



# Hardware Manual

B series

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## A. CAUTION

To our dear customers!

Thank you for using our products. If you encounter any problems when using, please do not hesitate to contact our resellers. We will provide excellent services to you via our resellers.

The software/hardware improvements of this series are subject to change without notice to you in advance. Before using, please read this user manual carefully to ensure that you can use the device correctly and safely

Caution for this DVR series

- After installation, never put anything heavy over this device. Owing to the use of the harddrive(s) insides this device, check the cooling fan periodically to see if it works. Never use this device when the cooling function is out of order!
- Do not allow any solid object or liquid fall into or penetrate into the device.
- Use cleaning tools (brushes) regularly to clean circuit boards, connectors, fans, chassis and etc. Before cleaning, turn off the power and unplug the power.
- Do not attempt to disassemble the equipment, repair, or replace parts. In case the machine does not work properly, please contact the resellers or manufacturers. In the shortest time, we will solve the problems you have during using.
- When not using the remote control for a long time, take out the inside battery To prevent the control from the damage coming from battery leakage!
- If this equipment connects to outdoor cameras or other external alarm devices, ground this equipment to prevent it from electrical surges.
- monitoring via Internet. Free or non-free domain names provided by ISPs are needed for the monitoring functions.

Free domain names may sometimes drop connections and nothing to do with DVR. Non-free domain names have less problems. Choose the domain names carefully before using the networking function.

Operating environment

- Keep and use this device at places where temperature ranges 0°C~40°C. Avoid direct sunlight or near heat sources.
- Do not install this equipment in a humid environment
- Do not expose this equipment in smoky, dusty environments;
- Avoid strong collision, do not drop the machine
- Ensure the installation quality, install in a stable place, avoid the product falling;
- Do not block any ventilation openings. And ensure well ventilation around the machine
- Please use this equipment within rated input and output current/voltage range.
- This device is for long-time use. For safety, do not have flammable items placed next to the device.

## B. Introduction

### 1. Product Overview

This equipment is an excellent digital surveillance product designed specifically for the security use. Using embedded LINUX operating system, it makes the system more stable. Using standard H.264 video compression and G.711A audio compression technology achieves audio and video functions such as high-quality, low bit rate and single-frame playback. Using TCP / IP and other network technologies, it provides strong network data transmission capacity and remote control capabilities.

This equipment can be used individually or be connected to form a powerful security monitoring network. Using professional network video surveillance software platform, be fully experienced the powerful networking and remote monitoring capabilities.

This equipment can be used for security in banks, telecommunications, power stations, justice, transport, intelligence communities, factories, warehouses, resources, water conservancy facilities and other categories.

### 2. Main functions

- Pentaplex Operation: which can Record / Playback / Remote Connection / mobile phone watch / video backup.
- Support 2 fixed internal Hard Drives, single hard drive can be up to 4TB.
- Support RAID recording to protect important video data.
- Support HD output (1920x1080).
- Support real-time recording and playback.
- Smart function: Motion detection area can be divided into 192(16x12) sub-areas.
- Support IE/Chrome/Firefox/Safari. On-line recording/playback and user management are available.
- Support HTTP, DHCP, DDNS, NTP, SMTP, FTP, DNS, UPNP, PPPoE, IP rights, IP search and other Internet services
- Support iPhone, Android, including live video monitoring, playback.
- Support CMS(Central Management System)
- Back-up to USB storage at the same time when recording
- Support analog/digital modes to record analog/digital signals at the same time.

## C. Unpacking

### 1. Accessories

- ★ Quick guide x 1pcs
- ★ Power cable and adaptor AC100-240V/DC12V 4.16A x 1PCS
- ★ HDD screws x 8pcs
- ★ Operation CD x 1pcs
- ★ Mouse x 1pcs

### 2. Unpacking

When you receive the product, check first whether the packing of the equipment has obvious damage. The protective material used for the package during transport can cope with most of the accidental impact.

Then, take out the device, remove the protective film of the digital video recorder and check if there is any visible damage;

Finally, open the case, check the front panel data cable, power cord, power supply fan and motherboard to see if they are connected firmly.

#### ■ Front/Rare panels

The key functions of the front panel and the interfaces of the rear panel are described in detail in the manual.

Please carefully check the plate or foil on the rear panel of the product to see if it is the model you ordered.

Information on the rear panel is important for our service, so keep it properly. Before contacting us, you will need to provide your model type and serial number.

#### ■ Inside check

In addition to checking for visible signs of damage, be careful to check the connections between the front panel data cable, power cord and motherboard.

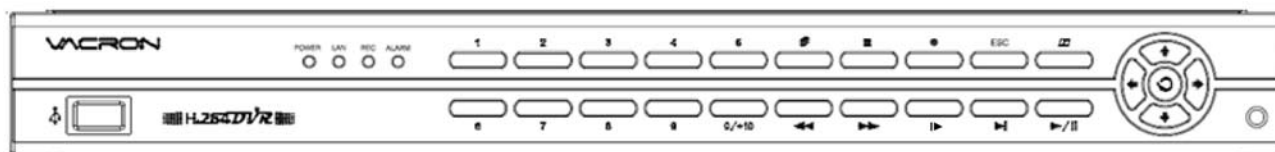
## D. Installation

Steps and cautions:





- 1 ∙ Ensure room temperature below 35°C.
- 2 ∙ Reserve space for air circulation around 15 cm (6 inches).
- 3 ∙ Chassis installation starts from bottom to up.
- 4 ∙ With multiple components in the chassis, take precautions to avoid overloading to the power outlet.

## E. Product appearance

### 1. Front Panel

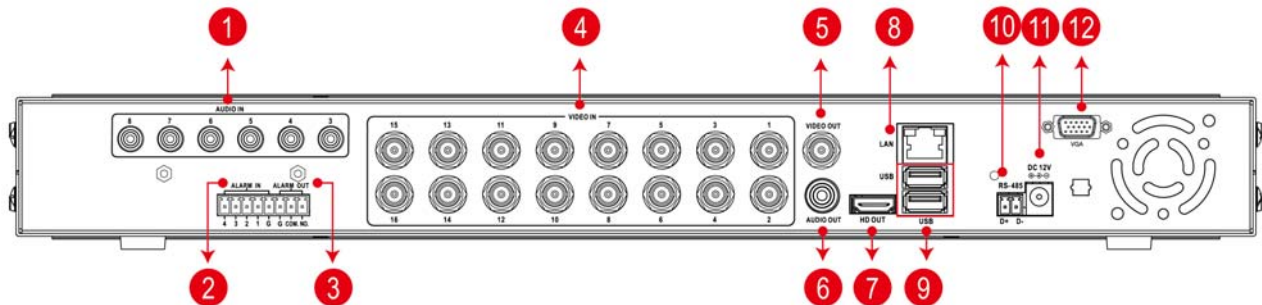


	MENU	Under the live viewing mode, press MENU to enter the main menu.
ESC	ESC	Quit the current menu.
	REC	Press the Manual Record button to start recording under the live mode.
	STOP	Stop playback under the playback mode.
	Step Forward	To playback frame by frame when paused in playback mode. ( Press Pause before operation )
	Play Pause	Under the live viewing mode, press the Play button to enter the playback mode and backup mode. Under the playback mode, press to play back. When playing, press to pause playback.
	Fast Rewind	Under the playback mode, there are 4 choices for the speed. Choose your choice to fast rewind.
	Fast Forward	Under the playback mode, there are 4 choices for the speed. Choose your choice to fast forward.
	Slow Forward	Under the playback mode, there are 4 choices for the speed. Choose your choice to slow forward
	UP Down	To move up or down of the selection setting in the UI menu. Under the live mode of Single/Quad/9 display, use the button to control video display.
	Left Right	To move left or right of the selection setting in the UI menu. Under the living mode, change to Single/Quad/9/16 division display.
	Enter	Press the Enter button to confirm the setup or go into sub-menu.
	Auto Switching	Under the live viewing mode, press the button to set auto-switching or start/stop auto switching function.
"1"	KEY_1	When text input, input digit "1" . Under the live viewing mode, display the individual channel 1.

"2"	KEY_2	When text input, input digit "2" . Under the live viewing mode, display the individual channel 2.
"3"	KEY_3	When text input, input digit "3" . Under the live viewing mode, display the individual channel 3
"4"	KEY_4	When text input, input digit "4" . Under the live viewing mode, display the individual channel 4.
"5"	KEY_5	When text input, input digit "5" . Under the live viewing mode, display the individual channel 5.
"6"	KEY_6	When text input, input digit "6" . Under the live viewing mode, display the individual channel 6.
"7"	KEY_7	When text input, input digit "7" . Under the live viewing mode, display the individual channel 7.
"8"	KEY_8	When text input, input digit "8" . Under the live viewing mode, display the individual channel 8.
"9"	KEY_9	When text input, input digit "9" . Under the live viewing mode, display the individual channel 9.
0/+10	KEY_0/+10	When text input, input digit "0" . Under the live viewing mode, display the individual channel 10. Or press this button, then press '1' - '6' in 2 seconds to display the individual channel 11-16.
	Power Indicator	Power Indicator.
	Network Indicator	Network Indicator ( When users access the device via internet, it will be turned on. )
	Recording Indicator	Recording Indicator for DVR
	Alarm indicator	Alarm indicator ( When AlarmIn, Video loss, video blind, motion detection are enabled and triggered, this indicator will be turned on. )

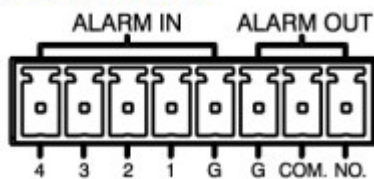
## 2. Rear Panel

### 16ch DVR illustration

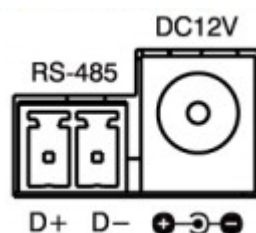


1	1~6 CH Audio Input
2	Alarm IN
3	Alarm OUT
4	1~16 CH Video Input (BNC)
5	Video Output
6	Audio Output
7	HD Digital Output
8	LAN Port
9	USB Mouse Port
10	RS-485 PORT
11	DC12V Power Input
12	VGA output

- ALARM IN/ ALARM OUT

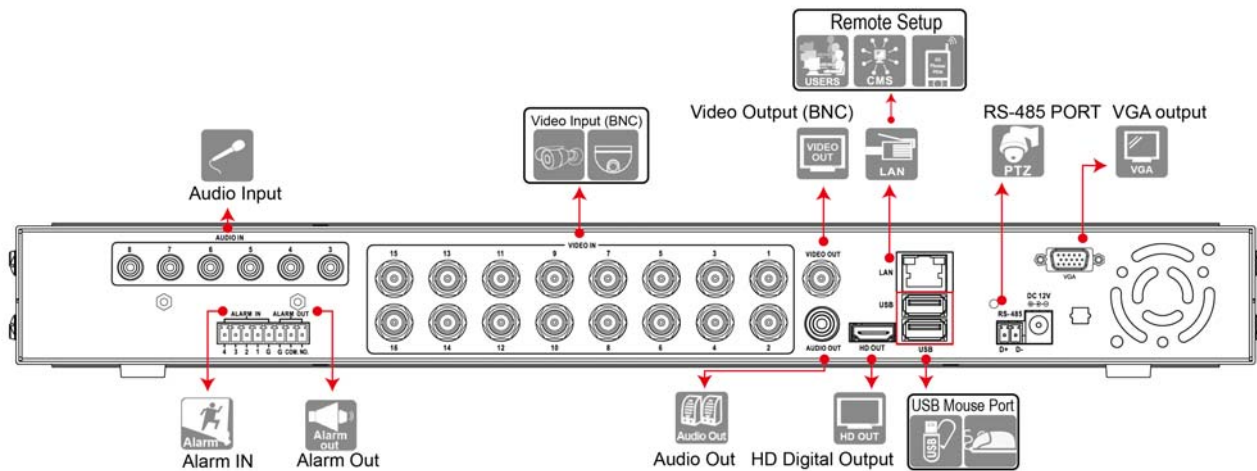


- RS-485 /DC12V





### 3. Installation Illustration



#### ■ Video input

Input interface is BNC type; input signal : PAL/NTSC BNC ( 1.0VP-P · 75Ω ). The Video signal should comply with national standards, a higher signal to noise ratio, low distortion, low-interference; clear images, invisible change, nature color and appropriate brightness.

##### ◆ Make sure stable and reliable signals from cameras

Cameras should be installed in a suitable position to avoid backlighting, low-light environment, or adopts the better BLC, low-light cameras.

Cameras and digital video recorders should be common ground, stably and reliably, in order to ensure the normal operation of the cameras.

##### ◆ Make sure the transmission cables are stable and reliable

Adopt high-quality, well-shielded coaxial cables, and choose the right model based on the transmission distance. If the distance is too far, use shielded twisted pair, video compensation equipment, optical transmission and other ways to ensure signal quality based on the specific circumstances.

Video cable should avoid strong electromagnetic interference with other devices and circuits, in particular, should avoid the current of high voltage.

##### ◆ Make sure the connectors well-connected:

Cables and shielded cable should be well-connected firmly to avoid false, joint welding or oxidation.

#### ■ The connections for video outputs

The video outputs include PAL/NTSC BNC(1.0VP-P · 75Ω), VGA and HD OUT interfaces.

Pay attention to the following when you select a PC display instead of a monitor.

1. Do not remain switched on for a long time to extend the life of the equipment;
2. Regular degaussing will help to maintain the normal operation of the monitor.
3. Keep away from equipments with strong electromagnetic interference.

Using TV as video output device is an unreliable alternative. It is also required to minimize the time of use and strictly control the power, the interference caused by neighboring devices. Leakage risks of low quality TV may result in damage to other equipments.

#### ■ Audio Inputs

Voice input impedance is high, so the microphone must be a microphone connected to the power supply.

Like video input, voice transmission cables should avoid interference, fake, poor contact, and special attention to prevent the current of the high-voltage.

#### ■ Audio Output

The audio output parameters of DVR are generally greater than 200mv 1K $\Omega$  (BNC), you can directly connect to the low impedance headphones, powered speakers or other sound devices through a power amplifier.

When the external speakers and microphones can not achieve spatial segregation, it is prone to the phenomenon of whistling. You may adopt the following actions:

1. Using better directional microphones
2. Adjust the speaker volume to make it lower than the value of the generated howling.
3. Using sound-absorbing materials for decoration to reduce sound reflections and improve the acoustic environment;
4. Adjusting the layout of the microphone and speakers can reduce the whistling.

#### ■ AlarmIn/AlarmOut connections

Pay attention to the following before installation:

1. AlarmIn
  - (a) Alarm input is grounding alarm input;
  - (b) The alarm input signals require voltage signals to the ground;

- (c) When the alarm device is shared with two DVRs or connected to a DVR and other devices, it should be isolated by relays.

## 2. AlarmOut

The alarm output of the DVR can not be connected with high-power load (no more than 1A). In the output circuit, be careful about the excessive current that may do damage to the relay. When using high-power load, extra relays are needed.

## ■ RS-485 connection

1. Connect RS-485 cable of the speed dome to the RS-485 interface of DVR, pay attention to the positive and negative signals.
2. Connect the video output cable of the speed dome to the DVR video input

## F. Q & A and Maintenance

### 1. Q & A

Q 1. After power on, DVR doesn' t work.

A: The possible causes:

1. Wrong power input
2. Bad connection of power cable
3. Power error
4. Firmware update error
5. Disk error or cable problem
6. Front panel error
7. Main PCB board error

Q 2. After power-on, DVR will restart after several minutes or the screen freezes.

A: The possible causes:

1. Unstable or low input voltage
2. The hard drive has bad sectors or cable error
3. Low adaptor power
4. Front video signal not stable
5. High temperature, too much dust and the machine runs in a bad condition
6. DVR hardware error

Q 3. HDD not found after power-on

A : The possible causes:

1. No power for the Hard Drive
2. Hard Drive cable error
3. Hard Disk error
4. Main board SATA slot error

Q 4. No output: Single, multiple or all channels

A : The possible causes:

1. Wrong firmware: Update to the right firmware.
2. Brightness set to 0: Set it to the default value.
3. No signal input or signal too weak.
4. Mask used.
5. DVR hardware error.

Q 5. Live video problems: Such as bad colors, brightness error, image blink...

A : The possible causes:

1. When using BNC as output, wrong NTSC/PAL matching will result in B/W image.
2. Impedance mismatch between digital video recorder and monitor.
3. Video transmission distance is too far or video transmission line attenuation is too much
4. Wrong settings of colors, brightness in the DVR

Q 6. No recorded file in local side

A : The possible causes:

1. Wrong data cable or jumper error in the harddisk
2. Hard Disk error
3. Upgraded firmware can not recognize the existing file system
4. Desired files are overwritten
5. Recording not enabled

Q 7. Bad image when playback

A : The possible causes:

1. Low recording quality
2. Data error when reading; small bit-rate; fuzzy when playback; Restart can be better.
3. Wrong data cable or jumper error in the harddisk
4. Hard Disk error
5. DVR hardware error

Q 8. No audio sound

A : The possible causes:

1. Not powered-microphone
2. Not powered-speaker
3. Audio cable error
4. DVR hardware error

Q 9. Live video with audio, but no sound when playback

A : The possible causes:

1. Wrong setting: audio not enabled
2. No video to the paired channels; when the screen is blue, playback will not be continuous.

Q 10. Wrong time

A : The possible causes:

1. Wrong settings
2. Bad battery connection or low voltage
3. Bad Frequency oscillator

Q 11. DVR can not control PTZ

A : The possible causes:

1. PTZ error
2. Wrong settings, cabling and installation for the PTZ
3. Wrong wiring
4. Wrong PTZ settings in the DVR side
5. Protocols mismatch between PTZ and DVR
6. Mismatch between PTZ decoder and DVR ID address
7. When connected to several decoders, the farthest AB line of PTZ decoder must add an 120 ohm resistor to eliminate reflection and impedance matching, otherwise it will make PTZ unstable.
8. Distance beyond limitation

Q 12. Motion detection not function

A : The possible causes:

1. Wrong schedule settings
2. Wrong area settings
3. Low sensitivity
4. Hardware limitation for different version

Q 13. Fail to login by using client software or Web browsers

A : The possible causes:

1. Operating system is Win98 or Win Me and the client software can not be installed or displayed properly; Upgrade the operating system to Win2000sp4 or above, or use lower versions of the client software.
2. ActiveX control blocked; install the ActiveX control in the attached CD.
3. DX8.1 or above not installed; upgrade the display driver.
4. Networking error
5. Wrong Networking settings
6. Wrong user/password
7. Wrong client software for the DVR firmware

Q 14. Mosaic or no video when Network preview and file playback

A : The possible causes:

1. Network traffic jam
2. Bandwidth limitation in the DVR side
3. Group mode is used in the DVR networking settings. More mosaics in group mode, not recommended.
4. Masks or channel protection in DVR side
5. No rights for the user account
6. Bad DVR output

Q 15. Networking not stable

A : The possible causes:

1. Networking not stable
2. IP conflict
3. MAC conflict
4. LAN card error (PC/DVR)

Q 16. USB backup error

A : The possible causes:

1. CPU too busy to back up the data! Stop recording then backup!
2. Device not compatible
3. Backup device error

Q 17. DVR can not be controlled by the keyboard

A : The possible causes:

1. DVR has wrong port setting
2. Wrong address
3. Low power for use; each adaptor need to be powered.
4. Transmission distance is too far

Q 18. Alarms can not be stopped

A : The possible causes:

1. Wrong alarm settings
2. AlarmOut turned on manually
3. Input equipment error or wrong connections.
4. Wrong firmware problem; Upgrade firmware to fix it.

Q 19. Alarms do not work

A : The possible causes:

1. Wrong alarm setting

2. Wrong alarm wiring
3. Wrong AlarmIn signal
4. One alarm equipment involves into two loops.

Q 20. The remote controller can not work

A : The possible causes:

1. Wrong control address
2. Long distance or poor angle
3. Battery run out
4. Controller or DVR front panel is out of order

Q 21. Short recording time

A : The possible causes:

1. Bigger data rate from poor camera quality, dirty lens, backlight installation, bad aperture adjustment.
2. Small HDD storage
3. HDD damage

Q 22. Download files can not be played back.

A : The possible causes:

1. No player installed
2. No graphic accelator with DX8.1 or above
3. Save as AVI files and play with MEDIA PLAYER

Q 23. Forget the administrative password or internet password

A : The possible solution:

Please contact local customer service staff or call the customer service phone of headquarters, we will guides you how to solve by the machine type and version of the program.

## 2. Maintenance

- Damped dust on the PCB board will cause a short circuit and will do something wrong to the DVR or damage it. For long-term stability of the DVR, regularly brush the circuit boards, connectors, fans and chassis to remove dust.
- Please ensure the project is well-grounded, so images, audio signal will not be disturbed. At the same time, we can protect the DVR from static or inductive voltage damage.
- Do not remove audio/video cables and RS-484 when the DVR is powered on, or they will be damaged.



- Do not use the TV interface in the DVR video output (VOUT), or the DVR output circuit will be damaged easily.
- Do not turn off the power switch directly to shut down the DVR. Use the menu shutdown or OFF button on the front panel (press more than three seconds) to turn off the power automatically to avoid hard Drive crash.
- Keep the DVR away from heats and hot places.
- Keep the DVR chassis well-ventilated for better heat dissipation.
- Have regular checks and system maintenance.

## G. Appendix : Specifications

### 1. 16CH DVR

Video	Input	BNC Video	16 channel BNC(1Vp-p 75Ω)
	Output	VGA	Yes
		HD	Yes
		Analog CVBS	1 channel output
Audio	Input	6 channel input (Including Two-way Audio)	
	Output	1 channel output	
	audio format	G.711A	
Alarm	Sensor Input	4 channel inputs, can be normal open/normal close.	
	Alarm output	1 channel output(Sensor/motion/video loss)	
Live View	Frame Rate	16CH D1 Real-time(NTSC) / 16CH D1 Real-time(PAL)	
	Digital Zoom	Mouse drag to zoom randomly	
	Switching	Auto-switching: 5-120 seconds	
Recording	Compression	H.264	
	Resolution	960H	
	Frame per second	16 CH 960H @14FPS/CH(NTSC) ; 16 CH 960H @12FPS/CH (PAL) 16 CH D1 @30FPS/CH(NTSC) ; 16 CH D1 @25FPS/CH (PAL)	
	Recording quality	Worse, poor, fair, good, very good, Nice	
	Recording mode	Always, Schedule, Motion, Alarm, Manual.	
	Motion detection	By grid setting, motion area can be 192(16*12)blocks	
	Pre-recording	1-30 seconds	
	Post-recording	10-300 seconds	
Display mode			Full Screen, 4/8/9/16 CH Split Screen, Auto Switch
Backup	Formats	AVI/ User defined	
	Media interface	USB/network	
	Player	Yes, installing this player enables Windows Media Player to playback the recorded H.264 files	
Networking	Stream	D1/HD1/CIF / QCIF	
	Playback	YES	
	Network protocols	HTTP 、 DHCP 、 DDNS 、 NTP 、 SMTP 、 FTP 、 DNS 、 UPNP 、 PPPoE 、 IP rights 、 IPsearch	
	Browsers	IE 、 Chrome 、 Firefox 、 Safari	
Storage	Hard	Interface	SATA

	Drive	Capacity	Support single 4TB Drive
		SATA ports	Max. 2 disk
	Mirror		YES
	External storage		Support synchronized recording to USB storage
	File system		Stable reliable private file system
	S.M.A.R.T		Disk error check
User interface	Menu		Graphical user interface; VGA & CVBS at the same time
	Methods		Front panel, remote controller, mouse
Serial port	PTZ & keyboard		Pelco-D / Pelco-P ( RS-485)
Network port	Ethernet		1*RJ-45, 10/100 Base-T
	Web browsing		Live view, search/playback, backup, PTZ, remote setup/update
Other functions	Daylight saving time		YES
	Buzzer		Video loss, disk boot error
	Languages		Yes, more than 20 languages
	Firmware update		USB update, Remote Network update
	Network time protocol		YES
	Smart phone support	iPhone, Android	
		Support monitoring(including audio), playback.	
	Intelligent functions		YES. Motion detection, removals, entry/exiting detection
General Specifications	Operating conditions		0 to 46 °C, humidity 20 to 80%
	Power		DC 12V / 4.16A(AC100V~240V 50/60HZ)
	Net weight (total weight)		3kgs(not including HDD and Power Adapter)
	Dimensions		430mm x 314mm x 53mm (W x L x H)

★ Product specifications are subject to change without notice; please contact us for the latest information.



Manufacturer :

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