

**DVR-4**

**4-channel Digital Video Recorder**

**Manual**

## Security Notice

- **Power supply**

This Digital-Video-Recorder applies AC 90-240 voltage indoor power supply. The voltage of the power must be verified before using.

When the machine is not in use for a long time, pull out the plug from the socket and disconnect the power.

- **Security**

This machine is indoor equipment; in order to avoid dangers of short circuit or electric shock, please do not expose the machine in rain or moist environment. In case any solid or liquids get into the machine's case, please cut off the power supply immediately, and ask for qualified technicians to check the machine before restart.

This machine is precise instrument; do not attempt to repair any unit of the machine by yourself without technical aids. When there is any malfunction with the machine, please ask for qualified technicians to examine and repair, or contact the dealers in your area.

- **Installation**

Please choose appropriate site to install the machine, to ensure well ventilation around the machine to avoid the machine excessively hot. The machine cannot be installed near radiator and ventilating trunk etc. heat sources, or under straight sunshine, or dusty places or anywhere there is a chance for mechanical librations or impact.

- **Advice**

While recording TV programs or VCD programs, please don't pirate the third-party's authority and/or any other relative rights.

## Features of this DVR

- Video input: 4channels, video output: 2 channels.
- May choose any one of the four video channels for surveillance and recording; as well as four channels recording simultaneously.
- Three optional levels of image quality: high, normal, low. Frame rate change enable for recording.
- Modified MJPEG.
- Compatiple with NTSC and PAL format.
- Support alarm recording and time recording.
- Multi-function searches: be able to distinguish alarm records and time record from ordinary records; be able to search by time or by segment (previous segment, next segment, first segment and last segment, etc.).
- Support various playback modes: pause, and 2X/3X/4X fast forward and backward play.
- Automatic spot protection when power-off, automatic resume when power on.
- Four alarm input and one alarm output.
- Equipped remote device
- P.T.Z control enable.
- Totally independent from PC platform, thoroughly keeping away from shutdown caused by inappreciative operations, complicated management and operation, and virus infection.

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## System Setup

Before using the video recorder, the first step is to set up the system according to user's needs; otherwise the machine will run with the default setup.

### 1. Access menu

System Setup is achieved through entering menu, and then setting up on each option's window. The method to access the menu is at the idle state (stop state), to push menu button on the front panel, it will display password input window.



The password is a random combination of 6 digits of "0-9". To enter the menu below, you have to input the correct password by pushing the digital buttons. If the password you input is incorrect, the system will automatically return. If you don't want to input the password but give up the operation, you can push menu button to return. While inputting the password, in order to avoid being revealed to stander-bys, the password you input is displayed on the screen as "\*" signs.



To change the password, please refer to password change.

## 2. Setup methods of menu

While choosing in system setup menu or in various setup windows, push upward button or downward button, the cursor will move among those options, continuous pushing will make the cursor move among the options one by one, and it can recur.

While choosing digital fields (e.g. year, month, day, hour, minute, second etc), push leftward button or rightward button, the cursor can move leftward or rightward among the several digits of one field, continuous pushing will make it move among digits one by one, and it can recur.

Please push add or decrease button to change the value that the cursor point to.

## 3. Camera select

Push 1,2,3,4 or +- button to open or close the channels, for example,

When you choose ( - - - - ), all cameras will be disabled.

When you choose ( 1 2 3 4 ), all cameras will be operational.

When you choose ( - - - 4 ), only camera 4 will be operational.

When you choose ( 1 2 - 4 ), cameras 1, 2, and 4 will be operational.

If you open or close one camera, the camera record is automatically opened or closed.

## 4. Record select

Selecting camera channel on RECORD SELECT menu is as same as CAMERA SELECT options. Please remind that only selected camera will record events during recording period.

## 5. Record mode

There are two different record modes: EACH and QUAD.

When you set as “EACH” mode, you can view each image displayed in a single full screen by using the key buttons on the front of the DVR box. When you set as “QUAD” mode, you can only see the images from the cameras in a quad screen, which shows four sections on the single TV screen, in this mode the playback is real time record.

## 6. Record frame rate

Factory default setting is 30 (25 for PAL), Which means DVR records the events at the speed of 30 shots of frames per second. The higher the record frame rate, the more natural look will be displayed on the screen when you playback. The lower the record frame rate, the more you can save the space on the hard disk drive.

There are 10 different record frame rate sets that you can choose.

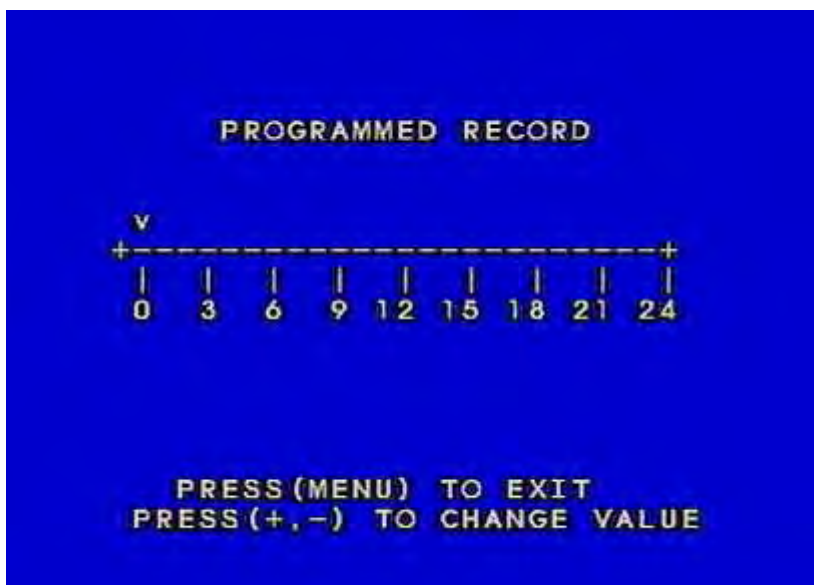
## 7. Video quality

There are three different video quality settings: NORMAL, LOW, HIGH. The higher the video quality, the clearer images when you playback. The lower the video quality, the more you can save the space on the hard disk drive.

## 8. Record schedule

When the cursor moves to record schedule, please push enter button, the record schedule

window will appear, which is illustrated as below. You change a recording schedule during a day (24-hour period) using this option.



0-24 instead of 24 hours of a day, each hour can be setup to one of three states: T (time), S (sensor), - (normal).

(T) this period is time scheduled, in time scheduled state (push the schedule button), this period will record automatically.

(S) this period is alarm scheduled, in alarm scheduled state (push the alarm button), this period will record automatically when there is an alarm input.

(-) this period will not record unless you push the record button.

Push leftward button or rightward button to move the cursor, push add or decrease button to change the value.

## 9. Hard drive setup

When the cursor moves to HARD DRIVE SETUP, then push enter button, the hard drive setup window will appear, which is illustrated as below. Push upward or downward button to move the cursor, push add or decrease button to change the value, push enter button to select.

**OVERWRITE ENABLED:** If you choose YES, recording continues and overwrite previous recording when hard disk drive space is full. If you choose NO, the recording session stops when all hard disk drive is full for recording.

**MASTER HDD SIZE:** It shows the size of the primary hard disk drive is full for recording.

**MASTER HDD USED:** It shows the space used on the first hard disk drive for recording.

**MASTER HDD FORMAT:** If you format the hard drive, it will erase all the data recorded on the first hard drive.

**SLAVE HDD SIZE:** It shows the size of the secondary hard disk drive is full for recording.

**SLAVE HDD USED:** It shows the space used on the secondary hard disk drive for recording.

**SLAVE HDD FORMAT:** If you format the hard drive, it will erase all the data recorded on the secondary hard drive.

N/A means there is no secondary hard drive.



You must enter correct password to format hard drive.

## 10. Sensor setup

When the cursor moves to SENSOR SETUP, then push enter button, the sensor setup window will appear, which is illustrated as below. Push upward or downward button to move the cursor, push add or decrease button to change the value.



**SENSOR RECORD TIME:** The number indicates how long sensor recording will last after the sensor indicates the movements in front of the camera.

**ALARM OUT TIME:** It controls how long the alarm will last after it sets off.

There are three different modes for sensor setting:

**NORMAL-OPEN:** if the cable line connected to the sensor is in short circuit, the sensor recording starts.

NORMAL-CLOSE: if the cable line connected to the sensor is cut off by an intruder, the sensor recording starts.

NOT-INSTALLED: the sensor recording does not work.

## 11. Sub menu

When the cursor moves to SUB MENU, then push enter button, the sub menu window will appear, which is illustrated as below, including PASSWORD CHANGE, TIME SET, PROTOCOL SET. Push select button to enter each sub menu.



## 12. Password change

When the cursor moves to PASSWORD CHANGE, then push enter button, the password change window will appear, which is illustrated as below.



To change password, you have to input six digits of current password, then input six digits of new password you want, then confirm the password, the confirm password must be same as the new password you input. When the new password is accepted, the board will flash the following screen message: "Password changing !!", the message will blink 5 times. Then the "SUB MENU" will return. If the password is not accepted, you will receive a message that informs you. The "SUB MENU" returns. You may try again by repeating the same steps.

The system's default password is "111111", In order to ensure system security, modifying the password is recommended strongly. Keep the password at a safe place is always very helpful.

### 13. Time set

When the cursor moves to TIME SET, then push enter button, the time set window will appear, which is illustrated as below.



Push leftward button or rightward button to move the cursor, push add or decrease button to change the value.

### 14. Protocol set

When the cursor moves to PROTOCOL SET, then push enter button, the protocol set window will appear, which is illustrated as below. Push upward or downward button to move the cursor, push "+" or "-" to change the value.

BAUDRATE: Can change from 1200bps to 19200bps. The default is 9600bps.

MAINBOARD PROTOCOL: The protocol that computer or keyboard control DVR, refer to appendix.

MAINBOARD ADDRESS: The address of the DVR for the mainboard protocol, can change from 0x00 to 0xff, default is 0x01.

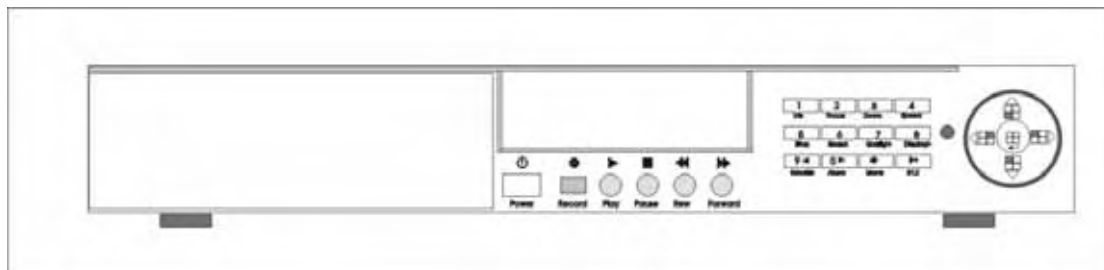
SPEEDDOME PROTOCOL: The protocol that DVR control speeddome, include pelco-p, pelco-d, vido, lilin, default is pelco-p.

SPEEDDOME ADDRESS: changable form 0x00 to 0xff, the default is 0x01. The default addresses of speeddome1 to speeddome4 are 0x01, 0x02, 0x03, 0x04.



## Buttons On the Front Panel

The front view of the video-recorder is illustrated as below.



### 1. Recording/Playing control buttons area

**Record:** It is manual recording button. Push this button to record video on hard disk, Re-push this button or push stop button, it will stop recording. So, this button is the switch button of manual recording and stopping recording operations. Recording and stop will work simultaneously on four channels' images. This button doesn't work while Time recording and Alarming recording.

**Play:** Push this button to start playing the video stored in hard disk, Re-push this button or push stop button, it will stop playing So, this button is the switch button of playing video and stopping playing operations. Playing and stop will work simultaneously on four channels' images. This button doesn't work while Time recording and Alarming recording.

**Pause:** Push this button to stop playing temporarily; push play button to continue to play.

**Rew:** Fast backward button. Push this button to start fast backward playing till push play button to start normal playing from the present position.

**Forward:** Fast forward button. Push this button to start fast forward playing till push play button to start normal playing from the present position. The fast backward has three speeds; every time you push the button will change the speed from slow to fast and then back to slow.

### 2. Function control area

**Iris/1 button:** While PTZ control state, push this button to select iris control. While inputting numbers, this button is used as numer key of "1".

**Focus/2:** While PTZ control state, push this button to select focus control. While inputting numbers, this button is used as numer key of "2".

**Zoom/3:** While PTZ control state, push this button to select zoom control. While inputting numbers, this button is used as numer key of "3".

**Speed/4 :** While PTZ control state, push this button to select iris control. While inputting numbers, this button is used as numer key of "4".

**Stop/5:** While recording or playing video, push this button to stop recording or playing. This button doesn't work while Time recording and Alarming recording. While inputting numbers, this

button is used as numer key of “5”.

**Search/6:** Push this button to enter search menu. While inputting numbers, this button is used as numer key of “6”.

**Quality/7/+:** Push this button to change picture quality. While inputting numbers, this button is used as numer key of “7”, When in system setup menu, this is an increase button.

**Display/8/-:** Push this button to display current information on the screen. When in system setup menu, this is a decrease button. While inputting numbers, this button is used as numer key of “8”.

**Schedule/Previous segment/9:** Press this button, the system starts the time setting function. Push “Time setting” button once to stop time setting operation. While playing, push this button, the system will jump directly to the head of the previous video segment and then begin to play. While inputting numbers, this button is used as numer key of “9”.

**Alarm/Next segment /0:** This button is used to put on guard, push one time to put on guard, push again to remove guard. While playing, push this button, the system will jump directly to the head of the next video segment and then begin to play. While inputting numbers, this button is used as numer key of “0”.

**Menu/First segment:** Push this button to enter system setup menu. While playing, push this button, the system will jump directly to the first segment and then begin to play

**PTZ/Last segment:** Push this button to enter PTZ control state, push once to control first speeddome, repush to second speeddome, then third, then forth, then quit PTZ control. While playing, push this button, the system will jump directly to the last segment and then begin to play.

### 3.Channel choosing control area

**First channel/up:** Push this button to see full screen display form channel 1. While selecting menu items, push this button to move up the cursor.

**Second channel/down:** Push this button to see full screen display form channel 1. While selecting menu items, push this button to move down the cursor.

**Third channel/left:** Push this button to see full screen display form channel 1. While selecting menu items, push this button to move the cursor leftward.

**Forth channel/right:** Push this button to see full screen display form channel 1. While selecting menu items, push this button to move right the cursor.

**Quad/enter:** Push this button to see full screen display form channel 1. While selecting menu items, push this button to select the item.

## Display statuses while running

### 1. Screen display while running



CH1-CH4 are the names of four channels. "OFF" means the fourth channel is set disabled.

### 2. Screen display while recording



■ : means this channel is recording now.

EACH: record mode.

[M]: current work hard drive is master hard drive. [S], slave

(-): normal record, (T): time record, (S): alarm record.

### 3.Screen display while playing



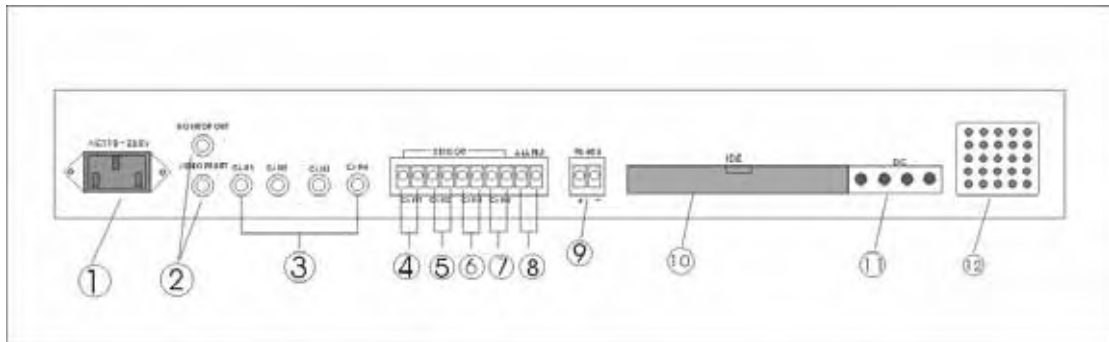
EACH: record mode.

[M]: current work hard drive is master hard drive. [S], slave

## System connection

### 1.Back panel and connection terminals

The power cord and input, output signal terminals are all at the back of the machine, the connections to monitor, camera etc equipments are all carried out through the terminals and sockets on the back panel. The back view of the machine is illustrated as below figure.



Each part of the back panel is illustrated as below:

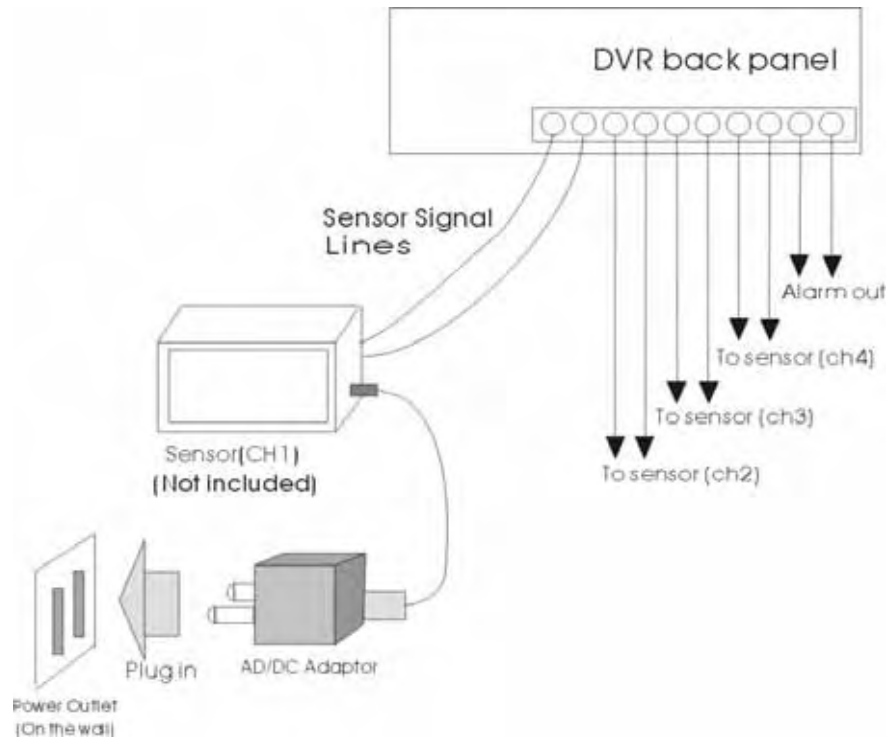
- 1.Power connector socket
- 2.Video output
- 3.Video input 1, 2, 3, 4
- 4.Sensor input(CH1)
- 5.Sensor input(CH2)
- 6.Sensor input(CH3)
- 7.Sensor input(CH4)
- 8.Alarm output
9. RS485 port.
- 10.IDE data port
- 11.IDE power
12. Ventilation outlet of fan

### 2.Sensor connection

The DVR has 4 sensor input for 4 channel. The sensor installation procedures are as follows. There are two simple steps for installation of cameras.

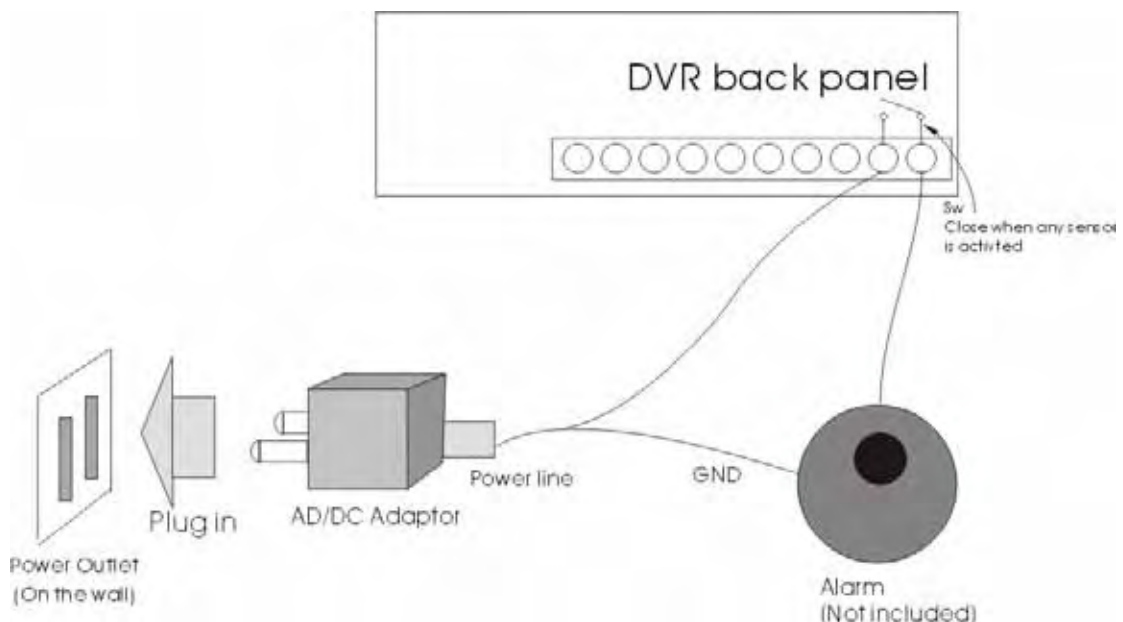
1. Connect the sensor signal line.
  2. Connect the sensor power line.
- Two lines are used for one sensor.

Flowing figure is the picture of the sensor installation. Now the sensor is ready to let DVR know if there is any movement.



### 3. Alarm connection

The DVR has 1 internal switch for sounding alarm when the sensor is activated due to the unwanted entrance of anonymous visitor. The switch is open at normal state, but when the alarm is activated, the switch is closed so that the alarm gets the power. The circuitry is as follows.



There are two simple steps for the installation of an alarm

1. Prepare the power supply
2. Connect the alarm power line.

Now the alarm is ready to sound alarm.

## User guideline

### 1.Start the machine

- Before starting the machine, please make sure all the items in the “**Security Notice**” at the beginning of this manual are fulfilled.
- Before starting the machine, please check the system connection, input and output equipment connection, and power connection.
- Please insure the video-recorder’s input video (NTSC/PAL) and the monitor (NTSC/PAL) meet the demands.
- Start exterior equipment after checking over.
- Insert the removable hard disk case to the end, and lock it up (turn right the hard disk lock); Push the power button, the machine start to work.
- If the machine stops abnormally while recording last time, then after restarting, the machine will ask you to restore the record by pushing enter button or abort by pushing menu button, hard disk can automatically clear up if you push enter button and then resumes to the status before power-off, and continue the interrupted recording. The time for hard disk resetting and clearing-up depends on the recorded information on the hard disk, which varies from ten seconds to a few minutes. So please wait patiently. If the machine stops abnormally during playing last time, it does not need automatic recovery function.

### 2.Turn off the machine

- Normally turn off the machine when the system shutdown, which means do not to turn off the machine while playing or system setting up, especially not to turn off the machine while recording (otherwise the system will start automatic recovery function when turn on next time).
- Push recording button to stop recording or push playing button to stop playing or exit from system setup menu, then turn off the power.
- It is best to turn off the video-recorder power first, and then turn off the power of external equipments.
- If do not use the video recorder for a long time, should pull out the power line from the electrical outlet.

### 3.Ordinary recording

- Connect the power to all related equipments; ensure that there is video input.
- Push display button to check spare space of the hard disk, if there is no much space,

please think whether to change hard disk first or select overwriting modes.

- Check recording parameter setup before recording; select video quality, frame rate. Or push quality button to select image quality, you cannot change record setting during the process of recording.
- Manual recordings belong to ordinal recording. Under the manual mode (non-watch-on status), you can choose certain channel image surveillance; here pushing record button will record this channel's single image video.
- Push the record button to begin recording, four channels will start simultaneously recording.
- During the process of recording, if the hard disk is full, and the system is set to automatic overwrite, then the recording will not be interrupted, and it begins to overwrite from the earliest recorded area; if the system is set to overwrite disable, it will stop recording when hard disk is full, the bottom right corner of the screen displays “\*” which shows disk overwriting.
- If the hard disk is used over 90% when you push the record button to record, the machine will inform you by blinking message. When over 99% of the hard disk while recording, the char [M] which instand master hard disk or [S] which instand slave hard disk will blink.

#### **4.Alarm recording**

- Alarm recording is not started by manually pushing record button, all the recording started by manually pushing the record button are ordinary record.
- Alarm recording can be activated by alarm input signal, so it is a must to check whether the connection of alarm input equipment is correct, stable and reliable before turning on the machine.
- The prerequisite condition of whether the alarm recording can be activated by exterior input signal or the changes of exterior environment is that the system must be set on guard and that period is set to “S” in record schedule setup, also, that channel must not be set to “NOT-INSTALLED” in sensor setup.
- Under the state of off-guard, system will never start alarm recording. Setting guard on or off is achieved through pushing the alarm button on the front panel, but not through system setup menu and window. Under watch-on situation, the character “alarmed” will display on the screen. You can push the display button to clear the character.
- Alarm video recording can not stop by pushing record or stop button, but can stop by removing guard. Because once the system is set on guard, the guard cannot be removed randomly, so there is a password protection to remove guard, only after inputting correct password, you can take guard off.

- Check alarm recording setup before recording, confirm the video quality and the frame rate, the record setting cannot change during recording process.
- In the process of alarm recording, any buttons do not work except alarm, schedule, display and channel select button.
- As long as the alarm input signal is effective, the alarm recording continues. When the alarm input signal loses efficacy, the time set up by “SENSOR RECORD TIME” becomes effective, and when the time goes out, the alarm recording automatically stops. In course of this, if you want to manually stop alarm recording, the only way is to first remove guard (answer the password).
- While the hard disk is full, it automatically overwrites the hard disk.

### **5. Time recording**

- Time recording starts and stops recording automatically according to the pre-arranged time period. It is applied to fixed timetable, for example, the periodical work time recording (or off time recording) with fixed start/stop time.
- Once timing recording function is set, it will work simultaneously on four channels, that is to say, four channels recording can only use the same timing setting, simultaneously starting and simultaneously stopping.
- To start Time recording function, besides making record schedule setup beforehand, must push down the schedule button on the front panel. While pushing down this button, the time recording symbol “SCHEDULED” will display on the screen. You can push the display button to clear the character. Without pushing the schedule button, the Time recording parameter setup will not work.
- In the process of alarm recording, no buttons work except alarm, schedule, display and channel select button. In time record state, you can repush schedule button then enter password to stop time recording.
- Because Time recording is correlated closely with time, so before using this function, should previously adjust the time.
- While the hard disk is full, it automatically overwrite the hard disk.

### **6. Playback**

- In the stop state, push play button , system begins to play the images recorded most recently.
- In the stop state, push play button will always play the images recorded most recently, no matter ordinary video or alarm video.
- In the process of playing, push pause button to pause playing, re-pushing play button can

resume continuous play.

- In the process of fast forward playing or fast backward playing, pushing pause button then push play button will begin normal playing from the current place.
- Continuous pushing forward button will change the fast-forward among three levels of speed(X2, X3, X4) circularly.
- Repush play button or push stop button will stop playing.

## 7.Search play

- In the stop state, pushing search button , time search window will display on the screen..



- HARD DRIVE: current working hard drive.
- 04/01/12 05:21:44 – 04/01/12 08:53:23 the start time and the end time of the record segment which the cursor point to.
- NO: the ID of each record segment.
- TYPE: the record type, which includes three types: normal, sensor, time.
- TIME: the record start time.
- Push upward or downward button to move cursor, leftward or rightward button to see next or previous page, then push enter button to play the record which the cursor points to.
- If the cursor points to the first record segment, push up button to enter search by time mode as below, push leftward or rightward button to move the cursor, push “+” or “-” to change time, then push enter button to play record from the time you select.
- In time search mode, push upward button to select hard disk if there are two more hard disk.
- Push search button to exit search play window.



## 8.Remote control



- All the function of the DVR can be operated by the remote device.

## **9.PTZ control**

- This DVR can control all speeddome which are connected to the DVR.
- To control the speeddome, make sure all the lins are correctly connected, first you must set the right protocol, baud rate, and speeddome's address, please refer to protocol set.
- For example, you connect the first speeddome to channel one, you have to make sure that the baud rate, the protocol, and speeddome1's address is the same as the speeddome you connect to the channel.
- Now you can control the speeddome, push the PTZ button, the character "PTZ CAM 1" will appear on the screen, that means you are now controlling the speeddome connected to channel one. Push the button again to control the speeddome that connect to the channel two, the character "PTZ CAM 2" will appear on the screen, the same to channel three, channel four. Then push the PTZ button one more time to exit from PTZ control.
- During the PTZ control state, you can push upward, downward, leftward, rightward button to move the speeddome, and push the enter button to stop. If you push the Iris button, the character "Iris" will appear on the screen, then you can push the add and decrease button to change the iris, the same to control the focus, zoom, and speed, also push enter button to stop.

## **10.Serial port control**

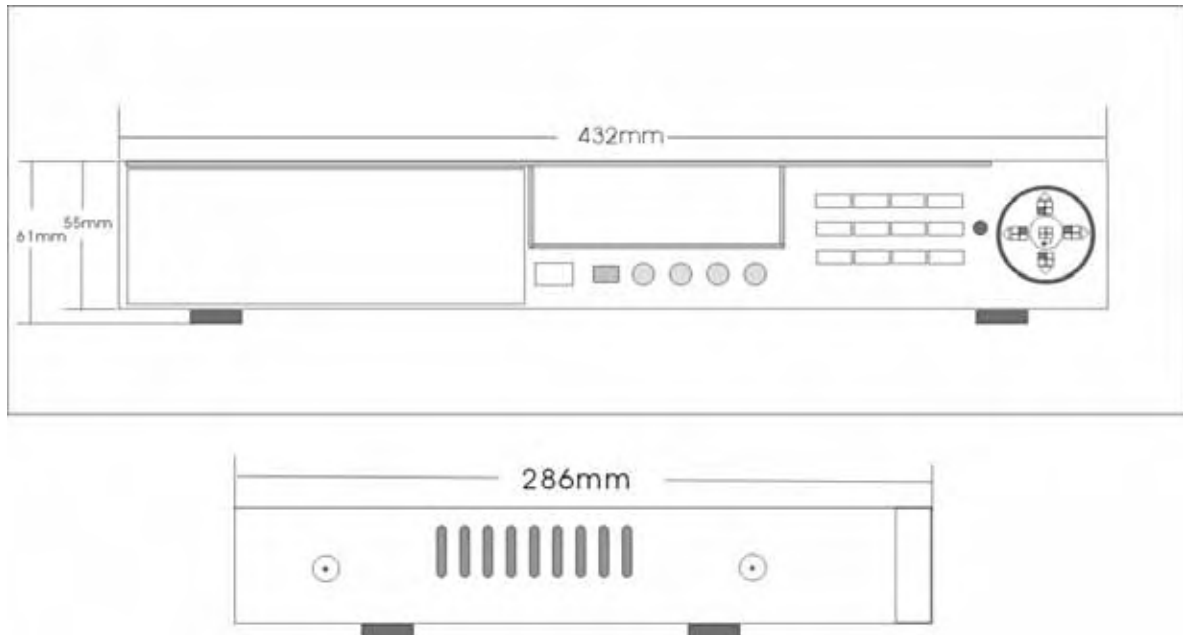
- You can also control the DVR by a keyboard or a compute through the RS485 port.
- To control the DVR through the RS485, you have to make sure the protocol and baud rate is the same, please refer to appendix A.

## Main standard & parameter chart

Item	Specification
Video signal	NTSC/PAL
Video input	Composite : 1.0V p-p/75 , BNC × 4
Video output	Composite : 1.0V p-p/75 , BNC × 2
Alarm input	4
Alarm output	1
Compression standard	Modified MJPEG
Hard disk	Support two hard disk up to 120G each
Record time	18-1680 hours/40G
Electron clock	Year/Month/Day ; Hour/Minute/Second
Secrete function	Password protection
Power source	AC90V~240V
Power	25W
Environment temperature	Work Temperature : +5 ~+50 ; humidity : < 90% Store Temperature : -20 ~+70 ; humidity : < 95%
Exterior size	432 × 55 × 286mm
Weight	About 3.2Kg

**Notice: Sorry for not inform in time of any changes to the standards and exterior sizes.**

## Exterior size



## Incase list

### Incase list

Name	Quantity
4-channel hard disk video recorder	1
Remote device	1
Power wire	1
Keys to removable hard disk control lock	2
User guideline	1

In case of any question, please do not hesitate to contact the dealer directly.

## Appendix A: serial port protocol

Serial port setting: BAUD, n, 8, 1(BAUD =1200,2400,4800,9600,19200)

**PTC1:** (three byte)

Command (CHAR)	Hexadecimal Number	Function Description
/RE	0x2F 0x52 0x54	record
/TP	0x2F 0x54 0x50	play
/PE	0x2F 0x50 0x45	pause
/RT	0x2F 0x52 0x54	reward
/FT	0x2F 0x46 0x54	forward
/RS	0x2F 0x52 0x53	Iris/1
/FS	0x2F 0x46 0x53	Focus/2
/ZM	0x2F 0x56 0x4d	Zoom/3
/SD	0x2F 0x53 0x44	Speed/4
/SP	0x2F 0x53 0x50....	Stop/5
/SR	0x2F 0x53 0x52	Search/6
/QY	0x2F 0x51 0x59	Quality/7/+
/DY	0x2F 0x44 0x59	Display/8/-
/SE	0x2F 0x53 0x45	Schedule/9/preview segment
/SR	0x2F 0x53 0x52	Alarm/0/next segment
/AF	0x2F 0x41 0x46	Menu/first segment
/DM	0x2F 0x44 0x4d	PTZ/last segment
/01	0x2F 0x30 0x31	ch1/up
/02	0x2F 0x30 0x32	Ch2/down
/03	0x2F 0x30 0x33	Ch3/left
/04	0x2F 0x30 0x34	Ch4/right
/22	0x2F 0x32 0x32	Chall/enter

**PTC2:** (seven byte)

Transmitting S.N	Transmitting worth	Instructions
Byte1	0x03	Fixed byte
Byte2	0xaa	DVR identifier word
Byte3	0x01	Fixed byte
Byte4	Device id	DVR device address
Byte5~7	Refer to PTC 1	Same command as PTC 1

**PTC3:** (seven byte)

Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
0xFF	Addr	<i>Var1</i>	<i>Var2</i>			Check sum

Var1	Var2	function
0x00	0x08	Ch1/up
0x00	0x10	Ch2/down
0x00	0x04	Ch3/left
0x00	0x02	Ch4/right
0x04	0x00	Chall/enter
0x00	0x40	Record
0x00	0x20	Play
0x02	0x00	Menu
0x00	0x80	Quality/+
0x01	0x00	Display/-

Byte 5 and byte 6 are random value from 0x00 to 0xff.

Byte 7 = mod [(byte2 + byte3 + byte4 + byte5 + byte6)/100]

**Note:** This protocol is the same as PELCO-D, which is used to control speeddome. So, if you use PELCO-D to control speeddome by a keyboard, you can also use the keyboard to control the DVR through this protocol, we can use different address to distinguish the DVR and the speeddome.

**PTC4:** (eight byte)

Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
0xa0	Addr	0x00	0x07	0x00	<i>Var</i>	0xAF	Checksum

Byte8 = byte1 xor byte2 xor byte3 xor byte4 xor byte5 xor byte6 xor byte7

Var	Function	Var	Function
0x01	Ch1/up	0x0C	Schedule/9/preview segment
0x02	Ch2/down	0x0D	Alarm/0/next segment
0x03	Ch3/left	0x0E	Menu/first segment
0x04	Ch4/right	0x0F	PTZ/last segment
0x05	Chall/enter	0x10	Iris/1
0x06	record	0x11	Focus/2
0x07	Play	0x12	Zoom/3
0x08	Pause	0x13	Speed/4
0x09	Reward	0x14	Stop/5
0x0A	Forward	0x15	Search/6
0x0B	Stop	0x16	Quality/7/+

## Appendix B: record time for 40G hard disk(hour)

NTSC		30 fps	15 fps	7 fps	1 fps
Display format	Quality				
Quad screen	HIGH	18	36	72	540
	NORMAL	24	48	96	870
	LOW	29	58	116	870
Each screen	HIGH	32	64	128	960
	NORMAL	45	90	180	1350
	LOW	56	112	224	1680
PAL		25fps	12 fps	6 fps	1 fps
Display format	Quality				
Quad screen	HIGH	19	38	76	475
	NORMAL	24	48	96	600
	LOW	30	60	120	750
Each screen	HIGH	31	62	124	775
	NORMAL	45	90	180	1125
	LOW	59	118	236	1475

**NOTE:**

1. A jumper setting on the main board may be used to convert the operation format from NTSC to PAL, or vice versa.

2. RESET(Initialization): To make the board to reset. Press pause button 8 times. Be aware that all the information (including the password) will be lost. After resetting, the password will be set as the default value(111111).

3. You have to use hard disk with 7200 RPM for the highest frame rate recording.

4. If you use two hard disk, you have to set the right jumper for master hard disk and slave hard disk.