

**Description**

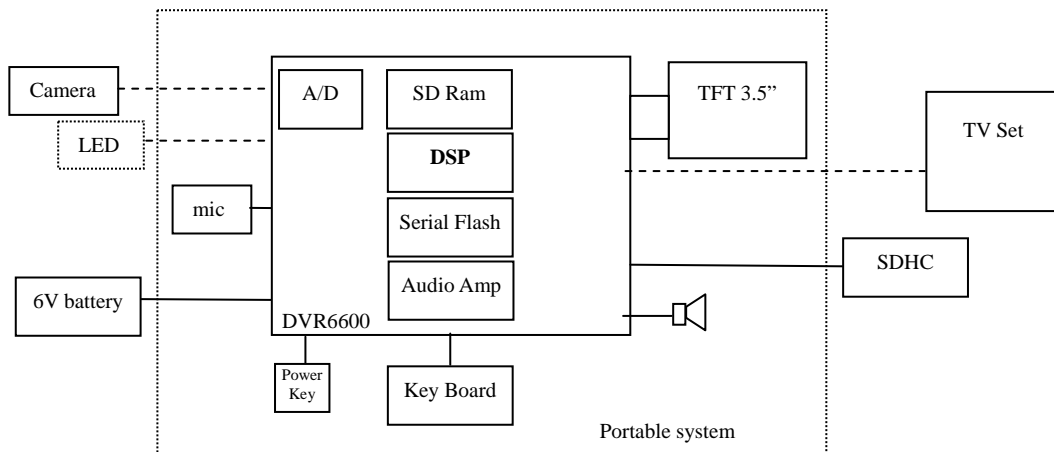
This portable DVR module has built in TFT display, accept analog video signal input. It is good for industrial inspection, viewing some hidden area, capture photo or recording video for analysis.

**Features**

- ✓ Small in size
- ✓ 1-channel video input with LED on-off control
- ✓ Built in TFT display of 3.5"
- ✓ JPG – 720x480 (NTSC)  
720x576(PAL)
- ✓ AVI – 720x480 30fps MJPEG(NTSC)  
720x576 25fps MJPEG(PAL)
- ✓ Video clip length 1-60 sec
- ✓ Zoom function 2X
- ✓ Support SDHC to 16G
- ✓ On system audio recording and playback
- ✓ Optional A/V output to TV
- ✓ Low battery detect
- ✓ Auto power off
- ✓ RTC to display date time
- ✓ Stamp data time on photo/AVI



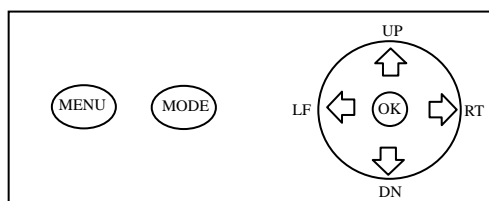
**Block Diagram**



**Electrical Characteristics** (at room temperature 25C)

Parameter	Condition	Min	Typ	Max	Unit
Operation Voltage		4.2	6	6.5	V
Operation Current			400		mA
RTC D/T backup	Full charged		10		hr

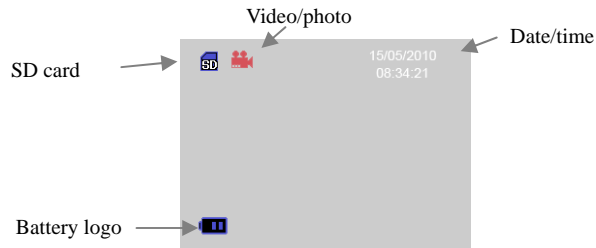
**Key board Layout**



## Operation

### Preview Mode

- 1 Press PWR key to turn on the machine. A welcome screen will pop up and the screen will show the real time video. The on screen display will be shown as below.



- 2 Change between preview mode and play back mode.  
By default, the DVR is in preview mode when power up. One can press MODE to switch preview mode or playback mode.
- 3 Capture JPG or AVI
  - 3.1 Before capture, user needs to select photo or video. Press DN key to set video or photo in preview mode. Relevant icon will be shown on screen.
  - 3.2 Take a snap shot – make sure it is in photo mode, press OK key to take a photo.
  - 3.3 Take a video clip - make sure it is in video mode, press OK to start recording. During recording a red dot will be flashing on the screen. Press OK again to stop recording. The machine has been set to a maximum recording time of 60sec. So, during recording, if OK key has not been pressed within 60sec, then it will stop recording and quit to preview mode

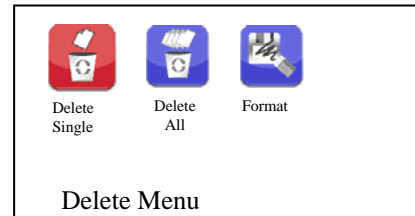
**Note: this module has no on-board memory, so it needs external SD card to store files. User needs to insert SD card before it can perform a snap shot or video capture**
- 4 Zoom in and Out
  - 4.1 The machine can perform zoom in and out the image up to 2x. One can press LF/RT key to perform zoom function. A status bar will be shown on the screen.
  - 4.2 Recording in zoom mode will be different to recording in normal mode. It will go back to normal scaling if the image has been zoomed. After capturing, it will keep normal scaling view instead of zoomed view.
- 5 Turn on off the external LED
  - 5.1 This module provides a GPIO to control the external LED. Assume there is a LED built in the front end of camera tip for illumination. By default the LED is on after power up.
  - 5.2 Use UP key to turn on/off the LED.
  - 5.3 This LED will be off in the play mode other than preview.
  - 5.4 Please note that the control of this LED will be disabled when recording AVI (i.e. the LED state, which stored before the recording process, cannot be changed until the end of the recording process).
- 6 Battery detect
  - 6.1 At power on, the battery icon will be on for a few seconds to indicate the battery status. If it is full, the icon will be disappeared after a few seconds. If it is less than half, it will be on until machine turns off.
  - 6.2 If the battery is lower than half capacity during operation, the battery icon will pop up until machine turns off.
  - 6.3 If the battery level is very low and not allowed to operate any more, battery icon will be flashing.
  - 6.4 If the battery level is really low, pop up "**Battery Low, Shutting down**" message for 2 sec and turn off the machine automatically.
- 7 Auto power off
  - 7.1 When the system has not been operated for 3 min in preview mode, it will turn off the power automatically. In playback mode, it will not auto off.
  - 7.2 When USB is connected, it performs as mass storage and the system will always be on, TFT will display a USB connection icon. Make sure the module is on before connected to PC.

## Playback Mode

- 8 Playback the files in SD card
  - 8.1 Press MODE to enter playback mode. If there is no file in the memory or there is no SD card, it will show "NO FILE" and return to preview mode automatically.
  - 8.2 If there are files in the memory, it will display last file on screen. Use RT/LF button to view next/previous file. Press Mode to enter view mode.
  - 8.3 If the file is AVI, press DN to start playing.
  - 8.4 In playback mode, press UP to turn on/off the OSD.
- 9 Playing AVI
  - 9.1 Use DN key to start playing, press DN key again to stop
  - 9.2 Use UP key to pause playing, press OK to resume, press DN to stop
  - 9.3 At playing, press RT to play fast forward (**2x speed**). Press OK to resume normal speed playing.
  - 9.4 At playing, press LF to play reverse (**1x speed**) Press OK to resume normal forward playing.
  - 9.5 During any playing mode, press UP to Pause, press DN to stop, press OK to return normal forward playing.
  - 9.6 During play, relevant icon will be shown to indicate pause, playing normal, fast forward and backward.

Note: the files are saved in the folder named DVID, file name: IMGxxxx.jpg or IMGxxxx.avi

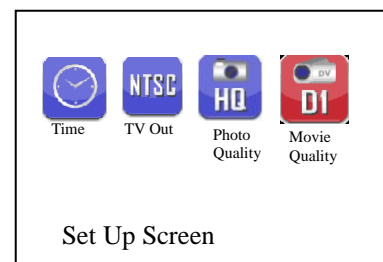
- 10 Delete files from SD card
  - 10.1 At playback mode, press MENU to enter deletion menu, by using LF/RT key, one can select delete current image or all files. A confirmation window will be popped up, YES to confirm, NO to cancel
  - 10.2 One can select format to delete all files and all folders
  - 10.3 Press MENU again to quit.



- 11 Playing files in PC
  - 11.1 Remove the SD card from module and insert to PC card reader.
  - 11.2 Using browser to view the SD card, all files are in the folder called DVID. One can play those files like other files taken by DSC.
  - 11.3 During USB connection, don't remove SD card from the machine, otherwise, it may cause machine hang problem.

## System Setup

- 12 System Setup  
At preview mode, press MENU
  - 12.1 Set up Date/time
    - 12.1.1 Use LF/RT key to select date or time and UP/DN key to set the correct digit. The setting will then store into system. Press OK to apply or press Menu to cancel.
    - 12.1.2 One can change the D/T display format by clicking the UP key on the field of DD/MM/YY
  - 12.2 Setup the image quality – high or low
    - 12.2.1 Press OK to toggle
  - 12.3 Setup the video quality – D1/QVGA
    - 12.3.1 Press OK to toggle
  - 12.4 Use LF/RT to move selection
  - 12.5 Press MENU to quit



## Icon Definition

### Set up Menu

	Date/Time setup	 	Image quality: High/Low
 	TV setting: PAL/NTSC	 	Movie quality: D1/QVGA

### Photo Management

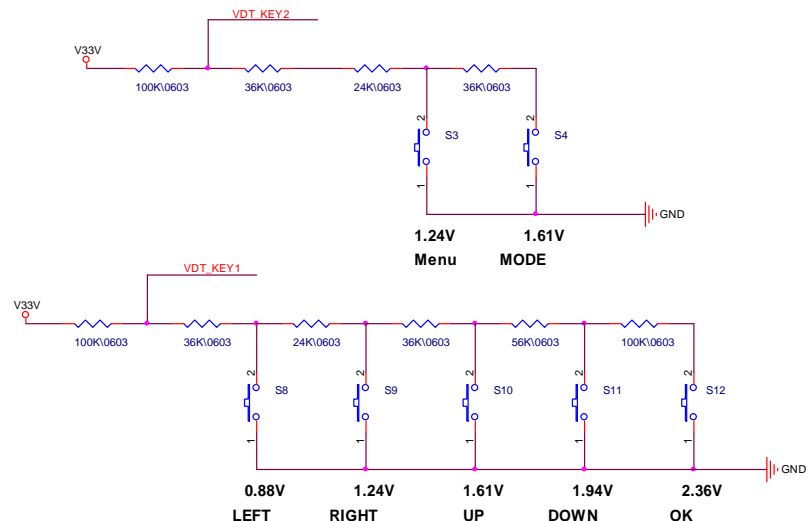
	Delete current file		Format SD card, clear all files and folders
	Delete all files		

## Keys Operation matrix

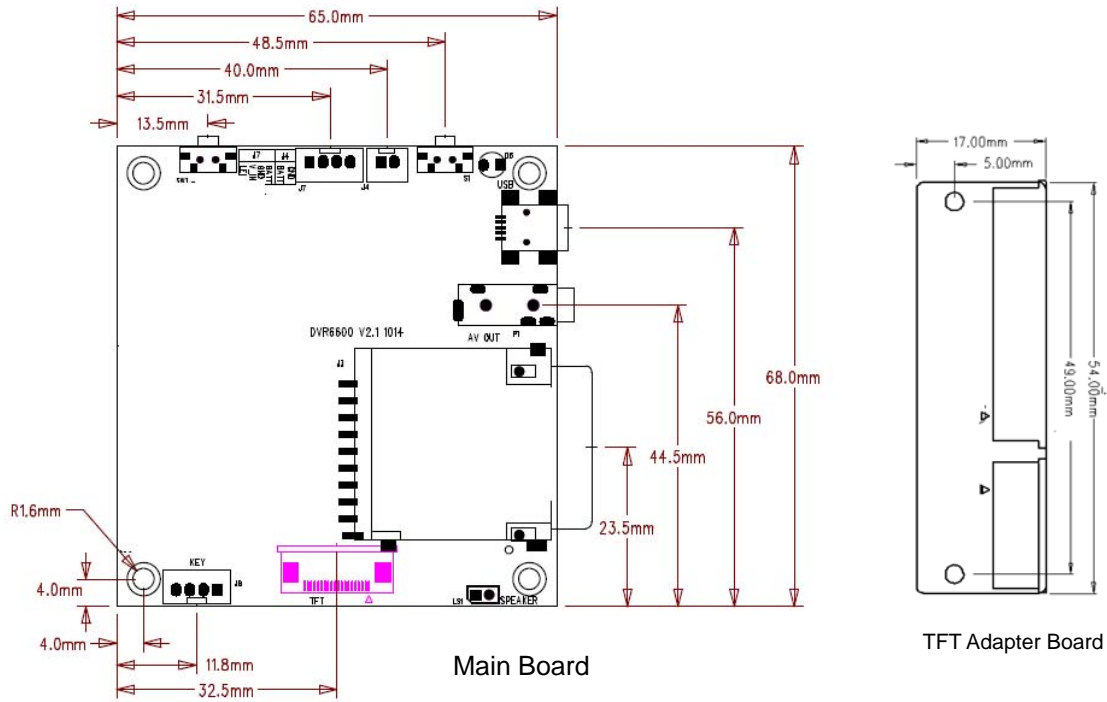
	Preview	Playback	Playing AVI
Mode	Enter playback mode	Enter preview mode	-
Menu	Enter setup Menu	Enter deletion menu	-
UP	Turn on/off LED	Turn on/off OSD	Pause
DN	Select JPG/AVI	Play AVI file	Start/Stop
LF	Zoom in	Previous file	Backward
RT	Zoom out	Next file	Fast Forward
OK	Snapshot or video capture		Normal playing

	Set up Menu	Date/time setting
Mode	-	-
Menu	Quit menu mode	Quit date/time setting
UP	-	Increase digit
DN	-	Decrease digit
LF	Select item	Cfm and shift to previous
RT	Select item	Cfm and shift to next
OK	Enter or toggle the setting	Cfm and quit

## Key Board Schematics



## Board Dimension



## TFT Specification

Feature		Spec
Display Spec.	Size	3.5inch
	Resolution	320(RGB) X 240
	Interface	RGB/CCIR656/601
	Color Depth	24bit
	Technology Type	a-Si
	Pixel Pitch (mm)	0.219 x 0.219
	Display Colors	16.7M Dithering
	Pixel Configuration	R.G.B. Vertical Stripe
	Display Mode	TM with Normally White
	Surface Treatment	Clear Type. 3H
	Viewing Direction	12 o'clock
Gray Scale Inversion Direction	6 o'clock	
Mechanical Characteristics	LCM (W x H x D) (mm)	76.9 x 63.9 x 3.15
	Active Area(mm)	70.08 x 52.56
	With /Without TSP	Without TSP
	Weight (g)	29.3
	LED Numbers	6 LEDs Serial
	Driver IC	Novatek NT39016D

Note 1: Viewing direction for best image quality is different from TFT definition, there is a 180 degree shift.

Note 2: Requirements on Environmental Protection: RoHS

Note 3: LCM weight tolerance:  $\pm 5\%$

**TFT Dimension**

