

**Introduction**

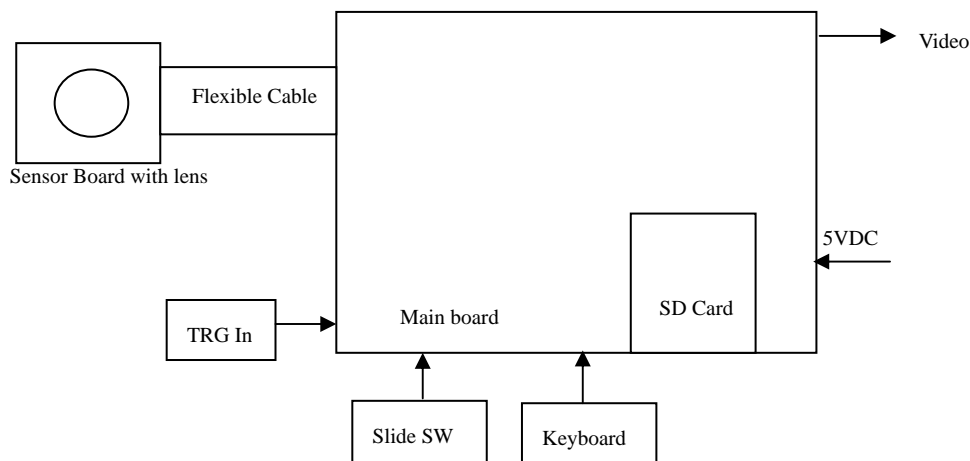
This module has been designed for very simple application. It can be configured to a special DSC or DV with various settings for hobbyist making his own recording device.

**Key Features**

- ✓ Built in meg pixel image sensor
  - ✓ Real time Video output to TV
  - ✓ RTC, OSD
  - ✓ Storage to SD card
- DV:
- ✓ Image size VGA or QVGA
  - ✓ Variable frame rate setting 1, 10, 30fps
  - ✓ Variable recording duration 1 -99 sec
  - ✓ Preset capture schedule, daily or periodic
  - ✓ Trigger input for unlimited capture duration
  - ✓ Manual key input for arbitrary duration capture
- DSC
- ✓ High Quality JPEG image of mega pixel
  - ✓ High quality image setting 3M, 1.3M and VGA
  - ✓ Preset capture schedule, daily or periodic
  - ✓ External trigger input or keyboard snap shot



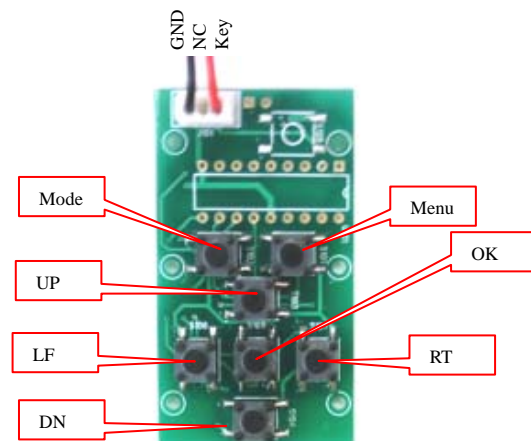
**Block Diagram**



**Keyboard Design**

7- Key design: mode/menu/UP/DN/LF/RT/OK

1. Mode: use to change playback or preview
2. Menu: for setup or quit the setup
3. LF/RT/UP/DN for item select
4. OK to confirm



## Module Specifications

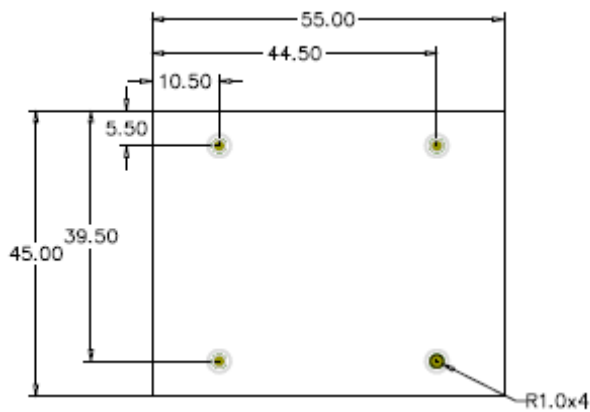
Image Sensor	Mega pixel CMOS sensor
Image Processor	ZORAN COACH-6E
On Board Memory	128 Mb (8 Mbytes)
Storage	External memory card up to 2GB Resident 32MB NAND Flash
Display Connector	Composite video out
Video Capture	Up to 640 × 480 (30 fps) Unlimited capturing time depends on available memory space
Photo Resolution	1280 × 960, 640 x 480 JPEG format
TV out	NTSC / PAL
USB Interface	Mass storage mode USB 1.1 Supported OS: Win2000 / XP / ME
Power	DC 5V

## Electrical Characteristics

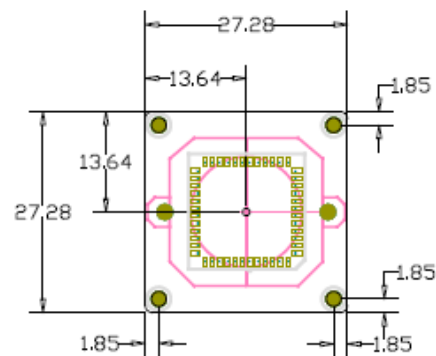
\* Operation at DC 5.0V

<b>No TV connect</b>			
Condition	Min.	Max.	Units
Idle (Peak @ downloading)	164	168	mA
Capture JPG (Peak @ capturing)	225	270	mA
Capture AVI (Peak @ recording)	286	295	mA
<b>TV output</b>			
Condition	Min.	Max.	Units
Idle (Peak @ downloading)	165	168	mA
Capture JPG (Peak @ capturing)	226	272	mA
Capture AVI (Peak @ recording)	286	300	mA
Playback JPG	180	220	mA
Playback AVI	195	225	mA

## Mechanical Dimension

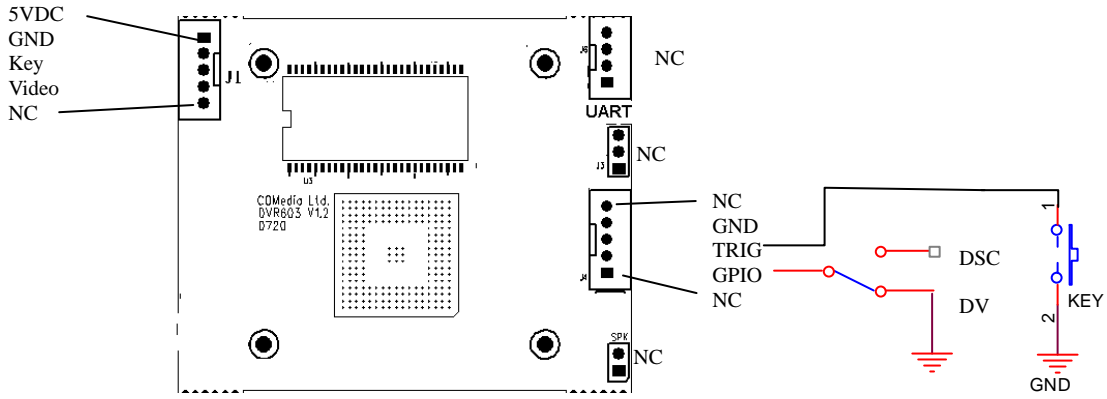


Main Board

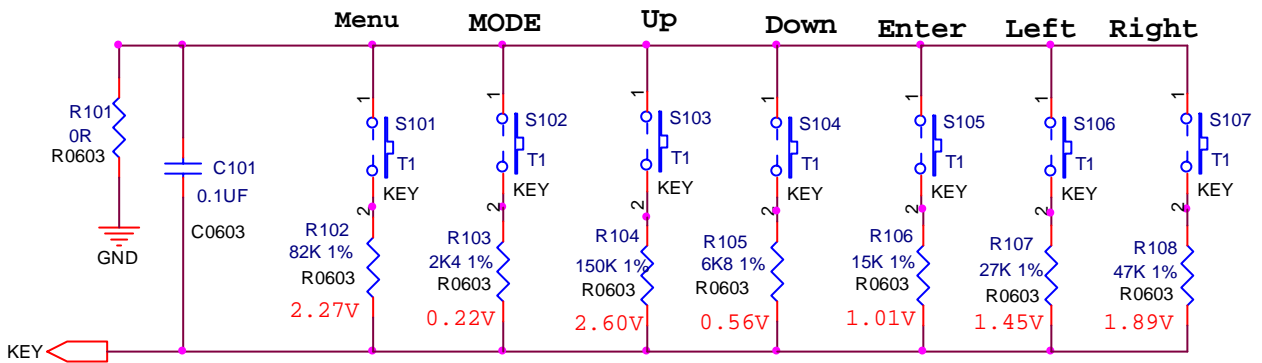


Sensor Board

## Pin Assignment for connectors



## Keyboard Circuit



Note: the keyboard input of DSP is connected to internal ADC circuit, thus, the accuracy of the resistor is important in this application

## Operation

The system uses a slide switch to select DSC or DV mode, it will check the GPIO at power up. During the operation, change this GPIO is ignored.

DSC or DV has its own settings of operation parameter but system setup is common for both cases.

### DSC Operation:

1. Press mode to toggle between preview or playback
2. At preview, press LF/RT key to select different operation mode.
3. There are 4 operation modes to be selected, namely Manual, Trigger In, Periodic capture, Daily capture. There are different icon to indicate the operation mode and status. Each operation mode has its own setting parameters.
  - 2.1 Manual: use keyboard OK to take a photo, like a common DSC.
  - 2.2 Trigger In: active low. To accept a signal from external device for the snapshot operation. This external signal can be a simple tact switch or complicated PIR sensor module, for automatic capture, like a security camera.
  - 2.3 Periodic: use OK key to start capture and stop. When it is active, the icon will change color
  - 2.4 Daily: it will take photo at a preset time everyday, when it is active, the icon will change color.
4. Different operation mode has different image setting which include size, quality and multi-capture
5. Memory management: the system will check the remaining storage size and compare to the preset value. If it is not enough to complete the operation, it will prompt "Memory Not Sufficient". In manual capture mode, when memory is full, it will show "Memory Full". In the mode, when memory full, it will perform rolling over, the oldest image will be over written by the new one.

### Menu

At different operation, press Menu key to enter parameter setup.

- 1 DSC manual setup: use UP/DN to select item, LF/RT to toggle value
  - 1.1 Image size, default 3.2M, selectable, 1.3M and VGA
  - 1.2 Image quality: default Mid, selectable Hi and Low
  - 1.3 No of shot: can be set 1 to 9 shots per press of OK key. Press OK to enter, use UP/DN key to select no of shots. Press again OK to exit.
  - 1.4 Shot interval: interval between 2 shots, minimum 4 sec. This time allow the system to compress and store the image to memory. Press OK to enter, use UP/DN to select. Press OK to exit
  - 1.5 Date Stamp: the system allow user to stamp the date time info onto the photo. Can turn off this function.
  - 1.6 Exit: press ok, save the setting and quit this menu. If it is not exit properly, the setting will not be stored.
- 2 DSC Trigger Setup
  - 2.1 Same as Manual setup except no of shot
  - 2.2 No of shot : if set to S, means single shot, when the trigger in, it will take only one photo, no matter how long the trigger duration is. If set to M, it performs multiple shots, it will take photos continuously as long as the trigger level keeps.
  - 2.3 Shot interval is valid for multiple shot only.
- 3 Periodic Setup
  - 3.1 Image size and quality, same as DSC manual setup
  - 3.2 There is no multi shot for Periodic capture. If for multi-shot, can set periodic schedule to 4 sec and repeat shot as long as desired.
  - 3.3 Schedule setting: press ok to enter, use UP/DN to set time, LF/RT key to select item. Default 4sec
- 4 Daily Setup
  - 4.1 All the settings are similar to manual setup, but add daily schedule time
  - 4.2 Schedule setting: 24Hr format. Press OK to enter, use LF/RT key to select item, UP/DN to set time. Press OK to quit.

Note: when exit the menu, the setting will be stored, when next time enter the same menu, it will restore the previous setting.

#### DSC Manual Setup

Image Size – VGA/1.3/3.2  
Image Quality – H/M/L  
No of shot – 1-9  
Shot interval – 4/6/8 sec  
Date Stamp – On/off

Exit

#### DSC Trigger Setup

Image Size – VGA/1.3/3.2  
Image Quality – H/M/L  
No of shot – S, M  
Shot interval – 4/6/8 sec  
Date Stamp – On/off

Exit

#### DSC Daily Setup

Image Size – VGA/1.3/3.2  
Image Quality – H/M/L  
No of shot – 1-9  
Shot interval – 4/6/8 sec  
Date Stamp – On/off  
Schedule: 00:00: 00

Exit

#### DSC Period Setup

Image Size – VGA/1.3/3.2  
Image Quality – H/M/L  
Date Stamp – On/off  
Interval: 00:00: 04

Exit

**DV Operation:**

1. Press mode to toggle between preview or playback
2. At preview, press LF/RT key to select different operation mode.
3. There are 4 operation modes to be selected, namely Manual, Trigger In, Periodic capture, Daily capture. There are different icon to indicate the operation mode and status. Each operation mode has its own setting parameters.
  - 3.1 Manual: use keyboard OK to take a video clip, like a common DV. Press OK to start and stop.
  - 3.2 Trigger In: active low. To accept a signal from external device for the video capture operation. This external signal can be a simple tact switch or complicated PIR sensor module, for automatic capture, like a security camera. As long as the input level is low, it will perform video capture, until the level change to high.
  - 3.3 Periodic: use OK key to start periodic capture and stop. When it is active, the icon will change color
  - 3.4 Daily : it will take video clip as per preset time everyday
4. Different operation mode has different image setting which include size, quality.
5. Memory management: the system will check the remaining storage size and compare to the preset value. If it is not enough to complete the operation, it will prompt "Memory Not Sufficient". In manual capture mode, when memory is full, it will show "Memory Full". In other mode, when memory full, it will delete some oldest file to release the space for the preset duration.

**Menu**

At different operation, press Menu key to enter parameter setup.

1. Manual setup: use UP/DN to select item, LF/RT to toggle value
  - 1.1 Image size, default VGA, selectable QVGA
  - 1.2 Image quality: default Mid, selectable Hi and Low
  - 1.3 Frame rate: default 30fps, selectable 1 fps and 10fps
  - 1.4 Exit: press OK to exit
- 2 Trigger Setup
  - 2.1 Similar to Manual setup, except add the min duration for one shot capture
  - 2.2 Min Duration: this figure is use for setting the capture duration if trigger time too short.
  - 2.3 Setting: press OK to enter. By default it is set to 10sec. Use UP/DN to change figure, press OK to quit.
- 3 Periodic Setup
  - 3.1 Similar to Manual setup, except add the duration and interval
  - 3.2 Duration: press OK to enter, UP/DN to set from 1-99 sec.
  - 3.3 Interval of periodic capture: Press OK to enter and UP/DN to set time, press OK again to quit. It counts from the starting capture time of first video to the start time of next video. If the setting is incorrect, ie interval is shorter than capture time, the system will calculate the right interval base on the duration set. Correct setting is, min interval = duration +5 sec
- 4 Daily Setup
  - 4.1 Similar to Periodic setup, but add the daily schedule time
  - 4.2 Schedule setting: 24Hr format. Press OK to enter, UP/DN to set HH, LF/RT to shift and set MM and SS. Ok to quit

DV Manual Setup  
Image Size – VGA/QGA  
Image Quality – H/M/L  
Frame Rate – 1/10/30  
Exit

DV Trigger Setup  
Image Size – VGA/QGA  
Image Quality – H/M/L  
Frame Rate – 1/10/30  
Min Duration: 10  
Exit

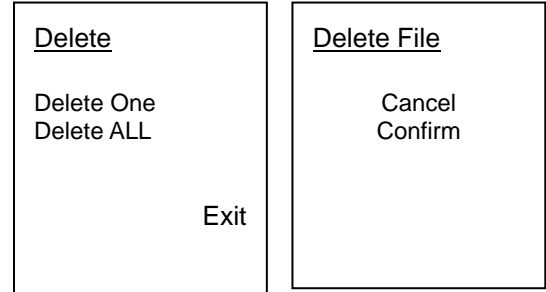
DV Daily Setup  
Image Size – VGA/QGA  
Image Quality – H/M/L  
Frame Rate – 1/10/30  
Duration: 00 sec  
Schedule: 00:00:00  
Exit

DV Periodic Setup  
Image Size – VGA/QGA  
Image Quality – H/M/L  
Frame Rate – 1/10/30  
Duration: 00 sec  
Interval: 00  
Exit

Note: when exit the menu, the setting will be stored, when next time enter the same menu, it will restore the previous setting.

**Playback Operation**

1. Press mode to toggle between preview or playback
2. Press Menu to enter file delete page
3. At playback, use LF/RT to search previous or next file to view file, press OK to start playing AVI
4. At playing AVI, use RT for fast forward, press OK to stop, LF for fast backward, OK to stop. Use DN to pause, UP to resume. During FF or FB, need to stop before change mode. Resume will enter normal play back speed at any cases.
5. Delete file: press Menu to select delete one or delete all, confirmation is required.



**Menu**

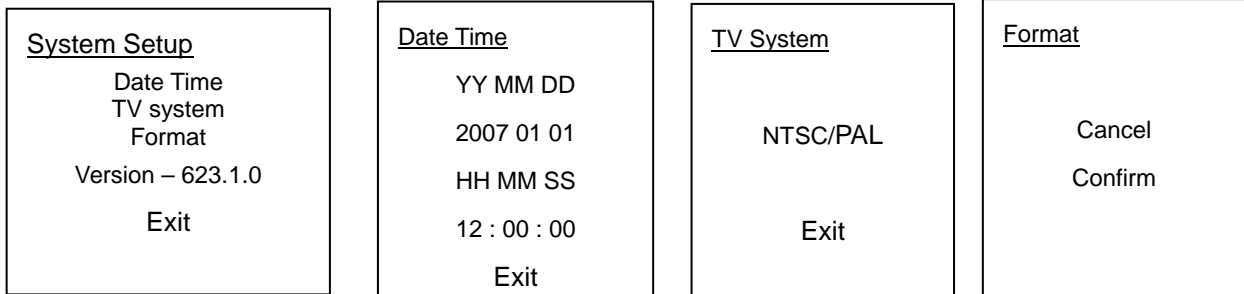
1. Use UP/DN key to select, use OK to confirm select
2. Sub-menu will be prompt for confirmation when either one is selected. Always set default to Cancel, use UP/DN to move cursor, OK to confirm and Quit

**System Setup**







1. Press and hold the Mode key to enter system setup
2. Date Time: the system has built-in the real time clock, and time stamping to the image, enter the correct date time is essential for the system. Press OK to enter date time setting. Use UP/DN to increase/decrease digit, LF/RT to shift next field, OK to confirm
3. TV System setting to set NTSC or PAL
4. Format on board memory or SD card. Reconfirmation is required when press OK

**Menu**

1. Use UP/DN key to select, use OK to confirm select. Sub-menu will be prompt for confirmation when either one is selected.
2. Date Time Setting: Use UP/DN to increase/decrease digit, LF/RT to shift next field, OK to confirm
3. TV system: select PAL/NTSC. Use LF/RT key to toggle. It can be set before shipment.
4. Format internal memory or SD card, it depends on SD card existent
5. Version: to show the version of firmware, no operation



**Explanation of the Icons on screen display**

 DV mode: AVI	 DSC mode: JPG	 Daily Mode	 Periodic Mode
 Trigger In Mode	 Manual Mode		

## Keys Operation matrix

	DSC	DV	Playback
Mode	Change to playback	Change to playback	Change to preview
Menu	Enter setup Menu	Enter setup Menu	Enter file delete menu
UP			
DN			
LF	Select mode	Select mode	Previous file
RT	Select mode	Select mode	Next file
OK	Snap shot /start periodic, daily capture,	Capture video/ start periodic, daily capture	Enter to play AVI

	Playing AVI	Set up Menu	Date time setting
Mode	-	-	-
Menu	-	Quit menu mode	Quit menu mode
UP	Resume to normal playing	Select item	Increase digit
DN	Pause	Select item	Decrease digit
LF	Fast Backward	Select setting	shift to previous
RT	Fast Forward	Select setting	shift to next
OK	Stop	Confirm and quit	Confirm and quit