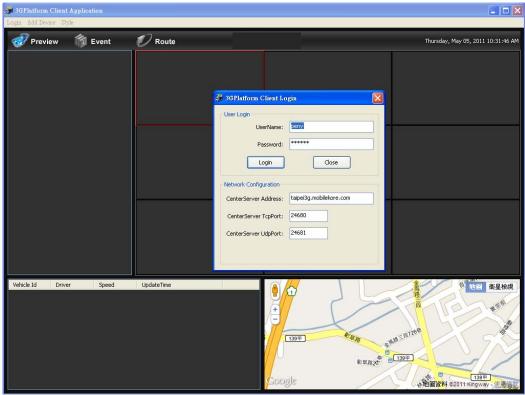(2) Play Speed: Support 2x, 4x fast forwarding and -2x, -4x slow play mode.

f. Volume Control

Volume BAR ←

Volume degree ←

Volume BAR: Click the left button of mouse control to adjust the volume degree.
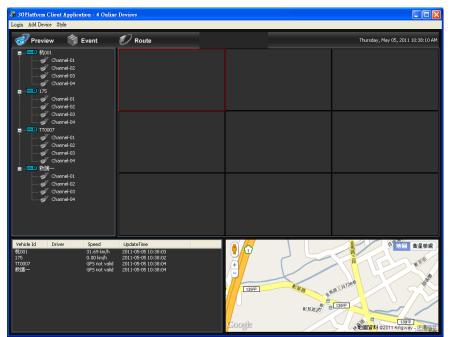
(2) **3G client software for viewing directly(select models with 3G modules)**

Executive Playback software "3G ClientApp.exe", the playback screen shown as below. Enter the username and password and then press " Login " button to login screen.
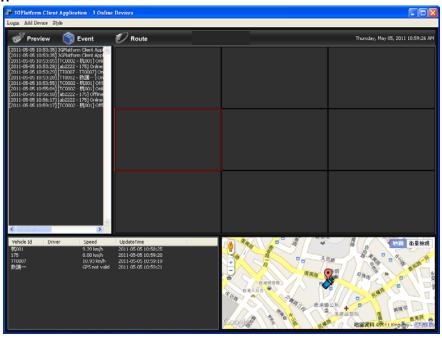
Note: To perform this software will require DirectX 9.0 or more. Click and then select the name of vehicle to view the image (example, the figure of 175) then click on Channel-01 (or other Channel) and then hold down the left mouse button and drag to the split screen in right side.
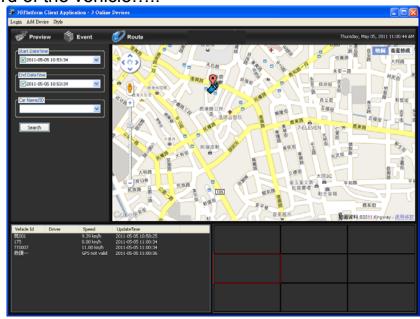
The other method to choose split-screen first and then click on Channel-01 with right key of the mouse, click PLAY function to view real-time image. (When the icon becomes , it means the vehicle that is currently offline. Only the icon returns to online status to see the real-time image.)

★ Note: When play real-time image, Channel icon will become green.

Click can watch the event log and vehicle driving records...

Click can watch the Google Map and inquiry the date and time record of the vehicle…..

■ 3G ClientApp page and other relevant settings

Login Add Device Style

1. Login: click Login on the top of the screen to open the login screen information.
2. Add Device: In order to identify each device, add the vehicle information here.
3. Style: watch different split-screen, just click Style option to set values; Total 1 * 1, 2 * 2, 3 * 3, 4 * 4, 4 types of split screen to choose.

F. Format Memory Card

When should you「format」the CF CARD?

When the used CF card or just a new card, you should format CF card first before use. (The CF Card with delivery has been formatted and tested, you can just plug it in DVR).
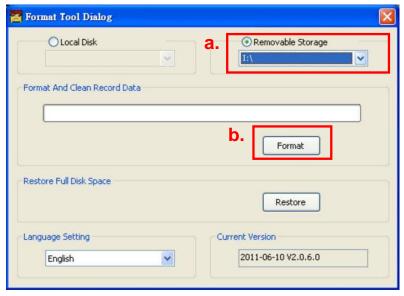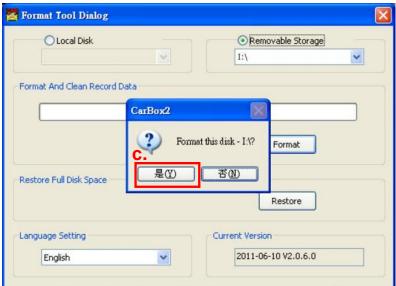
■ The procedure to format the CF card:

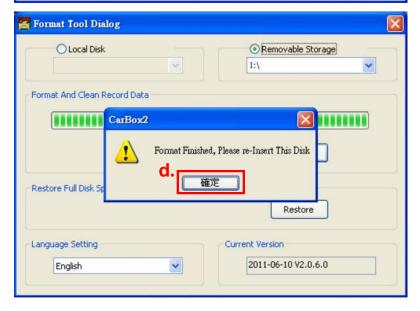1. Put CF card into the reader slot and make sure the direction is correct.

2. Insert the reader into the USB Port on PC.

3. Execute the player "CarBox2.exe" into main page (refer to the charts below)

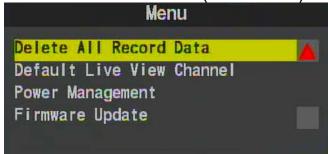4. Select format button to start as following steps

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5. After formatting completed, re-insert the CF card to do relative setting. please insert the card into DVR for recording.

■Process to Format the CF Card on DVR:
1. Use remote controller to enter DVR menu and choose Delete All the Record Data(format disk).

2. Select "Yes" and Click "Enter" to start formatting.

3. When the screen back to LIVE mode ,the formatting is completed.

G. Restoring Memory Card
When should you「restore」 the CF CARD?
When the used CF card or just a new card, you should format CF card first before use. (The CF Card with delivery has been formatted and tested, you can just plug it in DVR).
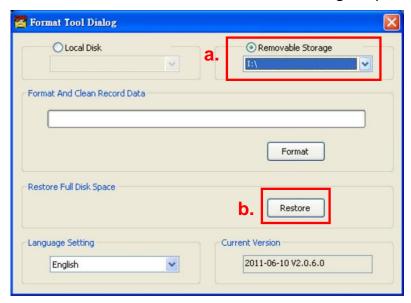■ Formatting procedure from PC site:
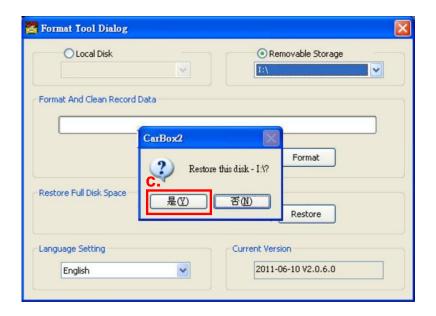

1. Put CF card into the reader slot and make sure the direction is correct.
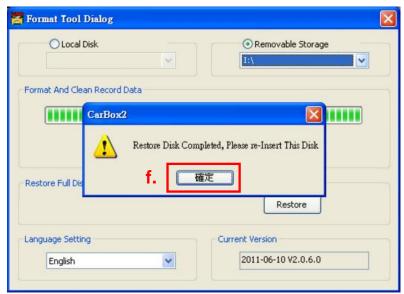

2. Insert the reader into the USB Port on PC.

3. Execute the player "CarBox2.exe" into main page(refer to the charts below)
4. Select restore button to start as following steps

d. 開始(S) 關閉(C)

e. 確定

格式化已完成。

Format Tool Dialog

○ Local Disk   ⊙ Removable Storage

Format And Clean Record Data

CarBox2

Restore Disk Completed, Please re-Insert This Disk

f. 確定

Restore Full Dis...   Restore

Language Setting   Current Version

English   2011-06-10 V2.0.6.0

5. You can use the memory card for other purposes.

H. Installation and setting up for 3G module

Please confirm 3G system with the telecom provider in local area, and choose appropriate module to fit in with.

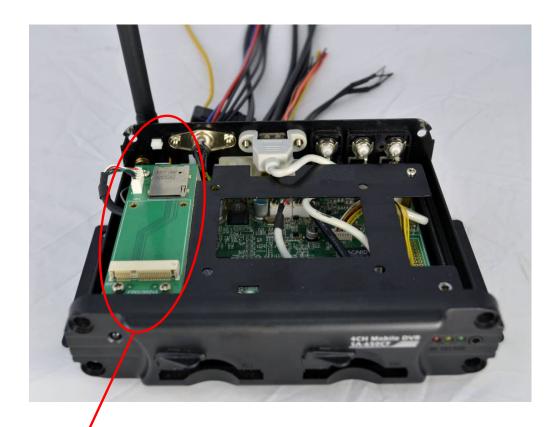| Telecommunication Norm: CMDA2000 3G Network Card: EM660	Telecommunication Norm: WCDMA 3G Network Card:EM770W

1. Installation Guide for 3G module
   a. Take off two screws from front and back cases as red mark; please remove upper cover from this device.

Installation interface for SIM card
and 3G module.

b. Installation process for EM770W of HUAWEI 3G Module (SIM card shell be purchased by customer)

i. **Disable PIN code from SIM card by mobile phone firstly and insert this card into the device.**

1. Insert SIM card into the slot

2. Flat the SIM card and push into the buttom then locked

ii. **Start to install of 3G module after SIM card installation.**

1. Slanting insert the 3G module into PCI-E slot.

2. Push the 3G mould on flat status and lock two pieces of M2 screws.

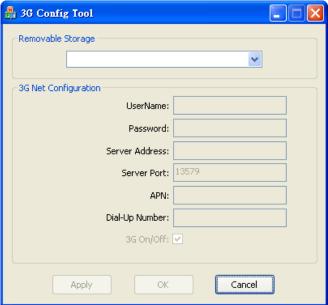3. Connect antenna to "M" Position of the module

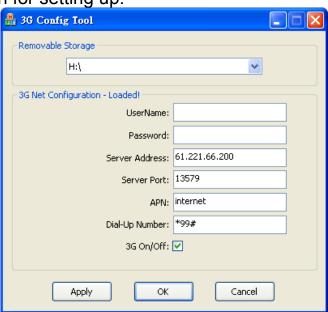4. Complete installation of antenna and module

✦**EM660 module**

2. 3G INTERNET SETTING

a. Please confirm whether the code number   is closed or not.

b. Confirm if The Telecommunication providers' APN is the same with Dial-Up Number's information, if not, please follow all 3G Config Tool setting file steps.

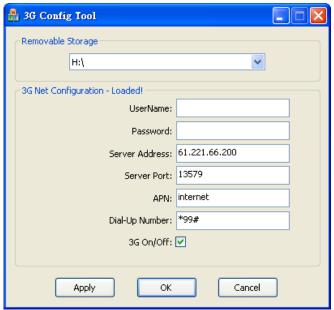i. Please double click [3G Config Tool icon] [MDVR 3G Net Config Tool] and open the setting page as below:

The explanation for setting up:

1. UserName: No need in common
2. Password: No need in common
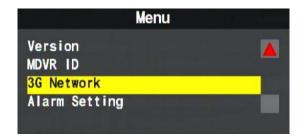3. Server Address: Enter Server IP address setting----Default

Server IP Address is 61.221.66.200
4. Server Port: Default Sever Port is 13579, Not recommend to change the original setting).
5. APN: 3G APN, generally preset to be Taiwan Telecommunication providers, if in other area, Please check local Telecommunication providers offered APN setting name.)
6. Dial-Up Number: 3G Dial-Up Number, generally preset to be *99#, if in other area, Please check local Telecommunication providers offered 3G Dial-Up SETTING Numbers.
7. 3G On/Off: To choice whether star the 3G tele-connecting function or not. "Pick" (V) mean "Star" commonly, if not willing to use tele-connecting function , please directly neglect it.

ii. Please put USB FLASH DRIVER into the PC's USB drive port, choice & click the proper disk storage. And input the following data as below:

iii. After inputting, pick <o.k.> and process saving, the 3G Module information setting would be finished at this moment. Please check the USB Flash Driver DISK to find out if our <net3g.ncf>file existed .

iv. And Please put your USB FLASH DRIVER into the SA-650-CF USB connecting Port, and re-connect the battery again.<After first {star}, if update information successfully, It would re-start again after 10 seconds.>

v. After re-start, please pick the 3G internet item up in contents to confirm whether the 3G information updating successful or not.

When updating successfully, all the updating information would shown on the 3G module related web information.

When 3G connecting successfully, the right upper screen would show N signal.

I. Record Time Estimation (Based on constant record mode with 8GB card)

＊The chart of estimated record time listed below is for reference only(based on 8Gb with 2 inner &2 exterior Cameras).The length of time recorded can be varied due to different record condition.

Unit: Hr

Resolution/fps Video Quality	D1			CIF					
	5 fps	10 fps	15 fps	5 fps	10 fps	15 fps	20 fps	25 fps	30 fps
High	9.5	4.2	3.1	15	13.3	8.5	8	7.5	7
Normal	12	6.7	6.3	18	14.3	9	8.3	8.1	7.5
Low	16.8	7.2	12	20	17.8	14.3	11.2	9.7	9.2