## Description

This digital video recorder is specially designed for vehicle surveillance. It overcomes machine hang and files corruption issues, with built-in battery back up and watchdog timer. It is suitable for using in worst working condition.

## Features

- Analog video input
- On board SD card support up to 4GB
- DC12V operation
- Motion detect to capture AVI
- File format – MJPEG
- Video format of 320x240
- Video clip length upto 60sec at 5fps
- Video playback both module and PC
- Pause and resume feature during playback
- Vehicle number and date time stamp

- Vehicle number and system setup by PC
- Power failure protection to prevent file corrupt
- Watch dog for system monitoring
- Video output to TV
- On board hardware setting for PAL/ NTSC TV system
- Hot plug key board for system testing and operation
- Battery backup for 15sec if power failure

## Block Diagram
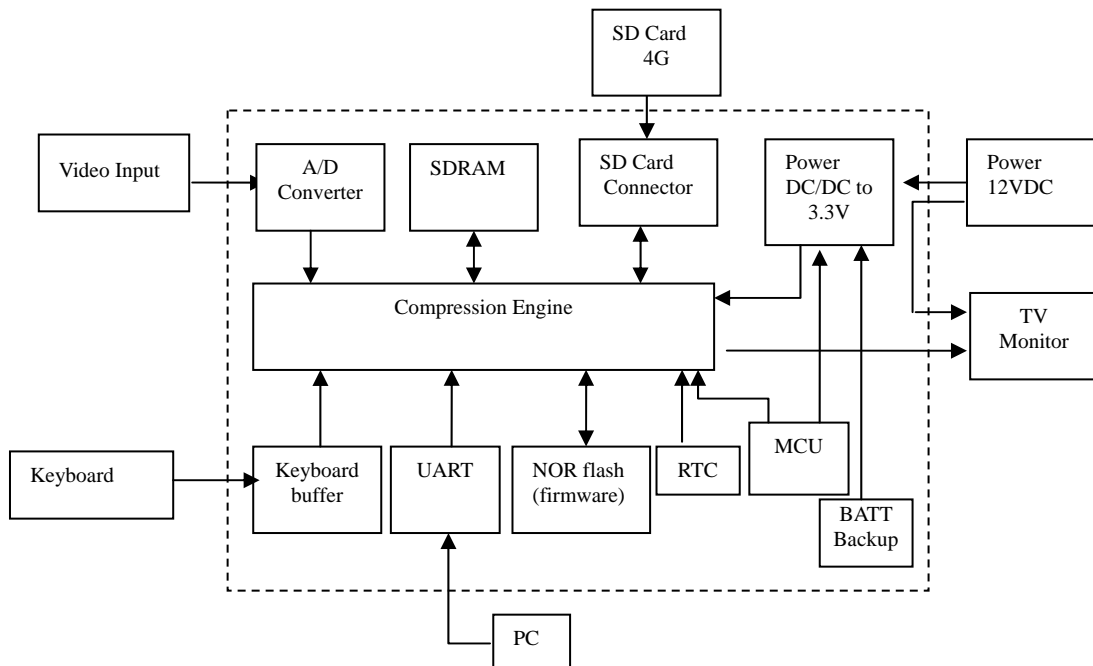


## Electrical Characteristics  (at room temperature 25C)

| Parameter | Condition | Min | Type | Max | Unit |
|---|---|---|---|---|---|
| Operation Voltage | | 7.5 | 12 | 13.5 | V |
| Operation Current | (no power output to camera, no charging) | | 180 | | mA |
| | Recording | | 190 | | mA |
| Power failure time allowed | Battery full charged | | 30 | | sec |

## Image and file storage information

| | |
|---|---|
| Image format | Video: MJPEG, QVGA (320x240), 1fps |
| File size per video clip(40sec) | ~470KB |
| Max file number per folder | 1024 files |
| Max folder number per card | 1024 folders |
| Max memory size for SD card | 4GB (~8900 clips or 99Hr recording time) |

## Connector Description

| Connector | Function | Remark |
|---|---|---|
| JP1 | Select NTSC/PAL | Need to be selected before power up |
| J1 | UART | To connect PC thru RS232 adapter cable |
| J2 | SD card slot | Support up to 4G SD card (note some brands may not be supported) |
| J3 | Keyboard input | 4 bit binary input |
| J4 | Video out | To output video signal to TV set |
| J5 | NC | |
| J6 | Camera input | For video input and power supply |
| J7 | NC | |
| J8 | DC input | 2-pins, for DC12V input |
| J9 | NC | |
| J10 | NC | |
| J11 | PWR on-off | Slide switch to turn on-off the power and also the backup battery |

## Key Definition

| Key | Name | Key | Name |
|---|---|---|---|
| 0001 | SNAP | 0111 | NOP |
| 0010 | OK | 1000 | NOP |
| 0011 | Down | 1001 | Left |
| 0100 | NOP | 1010 | UP |
| 0101 | Right | 1011 | Mode |
| 0110 | DISP | 1100 | NOP |

Note: all other combinations are NOP (no operation)

## System Configuration

1. The system is installed in vehicle, no monitor nor keyboard to be connected when system is running. For system setup such as, testing, camera position in the vehicle, an external keyboard and monitor are required.
2. The system accepts clean 12VDC and provides the same 12VDC to supply the external camera as an option. User needs to provide a regulated 12VDC to this system for the best performance.
3. A Lithium battery is used to backup the system about 15 second to prevent from the file corrupt due to unexpected power drop. If video recording is taken place this period, it will close file correctly before turn off the power.
4. A micro controller (MCU) is use to monitor the power and main DSP status to prevent from system hang. If the system hanged due to any reason, the MCU will re-boot the system until it is operating normally. If the system cannot be rebooted the first time, it will repeat until it is succeeded.
5. The UART interface is implemented for PC connection. A PC application software will be provided to setup the system and enter the vehicle number.
6. RTC is used for date time display and stamp to the video. The date time can be set by the PC interface, thru UART port. This makes the operation simpler.
7. File format of video clip is MJPEG. It can be playback on the module or PC. The video clip can be played in 4 mode, forward, backward, pause, resume playing and stop. In PC, a viewing software is required since the file format is proprietary.
8. No user menu for the module operation. No file delete is allowed.

## Board layout and connector location
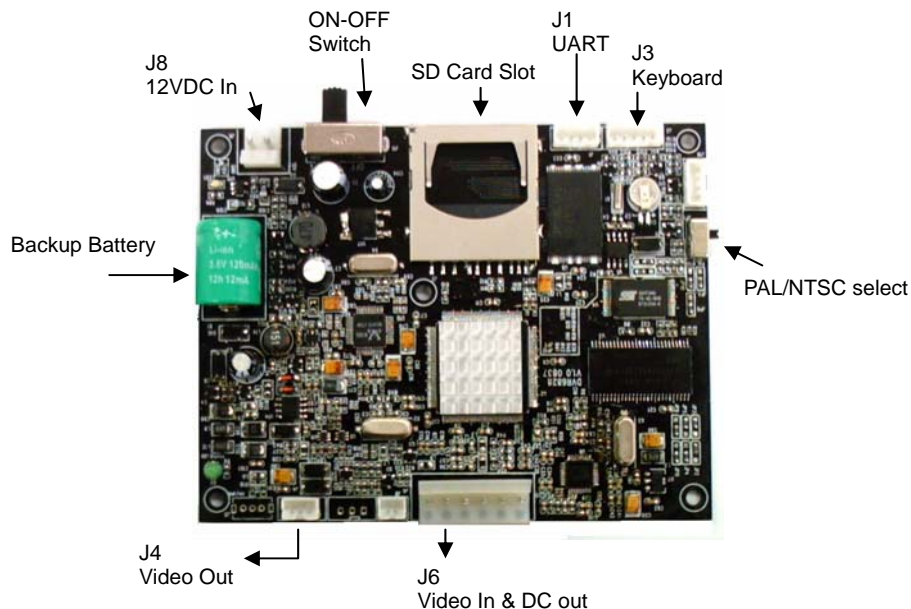


## Operating the Module

1 Power up system the first time: before power up, connect the device as below:
    1.1 J3: to keyboard thru a 5 pin flat cable
    1.2 J4: video output to TV set using coaxial cable
    1.3 J6: video input, connect to camera output; 12VDC output for camera, if required
    1.4 J8: connect the power cable, accept only 12VDC+/-1V, note polarity.
    1.5 Insert the SD card. There is no flash memory on board, if there is no SD card, it will not perform recording. This system supports up to 4G card.
    1.6 Slide the on-off switch to ON, now the system will start operation. The welcome logo will display on the TV screen. Note the power up time may be differed from size of memory card.
    All the connectors have the polarity, need to take care before plug in.

2 Preview Mode:
    2.1 Use UP key to turn motion detect (MD) on-off, by default MD is ON.
    2.2 Press SNAP key to take a video clip instead of MD function. During recording, a red dot will be appeared and flashing on top of the screen. It can't be stopped unless it reaches the

preset recording time.
2.3 Press MODE to switch between preview or playback mode

3 Playback Mode:
3.1 Press MODE to enter playback mode. It will show the last video captured with the OSD. This OSD can be removed by pressing UP key. If there is no files inside the memory, it will pop up " NO FILE" and return to preview mode
3.2 Use LF/RT key to select the desired video clip.
3.3 Press DN key to start playing the selected video clip
3.4 During playback, use UP to pause, press again or RT key to resume playing. Use LF/RT key to play the clip reverse or forward. Use OK key to stop the video and back the start position.
3.5 Press DISP key will enter folder list. Use UP/DN key to select the folder. The folder name is sorted by the date and time. Press OK to confirm selection.
Note: never pull out the SD Card when the module is recording, the file will be corrupted if do so.

## System Setup using PC interface

Before setup, need to prepare the RS232 adapter cable and connect to pc com port. Open the program DVR6828PC.exe. The application will be opened, as below:

1 Open the COM port: make sure the adapter cable is connected to the module (J1) and the module is powered. Select the COM port no. Please note some PC/notebook uses different number of serial port, need to check the right port number before it can connected properly. The baud rate is set to 9600. Press OPEN to connect to module.
2 Set the Clock: one can get the clock from module or get the system clock from PC. Then press SET to set the clock to module. Note that if take the clock from PC system, need to set ASAP. Since the system clock will not update this application automatically.
3 Memory Operation: one can format the memory card by press FORMAT. A window will be popped up for confirmation. Note this action can't be undo. Once formatted, the content of the card will be erased.
4 Motion Detect Setting: to turn on-off the MD. By default, it is always ON at power up. Use short cut key UP to turn off and ON. Sensitivity can also be selected
5 AVI Setting
5.1 Image quality can be set for Hi, Mid and Lo, the higher the quality, the bigger the file size.
5.2 Duration: limited to 10-60sec, this is the best time frame for system, more stable.
5.3 Frame rate: it can be set from 1fps to 5fps, higher frame rate will have bigger file size.
6 Vehicle No.: max 10 characters, include text or digit. This will stamp on the photo at the left hand side lower bottom.
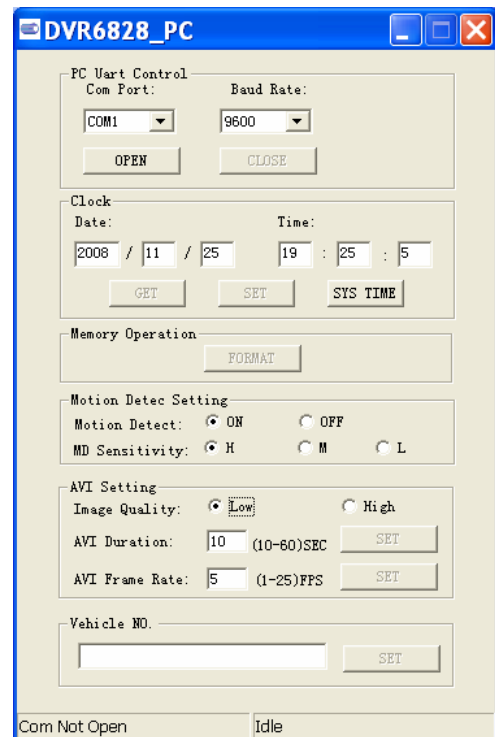
Note: before connect to PC, please turn off the MD by press UP key, to reduce the error rate.

Key Operation (summary)

|  | Preview | Playback | During Playing |
|---|---|---|---|
| SNAP | Press to capture | - | - |
| Mode | Enter playback | Enter preview | - |
| OK | - | - | Stop |
| UP | MD on/off | Turn ON/OFF OSD | Pause/Resume |
| DN | - | Start playback | - |
| LF | - | Select file | -Resume, reverse |
| RT | - | Select file | -Resume, forward |
| DISP | - | Select folder |  |