



4/8/16CH DIGITAL VIDEO RECORDER

DVR304/308/316

INSTRUCTION MANUAL

Summary

DVR series are designed to meet the demands for full 4/8/16-channel real-time recording systems. Frame rate, video quality, and resolution can be adjusted for each channel to meet recording requirement. VGA engines are built-in 3D intellectual motion adoptive refinement with vivid image enhancement algorithm to provide best video quality.

DVR series provide various backup features include USB DVD/RW, USB flash disk, HTTP download, and Backup Manager FTP for multiple DVRs' files download. Mobile phone device remote monitoring is also supported. Browser based remote live monitoring and video playback features are provided.

The DVR can provide D1 real-time for 4-channel and CIF real-time for 8/16-channel recording and playback. Full features web-based user interface, multiple DVR system monitoring features, various backup features, and easy of cabling, the DVR is ideal solution for DVR applications.

Major Features

- Full D1 real-time for 4-ch and CIF real-time for 8/16-channel H.264 recording and playback.
- VGA outputs at 1920x1080i, built-in 3D intellectual motion adoptive refinement and vivid image enhancement engines.
- Concurrent multiple-channel playback for 4/8/16-channel.
- Audio recording and playback.
- Full features of remote controller controlling.
- HTTP web-based interface including DVR configuration, PTZ control, playback, and live monitoring.
- 3G mobile phone solutions provided.
- Resolution, frame rate, and video quality configurable for each channel.
- LCD Power saving design.

Trademarks and Registered Trademarks

Microsoft, Windows 2000, Windows XP, Internet Explorer are registered trademarks of Microsoft Corporation in the U.S. And/or other countries.

Adobe and Adobe PDF are registered trademarks of Adobe Systems Incorporated in the U.S. and/or other countries.

JavaScript and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and/or other countries.

Linux, Macintosh, Mozilla, and Netscape Navigator are registered trademarks of the respective holders.

Pelco is a trademark of Pelco-Clovis, CA, and may be registered in certain jurisdictions.

Other names of companies and their products mentioned in this manual may be trademarks or registered trademarks of their respective owners.

Caution

- Do not drop or strike this equipment.
- Do not install the equipment near any naked flames or heat sources.
- Do not expose this unit to rain, moisture, smoke or dust environment.
- Do not cover the opening of the cabinet with cloth and plastic or to install this unit in poor ventilated places. Allow 10cm between this unit and its surroundings.
- Do not continue to operate the unit under abnormal conditions such as detection of smoke, strange smell or no display on screen while power is turned on.
- Do not damage the power cord or leave it under pressure.
- Do not operate this unit near magnet, speaker system, etc., To avoid unnecessary magnetic interference.
- Connection cables should be grounded properly.

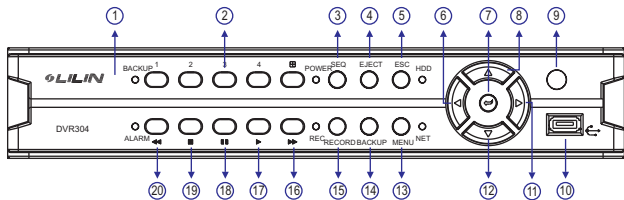
CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS



Front Panel

[DVR304]



1. LED status panel

Please see system LED status panel.

2. Split-display/camera buttons

- 4 split-display.
- Camera selection mode.

3. SEQ button

4. EJECT button

5. ESC button

6. Left button

- Move cursor left at menu setup.
- Pan left at PTZ control mode.
- Decrease a value.

7. Enter button

- Enter operation in menu setup.
- Instant PTZ camera selection at live mode.
- Camera active mode.

8. Up button

- Move cursor up in menu.
- Tilt up at PTZ control mode.

9. Remote control IR receiver

10. USB 2.0 connector

- USB flash disk.
- USB DVD/RW.

11. Right button

- Move cursor right in menu.
- Pan right at PTZ control mode.
- Increase a value.

12. Down button

- Move cursor down at menu mode.
- Title down at PTZ control mode.

13. Menu button

14. Backup button

15. REC button

Start recording operation or stop the recording task.

16. Fast forward button

- Video fast forward.
- Next event page.

17. Play button

- Invoke playback selection menu.
- Replay after FF, FR, Pause, stepping when playing video.

18. Pause button

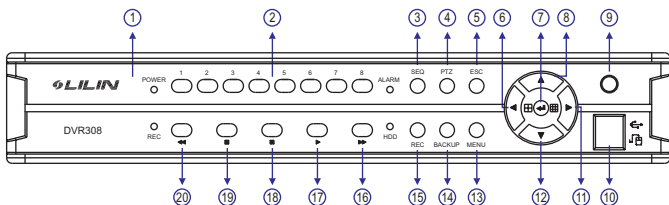
19. Stop video playback button

Live: freeze video, Playback: pause video.

20. Fast reverse button

- Video fast reverse.
- Previous event page.

[DVR308]



1. LED status panel

Please see system LED status panel.

2. Camera buttons

Camera selection mode.

3. SEQ button

4. PTZ button

- At PTZ control mode.
- At Split-display mode.

5. ESC button

6. Left button/Split-display

- Move cursor left at menu setup.
- Pan left at PTZ control mode.
- Decrease a value.
- 4 split-display.

7. Enter button

- Enter operation in menu setup.
- Instant PTZ camera selection at live mode.
- Camera active mode.

8. Up button

- Move cursor up in menu.
- Tilt up at PTZ control mode.

9. Remote control IR receiver

10. USB 2.0 connector

- USB flash disk.
- USB DVD/RW.
- USB Mouse.

11. Right button/Split-display

- Move cursor right in menu.
- Pan right at PTZ control mode.
- Increase a value.
- 9 split-display.

12. Down button

- Move cursor down at menu mode.
- Title down at PTZ control mode.

13. Menu button

14. Backup button

15. REC button

Start recording operation or stop the recording task.

16. Fast forward button

- Video fast forward.
- Next event page.

17. Play button

- Invoke playback selection menu.
- Replay after FF, FR, Pause, stepping when playing video.

18. Pause button

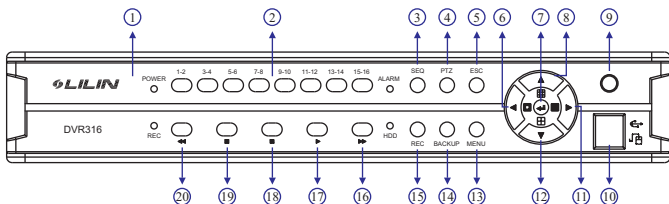
19. Stop video playback button

Live: freeze video, Playback: pause video.

20. Fast reverse button

- Video fast reverse.
- Previous event page.

[DVR316]



1. LED status panel

Please see system LED status panel.

2. Camera buttons

Camera selection mode.

3. SEQ button

4. PTZ button

- At PTZ control mode.
- At Split-display mode.

5. ESC button

6. Left button/Split-display

- Move cursor left at menu setup.
- Pan left at PTZ control mode.
- Decrease a value.
- 13 split-display.

7. Enter button

- Enter operation in menu setup.
- Instant PTZ camera selection at live mode.
- Camera active mode.

8. Up button

- Move cursor up in menu.
- Tilt up at PTZ control mode.
- 9 split-display.

9. Remote control IR receiver

10. USB 2.0 connector

- USB flash disk.
- USB DVD/RW.
- USB Mouse.

11. Right button/Split-display

- Move cursor right in menu.
- Pan right at PTZ control mode.
- Increase a value.
- 16 split-display.

12. Down button

- Move cursor down at menu mode.
- Title down at PTZ control mode.
- 4 split-display.

13. Menu button

14. Backup button

15. REC button

Start recording operation or stop the recording task.

16. Fast forward button

- Video fast forward.
- Next event page.

17. Play button

- Invoke playback selection menu.
- Replay after FF, FR, Pause, stepping when playing video.

18. Pause button

19. Stop video playback button

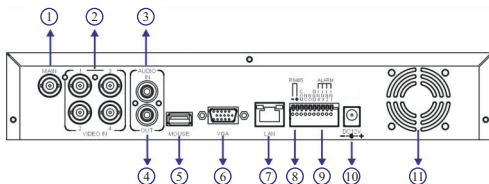
Live: freeze video, Playback: pause video.

20. Fast reverse button

- Video fast reverse.
- Previous event page.

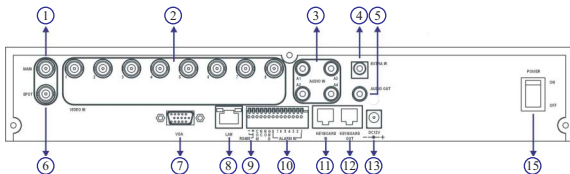
Rear Panel

[DVR304]



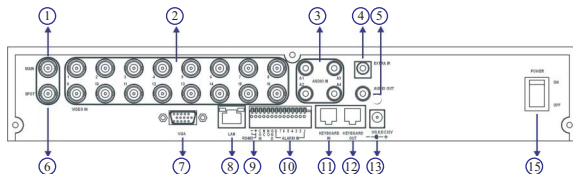
- 1. Main monitor**
- 2. Camera inputs**
Analog camera BNC inputs.
- 3. Audio inputs**
Four RCA audio connectors.
- 4. Audio output**
- 5. USB button**
For mouse connection.
- 6. VGA output**
- 7. Network RJ-45 connector**
- 8. RS-485**
For PTZ connection.
- 9. Alarm I/Os**
Alarm input switches, 1 N/O alarm output, and 1 N/C alarm output.
- 10. DC12V input**
- 11. Fan**

[DVR308]



- 1. Main monitor**
- 2. Camera inputs**
Analog camera BNC inputs.
- 3. Audio inputs**
Four RCA audio connectors.
- 4. External IR receiver(RCA)**
- 5. Audio output**
- 6. Spot monitor**
 - Spot monitor accessible by keyboard.
 - Each spot output can be programmable for alarmed camera display and sequence display.
- 7. VGA output**
- 8. Network RJ-45 connector**
- 9. RS-485**
For PTZ connection.
- 10. Alarm I/Os**
Alarm input switches, 1 N/O alarm output, and 1 N/C alarm output.
- 11. RJ-45 Keyboard-in**
Connected from previous DVR's keyboard output in daisy chain.
- 12. RJ-45 keyboard-out**
Connct to the next DVR's input. RJ-45 connector.
- 13. DC12V input**
- 15. Power switch**

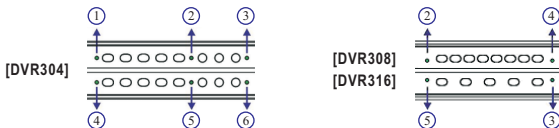
[DVR316]



- 1. Main monitor**
- 2. Camera inputs**
Analog camera BNC inputs.
- 3. Audio inputs**
Four RCA audio connectors.
- 4. External IR receiver(RCA)**
- 5. Audio output**
- 6. Spot monitor**
 - a. Spot monitor accessible by keyboard.
 - b. Each spot output can be programmable for alarmed camera display and sequence display.
- 7. VGA output**
- 8. Network RJ-45 connector**
- 9. RS-485**
For PTZ connection.
- 10. Alarm I/Os**
Alarm input switches, 1 N/O alarm output, and 1 N/C alarm output.
- 11. RJ-45 Keyboard-in**
Connected from previous DVR's keyboard output in daisy chain.
- 12. RJ-45 keyboard-out**
Connct to the next DVR's input. RJ-45 connector.
- 13. DC12V input**
- 15. Power switch**

LED Status Panel

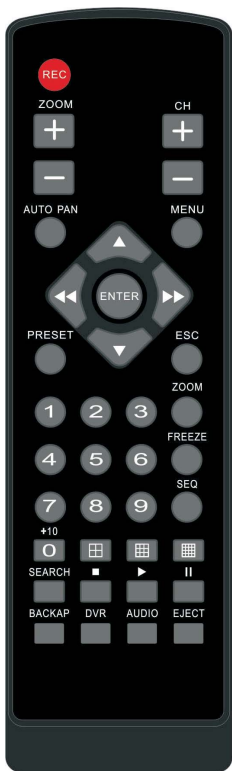
System LEDs are meaningful while operating the DVR. The status of each LED is deccribed as in the following table:











Item	LED	Description	Color
1	BACKUP	Backup LED indicator	Green (blinking)
2	POWER	DVR power on/off indicator	Yellow
3	HDD	Master HDD recording indicator	Green (blinking)
4	ALARM	External alarm switches indicators when motioned or alarmed	Red
5	REC	Recording indicator	Yellow
6	NET	Network indicator	Green

Remote Controller






The button arrangement of the remote controller is designed for easy-to-use purposes. Buttons are separated in regions based on their features including DVR operational keys, pan, tilt, and zoom camera device (PTZ) keys, numerical keys, and PTZ buttons.



DVR operational keys:

- MENU : Setup menu.
- ESC : Escape/exit/stop buzzer
- ZOOM : Digital video 5X or 9X zooming.
- REC : Record/stop recording.
- FREEZE : Live video freeze.
-  : Pause.
-  : Playback.
-  : Stop.
-  : Fast forward.
-  : Fast rewind.
- CH+ : Next single channel.
- CH- : Previous single channel.
-  : 4 split display.
-  : 9 split display.
-  : 16 split display.
- SEQ : Sequential display.
- AUDIO : Audio/mute.
- BACKUP : Video backup.
- DVR : Addressable DVR control.

PTZ operational keys:

- Auto Pan : Perform auto pan feature.
- Zoom in : Zoom in of a fast dome camera.
- Zoom out : Zoom out of a fast dome camera.
- Preset : Call preset of a fast dome camera.
-  : Move up/tilt up.
-  : Move down/tilt down.
-  : Move left/pan left.
-  : Move right/pan right.
-  : Enter/set.

0 to 9: Numerical keys.

HDD Information

HDD INFO shows the following information:

1. Size — The capacity of the hard disk drive.
2. Approximate recording hour — recording hours based on the HDD(s).
3. Approximate recording days — recording days based on the HDD(s).
4. Average frame size — Average picture size.

HDD INFO		
PRI	MASTER	
	SIZE	
	SLAVE	
	SIZE	
SEC	MASTER	
	SIZE	250 GB
	SLAVE	
	SIZE	250 GB
HDD FORMAT		
	APPROX REC HOURS	142
	APPROX REC DAYS	7
	RESET COUNTER	

HDD Format

To format HDDs, please select HDD Format menu item. Password is required for preventing unauthorized access. A warning message also gets prompted for formatting verification. Please be alerted to this operation. It may erase not only event list data but also recorded video data. Press [Enter] button at HDD Format menu to format the hard disk drives.

Formatting hard disk drives may take several seconds based on the number of lists recorded.

Password/Access

The DVR has three sets of password protection(accounts) preventing unauthorized access. To activate password function, please turn Enable Password on or off at System -> Password.

The password consists of four to eight digits for entering the DVR. The default passwords are admin, "1111", operator, "2222", and guest, "3333". The acceptable characters are 1 to 10(0) and A to Z. To change the password setting, please press [Enter] at System -> Password -> Change Password.

PASSWORD/ACCESS	
USER	ADMIN
OLD PASSWORD	****
NEW PASSWORD	****
CONFIRM PASSWORD	****
PROPERTY	
ENABLE PASSWORD	OFF

NOTE

In case, forgetting your password, please contact your sales agent for master password.

Firmware Update

Firmware update allows one to upgrade the DVR's firmware for improving system performance. To perform firmware update, press [Enter] on Setup -> System -> Firmware Update. There are two ways to perform firmware update via (1) USB flash disk at DVR site and (2) HTML interface via network.

To Perform firmware update using USB flash disk, please follow the instructions:

- (1) Plug in a portable USB disk at the DVR's USB port.
- (2) Press [Enter] button at Start Update Firmware.
- (3) After finishing transferring, remove the USB device and reboot the DVR.

Prepare Firmware

To prepare firmware update, please create a directory, firmware, in the USB flash disk. The USB flash disk should contain file system FAT-16 or FAT-32. Please visit the web site at www.meritlilin.com to download the latest firmware and save the file in the directory mentioned above.

DDNS

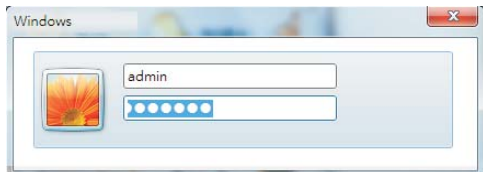
To use domain name provided by DDNS server ddnsipcam.com or www.dyndns.org, please first visit ddnsipcam.com to register an account. After registration, please enter "host name", "username", and "password" in DDNS menu item at DVR side.

NOTE

Please use lower case for "host name", "username", and "password" for both DynDNS registration and DVR settings.

Logon

To logon the DVR, please type in the IP address in the HTTP address box via Internet browser. By default, type "192.168.0.111" in the HTTP address box to access the logon page. Use default password "1111" for Administrator, password "2222" for Operator, and password "3333" for Guest.

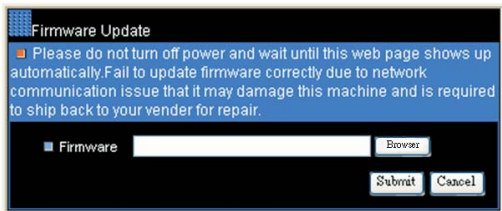


NOTE

Each user can be assigned for different access level at System -> Password/Access.

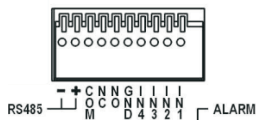
Remote Firmware Update

This DVR is allowed to perform firmware upgrade via network. After DVR receives the firmware, it starts to perform firmware upgrade automatically. After finishing the firmware update, HTML page gets reload. The user can then start to operator the DVR.



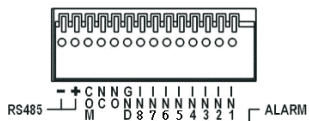
APPENDIX

Appendix A. 4-ch DVR Alarm I/Os and RS-485 for PTZ



Pin 1	Alarm input 1
Pin 2	Alarm input 2
Pin 3	Alarm input 3
Pin 4	Alarm input 4
Pin 5	GND
Pin 6	ALARM NO (normal open)
Pin 7	ALARM NC (normal close)
Pin 8	COM
Pin 9	RS485 +
Pin 10	RS485 -

Appendix B. 8/16-ch DVR Alarm I/Os and RS-485 for PTZ



Pin 1	Alarm input 1
Pin 2	Alarm input 2
Pin 3	Alarm input 3
Pin 4	Alarm input 4
Pin 5	Alarm input 5
Pin 6	Alarm input 6
Pin 7	Alarm input 7
Pin 8	Alarm input 8
Pin 9	GND
Pin 10	ALARM NO (normal open)
Pin 11	ALARM NC (normal close)
Pin 12	COM
Pin 13	RS485 +
Pin 14	RS485 -

Appendix C. RS-485 Input and Output Pin Assignment



Terminal	Name
1	--
2	--
3	--
4	--
5	RS-485 - Out Link Keyboard
6	RS-485 + Out Link Keyboard
7	GND
8	DC+12V input

Appendix D. Hard Disk Drive Support List

Model	HDD size
WD5000AVDS	500GB
WD5000AVVS	500GB
WD10EVDS	1TB
WD3200AVVS	320GB
WD2500AVVS	250GB
WD20EVDS	2TB
ST3500418AS	500GB

Appendix E. Supported USB-DVD/RW and Disk

Manufacturer	Model
SONY	DRX-S30U-W
Lite-On	eSAU108
Lite-On	eTAU108
Lite-On	eHAU424-01

Brand	Specification	Capacity	Max Speed	Manufacturer
Melody	DVD-RW	4.7GB	4x	Rewritable
RiTEK	DVD-RW	4.7GB	8x	Rewritable
Sony	DVD+R	4.7GB	8x	Burn once
OEM disk	DVD-R	4.7GB	8x	Burn once

Appendix F. Supported USB Flash Disk

Transcend 8G, 16G

Kingston 4G, 8G, 16G

Sanddisk 8G, 16G

Appendix G. Hard Disk Recording Table

Approximate recording days and hours can also be found at Menu -> System -> HDD Info.

Recording Quality		Very high		High		Normal		Low	
HDD	Picture size	8.2	KB/Pic	6.4	KB/Pic	4.2	KB/Pic	2.1	KB/Pic
	120	GB	1.5	Days	2.3	Days	4.2	Days	6.9
250	GB	17.1	Days	4.7	Days	3.5	Days	14.4	Days
400	GB	2.4	Days	7.6	Days	7.2	Days	23.1	Days
500	GB	21.4	Days	9.5	Days	11.6	Days	28.9	Days
750	GB	3.7	Days	14.2	Days	14.4	Days	43.3	Days
1000	GB	28.5	Days	19.0	Days	13.0	Days	57.8	Days
2000	GB	7.3	Days	37.9	Days	28.9	Days	115.6	Days
4000	GB	56.9	Days	75.9	Days	57.8	Days	231.2	Days

NOTE

1. Recording frame rate is 30FPS*4-ch at CIF resolution.
2. Above information may be inaccurate due to the installation environment.

SPECIFICATIONS

Models	DVR304	DVR308	DVR316
Recording	SATAHDD: internal*1		SATAHDD: internal*2
Recording mode	External alarm / motion detection / schedule / manual		
Video source	Analog*4	Analog*8	Analog*16
Resolution	Full D1: 720*576(PAL) 720*480(NTSC) / CIF: 320*288(PAL) 320*240(NTSC)		
Recording NTSC	D1 120 / CIF 120 FPS	D1 120 / CIF 240 FPS	D1 120 / CIF 480 FPS
Recording PAL	D1 100 / CIF 100 FPS	D1 100 / CIF 200 FPS	D1 100 / CIF 400 FPS
Schedule	7 day*24 hrs time table, recording mode configurable		
Backup	USB2.0 flash disk / HTTP file download / Audio supported		
DVD/RW	External USB DVD/RW		
Playback	H.264 AVC video		
Speed	FR: 2x, 4x, 8x, 16x, 32x, 64x, / FF: 2x, 4x, 8x, 16x, 32x, 64x		
Compression	H.264 AVC and JPEG		
Video Input	Analog cameras		
Camera Name	12 characters		
Live video	PAL: 100 FPS/Sec NTSC: 120 FPS/Sec	PAL: 200 FPS/Sec NTSC: 240 FPS/Sec	PAL: 400 FPS/Sec NTSC: 480 FPS/Sec
Video Output	BNC*1		BNC*1 + Spot monitor
VGA output	3D intellectual motion adoptive refinement with vivid image enhancement VGA engine up to 1920*1080i		
Backlight saving	LCD backlight saving mode		
Multiplexer	Sequence / digital zoom / freeze		
Digital zoom	ROI for 5X and 9X with PIP	—	
Split screen	4, PIP	4, 9	4, 9, 13, 16
Spot monitor	No	Yes	Yes
Matrix			
Matrix	No	Control DVR and IP Fast Dome via TCP/IP by multiple keyboards	
Management			
Reports	Full alarm, configuration, and operation reports exporting over HTTP or USB		
Authentication	User authentication with feature configurable		
Recording day	Dynamic recording day calculation		
Alarm/event	D1*4 and DO*2 (NO/NC)	D1*8 and DO*2 (NO/NC)	
Motion	Motion grid 30*24 each channel, 8 sensitivities		
Event	External alarm, video loss, stop recording, power recovering, motion detection, schedule, logon, HDD format		
Email	Alarm notification with JPEG attachments		
Accessories	Remote controller addressable up to 255 DVRs		
P/T/Z protocol	LILIN MLP2 and Pelco RS-485		
Keyboards	None	PIH-931 keyboard	
IR receiver	None	Extra IR extension connector, up to 200m	
Mouse	USB / PS-2, drag-n-drop, right-mouse-click, mouse wheel		
Audio	G.711 audio, 0.7Vp-p, 16KHz		
Audio In/out	RCA 1 in, 1 output	RCA 4 in, 1 output	
Remote control	Yes		
Network	Direct Internet browser access / multiple users access		
Protocols	ARP / TCP/IP / UDP / HTTP / SMTP / FTP / DDNS / PPPoE / DynDNS / NTP		
Web	Live / event log & time search playback / AVI / snapshot		
DVR status	HTML DVR status		
IPScan	IPScan supported, easy-to-setup for IP address		
Software			
BackupManager	Multiple DVRs FTP file download and multi-channel playback		
Mobile phone	iPhone, and Android mobile phone supported		
Others			
WDT	Hardware watchdog timer		
DST	Daylight saving time		
Multilanguage	English, Chinese, Spanish, Danish, Swiss, Norwegian, Arabic, Japanese, Germany, French, Polish, Portuguese, Simplified Chinese, Vietnam, Italian		
CPU/OS	32-bit RISC Processor, ARM926 SoC 336 Mhz, Linux 2.6 kernel		
Power	DC12V, 4.2A, 48W	DC12V, 5.0A, 60W	
Working Env.	Temp: 0°C ~ +50°C / Humidity: 0% ~ 80%		
Dimension	290mm*52mm*260mm	360mm*60mm*308mm	
Weight	1.5Kg	3.0Kg	



MERIT LILIN ENT. CO., LTD
<http://www.meritlilin.com>

66-DVR304CSE