

DVR623V 5M DSC/DV Module For Hobbyist

Introduction

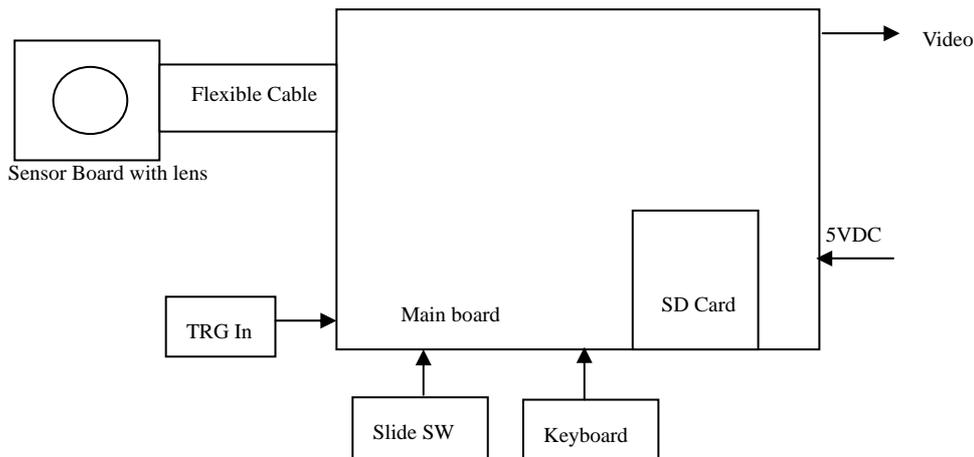
This module is designed for very simple application. It can be configured to a special DSC or DV with various settings for hobbyist making his own recording device.

Key Features

- ✓ Built in 5-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 5M, 3M, 1.3M and VGA
 - ✓ Preset capture schedule, daily or periodic
 - ✓ External trigger input or keyboard snap shot



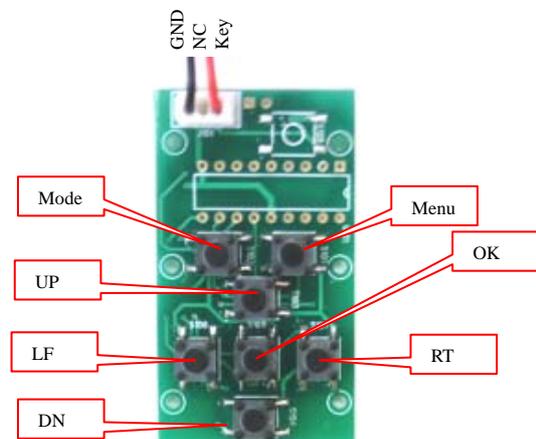
Block Diagram



Keyboard Design

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

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



Module Specifications

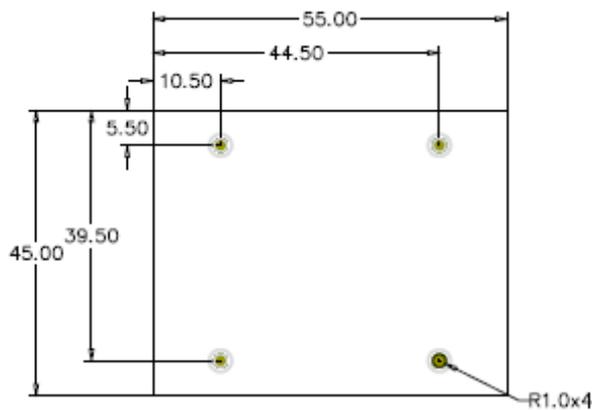
Image Sensor	Mega pixel CMOS sensor
Image Processor	ZORAN COACH-6M
On Board Memory	128 Mb (8 Mbytes)
Storage	External memory card up to 4GB Resident 32MB NAND Flash
Display Connector	Composite video out
Video Capture	Up to 640 × 480 (30 fps) Unlimited capturing time depends on available memory space
Photo Resolution	2592x1944, 2048 x 1536, 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

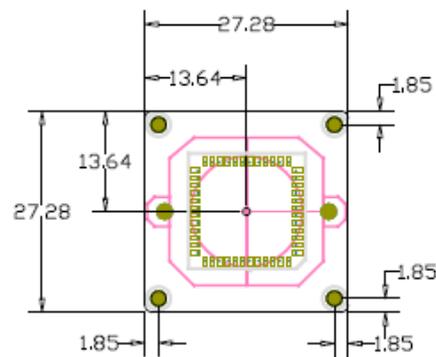
* Operation at DC 5.0V

No TV connect			
Condition	Min.	Max.	Units
Idle (Peak @ downloading)	164	168	mA
Capture JPG (Peak @ capturing)	225	270	mA
Capture AVI (Peak @ recording)	286	295	mA
TV output			
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

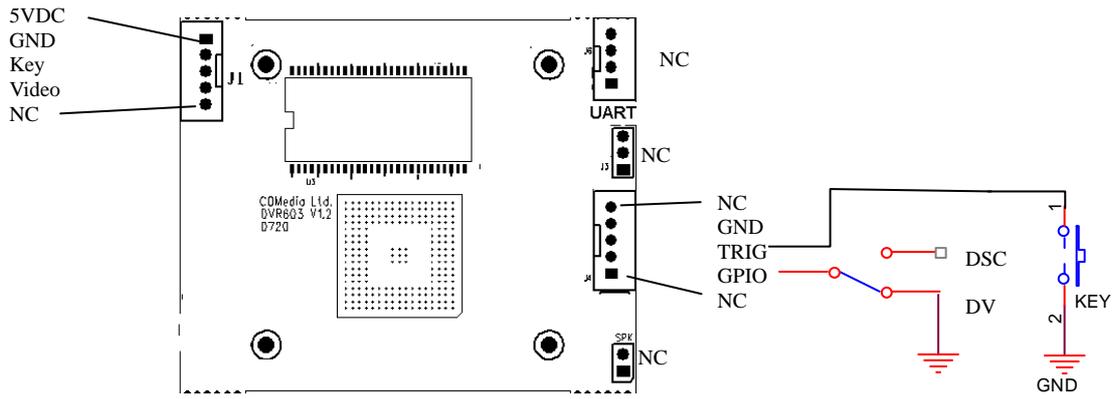


Main Board

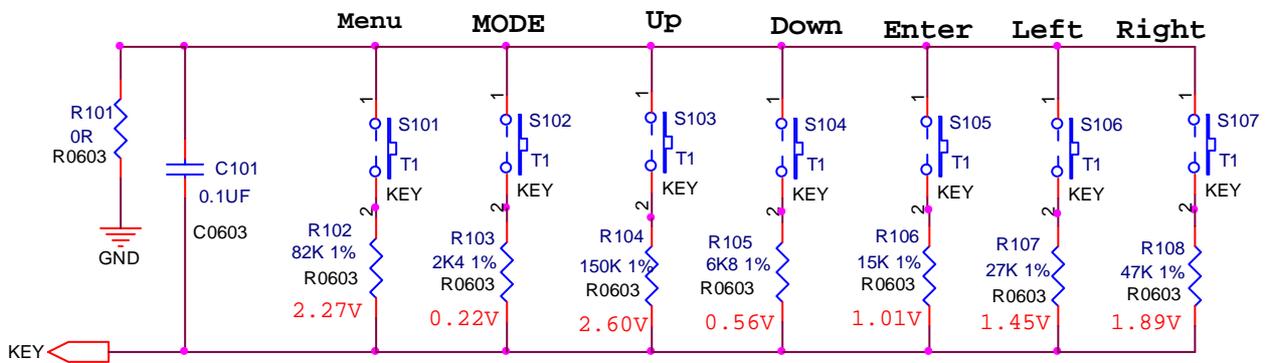


Sensor Board

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. User needs to build the connection as per diagram of pin configuration for connectors. It will check the GPIO at power up. During the operation, change of this GPIO is ignored. By default the module has been set to DSC if the GPIO is NC.

DSC and DV have its own settings of operation parameter but system setup is common for both.

To Switch Among the Preview, Playback and Setup Mode

- I. Press MODE to toggle preview and playback mode
- II. Press and hold the MODE key in preview mode to enter system setup mode,
- III. Press MODE to exit system setup mode and return to preview mode.

Note: Only DSC mode has a system setup menu.

DSC Operation:

A. To Select Different DSC Operation Mode

- 1 There are 4 operation modes to be selected, namely Manual, Trigger In, Daily Capture and Periodic Capture mode.
- 2 At preview, press LF/RT key to select different operation mode.
- 3 There are different icons to indicate the operation mode and status. Each operation mode has its own setting parameters.

B. To Set Image Size in Different Modes

- 1 Press MENU key to view DSC setup menu.
- 2 Choose Image Size by UP/DN key.
- 3 Press LF/RT to change setting to VGA/1.3M/3M/5M.
- 4 Choose EXIT by UP/DN key
- 5 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

C. To Set Image Quality in Different Modes

- 1 Press MENU key to view DSC setup menu.
- 2 Choose Image Quality by UP/DN key.
- 3 Press LF/RT to change setting to H/M/L (High/Mid/Low).
- 4 Choose EXIT by UP/DN key
- 5 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

D. To Set Shot Interval in Different Modes (except Periodic Mode)

- 1 Press MENU key to view DSC setup menu.
- 2 Choose Shot Interval by UP/DN key.
- 3 Press OK to select.
- 4 Change setting to 4/6/8 sec by UP/DN key
- 5 Press OK to confirm.
- 6 Choose EXIT by UP/DN key
- 7 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

E. To Set Date Stamp Function in different modes

- 1 Press MENU key to view DSC setup menu.
- 2 Choose Date Stamp by UP/DN key.
- 3 Press LF/RT to change setting to ON/OFF.
- 4 Choose EXIT by UP/DN key
- 5 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

Manual Mode

A. To Capture using *Manual Mode*

- 1 Press keyboard OK to take a photo, like a common DSC

B. To Set Number of Shot in *Manual Mode*

1. Press MENU key to view DSC manual setup menu.
2. Choose No. of Shot by UP/DN key.
3. Press OK to select.
4. Choose setting 1-9 by UP/DN key

5. Press OK to confirm.
6. Choose EXIT by UP/DN key
7. Press OK to save settings and quit the menu.

Trigger In Mode

A. To Capture using *Trigger Mode*

1. Active low.
2. It accepts a signal from external device for the snapshot operation. External signals can be a simple tact switch or complicated PIR sensor module.
3. For automatic capture, like a security camera. When there is signal detected, it capture automatically.

B. To Set Number of Shot in *Trigger Mode*

1. Press MENU key to view DSC trigger setup menu.
2. Choose No. of Shot by UP/DN key.
3. Press OK to select.
4. Change setting to S/M (single/multiple) by UP/DN key
5. Press OK to confirm.
6. Choose EXIT by UP/DN key
7. Press OK to save settings and quit the menu.

Daily Capture Mode

A. To Capture using *Daily Capture Mode*

1. It takes photos at a preset time everyday automatically
2. Press OK to activate the capture function
3. When it is activated, the color of the icon will change to red.
4. When it is inactive, the color of the icon is black.

B. To Set Number of Shot in *Daily Capture Mode*

1. Press MENU key to view DSC daily setup menu.
2. Choose No. of Shot by UP/DN key.
3. Press OK to select.
4. Choose setting 1-9 by UP/DN key
5. Press OK to confirm.
6. Choose EXIT by UP/DN key
7. Press OK to save settings and quit the menu.

C. To Set Schedule in *Daily Capture Mode*

1. Press MENU key to view DSC daily setup menu.
2. Choose Schedule by UP/DN key.
3. Press OK to select.
4. Set the time in Hour/Minute/Second format by UP/DN key
5. Press LF/RT to shift to the item on the left or right.
6. Press OK to confirm.
7. Choose EXIT by UP/DN key
8. Press OK to save settings and quit the menu.

Periodic Mode

A. To Capture using *Periodic Mode*

1. Press keyboard OK to start periodic capture.
2. When it is activated, the color of the icon will change to red.
3. It will capture photos in every preset time interval after pressing OK.
4. Press OK to stop periodic capture.
5. When it is inactive, the color of the icon is black.

B. To Set Shot Interval in *Periodic Mode*

1. Press MENU key to view DSC periodic setup menu.
2. Choose Schedule by UP/DN key.
3. Press OK to select.
4. Set the time interval in Hour/Minute/Second format by UP/DN key
5. Press LF/RT to shift to the item on the left or right.
6. Press OK to confirm.

7. Choose EXIT by UP/DN key
8. Press OK to save settings and quit the menu.

Memory management:

- i. The system will check the remaining storage size and compare to the preset value.
- ii. If it is not enough to complete the operation, it will prompt "Memory Not Sufficient".
- iii. In manual capture mode, when memory is full, it will show "Memory Full".
- iv. In the auto mode, when memory full, it will perform rolling over, the oldest image will be over written by the new one.

DSC Menu Design

At different operation, press MENU key to enter parameter setup. Use UP/DN to select item, LF/RT to toggle value

- 1 DSC Manual setup
 - 1.1 Image size: default 5M, selectable 3M, 1.3M and VGA
 - 1.2 Image quality: default Mid, selectable High and Low
 - 1.3 Number of shot: It can be set from 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 confirm
 - 1.4 Shot interval: Interval between 2 shots, minimum 4 sec. This duration allows the system to compress and store the image into the memory. Press OK to enter, use UP/DN to select. Press OK to confirm.
 - 1.5 Date Stamp: The system allows users to stamp the date time info onto the photo. This function can be tuned off.
 - 1.6 Exit: Press OK to save the settings and quit the menu. If it does not exit properly, the setting will not be stored.
- 2 DSC Trigger Setup
 - 2.1 All same as the Manual setup except number of shot.
 - 2.2 No. of shot: If set to S, means single shot. When 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 on.
 - 2.3 Shot interval is valid for multiple shot only.
- 3 DSC Daily Setup
 - 3.1 All the settings are similar to Manual setup with an extra item daily schedule time.
 - 3.2 Schedule setting: 24Hr format. Press OK to enter, use LF/RT key to select item, UP/DN to set time. Press OK to confirm.
- 4 DSC Periodic Setup
 - 4.1 Image size and quality, date stamp and shot interval same as Manual setup
 - 4.2 There is no multi shot for Periodic capture.
 - 4.3 Schedule setting: Press OK to enter, use UP/DN to set time, LF/RT key to select item. Default is 4sec.

<p><u>DSC Manual Setup</u></p> <p>Image Size–VGA/1.3M/3M/5M Image Quality – H/M/L No of shot – 1-9 Shot interval – 4/6/8 sec Date Stamp – On/Off</p> <p style="text-align: center;">Exit</p>

<p><u>DSC Trigger Setup</u></p> <p>Image Size–VGA/1.3M/3M/5M Image Quality – H/M/L No of shot – S, M Shot interval – 4/6/8 sec Date Stamp – On/off</p> <p style="text-align: center;">Exit</p>

<p><u>DSC Daily Setup</u></p> <p>Image Size–VGA/1.3M/3M/5M Image Quality – H/M/L No of shot – 1-9 Shot interval – 4/6/8 sec Date Stamp – On/off Schedule: 00:00:00</p> <p style="text-align: center;">Exit</p>

<p><u>DSC Period Setup</u></p> <p>Image Size–VGA/1.3M/3M/5M Image Quality – H/M/L Date Stamp – On/off Shot Interval: 00:00:04</p> <p style="text-align: center;">Exit</p>

Note: After exiting the menu, the setting will be stored. When next time you return to the same menu, it will restore your previous setting.

DV Operation:

- A. To Select Different DV Operation Mode
 - 1 There are 4 operation modes to be selected, namely Manual, Trigger In, Daily Capture and Periodic Capture mode.
 - 2 At preview, press LF/RT key to select different operation mode.
 - 3 There are different icons to indicate the operation mode and status. Each operation mode has its own setting parameters.
- B. To Set Image Size in Different Modes

- 1 Press MENU key to view DV setup menu.
- 2 Choose Image Size by UP/DN key.
- 3 Press LF/RT to change setting to QVGA/VGA.
- 4 Choose EXIT by UP/DN key
- 5 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

C. To Set Image Quality in Different Modes

- 1 Press MENU key to view DV setup menu.
- 2 Choose Image Quality by UP/DN key.
- 3 Press LF/RT to change setting to H/M/L (High/Mid/Low).
- 4 Choose EXIT by UP/DN key
- 5 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

D. To Set Frame Rate in Different Modes

- 1 Press MENU key to view DV setup menu.
- 2 Choose Frame Rate by UP/DN key.
- 3 Press LF/RT to change setting to 1/10/30 fps.
- 4 Choose EXIT by UP/DN key
- 5 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

E. To Set Duration in Different Modes (Except Manual Mode)

- 1 Press MENU key to view DV setup menu.
- 2 Choose Duration by UP/DN key.
- 3 Press OK to select.
- 4 Change video duration from 1-99sec by UP/DN key
- 5 Press OK to confirm.
- 6 Choose EXIT by UP/DN key
- 7 Press OK to save settings and quit the menu.

Note: Different operation mode has different image setting. One change does not apply to all modes.

Manual Mode

A. To Capture using *Manual Mode*

1. Press keyboard OK to start capturing a video
2. Press OK again to stop.

Trigger In Mode

A. To Capture using *Trigger In Mode*

1. Active low.
2. It accepts a signal from external device for the snapshot operation. External signals can be a simple tact switch or complicated PIR sensor module.
3. For automatic capture, like a security camera. When there is signal detected, it capture automatically

Daily Capture Mode

A. To Capture using *Daily Capture Mode*

1. Press MENU key to view DV daily setup menu.
2. Choose Schedule by UP/DN key.
3. Press OK to select.
4. Set the time in Hour/Minute/Second format by UP/DN key
5. Press LF/RT to shift to the item on the left or right.
6. Press OK to confirm.
7. Choose EXIT by UP/DN key
8. Press OK to save settings and quit the menu

B. To Set Schedule in *Daily Capture Mode*

1. It captures video at a preset time everyday automatically
2. Press OK to activate the capture function
3. When it is activated, the color of the icon will change to red.
4. When it is inactive, the color of the icon is black.

Periodic Mode

A. To Capture using *Periodic Mode*

1. Press keyboard OK to start periodic capture.
2. When it is activated, the color of the icon will change to red.
3. It will capture videos in every preset time interval after pressing OK.
4. Press OK to stop periodic capture.
5. When it is inactive, the color of the icon is black.

B. To Set Interval in *Periodic Capture Mode*

1. Press MENU key to view DV periodic setup menu.
2. Choose Interval by UP/DN key.
3. Press OK to select.
4. Set the time interval in Hour/Minute/Second format by UP/DN key
5. Press LF/RT to shift to the item on the left or right.
6. Press OK to confirm.
7. Choose EXIT by UP/DN key
8. Press OK to save settings and quit the menu.

Memory Management:

- i. The system will check the remaining storage size and compare to the preset value.
- ii. If it is not enough to complete the operation, it will prompt "Memory Not Sufficient".
- iii. In manual capture mode, when memory is full, it will show "Memory Full".
- iv. In other modes, when memory full, it will delete some oldest file to release the space for the preset duration.

DV Menu Design

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 High 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 the minimum duration for one-shot capture is added.
 - 2.2 Min Duration: This figure is used for setting the capture duration if the trigger time is 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 the addition of 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 the next video. If the setting is incorrect, i.e. 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, with the daily schedule time added.
 - 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

Note: After exiting the menu, the setting will be stored. When next time you return to the same menu, it will restore your previous setting.

<p style="text-align: center;"><u>DV Manual Setup</u> Image Size – VGA/QVGA Image Quality – H/M/L Frame Rate – 1/10/30</p> <p style="text-align: center;">Exit</p>

<p style="text-align: center;"><u>DV Trigger Setup</u> Image Size – VGA/QVGA Image Quality – H/M/L Frame Rate – 1/10/30 Min Duration: 10</p> <p style="text-align: center;">Exit</p>

<p style="text-align: center;"><u>DV Daily Setup</u> Image Size – VGA/QVGA Image Quality – H/M/L Frame Rate – 1/10/30 Duration: 00 sec Schedule: 00:00:00</p> <p style="text-align: center;">Exit</p>

<p style="text-align: center;"><u>DV Periodic Setup</u> Image Size – VGA/QVGA Image Quality – H/M/L Frame Rate – 1/10/30 Duration: 00 sec Interval: 00:00:00</p> <p style="text-align: center;">Exit</p>

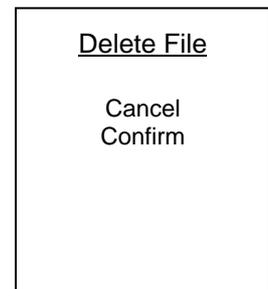
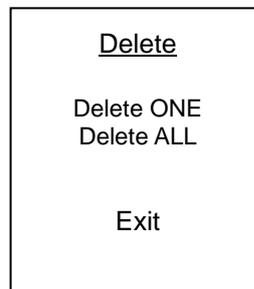
Playback Operation

- A. To View Files in Playback Mode
- 1 Press MODE to enter playback mode.
 - 2 The latest photo or video captured will be shown on the screen.
 - 3 Press LF to view previous files and press RT to view following files.
- B. To Playback Videos
- 1 Select the video to play by LF/RT key.
 - 2 Press OK to play the movie.
 - 3 Press RT to fast forward (FF) and LF to fast backward (FB).
 - 4 During FF or FB, it has to be paused before changing back to normal speed.
 - 5 Press DN to pause and then press UP to resume.
 - 6 Press OK to stop and return to the start position.
- Note: Resume will playback at normal speed at any cases.
- C. To Delete Files
- 1 Press MODE to enter playback mode.
 - 2 Select the file to delete by LF/RT key.
 - 3 Press MENU to view menu.
 - 4 Choose DELETE ONE or DELETE ALL by UP/DN key and press OK to select.
 - 5 Choose CONFIRM by LF/RT key and press OK to delete.

Playback Menu

Playback Delete Menu: Use UP/DN key to select, use OK to confirm.

1. Delete One: To delete the current file, confirmation required. Default is Cancel in the sub-menu.
2. Delete All: To delete all the files in the memory, confirmation required. Default is Cancel in the sub-menu.
3. Exit: To quit menu.



System Setup

- A. To Set Date and Time
- 1 Press and hold the MODE key to enter system setup mode.
 - 2 Choose DATE TIME by UP/DN key and press OK to select.
 - 3 In Date Time option, set digits by UP/DN and shift to other items by LF/RT key.
 - 4 Choose Exit by LF/RT key and press OK to save and return to menu.
- Note: The system has built-in the real time clock, and time stamping to the image. Thus, entering the correct date and time is essential for the system.
- B. To Set TV System
- 1 Press and hold the MODE key to enter system setup mode.
 - 2 Choose TV System by UP/DN key and press OK to select.
 - 3 Press LF/RT key to choose between PAL or NTSC system.
 - 4 Choose Exit by LF/RT key and press OK to save and return to menu.
- C. To Format the Board Memory or the SD Card.
- 1 Press and hold the MODE key to enter system setup mode.
 - 2 Choose FORMAT by UP/DN key and press OK to select.
 - 3 Choose CONFIRM by LF/RT key and press OK to format.
- Note: Once formatted, all contents in the memory are deleted. This operation cannot be undo.
- D. To View Version
- 1 Press and hold the MODE key to enter system setup mode.
 - 2 The version information is shown on the forth line of the content under the setup menu.

System Setup Menu

Keyboard Control: Use UP/DN key to select, use OK to confirm.

1. Date/Time: To set date and time. Use UP/DN to increase/decrease digit, LF/RT to shift next field, OK to confirm
2. TV system: select PAL/NTSC. Use LF/RT key to toggle. It can be set before shipment.
3. Format: To format the on board memory or the SD card (it depends on SD card existence). Confirmation required.
4. Version: To show the version of the firmware, no operation.

<u>System Setup</u> Date Time TV system Format Version – 623.1.0 Exit	<u>Date Time</u> YY MM DD 07 01 01 HH MM SS 12 : 00 : 00 Exit	<u>TV System</u> NTSC/PAL Exit	<u>Format</u> Cancel Confirm
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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