

AVE MULTIVIEW DR9/ DR16 User Manual

00-37963-AEA3

VER 1.3

Precautions

- All the safety and operation instructions should be read before the MV-DR9/ MV-DR16 are operated.
- All the safety and operation instructions should be retained for future reference.
- Comply with operating instruction and notice warning information.
- Do not use strong or abrasive detergents when cleaning the MV-DR9/ MV-DR16.
- There are no user-serviceable parts inside. Contact qualified service personnel for maintenance.
- Do not expose the MV-DR9/ MV-DR16 to water or moisture and do not try to operate it in wet areas. Well-chosen cover is needed when you put the MV-DR9/ MV-DR16 in outdoor areas.
- Make sure that two ends of the power port are plugged.
- Do not drop metallic parts through slots or slop the MV-DR9/ MV-DR16 with any liquid.
- Do not attempt to disassemble the MV-DR9/ MV-DR16.
- Contact qualified service personnel if the following situation happens:
 - The power-supply cord or plug is damaged.
 - The MV-DR9/ MV-DR16 has been exposed to rain or water.
 - The MV-DR9/ MV-DR16 does not operate normally by following the operating instructions.
 - The MV-DR9/ MV-DR16 falls to the ground or its cover is damaged.
- When replacement parts are required, make sure that the service technician has used replacement parts specified by original seller or that these parts have the same characteristics as the original ones. Unauthorized substitutions may result in fire, electric shock, or other hazards.
- Use only with a mounting accessory recommended by original seller.
- Never push objects of any kind into this MV-DR9/ MV-DR16 through openings as they may touch dangerous voltage points or short cut parts that could result in a fire or electric shock.
- Certify operating safety by qualified installer.
- If an outside cable system is connected to the MV-DR9/ MV-DR16, be sure the cable system is grounded so as to provide some protection against voltage surges and built-in static charges.
- All normal precautions to avoid component damage due to electrostatic discharge should be taken during installation and operation.
- To prevent electric shock, do not remove screws or covers.

CONTENT

1. Features	4
2. MV-DR9/ MV-DR16 Application	4
3. Front Panel Introduction	5
3.1 Buttons on the Front Panel	5
3.2 HDD and CD-RW	8
4. Menu Tree	9
5. OSD Menu Setup	12
5.1 Event List	12
5.2. Date/ Time	12
5.3 Display	12
5.3.1 Date/ Time Position	12
5.3.2 PB Date/ Time Position	13
5.3.3 Date Display Mode	13
5.3.4 Date/ Time Display	13
5.3.5 Spot Monitor Dwell	13
5.3.6 Live Refresh Rate	13
5.3.7 Text Colour	13
5.3.8 Display Type	13
5.4 Monitor	13
5.4.1 Video Setup	13
5.4.2 Multi-Window Type	14
5.4.3 Screen Center Point	14
5.4.4 Screen H-Size	14
5.4.5 Background Colour	14
5.4.6 Show Colour Bar	14
5.5 Camera	14
5.5.1 Camera Title	14
5.5.2 Title Position	14
5.6 Record	15
5.6.1 Day/ Night	15
5.6.2 Weekend	15
5.6.3 REC Event Only	16
5.6.4 REC Priority Mode	16
5.6.5 Circular Record	17
5.6.6 HDD Full Alarm	17
5.7 Alarm	17
5.7.1 Day/ Night Switch	17
5.7.2 Alarm Response	18
5.7.3 Motion Detect	19

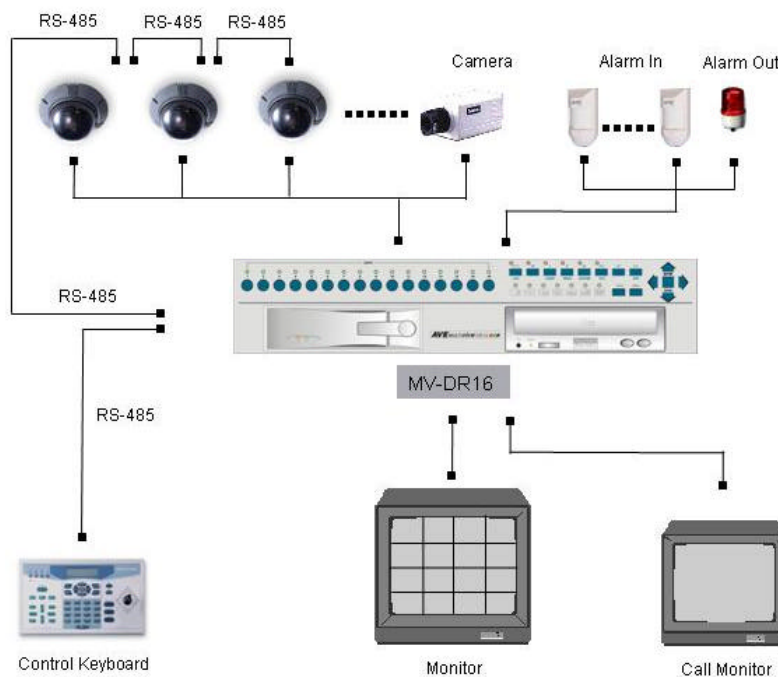
5.7.4 Alarm In	20
5.7.5 Video Loss Detect	21
5.7.6 Alarm Set/ Reset SW	21
5.7.7 Release Time	21
5.7.8 Clear Alarm List	21
6.8 Others	21
6.8.1 RS-485 ID Set Up	21
6.8.2 RS-485 Protocol	21
6.8.3 Software Information	22
6.8.4 HDD Information	22
6.9 Default	22
6.10 CD-RW Copy	23
6.11 Engineer	23
6.11.1 Engineer Table	23
6.11.2 Camera Detect	24
6.11.3 Engineer Password	24
6.11.4 Disable Password	25
6.11.5 Playback Check	25
6.11.6 Super MMX Mode	25
6.11.7 Language	25
6.11.8 Format HDD Disk	26
6.11.9 System Colour	26
6.12 Manager	26
6.12.1 Manager Password	26
6.12.2 Covert Playback	26
6.12.3 Covert Set Up	26
6.13 Shutdown	26
6.14 Exit	27
7. Windows Application Software	27
7.1 Connect the USB Mobile Rack to PC	27
7.2 Install the Software	27
7.3 Function Buttons	28
8. Connectors	30
9. Specification	32
Appendix 1. RS-485 Command Set	33

1. Features

- Powerful Wavelet compression
- Proprietary real time O.S.
- Duplex operation: View live and playback video simultaneously
- Support NTSC and PAL system
- Programmable recording picture rate (up to 60 PPS /NTSC and 50 PPS /PAL)
- Recording priority of each camera dynamically adjusted by motion detection
- Hot swappable HDD
- Built in CD-RW for video clip export
- Data format compatible with Windows
- Powerful Alarm Processor allows flexible alarm trigger and response configuration
- Programmable motion detection area and sensitivity for each camera individually
- Different motion sensitivities available for day and night time
- Intelligent algorithm refreshing main monitor display dynamically
- User friendly video search
- Versatile multiple-windows display format
- Password to secure installation authorization
- System auto reboot after power interruption
- System software stored in nonvolatile memory, free from hard disk crash

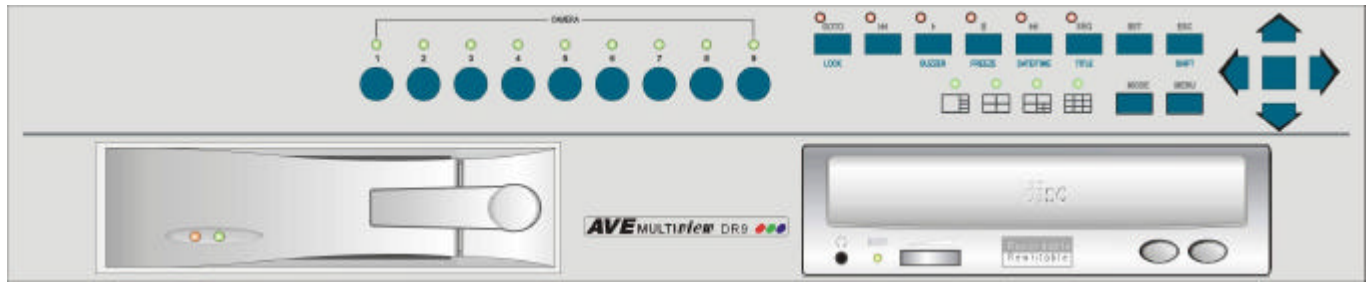
2. MV-DR9/ MV-DR16 Application

MV-DR9/ MV-DR16 is a cost-effective and easy-to-use multiplexed digital video recorder, equipped with proprietary real time operating system, powerful Wavelet compression engine, duplex multiplexer front-end, CD-RW drive and the hot swappable Hard Disc Drive.

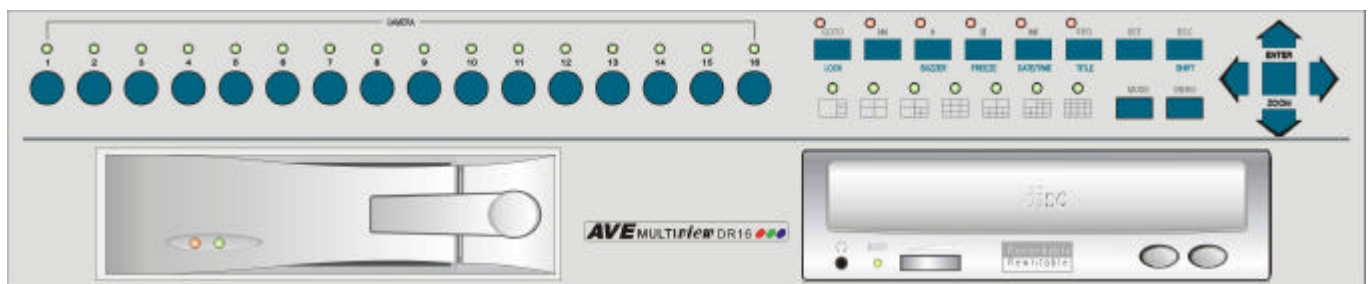


3. Front Panel Introduction

The MV-DR9/ MV-DR16 front panel controls enable you to perform preset and programmable functions. The figures below show the buttons available on the front panels.



MV-DR9 Front Panel

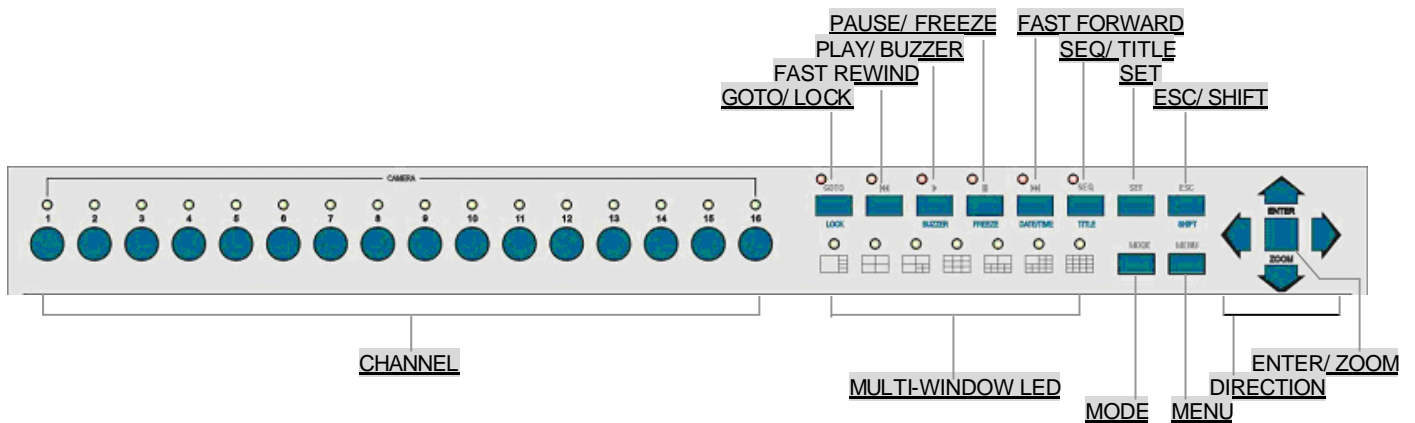


MV-DR16 Front Panel

**MV-DR9/ MV-DR16 start detecting the camera and recording automatically after power is on.

3.1 Buttons on the Front Panel

The following are the introductions of MV-DR9/ MV-DR16 front panel buttons. The front panel is illustrated and each button is described by name and function.



CHANNEL

Press one of these buttons to view the channel full screen. The number of channel buttons corresponds to the number of cahnnels supported by your unit. The MV-DR9 and MV-DR16 front panels have 9 and 16 channel buttons, repectively.

GOTO / LOCK

- ◆ In playback mode, you can press GOTO to enter GOTO menu. This menu allows you to search for certain recorded video by date and time, or you may either go to the beginning or the end of the recorded video.
- ◆ Press LOCK and SHIFT simultaneously to lock or unlock the keypad, in order to prevent accidental changes to the system setup. The LOCK LED remains lit when the keypad is locked.

GOTO	
1 Minute	30
2 Hour	20
3 Day	21
4 Month	11
5 Year	02
5 Goto Begin	
6 Goto End	
7 Exit	

FAST REWIND

In playback mode, press this button to play recorded video in reverse direction. Press it repeatedly can change the rewind speed: x1, x2, x4 and x8. If you press and hold this button for 3 seconds, the MV-DR9/MV-DR16 will go to the beginning of the recorded video.

PLAY / BUZZER

- ◆ In Live mode, press this button to start playing back recorded video; In playback mode, press this button to stop playing (and start recording automatically).
- ◆ With each press of the button a beep sound will be heard, you can press BUZZER and SHIFT simultaneously to stop the sound.

PAUSE / FREEZE

Press this button to pause playback video or to freeze live video. During this time of pause/freeze, the button LED would be lit.

FAST FORWARD / DATE/TIME

- ◆ In playback mode, press this button to play recorded video in forward direction; press it repeatedly to change the playback speed: x1 x2, x4 and x8. You can press and hold this button for 3 seconds to go to the end of video.
- ◆ Press this button and SHIFT simultaneously to enable or disable the OSD date and time.

SEQ/TITLE

- ◆ Press TITLE and SHIFT buttons simultaneously to enable or disable the OSD camera title.
- ◆ In Live mode, press this button to start sequencing, press MODE to stop. The button LED will be lit (and also those channels LED currently in display).
In Sequence mode, press Set button to enter this OSD Sequence menu. The number on the top is to remind you which sequence is being set. The items will be described below.

Sequence_1 Set Up					
1	Pages	16	11	Page 8	5
2	Mode	0	12	Page 9	5
3	Timer	Ind.	13	Page 10	5
4	Page 1	5	14	Page 11	5
5	Page 2	5	15	Page 12	5
6	Page 3	5	16	Page 13	5
7	Page 4	5	17	Page 14	5
8	Page 5	5	18	Page 15	5
9	Page 6	5	19	Page 16	5
10	Page 7	5	20	Exit	

? **Pages**

This item allows you to decide the total number of pages for this sequence. The maximum value is 16, which means that each sequence can have up to 16 pages.

? **Mode**

This item allows you to decide which display mode will be used in this sequence. "0" represents "full screen" mode, ...and "7" represents 16-windows mode.

? **Sequence Timer**

This item allows you to select "Com." or "Ind." Sequence Timer. "Common timer" means every page in this sequence has the same dwell time; while individual timer means each page can have different dwell time.

? **Dwell Time and Page Setup**

The following items allow you to setup each page and decide the "Dwell Time" of that page. If the sequence timer is selected as "Common", once you change the dwell time of certain page, all dwell time of other pages will be changed as well. If the sequence timer is selected as "Individual", the dwell time value can be changed page by page individually. Move the cursor to one of the page number, use right/ left buttons to change the dwell time, or press ENTER for page setup.

SET

In multi-windows display mode, press this button to enter SET mode. The menu will appear with the cursor over the first window. Use DIRECTION buttons to move the cursor, then press the CHANNEL button to assign the camera. The cursor will move to next window automatically. Press ESC button to exit SET mode when the setting is finished.

ESC

1. In OSD mode, press this button to return to previous menu.
2. Press ESC and "Down Arrow" simultaneously to power the MV-DR9/ MV-DR16 on and off.

DIRECTION

- ◆ These buttons function as directional control in Zoom mode or OSD menu. After enter Zoom mode, these buttons can be used to pan and tilt the window.
- ◆ In multi-window mode, the MV-DR9/ MV-DR16 allow you to select one window for playing back the recorded video while the MV-DR9/ MV-DR16 is in Live mode. Press one of these buttons and a window cursor will be displayed. Using Direction buttons to move the cursor to desired window, and then press PLAY button to playback the recorded video on this window. The password is needed before you playback the recorded video.

MODE

Press this button to choose one display format from all (4, 5, 7, 9,10,13 and 16 windows). The camera LEDs of selected cameras should be lit.

MENU

Press this button to enter OSD setup menu.

ENTER / ZOOM

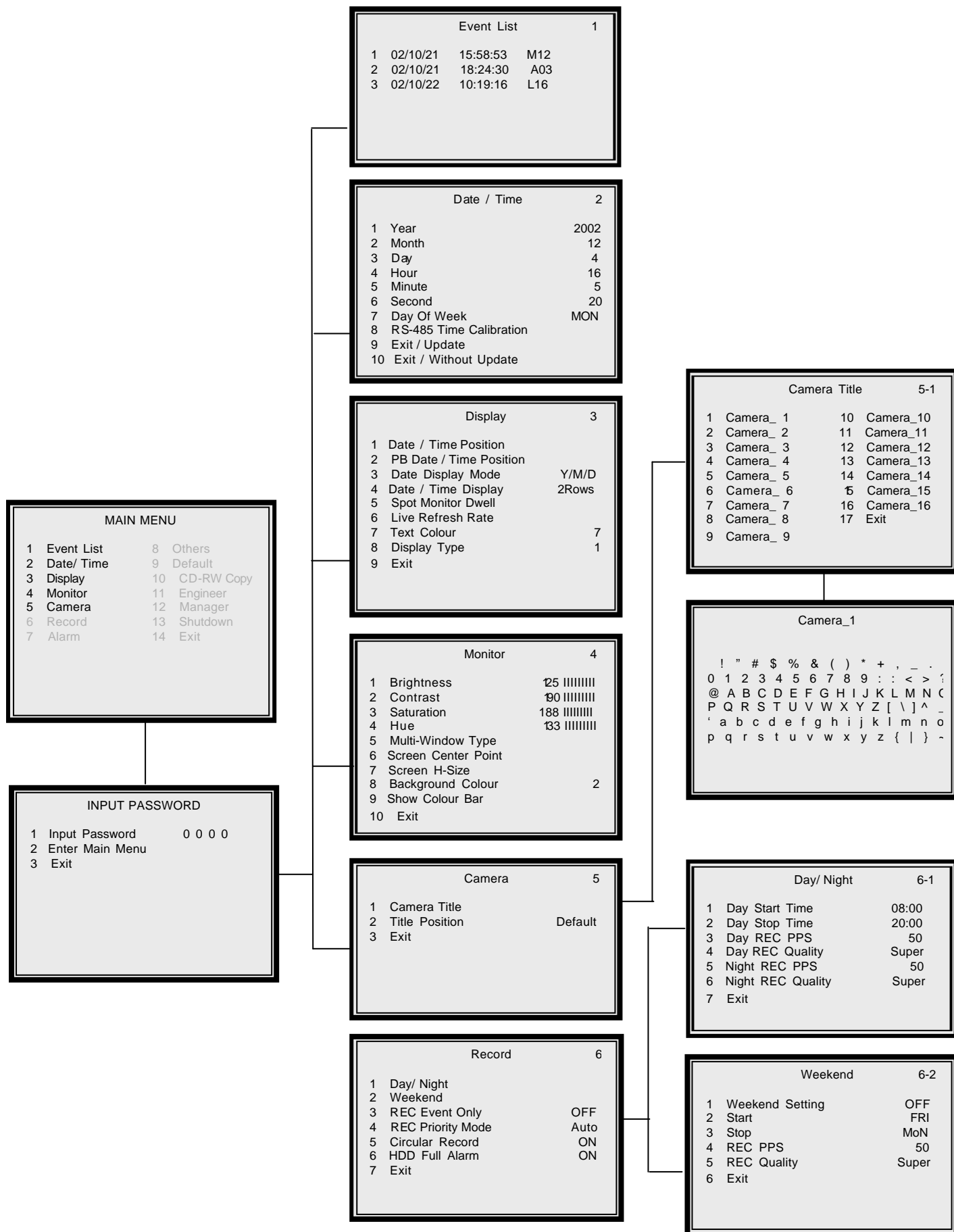
- ◆ In OSD menu mode, this button is used for “entering” the sub-menu, or to confirm (execute) command.
- ◆ In full-screened Live and Playback modes, press this button to enter 2x2 Zoom-in mode.

3.2 HDD and CD-RW

The front panel contents a swappable HDD and a CD-RW for video export.



4. Menu Tree



MAIN MENU

1 Event List	8 Others
2 Date/ Time	9 Default
3 Display	10 CD-RW Copy
4 Monitor	11 Engineer
5 Camera	12 Manager
6 Record	13 Shutdown
7 Alarm	14 Exit

Alarm 7

1 Day / Night Switch	
2 Alarm Response	
3 Motion Detect	
4 Alarm In	
5 Video Loss Detect	Dis
6 Alarm Set/ Reset SW	En
7 Release Time	
8 Clear Alarm List	
9 Exit	

Day / Night Switch 7-1

1 Day / Night SW Enable	No
2 Switch<OFF>	Day
3 Delay For Active	60
4 Exit	

Alarm Response 7-2

1 Internal Buzzer	ON
2 Alarm Output	ON
3 Alarm List	ON
4 Alarm Full Screen	OFF
5 Spot Alarm Display	ON
6 Response Duration	10
7 Any Key To Stop	ON
8 Exit	

Motion Detect 7-3

1 Motion Detect	OFF
2 Configuration Table	
3 Condition 1 Set Up	
4 Condition 2 Set Up	
4 Exit	

Configuration Table 7-3-2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Alm In Type	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Motion Algo	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1
Day: Alm In	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Day: Motion	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
Night: Alm In	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Night: Motion	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1

ESC For Return

Condition 1 Set Up 7-3-3

1 Camera_ 1	10 Camera_10
2 Camera_ 2	11 Camera_11
3 Camera_ 3	12 Camera_12
4 Camera_ 4	13 Camera_13
5 Camera_ 5	14 Camera_14
6 Camera_ 6	15 Camera_15
7 Camera_ 7	16 Camera_16
8 Camera_ 8	17 Exit
9 Camera_ 9	

Camera_1 7-3-3-1

1 Detect Area	
2 Sensitivity	
3 Exit	

Alarm In 7-4

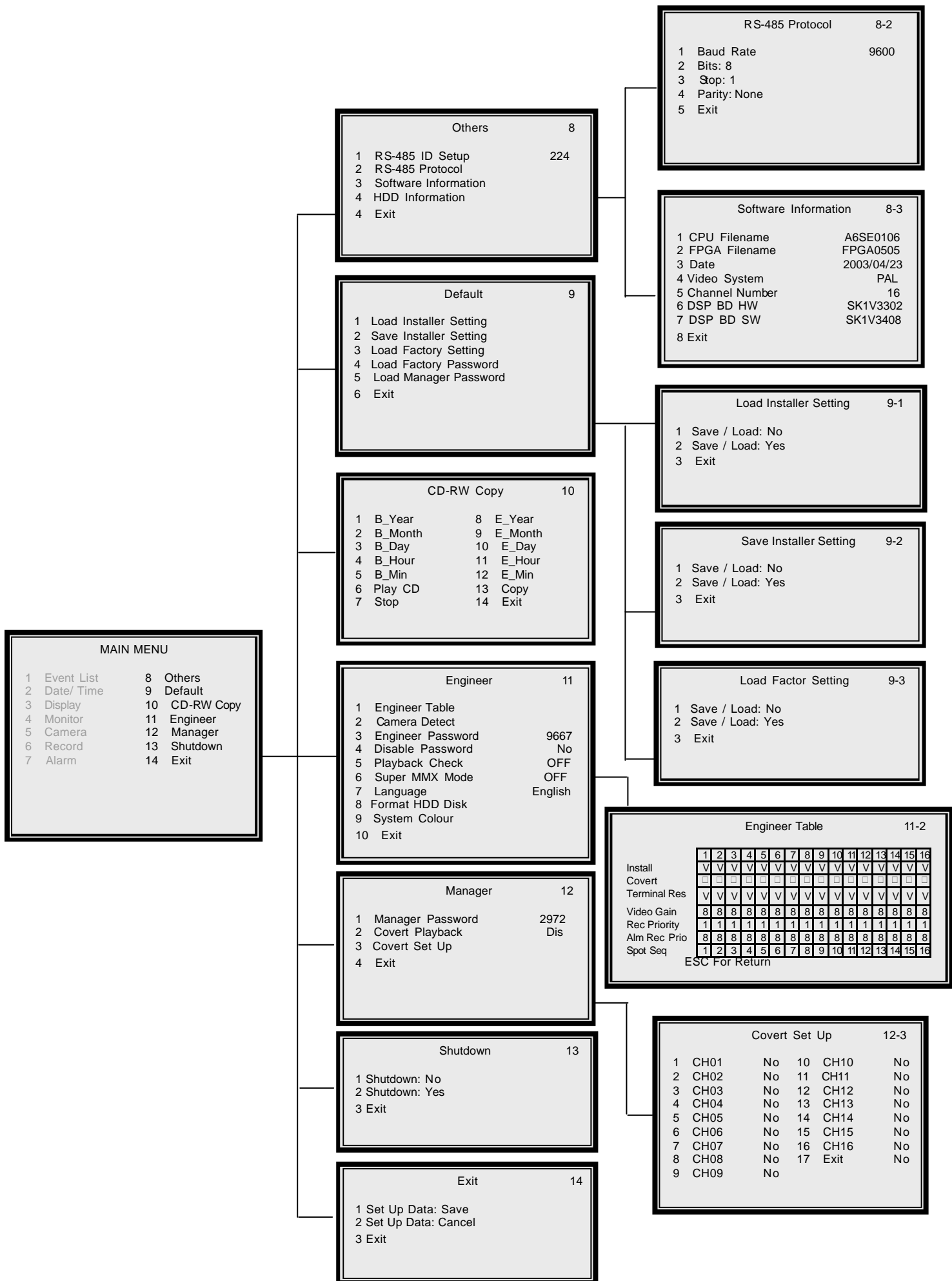
1 Alarm In Detect	OFF
2 Configuration Table	
3 Exit	

Release Time 7-7

1 Motion RES Time	2
2 V- Loss RES Time	2
3 Alarm In RES Time	10
4 Exit	

Clear Alarm List 7-8

1 Clear Alarm List: No	
2 Clear Alarm List: Yes	
3 Exit	



5. OSD Menu Setup

The OSD menu is composed in hierarchy architecture, it allows you to configure MV-DR9 or/ and MV-DR16 according to the application environment. Many options can be selected via the operation of the OSD menu.

To enter this OSD menu, press the MENU button of the front panel, then the OSD menu will appear with a highlight cursor over the first item. The cursor can be moved by the Up and Down buttons.

If you want to exit the OSD menu, you may either 1) select the last item “EXIT” and then press ENTER button; or 2) press ESC button of the front panel directly.

MAIN MENU	
1 Event List	8 Others
2 Date/ Time	9 Default
3 Display	10 CD-RW Copy
4 Monitor	11 Engineer
5 Camera	12 Manager
6 Record	13 Shutdown
7 Alarm	14 Exit

5.1 Event List

When an alarm event is triggered, its date, time and alarm type will be list here in this menu. “L” represents “Video Loss”; “A” represents “Alarm In”; and “M” represents “Motion”.

Up to 255 events will be logged using non-volatile memory. The memory architecture is “First In First Out”, so always the latest events are remained on the list.

Event List			
1	02/10/20	08:12:39	L16
2	02/10/22	12:38:21	A03
3	02/10/22	15:58:53	M12
---Continue---			

5.2. Date/ Time

Item 1~7 allow you to set date and time, use the right/ left buttons to adjust the MV-DR9/ MV-DR16 to local time.

If you want to save the modification(s), move the cursor to the 8th item and press Enter button, the adjusted setting(s) will be memorized. If you don't want to save the modifications, move the cursor to the 9th and press Enter button, the adjusted setting(s) will be discarded.

Date / Time	
1 Year	2002
2 Month	12
3 Day	4
4 Hour	16
5 Minute	5
6 Second	20
7 Week	MON
8 Exit / Update	
9 Exit / Without Update	

5.3 Display

This sub-menu allows you to adjust items that related to On-Screen-Display, including Date/ Time Position, Date Display Mode, Spot Monitor Dwell, etc.

Display	
1 Date/ Time Position	
2 PB Date/ Time Position	
3 Date Display Mode	Y/ M/ D
4 Date/ Time Display	2 Rows
5 Spot Monitor Dwell	
6 Live Refresh Rate	
7 Text Colour	
8 Display Type	
9 Exit	

5.3.1 Date/ Time Position

This item allows you to select the position of current Date/ Time Display. Use the DIRECTION buttons to move Date/ Time display direction. After the Date/ Time Display has been well positioned, you can press ESC to exit.

5.3.2 PB Date/ Time Position

The position of recorded Date/ Time Display can be moved as well. Use the DIRECTION buttons to move, and press the ESC button to exit.

5.3.3 Date Display Mode

There are three Date Display Modes to be chosen from: Y/M/D, M/D/Y and D/M/Y. Select the desired one using the DIRECTION buttons.

5.3.4 Date/ Time Display

The Date/ Time Display can be shown in one row or two rows type. Use right/ left DIRECTION buttons to select between the two types.

5.3.5 Spot Monitor Dwell

The Spot monitor is always switching full screen video of all installed cameras, and this item allows you to set the Dwell Time between switching. The timer value ranges from 1 to 255 seconds.

5.3.6 Live Refresh Rate

In Live multi-window mode, each camera does not necessarily share the same frame rate. This item allows you to setup the camera refresh rate on the Main monitor; use right/ left DIRECTION buttons to select between “Fix” and “Auto”. “Fix” means each camera has the same refresh rate. “Auto” means the camera with more motion will get higher refresh rate automatically.

5.3.7 Text Colour

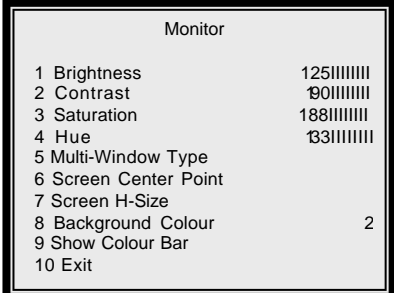
This item allows you to select one of 16 different colours for Date/ Time display.

5.3.8 Display Type

This item allows you to select one from 6 different text types (reverse, bold...) for on Date/ Time display.

5.4 Monitor

The Monitor menu allows you to tune the quality of the displayed image.



Monitor	
1 Brightness	125|||||||
2 Contrast	90|||||||
3 Saturation	188|||||||
4 Hue	133|||||||
5 Multi-Window Type	
6 Screen Center Point	
7 Screen H-Size	
8 Background Colour	2
9 Show Colour Bar	
10 Exit	

5.4.1 Video Setup

Item 1~4 involve adjusting the brightness, contrast, saturation and hue of attached cameras. You can use the right/ left DIRECTION buttons to adjust the value.

5.4.2 Multi-Window Type

This item allows you to select a set of multi-window type.

5.4.3 Screen Center Point

This item allows you to move the center point of the main monitor. Use the DIRECTION buttons to pan and tilt the monitor center point. Press ESC button to exit when the setting is finished.

5.4.4 Screen H-Size

This item allows you to change the horizontal size of display image. Press this right/ left DIRECTION buttons to adjust the horizontal size.

5.4.5 Background Colour

This item allows you to select 1 of 16 different colours for the background colour of following situation: 1) video-loss; 2) camera un-installed; and 3) covert camera.

5.4.6 Show Colour Bar

This function allows you to fine tune the monitor's performance using colour bar pattern generated by the MV-DR9/ MV-DR16.

5.5 Camera

The Camera menu allows you to set each camera's title, and also to choose the position you want to put the camera title.

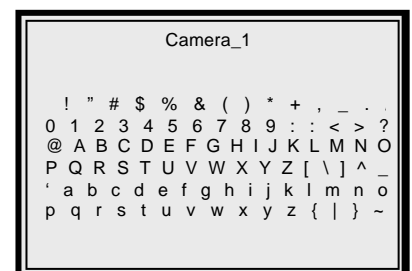
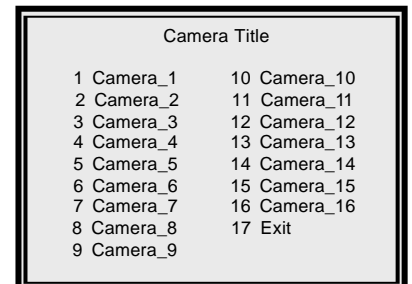
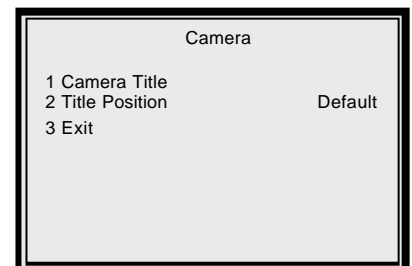
5.5.1 Camera Title

Each camera can be assigned a "Title" (up to 12 characters). The default title for each camera is the channel number.

Move to first item and press ENTER, the list of cameras will appear. Select one camera from the list, and then press ENTER on it for entering the following setup menu.

Use DIRECTION buttons to select wanted character contained in the setup menu, and press ENTER to add the character to the title.

If you enter wrong character by mistake, you can follow the procedure to correct it: press MODE repeatedly to move the title cursor over the character you want to replace. Then press right/ left DIRECTION buttons to select the right character you want to enter.



5.5.2 Title Position

The camera title can be placed in one of five positions in the display window: Default, Top-R (top-right), Top-L (top-left), Bom-R (bottom-right) and Bom-L (bottom-left).

5.6 Record

This menu allows you to set up all the parameters related to recording, including REC Quality, Frame Rate, etc.

If you choose “No” for the 5th item (Circular Record), then the rest recording time will be calculated and shown on the top-right side of the screen.

Once you change these parameters, the total record time will be changed as well. Below table is offered to refer to (the standard PPS is 60 PPS).

Record	
1 Day / Night	
2 Weekend	
3 REC Event Only	OFF
4 REC Priority Mode	Auto
5 Circular Record	ON
6 HDD Full Alarm	ON
7 Exit	

HDD size	Total Record Time (Hour)				
	Quality: Ultra	Quality: Super	Quality: High	Quality: Normal	Quality: Low
40 GB	5	7	9	12	15
80 GB	10	14	18	24	30
120 GB	15	21	27	36	45
160 GB	20	28	36	48	60

5.6.1 Day/ Night

This Day/ Night menu allows you to setup the duration, the PPS (Picture Per Second) and the recording quality for Day and Night time.

Day / Night	
1 Day Start Time	08:00
2 Day Stop Time	20:00
3 Day REC PPS	50
4 Day REC Quality	Super
5 Night REC PPS	50
6 Night REC Quality	Super
7 Exit	

Day Start Time/ Day Stop Time

The first and second items allow you to set the duration of daytime. Use the DIRECTION buttons to enter the start/ stop time.

Day REC PPS/ Night REC PPS

These two items allow you to set the Day and Night record PPS (Picture Per Second) respectively. The higher the number of picture per second, the smoother the video playback appears to you, but it'll take more storage space.

Day REC Quality/ Night REC Quality

These two items allow you to set up the Day/ Night record quality. A superior picture quality affects a better playback, but will fill the hard disk faster; total record time will be shorter.

5.6.2 Weekend

This menu allows you to set up weekend start/ stop time, record PPS and record quality.

Weekend	
1 Weekend Setting	OFF
2 Start	FRI
3 Stop	MON
4 REC PPS	50
5 REC Quality	Super
6 Exit	

Weekend Setting

Weekend Setting allows you to enable/ disable the following weekend-related functions. If the item is set “OFF”, all related functions will be disabled.

Weekend Start Time/ Weekend Stop Time

These two items allow you to set up the duration of weekend. The duration has been set here indicates when the regular Day and Night record ends, and Weekend record begins.

Weekend REC PPS

This item allows you to set weekend record PPS (Picture Per Second).

Weekend REC Quality

This item allows you to set up the weekend record quality

5.6.3 REC Event Only

This item allows you to record event video (Alarm and Motion events) only. If you select “OFF” for this item, the MV-DR9/ MV-DR16 remains in recording mode all the time. If you choose other options for this item, the MV-DR9/ MV-DR16 will start recording only when an event is triggered; and the selected time period decides how long the MUXDVR stays in recording mode.

5.6.4 REC Priority Mode

This item allows you to set up the record priority, use right/ left DIRECTION buttons to select “Setup” or “Auto”. “Setup” means priority mode will follow the setup value in configuration table; “Auto” means the camera with most motion will get higher priority automatically.

Example:

If the DVR recording PPS is “30”, and you set the record priority of channel 1 to level 4, and the other channels’ record priority are all set to level 1, then each channel’s PPS can be calculated by below formula.

Situation 1: No alarm event happens.

$$\text{Channel 1 PPS} = 30 * \frac{4}{4+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 6.31$$

$$\text{Channel 2 PPS} = 30 * \frac{1}{4+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 1.58$$

$$\text{Channel 3 PPS} = 30 * \frac{1}{4+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 1.58$$

Situation 2: An alarm event happens on channel 2.

$$\text{Channel 1 PPS} = 30 * \frac{4}{4+8+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 4.61$$

$$\text{Channel 2 PPS} = 30 * \frac{8}{4+8+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 9.23$$

$$\text{Channel 3 PPS} = 30 * \frac{1}{4+8+1+1+1+1+1+1+1+1+1+1+1+1+1+1+1} = 1.15$$

5.6.5 Circular Record

The MV-DR9/ MV-DR16 can store the recorded video information in circular or not. If the setting is “ON” (default), the earliest recorded video will be over-written automatically (none-stop recording).

If Circular Record setting is “OFF”, the recording will be stopped when the HDD is full; under this situation, a flash highlighted message (HDD Full) will be shown on the screen when the rest recording time is about 45 minutes; and the beeper will start beeping when the rest recording time is about 15 minutes.

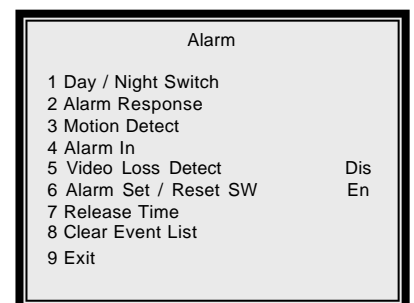
5.6.6 HDD Full Alarm

If you select “ON” for this item, the beeper will start beeping when the rest recording time is about 15 minutes. The internal beeper will stop beeping after you insert a new HDD; and the other way to stop beeping is to select “OFF” for this item.

5.7 Alarm

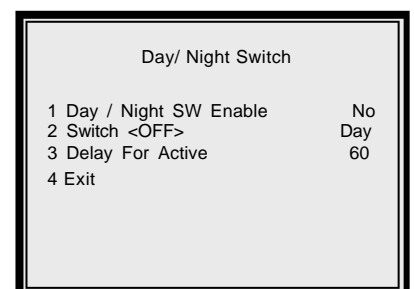
This Alarm menu allows you to configure how the EVENT condition is handled and how the MV-DR9/ MV-DR16 responses.

When an alarm is triggered, you can press ESC and the alarmed CHANNEL simultaneously to switch the call monitor to the alarm channel; after then, you can press these two buttons to start switching again.



5.7.1 Day/ Night Switch

This sub-menu allows you to enable or disable the “Day/ Night Switch” signal from the external I/O connector. Move to first item and press ENTER on it, then there will have a sub-menu shown up.



Day/ Night SW Enable

Use right/ left DIRECTION buttons to select YES (enable) or NO (disable). If you select “NO”, the Day/ Night Switch signal will be ignored; the event processor will follow the time schedule that defined in Section 5.6.1. If you select “YES”, the event processor will follow the On/ Off position of the external Day/ Night switch.

Switch <OFF>

This item allows you to configure which setting (Day/ Night) will be activated when the switch is "OFF". You can select "Day" or "Night" by using the right/ left DIRECTION buttons.

Delay For Active

After the Day/ Night switch setting has changed, there is a delay time before the event process takes effect; this function is to avoid the operator triggering a false event by mistake.

5.7.2 Alarm Response

This sub-menu allows you to set how the MV-DR9/ MV-DR16 respond to the triggered alarm event.

Alarm Response	
1 Internal Buzzer	ON
2 Alarm Output	ON
3 Alarm List	ON
4 Alarm Full Screen	OFF
5 Spot Alarm Display	ON
6 Response Duration	10
7 Any Key To Stop	ON
8 Exit	

Internal Buzzer

This item allows you to enable or disable the internal buzzer. If set to "ON", the buzzer is activated in response to an alarm; if set to "OFF", the buzzer is not activated.

Alarm Output

There are two alarm output signals in the external I/O connector: Alarm N.O. (normal open) and Alarm N.C. (normal close), these signals are driven by an on-board relay. These signals can be used to drive a light or siren to warn the operator of alarm events.

This item allows you to enable/ disable the alarm output pins. If the alarm output is OFF (disabled), the relay won't be energized when alarm is triggered.

Alarm List

This item allows you to enable or disable the Alarm List display. If set to "ON", all alarm events will be logged in the non-volatile memory, and you can check the event by entering Alarm List.

The first column is the item number, followed by the date, time and the type of the event: "A" represents "Alarm Input"; "L" represents "Video Loss"; and "M" represents "Motion Detection". The last column is the channel number of the event.

Alarm Full Screen

This item allows you to enable or disable the full screen display of alarmed camera output. If enabled, and an alarm event occurs on any camera input, the video from that camera is displayed on the Main Monitor in full screen until the alarm expires.

Spot Alarm Display

If set to "YES", the Call Monitor will switch to the corresponded camera immediately when an event is triggered. Otherwise, the Call Monitor just switches between each installed camera sequentially.

Response Duration

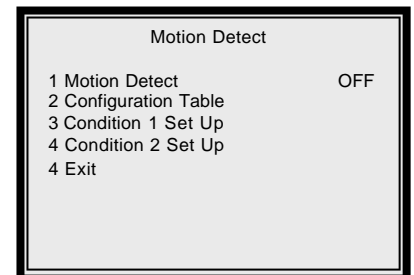
This item allows you to determine the duration of the buzzer and Alarm Out relay function after an event is triggered. The value is in the range of 1 to 9999 seconds; the default setting is 10 seconds.

Any Key To Stop

If enabled, you can turn the buzzer and alarm relay responses off following an alarm by pressing any button. If disabled, these responses continue until the alarm event has been handled. The default setting is "ON".

5.7.3 Motion Detect

This menu allows you to configure how Motion Detection works. Each camera can have its "Detect Area" and "Sensitivity" defined individually.



Motion Detect

This item allows you to enable or disable the motion detect function of the MV-DR9/ MV-DR16.

Configuration Table

This table allows you to configure Alarm In & Motion Detection operation for Day/Night time.

- Alm In Type** define signal type of external alarm sensor is Normal-Open or Normal-Close: O=Normal-Open, C=Normal-Close.
- Motion Algo** define motion detect algorithm of each camera: D1=Normal, D1 fit for small change for large area, D2=Special, D2 is suitable for rapid change of small area.
- Day: Alm In** define each Alarm In pin is enabled or not during Day time, \surd =enabled, \bullet =disabled.
- Day: Motion** decide the condition of Daytime motion detection function. C1=Condition 1, C2=Condition 2, \bullet =disabled.
- Night: Alm In** define each Alarm In pin is enabled or not during Night time, \surd =enabled, \bullet =disabled.
- Night: Motion** decide the condition of Nighttime motion detection function. C1=Condition 1, C2=Condition 2, \bullet =disabled.

Alarm In Detect

This item allows you to enable (YES) or disable (NO) the Alarm In pins.

Configuration Table

This item allows you to select N.O. (normal open) or N.C. (normal close) type for each Alarm In pins. Please refer to section 5.7.3 for the table.

5.7.5 Video Loss Detect

This item allows you to enable/ disable the MV-DR9/ MV-DR16 to detect Video Loss as an alarm event.

5.7.6 Alarm Set/ Reset SW

This item allows you to enable/ disable the Alarm Set/ Reset signal of the external connector. If you select EN (enable), then you can force the alarm output to on/ off by using Alarm Set signal.

5.7.7 Release Time

This menu allows you to set the “release time” of alarm source: motion detection, video loss and alarm in. The release time defines how long time after the alarm trigger condition disappears; the same condition should be ignored to avoid false alarm being re-triggered.

Release Time	
1 Motion RES Time	2
2 V- Loss RES Time	2
3 Alarm In RES Time	10
4 Exit	

5.7.8 Clear Alarm List

This menu allows you to clear event list. If you want to delete the event list, move your cursor to **2 Clear Alarm List: NO**. If you want to keep the event list, move your cursor to **1 Clear Alarm List: YES**.

This arrangement is to avoid user clear the list by mistake.

Clear Alarm List	
1 Clear Event List: No	
2 Clear Event List: Yes	
3 Exit	

6.8 Others

This menu allows you to check the RS485 communication protocol and software version.

Others	
1 RS-485 ID Setup	224
2 RS- 485 Protocol	
3 Software Information	
4 HDD Information	
5 Exit	

6.8.1 RS-485 ID Set Up

This item can only be accessed by the installer, the RS-485 ID address of this MV-DR9/ MV-DR16 can be modified here.

6.8.2 RS-485 Protocol

This menu shows the details of RS-485 protocol. The only setting user or installer can change here is “Baud Rate”. You can choose from 38400, 19200, 9600, 4800 and 2400.

RS-485 Protocol	
1 Baud Rate:	9600
2 Bits: 8	
3 Stop: 1	
4 Parity: None	
5 Exit	

6.8.3 Software Information

This menu presents the software information.

Software Information	
1 CPU Filename	D6SE0100
2 FPGA Filename	FPGA0505
3 Date	2002/01/23
4 Video System	PAL
5 Channel Number	16
6 DSP BD HW	SK1V3302
7 DSP BD SW	SK1V3300
8 Exit	

6.8.4 HDD Information

This menu shows the HDD information.

HDD Size shows how large size the current HDD has for saving video files.

Free Size shows how much available space the current HDD leaves.

Total Rec Time shows how much time the current HDD originally can provide for saving the video files.

Free Rec Time shows how much time the current HDD can save video files. If the DVR is set to record in linear mode (the system will start to overwrite files when the HDD is full), the available recording time will be calculated and shown on the screen automatically; or, if the DVR is set to record in circular mode, it will be shown as “- - - - Hr”.

HDD Information	
1 HDD Size	40 GB
2 Free Size	22 GB
3 Total Rec Time	7Hr
4 Free Rec Time	- - - - Hr
5 Begin	2003/04/23
6 End	2002/04/25
7 Exit	

6.9 Default

This menu allows you to restore the MV-DR9/ MV-DR16 to the default configuration, which was done by the installer (engineer), or the factory setting.

Default	
1 Load Installer Setting	
2 Save Installer Setting	
3 Load Factory Setting	
4 Load Factory Password	
5 Load Manager Password	
6Exit	

Load Installer Setting

This item allows you to recall the “Installer’s Configuration” from the on-board non-volatile memory.

Load Installer Setting	
1 Save/ Load: No	
2 Save/ Load: Yes	
3 Exit	

Save Installer Setting

This item allows you to save the current setting as “Installer’s setting”. This operation can only be executed with engineer password; otherwise, “Illegal Operation” message will be displayed.

Load Factory Setting

This item allows you to recall the “Factory’s Default” from the read only memory.

Load Factory Password

This item allows you to reload the factory password in case you forget your own password.

Load Manager Password

This item allows you to load manager password in case that you forgot it.

6.10 CD-RW Copy

This sub-menu allows you to export video to CD-RW. Select the start time and end time of desired video and then press ENTER on **13 Copy** to start copying.

Press the 6th item to play the CD.

CD-RW Copy	
1 B_Year	8 E_Year
2 B-Month	9 E_ Month
3 B-Day	10 E_Day
4 B_Hour	11 E_Hour
5 B_Min	12 E_Min
6 Play CD	13 Copy
7 Stop	14 Exit

6.11 Engineer

If you enter the main menu with engineer's password, you can enter the sub-menu.

Engineer	
1 Engineer Table	
2 Camera Detect	
3 Engineer Password	9667
4 Disable Password	No
5 Playback Check	OFF
6 Super MMX Mode	OFF
7 Language	English
8 Format HDD Disk	
9 System Colour	
10 Exit	

6.11.1 Engineer Table

Engineer Table																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Install	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Covert	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Terminal RES	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Video Gain	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
REC Priority	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Alm REC Prio	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Spot Seq	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

ESC For Return

Install

This item allows you to install each channel on **1 Engineer Table**. Every channel is "installed" by default; you may uninstall any one of them manually. Once a channel is un-installed, all related functions are disabled.

v = camera installed • = camera not installed

Covert

This item allows you to make each camera's input invisible (covert) on both main and call monitor, while MV-DR9/ MV-DR16 keeps recording the camera's video. The default setting is every camera visible.

v = covert • = not covert

Terminal RES

This item allows you to enable/ disable the terminal resistor of each camera. If the camera loop-back connector is not used, the terminal resistor should be enabled to get correct signal termination; this is the default condition. Otherwise, the terminal resistor should be disabled.

v = Terminal resistor is enabled • = Terminal resistor is disabled

Video Gain

This item allows you to adjust the camera's video level. You may adjust the value between 1 and 16 for each camera.

REC Priority

This item allows the user to set the recording priority for each camera under normal state (No alarm occurred). The MV-DR9/ MV-DR16 will record the camera that is assigned with a higher priority more frequently.

The user can move the cursor and use ENTER key to adjust the value. The value ranges from 1 to 16; "1" stands for the lowest priority; "16" stands for the highest priority. If the camera is not installed, the priority will be set to "0" automatically.

Alarm REC Priority

This item allows you to set the recording priority when an alarm is triggered for the current channel, either by Alarm In or by Motion.

Spot Seq

For Call monitor, there are 16 steps programmable. This item allows you to assign camera for each step (1~16); "0" means to skip this step. Those cameras which are not installed or converted won't be displayed on call monitor.

6.11.2 Camera Detect

The MV-DR9/ MV-DR16 can check the camera BNC connectors for video signal and judge the channel is connected or not. If the camera doesn't exist, it's recommended to set that channel as "not installed". Otherwise that channel will be considered as "video loss". Besides, the MV-DR9/ MV-DR16 storage space is wasted. Move the cursor to **2 Camera Detect** and press the Enter button, the Engineer Table will appear. The cameras which are not installed will have a dot symbol in the corresponding position.

6.11.3 Engineer Password

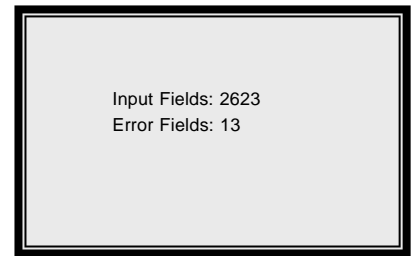
This sub-menu allows you to setup a four-digit number engineer password. Use right/ left buttons to change to a new number, press ESC button when finished, the password will be saved into non-volatile memory. The default password is 9667.

6.11.4 Disable Password

This item allows you to enter the OSD menu without entering the password. Therefore, you can save a lot of time while setting the DVR. This item will be restored to the default setting “No” automatically after you power off and on the DVR.

6.11.5 Playback Check

This item allows you to check the internal cabling of MV-DR9/ MV-DR16 is functioning correctly or not, usually the ‘Error Fields’ would be a very small number if the system functions correctly.

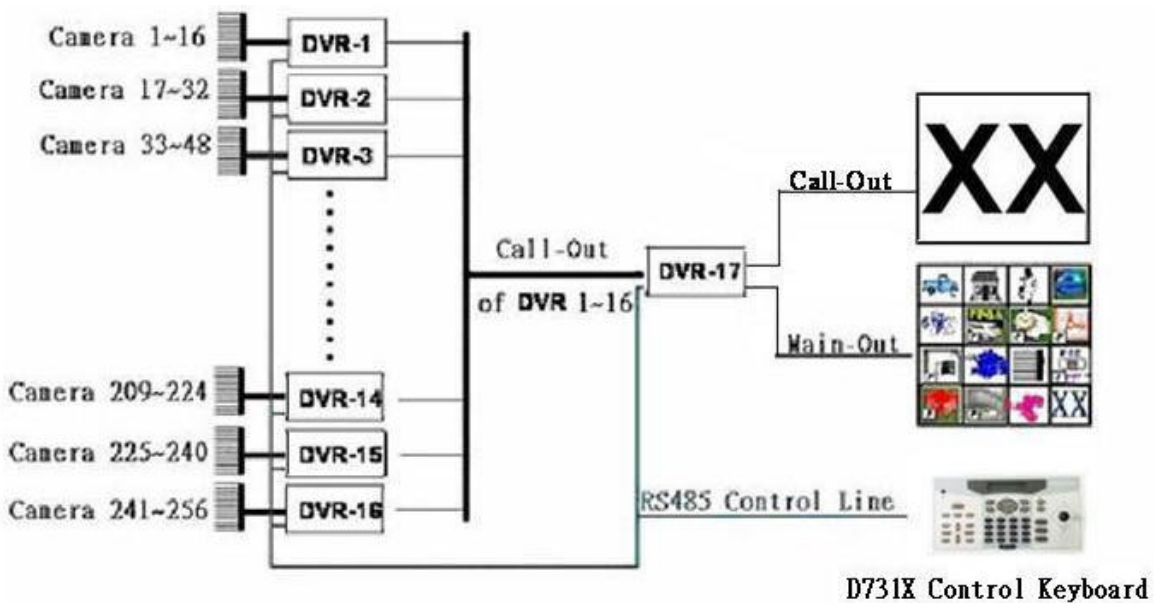


6.11.6 Super MMX Mode

This function is used for Matrix-Multiplexer system. The system skeleton is shown as following figure.

If you select “Yes”, the call monitor display will depend on RS-485 command. The call monitor output of DVR 1~16 must be connected to the video input of DVR 17; you can monitor any camera of 256 cameras. How to command the multiplexer for super MMX mode? Please refer to the user manual of D731X control keyboard. If you want to control the multiplexer by computer or other devices, please refer to appendix C. of multiplexer user manual.

If you select ‘OFF’, the call monitor will work as defined in Configuration Table1 or Alarm Set Up.



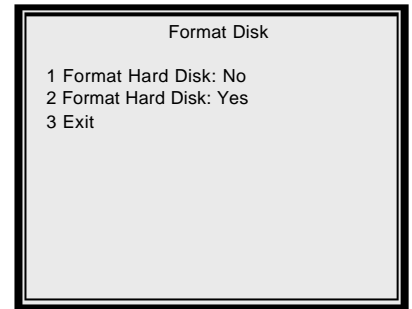
6.11.7 Language

This item allows you to choose language. Use the Right/ Left DIRECTION to choose the wanted language.

6.11.8 Format HDD Disk

This item allows you to format the Hard HDD. If you want to format the HDD then you should choose **2 Format Hard Disk: YES** and press ENTER to start formatting.

Before you use a new HDD, you should insert it to MV-DR9/ MV-DR16 to format to FAT32. And if the HDD was used in another machine with another kind of file system, therefore, the HDD must be formatted to FAT32 in MV-DR9/ MV-DR16 before recording process.



6.11.9 System Colour

This item allows you to choose “Colour” or “Mono”

6.12 Manager

You must enter correct manager password when you get into the main menu, otherwise this sub-menu will be forbidden. The default manager password is 2972.

6.12.1 Manager Password

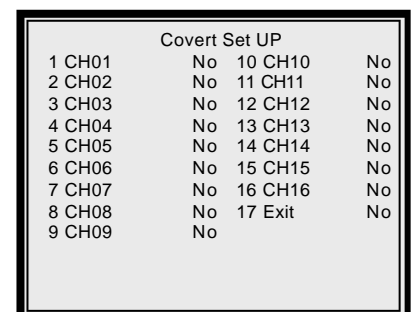
This sub-menu allows you to setup a manager password. If the user forgets this new password, he can recall the factory password by using Load Factory Password in Save Load Option sub-menu.

6.12.2 Covert Playback

You can make some of the camera’s video invisible (covert) on both main and call monitor, (but the recording is continued); if you want to view the covert video while the MV-DR9/ MV-DR16 is playing back the recorded video, you should change this item to “En”. This item will be restored to the default setting “Dis” automatically after you power off and on the DVR.

6.12.3 Covert Set Up

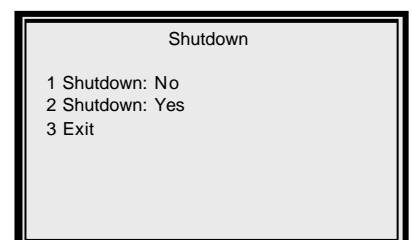
This item allows you to select the camer(s) you want to covert. Press Exix when the setting is done.



6.13 Shutdown

This item allows you to shutdown the MV-DR9/ MV-DR16.

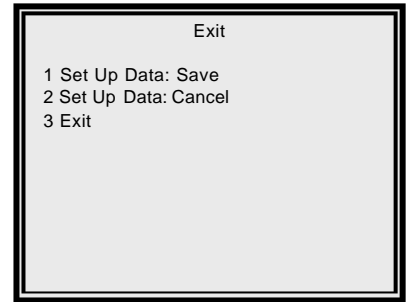
There is the other way to shutdown the MV-DR9/ MV-DR16: press ESC and Down Arrow buttons simultaneously.



6.14 Exit

If you move the cursor to **1 Set Up Data: Save** and press ENTER button, the modifications you have made will be saved into the non-volatile memory (EEPROM).

If you move the flashing highlight to **2 Set Up Data: Cancel** and press ENTER button; or press ESC button on the front panel, the modification you have made will keep affective, but not saved into EEPROM. Therefore, if you power OFF and ON the MV-DR9/ MV-DR16, the modifications will be canceled.

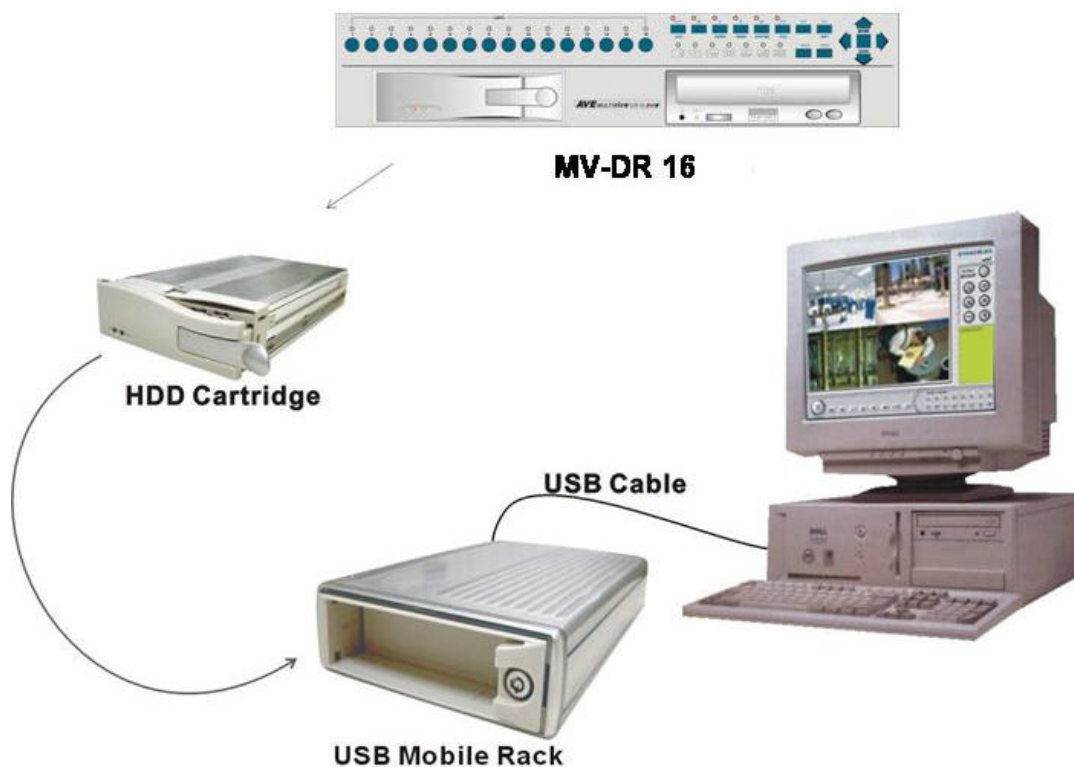


7. Windows Application Software

The file format of DVR is compatible with Windows O.S; you can process recorded video data under Windows 98, 2000 and XP systems. The application software allows you to playback, printout, export JPEG file or clip a segment of video.

7.1 Connect the USB Mobile Rack to PC

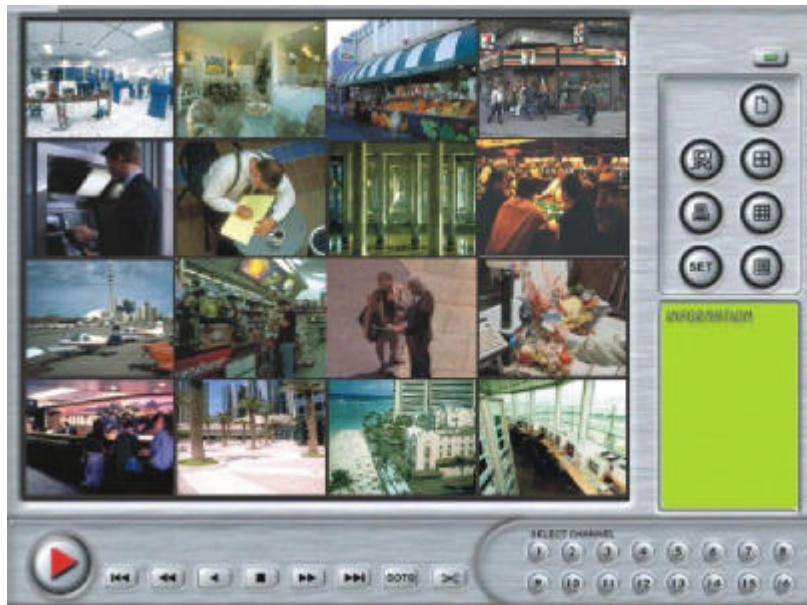
Move out the HDD Cartridge form DVR and insert it to a “USB Mobile Rack”, then connect the “USB Mobile Rack” and PC with a USB Cable.



7.2 Install the Software

To process recorded video on your computer, you need to install DVR Windows application

software. After “dvrwinap.exe” has been installed, you can connect the swappable HDD to your computer and process the recorded video.



7.3 Function Buttons

1. Open File

Press this button to search and open recorded video file.

2. Display Mode

Press these buttons to choose display mode (4, 9 and 16 windows).

3. Save Image

Press this button for saving current image (JPEG) on your P.C.

4. Print Out

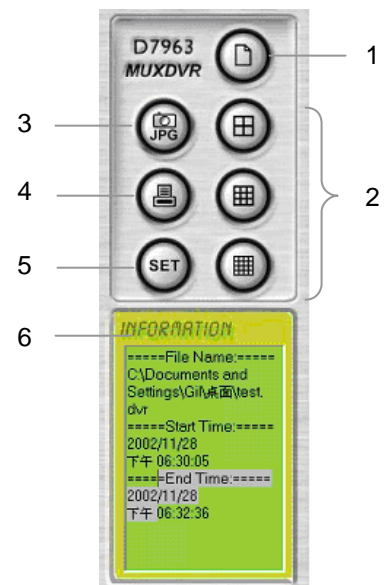
Press this button to print out single picture.

5. Set

Press this button to start setting windows. Use the Mouse to move the cursor to certain window, and then press a Channel button for assigning the camera to this window. The cursor will move to next window automatically.

6. File Information

The Information of the opened file will be shown here: File Name, Start Time and End Time.





7. Playback

Press this button to play the recorded video, and press it again to pause.

8. Go to Begin

Press this button to go to the first image of the recorded video.

9. Fast Rewind

Press this button to play the recorded video in reverse direction. Press this button repeatedly to change the playback speed: x1, x4, x8, x16, x32 and x64.

10. Rewind Playing

Press this button to rewind playing the recorded video at normal speed.

11. Stop

Press this button to stop playing the recorded video.

12. Fast Forward

Press this button to play the recorded video in forward direction. Press this button repeatedly to change the playback speed: x1, x4, x8, x16, x32, and x64.

13. Go to End

In playback mode, press this button to go to the end image of the opened file.

14. GOTO

In playback mode, press this button for searching the recorded video of certain date and time.

15. Video Clipping

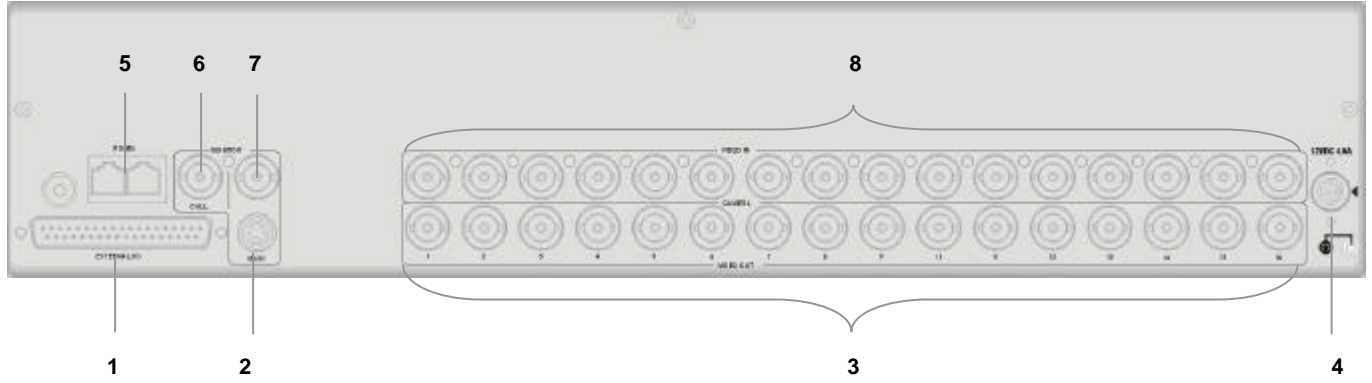
Press this button to clip a small period of video for transferring more easily. Press "Video Clipping" to start clipping and Press again for stop.

16. Channel 1~16

Press one of these buttons to view the channel full screen.

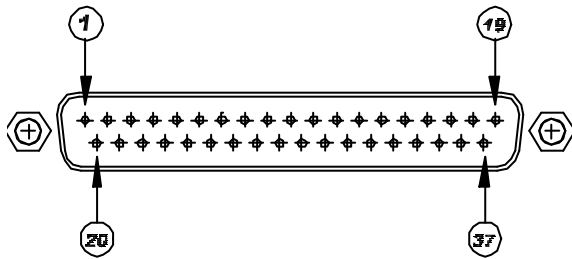
8. Connectors

Rear Board



Item	Description
1	External I/O
2	Monitor output
3	Video Looping (1~16)
4	Power Jack
5	RS-485
6	Call Monitor (BNC)
7	Monitor Output (BNC)
8	Video Input (1~16)

External I/O Port (37pin DSUB)



Pin No.	Definition	Direction	Pin No.	Definition	Direction
1	GND	Power	20	Reserved	Input
2	GND	Power	21	Reset Alarm	Input
3	GND	Power	22	Day / Night output	Output
4	GND	Power	23	Day / Night switch	Input
5	Reserved	-	24	Set Alarm	Input
6	Reserved	-	25	Reserved	-
7	Alarm NO	Output	26	Alarm In 13	Input
8	Alarm COM	Output	27	Alarm In 12	Input
9	Alarm NC	Output	28	Alarm In 11	Input
10	GND	Power	29	Alarm In 10	Input
11	GND	Power	30	Alarm In 9	Input
12	GND	Power	31	Alarm In 8	Input
13	GND	Power	32	Alarm In 7	Input
14	GND	Power	33	Alarm In 6	Input
15	GND	Power	34	Alarm In 5	Input
16	Alarm In 16	Input	35	Alarm In 4	Input
17	Alarm In 15	Input	36	Alarm In 3	Input
18	Alarm In 14	Input	37	Alarm In 2	Input
19	Alarm In 1	Input			

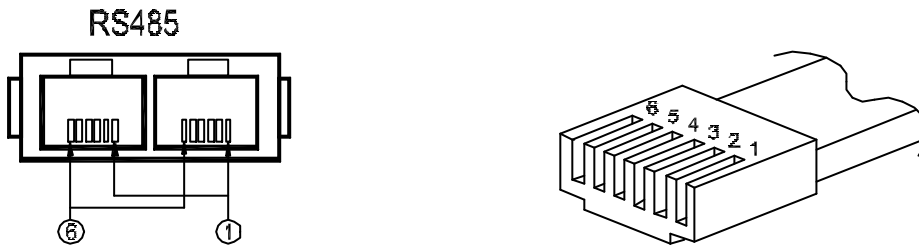
External I/O Board

There is an “External I/O board” included in the MV-DR9/ MV-DR16 box. You can connect it to the External I/O port; the pins are identified as the definitions listed on the board. One pin is listed but of no use: VCR Trigger.



RS-485 (RJ11)

The default RS-485 port connector is RJ11 6P6C connector.



RJ11 Cable 6P6C pin definition:

Pin No.	Definition	Direction
1	-	-
2	+ 12V	Power
3	GND	Ground
4	DA (D +)	I/O
5	DB (D -)	I/O
6	-	-

9. Specification

Model Name	MV-DR9/ MV-DR16	
Compression Method	Wavelet	
Video System	NTSC	PAL
Resolution-Live Video	720 x 480 pixels	720 x 512 pixels
Resolution-Recorded	720 x 240 pixels	720 x 256 pixels
Recording Rate	Up to 60 PPS	Up to 50 PPS
Recording Device	Hot swappable HDD	
Recording Quality	Ultra/ Super / High / Normal / Low	
Video Input	BNC x 9/ 16, 1.0 Vp-p, 75 ohm.	
Video Looping Through	BNC x 9/ 16, 1.0 Vp-p, 75 ohm.	
Main Monitor Output	BNC x 1, S-VHS x 1, 1.0 Vp-p, 75 ohm.	
Call Monitor Output	BNC x 1, 1.0 Vp-p, 75 ohm.	
Alarm Input	x 9/ 16, DSUB 37 pin male (TTL level)	
Alarm Output	x 1, DSUB 37 pin male, 2.0 A / 24 V	
Remote Control	RS-485 DSCP	
Playback Speed	Fast Forward / Rewind (x1~x8), picture by picture	
Zoom	Yes	
Power Supply	DC 12 V / 4 A	
Title	12 characters	
Alarm List	Up to 255 events	
Dimensions	432 x 88 x 400mm (W x H x D)	
Operating Temperature	0~40°C	

Appendix 1. RS-485 Command Set

The texts of Data 0, 1 is in **ASCII** code format (**Normal Command**)

Command	OP_code	Data 0,1	Note	
Channel select	A0H	"01" ~ "0G"	Channel 1~16	
Screen mode select		Right	"MR"	Detail setting must reference User's manual
		Left	"ML"	
Sequence		"S1" ~ "S3"	Sequence 1~3	
Up key		"DU"		
Down key		"DD"		
Left key		"DL"		
Right key		"DR"		
Zoom/Enter		"DZ"		
Play key		"KV"		
Freeze/Pause		"KA"		
Set		"KS"		
ESC		"KE"		
List		"KL"		
Date/Time		"SD"		
Title		"ST"		
Menu		"SP"		
Key Lock		"SK"	Lock/Un_Locked	
Goto		"SR"		
Fast Rewind		"RW"	x1,x2,x4,x8	
Fast Forward		"FF"	x1,x2,x4,x8	
Universal End		"UE"		
Goto Time1		BDH	Data1, Data0	Year & Month
Goto Time2		BEH	Data1, Data0	Day & Hour
Goto Time3	BFH	Data1, Data0	Minute & "G"	

PS: Goto Time1: Year=00~99 (it means 2000~2099); Month=01~12

Goto Time2: Day=01~31; Hour=00~23

Goto Time3: Minute=00~59; "G" ASCII=47H

Example:

If the Keyboard ID is 00H, the Multiplexer ID is E0H.

If you want to select camera 0 on the main monitor, you can use '01' command.

(The ASCII Code of '01' is 30H & 31H.)

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
Receiver ID	Transmitter ID	OP Code	Data0	Data1	Checksum
E0H	00H	A0H	30H	31H	41H

NOTE :

1. The time interval between byte and byte must be shorter than 2ms, and the time interval between 2 commands (6 bytes/command) must be longer than 2ms.
2. Checksum = Byte1 .xor. Byte2 .xor. Byte3 .xor. Byte4 .xor. Byte5

Filename: 00-37963-AEA3
Directory: C:\Documents and Settings\Ayub Malik UK\Local
Settings\Temporary Internet Files\OLK5
Template: C:\Documents and Settings\Ayub Malik
UK\Application Data\Microsoft\Templates\Normal.dot
Title: MULTIPLEXED DIGITAL VIDEO RECORDER
Subject:
Author: Tonylin
Keywords:
Comments:
Creation Date: 5/12/2003 10:36 AM
Change Number: 13
Last Saved On: 6/18/2003 1:32 PM
Last Saved By: Gil
Total Editing Time: 59 Minutes
Last Printed On: 3/23/2004 8:42 PM
As of Last Complete Printing
Number of Pages: 34
Number of Words: 7,014 (approx.)
Number of Characters: 39,984 (approx.)