Embedded DVR

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Part I
1 **Product Introduction**

Thank you for purchasing our Embedded Net DVR. This manual is applicable for the Aventura DHE Series Net DVR. Please read this User Manual carefully to ensure that you can use the device correctly and safely. The contents of this Manual are subject to change without notice.

1.1 **Summary**

The Aventura DHE- Series network digital video recorder is an excellent digital surveillance product. It uses the embedded MCU and the embedded operating system (RTOS), combining the most advanced technology in the information industry such as: video and audio encoding/decoding, hard disk record, and TCP/IP. The firmware is burned in the flash, and is more stable and reliable.

The Aventura DHE- Series device has both the features of a digital video recorder (DVR) and a digital video server (DVS). It can work stand alone, and can also be used to build a powerful surveillance network, widely used in banks, telecommunication, transportation, factories, warehouse, and irrigation.

1.2 **Features**

**Compression**
- Supports 16 channel video input (PAL/NTSC) at most. Each channel is independent, H.264 hardware compression, and real time (PAL: 25 FPS, NTSC: 30FPS). Supports both variable bitrate and variable frame rate.
- Supports 16 channel audio input at most. Each channel is independent, OggVorbis compression and bitrate is 16Kbps.
- Compressed video and audio are synchronous. You can select either mixed stream, or only video stream.
- Supports 4CIF, DCIF, 2CIF, CIF, and QCIF resolution.
- Supports multi-area motion detection.
- Supports OSD and changeable OSD position.
- Supports LOGO and changeable LOGO position.

**Local Functions**

**Record**
- Supports multiple record type, including real time, manual record, motion detection, external alarm, motion&alarm, and motion|alarm.
- Supports 8 SATA HDD’s and each HDD can support a maximum of 200GB.
- Supports a FAT32 file system.
- Supports cycle or no cycle record.
- Supports backup for the recorded files and clips. Supports USB memory, USB HDD, USB CD-R/W, USB DVD-R/W, and SATA HDD for backup.

**Preview and Playback**
- Supports BNC analog monitor and VGA output for main output
- Supports one aux video and audio input
- Supports multiple preview modes.
- Supports sensitive area mask.
- Supports camera spiteful block alarm.
- Supports 2-channel synchronous playback. Supports play forward, backward, pause, and frame by frame.
- Supports playback by files, or by time.
- Displays local record status.

**PTZ**
- Supports many types of the PTZ protocol.
- Supports preset, sequence, and cruise.
Alarms
- Supports exception alarm, motion detection alarm, and external alarm.

Others
- Supports IR control.
- Supports RS-485 keyboard.
- Supports multi-level user management.

Network
- Supports TCP, UDP, RTP, and Multicast for network preview.
- Supports PPPoE for broad band dial-up.
- Supports PSTN for narrow band dial-up.
- Supports remote parameter setup.
- Alarm information can be sent to the remote center.
- Network control of the PTZ.
- Network record the real time stream.
- Network download and playback the recorded files in the DVR.
- Remote upgrade the firmware.
- RS-232 supports transparent channel function, so that the remote PC can use the DVR to control serial devices.
- Supports bi-directional voice talk or one-way voice broadcast.
- Support Internet Explorer to preview and configure the DVR.
- Supports log.

Development Support
- Provide network SDK.
- Provide client demo source code.
2 Installation

Warning: Before you install the DVR, please make sure that the power of the DVR is switched off.

2.1 Checking the DVR and Its Accessories

When you get the product, check that all the items are included in your product package. There is a list in the package. If any of the items are missing, please contact your dealer.

2.2 HDD Installation

Installation Notice
The DVR has no HDD when leaving the factory. Based on the record schedule, you can calculate the total capacity you need (refer to Appendix A). Please ask the specialist to disassemble the DVR and install the HDD.

Installation Instrument
One-cross screw driver.

HDD Installation
1. Open the DVR box.
2. Take off the HDD mounting plate.
3. Place the HDD on the mounting plate and fix it with a screw.
4. Fix the mounting plate in the DVR.
5. Connect the ATA data cable correctly. The cable has three connectors for the DVR main board, master HDD, and slave HDD.
6. Plug in the HDD power connector.
7. Cover and fix the DVR box.

NOTE: After you install the HDD, you must format them. Please refer to Section 6.4.

2.3 Rear Panel Description

Notice: Please refer to the product for a different model.
### 2.3.1 4-Channel Rear Panel

<table>
<thead>
<tr>
<th>Index</th>
<th>Physical Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Video Input</td>
<td>Standard BNC.</td>
</tr>
<tr>
<td></td>
<td>Audio Input</td>
<td>Standard BNC.</td>
</tr>
<tr>
<td>2</td>
<td>Main Video Output</td>
<td>Connect CCTV monitor, output video, and menu.</td>
</tr>
<tr>
<td></td>
<td>Main Audio Output</td>
<td>Local audio output.</td>
</tr>
<tr>
<td>3</td>
<td>Aux Video Output</td>
<td>Spot monitor for video preview and playback.</td>
</tr>
<tr>
<td></td>
<td>Aux Audio Output</td>
<td>Spot monitor for audio preview and playback.</td>
</tr>
<tr>
<td></td>
<td>Line In</td>
<td>Audio line input for voice talk.</td>
</tr>
<tr>
<td></td>
<td>USB Interface</td>
<td>USB memory disk, USB HDD, USB CD-R/W, USB DVD, or USB mouse</td>
</tr>
<tr>
<td>4</td>
<td>VGA Interface</td>
<td>VGA display.</td>
</tr>
<tr>
<td>5</td>
<td>Keyboard Interface</td>
<td>One is for the CAM-PTZ-KB-PTZ01 keyboard, and the other is for the DVR cascade. Using Pin 3 and Pin 4.</td>
</tr>
<tr>
<td></td>
<td>RS-232</td>
<td>Connect the RS-232 devices. Refer to Appendix B for pin definition.</td>
</tr>
<tr>
<td></td>
<td>UTP Network Interface</td>
<td>Connect the network devices. Refer to Appendix B for pin definition.</td>
</tr>
<tr>
<td>6</td>
<td>SW1</td>
<td>RS-485 terminal resistor switch. Default is off. The resistor is 120Ohm.</td>
</tr>
<tr>
<td></td>
<td>RS-485</td>
<td>PTZ connection. Using T+/T- to connect the PTZ.</td>
</tr>
<tr>
<td></td>
<td>External Alarm Input</td>
<td>4 Sensor Alarm In.</td>
</tr>
<tr>
<td></td>
<td>Relay Output</td>
<td>2 Relay Output.</td>
</tr>
<tr>
<td>Index</td>
<td>Physical Interface</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Video Input</td>
<td>Standard BNC.</td>
</tr>
<tr>
<td></td>
<td>Audio Input</td>
<td>Standard BNC.</td>
</tr>
<tr>
<td>2</td>
<td>Main video Output</td>
<td>Connect CCTV monitor, output video, and menu.</td>
</tr>
<tr>
<td></td>
<td>Main audio Output</td>
<td>Local audio output.</td>
</tr>
<tr>
<td>3</td>
<td>Line In</td>
<td>Audio line input for voice talk.</td>
</tr>
<tr>
<td></td>
<td>USB Interface</td>
<td>USB memory disk, USB HDD, USB CD-R/W, USB DVD, or USB mouse</td>
</tr>
<tr>
<td>4</td>
<td>VGA Interface</td>
<td>VGA display.</td>
</tr>
<tr>
<td>5</td>
<td>Keyboard Interface</td>
<td>One is for the CAM-PTZ-KB-PTZ01 keyboard, and the other is for the DVR cascade. Using Pin 3 and Pin 4.</td>
</tr>
<tr>
<td></td>
<td>RS-232</td>
<td>Connect the RS-232 devices. Refer to the Appendix B for pin definition.</td>
</tr>
<tr>
<td></td>
<td>UTP Network Interface</td>
<td>Connect network devices. Refer to the Appendix B for pin definition.</td>
</tr>
</tbody>
</table>

**Embedded DVR**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>8</td>
<td>AC Input</td>
<td>100-240VAC</td>
</tr>
<tr>
<td>9</td>
<td>E-SATA</td>
<td>Optional. Extend 1st internal SATA to E-SATA.</td>
</tr>
</tbody>
</table>

**2.3.2 4-Channel Rear Panel**

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2.3.3 8-Channel/16-Channel Rear Panel

<table>
<thead>
<tr>
<th>Index</th>
<th>Physical Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Video Input</td>
<td>Standard BNC.</td>
</tr>
<tr>
<td></td>
<td>Audio Input</td>
<td>Standard BNC.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Aux Video Output</td>
<td>Spot monitor for video preview and playback.</td>
</tr>
<tr>
<td></td>
<td>Aux Audio Output</td>
<td>Spot monitor for audio preview and playback.</td>
</tr>
<tr>
<td>3</td>
<td>Main Video Output</td>
<td>Main monitor for video and menu.</td>
</tr>
<tr>
<td></td>
<td>Main Audio Output</td>
<td>Main monitor for audio preview and playback.</td>
</tr>
<tr>
<td>4</td>
<td>Line In</td>
<td>Audio line input for voice talk.</td>
</tr>
<tr>
<td>5</td>
<td>VGA Interface</td>
<td>VGA display.</td>
</tr>
<tr>
<td>6</td>
<td>RS-232</td>
<td>Connect RS-232 devices. Refer to the Appendix B for pin definition.</td>
</tr>
<tr>
<td></td>
<td>UTP Network Interface</td>
<td>Connect network devices. Refer to the Appendix B for pin definition.</td>
</tr>
<tr>
<td>7</td>
<td>USB Interface</td>
<td>USB memory disk, USB HDD, USB CD-R/W, USB DVD, or USB mouse.</td>
</tr>
<tr>
<td>8</td>
<td>E-SATA</td>
<td>Optional. Extend 1st internal SATA to E-SATA.</td>
</tr>
<tr>
<td>9</td>
<td>SW1</td>
<td>RS-485 terminal resistor switch. Default is off. The resistor is 120Ohm.</td>
</tr>
<tr>
<td>10</td>
<td>RS-485</td>
<td>PTZ connection. Using T+/T- to connect PTZ.</td>
</tr>
<tr>
<td></td>
<td>Keyboard Interface</td>
<td>Using D+/D- for keyboard and DVR cascade connection.</td>
</tr>
<tr>
<td></td>
<td>External Alarm Input</td>
<td>16 Sensor Alarm In.</td>
</tr>
<tr>
<td></td>
<td>Relay Output</td>
<td>4 Relay Output.</td>
</tr>
<tr>
<td>11</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>12</td>
<td>AC Input</td>
<td>100-240VAC</td>
</tr>
</tbody>
</table>
2.4 External Alarm In/Out Connection

Alarm input port (drip node):
G (GND): Connect the GND of sensor.
1-8: Alarm input, support normal open/normal close.
0: Reserved.

Alarm output:
1G-4G: 4 relay output.

Alarm Output Connection

Please note the usage of jumper JJ1. If you use DC, either connection is OK. We suggest use of the DC under 12V, 1A.

If you use AC, please open the jumper. There are 4 jumpers (JJ1, JJ2, JJ3, and JJ4) in the DVR main board, corresponding with 4 alarm output. The default is closed.

Warning: If you use AC input for relay output, please open the jumpers.
Part III
3 Operational Instructions

3.1 Front Panel

This is the front panel of the DHE-Series Net DVR

<table>
<thead>
<tr>
<th>Index</th>
<th>Type</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>IR receiver.</td>
</tr>
<tr>
<td>1</td>
<td>Status</td>
<td>1-8</td>
<td>Show channel 1-8 status. Green means recording; Red means network transmission; Orange means recording and network transmission. Light twinkle and red means the corresponding HDD has an error.</td>
</tr>
<tr>
<td></td>
<td>Lights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Status</td>
<td>9-16</td>
<td>Show channel 9-16 status. Green means recording; Red means network transmission; Orange means recording and network transmission.</td>
</tr>
<tr>
<td></td>
<td>Lights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>POWER</td>
<td>POWER</td>
<td>Device switch with power indicator light. Green means that the DVR is working; Red means that the DVR is powered off; No light means that there is no power supplied.</td>
</tr>
<tr>
<td>3</td>
<td>Status</td>
<td>READY</td>
<td>DVR is ready.</td>
</tr>
<tr>
<td></td>
<td>Lights</td>
<td>STATUS</td>
<td>Green means that you can use the IR remote control.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ALARM</td>
<td>Red means that there is an alarm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MODEM</td>
<td>Green means that the modem connection and dial-up was successful.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HDD</td>
<td>Twinkle in red means reading or writing HDD.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LINK</td>
<td>Green means network is OK.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tx/Rx</td>
<td>Twinkle in green means data is being transmitted.</td>
</tr>
</tbody>
</table>
| 4 | Compound Keys | MENU | 1. Switch preview mode into menu;  
2. Brush control short key [WIPER].  
   Cancel and back to the parent menu.  
ESC | 1. Local playback;  
2. [AUTO] in PTZ mode.  
PLAY | 1. Manual record;  
2. [SHOT] in PTZ mode (adjust preset).  
REC | 1. In the edit state, delete current cursor character;  
EDIT | 2. [IRIS+] in PTZ control;  
   1. Select √ or × to enable or disable.  
PTZ | 1. Enter into PTZ control mode;  
A | 2. [IRIS-] in PTZ control.  
PREV | 1. Input switch (number, lower case, upper case, and symbol)  
INFO | 2. [FOCUS+] in PTZ control;  
Main/Aux | 3. In preview mode, display or hide the channel status bar.  
| | 1. Multi-screen preview switch;  
| | 2. Switch menu mode into preview;  
| | 3. [FOCUS-] in PTZ control.  
| | [ZOOM+] in PTZ control.  
| | 1. [ZOOM-] in PTZ control.  
| | 2. Switch main/aux video output control mode.  

| 5 | Input Keys | Numeric Keys | Input number, lower case, upper case characters, and symbols.  
F1 | [LIGHT] in the PTZ control.  
F2 | [AUX] in the PTZ control.  

| 6 | Control Keys | Directional Keys | Composed of [↑],[↓],[←]and[→].  
ENTER | 1. Menu mode, use[←]/[→] to select [↑]/[↓] to edit;  
| | 2. PTZ directional control;  
| | 3. Playback speed control.  
| | 1. Menu confirmation;  
| | 2. Select √ " or "×" to enable or disable;  
| | 3. Pause playback.  
| | 4. Multi-screen preview switch;  
| | 5. Switch menu mode into preview;  
| | 6. [FOCUS-] in PTZ control.  
| | 7. Switch main/aux video output control mode.  

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3.2 IR Controller

<table>
<thead>
<tr>
<th>Index</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>POWER</td>
<td>Turn off device.</td>
</tr>
<tr>
<td>2</td>
<td>DEV</td>
<td>Enable/Disable IR remote control</td>
</tr>
<tr>
<td>3</td>
<td>Numeric Keys</td>
<td>Same as numeric keys on the front panel.</td>
</tr>
<tr>
<td>4</td>
<td>EDIT</td>
<td>Same as [EDIT] key on the front panel.</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>Same as [A] key on the front panel.</td>
</tr>
<tr>
<td>6</td>
<td>REC</td>
<td>Same as [REC] key on the front panel.</td>
</tr>
<tr>
<td>7</td>
<td>PLAY</td>
<td>Same as [PLAY] key on the front panel.</td>
</tr>
<tr>
<td>8</td>
<td>INFO</td>
<td>Same as [INFO] key on the front panel.</td>
</tr>
<tr>
<td>9</td>
<td>VOIP</td>
<td>Same as [Main/Aux] key on the front panel.</td>
</tr>
<tr>
<td>10</td>
<td>MENU</td>
<td>Same as [MENU] key on the front panel.</td>
</tr>
<tr>
<td>11</td>
<td>PREV</td>
<td>Same as [PREV] key on the front panel.</td>
</tr>
<tr>
<td>12</td>
<td>Directional Keys</td>
<td>Same as directional keys and the Enter key on the front panel.</td>
</tr>
</tbody>
</table>
### Loading the Batteries Into the IR Controller

1. Remove the battery cover.
2. Insert the battery. Please take care that the poles (+ and -) are correctly positioned.
3. Replace the battery cover.

### Start to Use IR Controller

Press the [DEV] key, and input the DVR device ID (The default is “88”, and can be changed in the “Display” menu) and then press the [ENTER] key. If the “STATUS” light of the DVR front panel is turned into green, and it means you can use the IR controller to operate this DVR.

### Stop Using IR Controller

When the IR controller status is on, press the [DEV] key again, and the “STATUS” light will be turned off. The IR controller cannot control this DVR.

### Switch the DVR Off

When the IR controller status is on, press the [POWER] key for several seconds, and the DVR will be powered off.

### When the IR Controller Cannot Work Normally

- Check battery poles.
- Check the remaining charge in the batteries.
- Check IR controller sensor is mask.

**NOTE:** Please change another IR controller to try again. If the problem is still exists, please contact an administrator.
## 3.3 Menu Description

### 3.3.1 Menu Items

<table>
<thead>
<tr>
<th>Menu Name</th>
<th>Function</th>
<th>Menu Name</th>
<th>Function</th>
</tr>
</thead>
</table>
| Display   | Video standard  
Brightness  
Menu transparency  
Unit name  
Device ID  
Require password  
Screen saver time  
VGA resolution  
Date and Time | Image | Camera name and position setup  
Adjust Brightness, Contrast, Hue and Saturation  
OSD Display mode, position and OSD format setup  
Mask area setup  
View tampering area and response setup  
Video signal loss  
Motion detection sensitivity, area and response setup |
| Recording | Overwrite/Stop recording  
Resolution and recording parameters setup  
Record schedule  
PreRecord time  
PostRecord time | Network | DVR IP address  
DNS IP  
Multicast IP address  
Remote host IP and port  
NAS IP and directory  
PPPoE username and password |
| Alarms | Alarm input type (Normal open/normal close)  
Alarm response and PTZ linkage  
Alarm output and schedule | Exceptions | Exceptions type  
Exceptions response |
| PTZ | PTZ parameters  
Preset setup  
Sequence setup  
Cruise setup | RS-232 | RS-232 parameters  
RS-232 work mode |
| Preview | Preview mode  
Switch time  
Enable/Disable audio preview  
Preview layout | User Password | Add or delete user  
Password setup or modification  
User rights setup |
| Transaction | Text input mode  
ATM IP address  
ATM type  
Text information | Utilities | Restore parameters  
Upgrade firmware  
HDD management  
Clear alarm output  
Reboot  
Power off  
View log  
System information |
3.3.2 Menu Operation

How to Enter into the Menu mode:
- Press [MENU] key to enter into the DVR main menu.
- Press [PLAY] short key to enter into the playback menu.
- Press [REC] short key to enter into the record menu.
- Press [PTZ] short key to enter into the PTZ control interface.

NOTES: You must input username and password. The default username is “admin” and the password is “12345”.

Main Menu Description
The main menu interface is as follows:

There is one small rectangular frame named “Active Frame”. It can be moved from one icon to another by using [>] or [<] keys. When the “Active Frame” is located on one icon, you can press the [ENTER] key to enter the secondary menu. For example, move the “Active Frame” to the “Image” icon, and press [ENTER] into the secondary menu as follows:

Each menu contains different kinds of items. There is a small rectangular frame named “Active Frame” which is pointing to the selected item. This “Active Frame” can be moved by [>] or [<] keys. There are such types of menu items:

a) Check Box: Provides 2 options, “✓” means enable and “✗” means disable. You can use [ENTER] or [EDIT] key to switch over.
b) List Box: Provides more than 2 options. However, only one of them can be selected. You can use [↑] and [↓] to select one option. For example, on the right side of “Select Camera”, there is a list box for you to
select one camera.

c) **Edit Box:** This is for you to input characters. Press the [EDIT] key so, you can input the characters as follows:

i. Press [A] key to select number, upper case, lower case, or symbols;
ii. Use [>] and [<] keys to move cursor;
iii. Use [EDIT] key to delete the character in front of the cursor;
iv. Press [ENTER] or [ESC] to exit edit.

d) **Button:** Execute a special function or enter into the next sub-menu. For example, press the “Policy” button to enter into the sub-menu. Press [Confirm] to save the parameters and return to the parent menu. Press the [Cancel] button to cancel, and return to the parent menu. The button in grey means it can be operated only after it is enabled.

**How to Exit Menu**

Press the [PREV] key to exit menu and return to the preview mode.

### 3.4 Character Input

In the menu interface, if you enter into the edit status (For example, in the “camera name” edit box), at the bottom of the screen, the input status appears:

```
  Number       admin  2005-07-05 10:26:31
```

This means you can press the numeric keys to input a digital number.

Press the [A] key to change the input methods. You can select “**Number, Uppercase, Lowercase, or Symbol**”.

- **Uppercase**

```
  Uppercase       admin  2005-07-05 10:30:38
```

- **Lowercase**

```
  Lowercase       admin  2005-07-05 10:30:42
```

- **Symbol**

```
  Symbol  1 2 3 4 5 6 7 8 9 0  a b c d e f g h i j k l m n o p q r s t u v w x y z
```

There are 24 symbols in all. They are divided into 4 pages, and you can use the [0] key to turn over page.
Part IV
4 Basic Operation Guide

4.1 Power On

NOTE: Please make sure that the power supply matches the DVR and AC cable connected correctly. Before you switch the DVR on, please connect one monitor with VOUT or VGA interface. Otherwise, you cannot see the graphic user interface and it cannot operate.

If [POWER] light is off, please do as follows:
   Step 1: Connect the AC cable correctly;
   Step 2: Switch on the power button on the real panel.

If the [POWER] light is in red, just press the [POWER] button to start the DVR.

When the DVR has started, the [POWER] light is in green. On the monitor or VGA display, the DSP and HDD initialization process will be shown.
   The first line represents DSP initialization. If the DSP icon is “×”, it means that the DSP has initialized an error, please contact the administrator at once.
   The second line represents HDD initialization. Icons of IDE1 master and slave HDD’s, IDE2 master, and slave HDD’s are displayed. If the HDD icon is “×”, it means that the corresponding HDD is not installed, or not detected. If the HDD is not detected, please contact the administrator.

NOTE: If the HDD is not installed or not detected, the DVR will beep for an alarm. You can disable the alarm option in the “Exceptions” menu.

4.2 Preview

The DVR will enter into the preview mode after it has started.
On the preview screen, you can see date, time, camera name, and camera status icon.
NOTE: Set system date and time in the “Display” menu, referring to 5.2.9; Change camera name in “Image” menu, referring to 5.3.2.

In the screen, it will display record and alarm status of each camera. This type of status will switch over automatically.
Press the [A] key to display or hide the camera status bar.

Camera record status is as follows:
### Embedded DVR

<table>
<thead>
<tr>
<th>Icon</th>
<th>Icon Color</th>
<th>Status Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="White Icon" /></td>
<td>White</td>
<td>No video signal</td>
</tr>
<tr>
<td><img src="image" alt="Yellow Icon" /></td>
<td>Yellow</td>
<td>Video input</td>
</tr>
<tr>
<td><img src="image" alt="Pink Icon" /></td>
<td>Pink</td>
<td>Manual recording</td>
</tr>
<tr>
<td><img src="image" alt="Green Icon" /></td>
<td>Green</td>
<td>Real time recording</td>
</tr>
<tr>
<td><img src="image" alt="Blue Icon" /></td>
<td>Blue</td>
<td>Motion detect recording</td>
</tr>
<tr>
<td><img src="image" alt="Red Icon" /></td>
<td>Red</td>
<td>External alarm recording</td>
</tr>
</tbody>
</table>

Camera alarm status is as follows:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Icon Color</th>
<th>Status Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="White Icon" /></td>
<td>White</td>
<td>Video signal lost</td>
</tr>
<tr>
<td><img src="image" alt="Yellow Icon" /></td>
<td>Yellow</td>
<td>View tampering alarm</td>
</tr>
<tr>
<td><img src="image" alt="Pink Icon" /></td>
<td>Pink</td>
<td>Motion&amp;External alarm</td>
</tr>
</tbody>
</table>

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Press the numeric keys to switch over the individual camera preview. If the DVR has less than 10 channels, press one numeric key to switch to the corresponding channel. For example, press the [2] key to preview the 2nd camera. If the DVR has 10, or more than 10 channels, press two numeric keys to switch to the corresponding channel. For example, press [0][2] to preview the 2nd camera, and press [1] [2] keys to preview the 12th camera.

Press the [EDIT] key for manual cycle preview. You can set the auto-preview mode in the “Preview” menu, referring to 5.11.

Press the [PREV] key to switch to multi-screen preview.

4.3 Username and Password

NOTE: When DVR is delivered from the factory, there is only one default administrator named “admin”, and the password is “12345”. The administrator’s name cannot be modified, while the password can be modified. The administrator can create 15 users and define their user rights.

Login
Login dialog is as follows:

Use [↑] / [↓] keys to select one user, press the [→] key to enter into the “Password” edit box. Input corresponding password, press [ENTER] key to exit edit box. The “Active Frame” will be moved to the “Confirm” button. Press the [ENTER] key into the main menu. If there is a beeper alarm, it means that the username and password are not matched. After three error messages, the DVR will enter into the preview mode.

Modify Password
For those users created by an admin, they can modify their password as follows:

Step 1: Enter into the Main Menu
Press [MENU] key in the login dialog, select your username, input the correct password, so you can enter into the main menu.
Step 2: Enter Into the Password Modification Menu
Move the “Active Frame” to the “Password” icon by using [→]/[←] keys. Press [ENTER] into the following password menu:

Step 3: Input the New Password
Press [EDIT] key into the edit box. You can use numeric keys to input the new password. The password can be null. It can also be 16 numbers. Press [ENTER] to exit the edit box, and move to the “Verify” item to input the verify password.

NOTE: In the edit box, use [→]/[←] to move the cursor, and [EDIT] key to delete the number in front of the cursor.

Step 4: Modify the Password Successfully
Move the “Active Frame” to the “Confirm” button, and press the [ENTER] key. If the password is modified successfully, you will get to the main menu. Or, an error dialog will pop up. You can repeat step 3 to modify
4.4 PTZ Control

NOTE: The user must have the “PTZ control” right.

PTZ Control Interface

In the preview mode, press the [PTZ] key, in the login dialog, and select one username and input the correct password, so you can enter into the PTZ control interface.
In the menu mode, press the [PTZ] key, so you can enter into the PTZ control interface directly.

There is a “PTZ Control” prompt in the PTZ control interface. The displayed camera name means which channel’s PTZ is under control. For example, “Camera 01” means you are controlling the 1st PTZ camera.

Select Channel

In the PTZ control mode, you can press numeric keys to select channel. If the DVR has less than 10 channels, press one numeric key to select. For example, press the [2] key to select the 2nd PTZ camera. If the DVR has 10, or more than 10 channels, you must press two numeric keys to select. For example, press [0][2] to select the 2nd PTZ camera, and press [1][2] to select the 12th PTZ camera.
After you select the PTZ camera, you can use the short keys to control the PTZ.

PTZ Control Keys Description

Directional control keys: [↑], [↓], [←], [→];
ZOOM control keys: [ZOOM+], [ZOOM-];
FOCUS control keys: [FOCUS+], [FOCUS-];
IRIS control keys: [IRIS+], [IRIS-];
Adjust preset keys: [REC/SHOT];
Auto control key: [PLAY/AUTO];
Wiper control key: [WIPER/MENU];
Light control key: [LIGHT/F1];
Auxiliary device control key: [AUX/F2]

Adjust Preset Description

In the PTZ control mode, press [REC/SHOT] key, and press the preset number (three numeric keys), and the DVR will adjust to the corresponding preset number. Repeat pressing [REC/SHOT] key, and press the preset number, so the DVR will adjust that preset number.
When you exit the PTZ control mode, the camera will stay at the current position.  
**Note:** The PTZ preset number is set already. Please refer to the PTZ menu for preset setup. V1.4 firmware can support up to 128 preset numbers.

### Start/Stop Auto in the PTZ Control Mode

In the PTZ control mode, press [PLAY/AUTO] key to start PTZ auto-function. Press [PLAY/AUTO] key again to stop.  
When the PTZ is in auto-mode, if you exit the PTZ control mode, the PTZ will continue auto-function. You must enter into the PTZ control mode again, and press [PLAY/AUTO] key to stop.

### Exit the PTZ Control Mode

Press [ESC] or [ENTER] to exit and return to the preview mode.

### 4.5 Manual Record

**Note:** The user must have the corresponding right. The DVR has HDD and the HDD is formatted already.

**Manual Record**

In the preview mode, press [REC] key, in the pop-up login dialog, select the name and input the correct password, you can enter into the “Manual Record” interface.  
In the menu mode, press the [REC] key into the “Manual Record” interface directly.

#### Description

The Manual record interface has the following: channel number, channel status, start/stop record, start all, and stop all buttons.  
**Channel:** The channel number of the DVR.  
**Status:** Channel work status has 4 scenarios: means idle. Green means the channel is recording (including real time recording, alarm recording, and motion detection recording). Red means network transmission. Orange means both recording and network transmission.  
**Start/Stop:** “✓” means you can start corresponding with channel recording. “×” means you can stop recording.  
**Start All:** Press this button to start all channel recording.  
**Stop All:** Press this button to stop all channel recording.

#### Exit Manual Record

Press the [ESC] key into the preview mode. Press [MENU] key into the main menu. Press [PLAY] key to enter into the playback menu. Press [PTZ] key into the PTZ control mode.
4.6  Playback

Note: The user must have “Playback” rights.

Playback Interface
In the preview mode, press the [PLAY] key, in the pop-up login dialog, select username and input the correct password, so you can enter into the “Playback” interface.
In the menu mode, press [PLAY] key, so you can enter into the “Playback” interface directly.

One-Channel Playback

Two-Channel Playback

Description
If the DVR only supports one channel playback, you cannot select the second channel. If the DVR can support two channel playback, you can select the second channel.

Main Channel: Use [↑] or [↓] key to select one channel.

Second: If the DVR supports 2-channel playback, you can use [↑] or [↓] key to select the second channel, except the main channel. These two channels can playback synchronously. If you select the second channel as none, only the main channel will play back.

Rec Type: Use [↑] or [↓] to select recorded file type. The file type options have “All, All Time, Motion Detect, Alarm and Manual”.

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**Time Section:** You can define the search time section. Move the “Active Frame” to the time edit box, and use numeric keys to input the detail time.

**Card Number:** The DVR can receive the text number through RS-232, or network port. The text is sent from devices such as: ATM machine, POS machine, or others. The DVR can overlay the text on the real time image and record. You can use the text to search the recorded files and play them back. Use the numeric keys to input the text number.

**Search:** Search the matched recorded files and display them in the list box. If there is not a matched file, and a corresponding dialog box will pop-up.

**Play by Time:** Playback the recorded stream directly based on the time section.

**Select Page:** In the file list box, each page will only display 8 files. If the matched files are more than 8, you can select a page to list other files. (500 pages / 4000 files) can be searched at one time. You can use numeric keys, or [↑] [↓] keys to select page.

**File List Box:** List the matched files. File start time, and file size are displayed in the list box. You can use [↑] [↓] keys to move the scroll bar to select file.

**Backup Devices:** You can select USB flash, USB HDD, USB CD-R/W, or IDE CD-R/W to backup the files, or clips.

**Copy:** Start to backup.

**Backup Today:** Backup all recorded files of today.

**Three kinds of playback mode:**

1. **Search and playback file:** In the playback interface, you can select the main channel, second channel (2-channel playback), record type, and time section. Move the “Active Frame” to the “Search” button and press [ENTER] key, so that the DVR will search and list the matched files.

   ![Playback Interface](image)

   If the matched files are more than 8, you can use “Page No.” to select the page (use numeric keys or [↑] [↓] keys to select page). In the file list box, use [↑] [↓] keys to move the scroll bar to the file, and press the [ENTER] key to playback the file. If the second channel is selected, these two channels can playback synchronously. If the DVR cannot find the matched files, a failure dialog will pop-up.

2. **Playback by Time:** In the playback interface, select the main channel, second channel (2-channel playback), record type, and time section, move the “Active Frame” to the “Play” button, and press the [ENTER] key, and the DVR will start to playback based on the time section.
3. Search by Card No. and Playback file: In the playback interface, select main channel, second channel (2-channel playback), record type, enable Card No. search option ("P") and input the card number, move "Active Frame" to "Search" button, press [ENTER] key, and the DVR will search and list the matched files. If the matched files are more than 8, you can use numeric keys or 

keys to select page. Use 

keys to move the scroll bar to the file, and press [ENTER] to playback the selected file. If the DVR cannot find the matched file, a message dialog will pop-up.

Operation When Playback

Playback picture:

One-Channel Playback

Two-Channel Playback

At the bottom of image, there is an information bar and the following information is included: Volume, Play Progress, Play Speed, Play Time, and File Total Time.

- Display/Hide information bar: [MENU]
- Open/Close sound: [PLAY]
- Adjust play progress: [←] (Backward), [→] (Forward). The unit is "%".
- Adjust play speed: Normal speed is "1x". Use [↑] to increase play speed (2X, 4X, 8X, and MAX). Use [↓] to decrease play speed (1/2X, 1/4X, 1/8X and Frame by Frame)
- Pause/Continue: Press [ENTER] to pause/continue playback. If played frame by frame, Press [ENTER] to play one frame.
- Copy segment: [EDIT]
- Exit: [ESC]
- Playback switch: When in 2-channel playback, press [PREV] to switch between main channel and second channel.

**NOTE:** When the DVR is busy, if you select high play speed, there may be a difference in actual play speed.

**Exit Playback**

In the playback interface, press the [ESC] key into the preview mode.
In the playback interface, press the [MENU] key into the main menu, and press [REC] into manual record, and press the [PTZ] key into the PTZ control mode.

### 4.7 Backup Recorded Files

**NOTE:** The user must have “Playback” rights. Please connect with backup devices before you start to backup.

In the playback interface, you can backup the recorded files.
In the preview mode, press [PLAY] key, in the login dialog, select username and input the correct password, so you can enter into the playback interface.
In the menu mode, just press the [PLAY] key, so you can enter into the playback interface directly.

**Backup Intraday Recorded Files**

In the playback interface, move the “Active Frame” to the “Backup Today” button, and press the [ENTER] key, so all intraday recorded files of all channels will backup to the save device. A pop-up dialog will display the backup status.
If the backup device is not connected correctly, or the DVR does not detect the backup device, the following dialog will pop-up. Please ask the administrator for more information.

**Backup the Files That Match Your Requirement**

**Step 1: Search the Matched Files**
In the playback interface, select one channel and record type, input the time section, move “Active Frame” to the “Search” button, and press [ENTER] key, so the DVR will start to find and list the matched files.
Step 2: Select the Files that You Want to Backup
In the file list box, use [↑] or [↓] keys to move the scroll bar. When the scroll bar stays at the file you want to backup, press the [EDIT] key to select it. The symbol “v” is the selection tag. You can use the same method to select other files you want to backup. After complete, you can go to the next step.

Step 3: Select Backup Device
Please confirm the backup device: USB flash memory, USB HDD, USB CD-R/W, or IDE CD-R/W, and select the corresponding backup device.

Step 4: Start and Finish Backup
Move “Active Frame” to “Save” button and press [ENTER] key to start backup.
When backup is started, corresponding message box will pop-up to indicate the result.

Backup Video Segment

You also can backup the image segments when the image is being played back. The steps are:
1) Enter into the interface of playback of the files or playback by time;
2) Press the [EDIT] key to start selecting the current playback image, and press [EDIT] again to stop selecting. This segment is selected;
3) You can repeat step 2 to select many segments. 30 segments can be selected in all;
4) After you select all segments, press the [ESC] key, and a message window will pop-up. If you press the “Confirm” button, the DVR will start to backup the selected segments. If you press the “Cancel” button the DVR will abort backup.

NOTE: The backup function is effective when two channels playback synchronously. In such a case, each channel can backup 30 segments, so 60 segments can backup the two channels.

Playback the Video Segment

You can use our file player software to playback the video segment in the PC. You can find the player software in the attached CD.

Exit Playback Interface

Please refer to Chapter 4.6.
4.8 Shutting Down the DVR

NOTE: Do not switch off the power directly in case of damaging HDD. The correct step is using “Power Off” in the “Utilities” menu, or [POWER] key on the front panel or on IR controller.

Shut Down DVR Normally

Use [MENU] key to enter into the “Utilities” menu, move the “Active Frame” to the “Power Off” button and enter into the power off dialog, and press “Confirm” to shut down the DVR.

Use [POWER] Key on the Front Panel of the IR Controller

Press [POWER] key for more than 3 seconds. In the preview mode, a login dialog will pop-up, select username and input password, press [Enter] to enter into power off dialog and press “Confirm” to shut down DVR. If you receive an error password three times, the DVR will return to the preview mode. In the menu mode, if the user has the “Utilities” right, you can enter into the power off dialog, and press “Confirm” to shut down the DVR. Otherwise, the user cannot shut down the DVR.

If the DVR has shut down correctly, the [POWER] light is in red.

NOTE: When the message of “Shut down” appears, please do not press the [POWER] key anymore, otherwise, the DVR cannot be shut down.

Shutting Down the DVR Incorrectly

Using the Power Switch on the Panel
When the DVR has run, if you switch off the power the HDD in the DVR will be damaged. Please avoid such an operation.

Take Away the Power Cable
Please avoid taking away the power cable directly.

NOTE: In some cases, when the power supply is not working properly, the DVR will be damaged. We suggest the use of stable power supplies.
Part V
5 Main and Aux Output Function

5.1 Main and Aux Output

The Aventura DHE- Series Net DVR has one main output and one aux output. You can use the main video output to enter into the DVR menu as follows, while aux output cannot display the DVR menu.

NOTE: The aux output can support DVR local preview, local playback, and local PTZ control. Press [Main/Aux] button to switch between “Main” output and “Aux” output control mode.

5.2 Main and Aux Output Preview

You can use the “Main” output to enter into the DVR menu, setup both “Main” and “Aux” output preview properties. Please press [Main/Aux] button to enter into the “Main” output control mode, and then press the [Menu] button to enter into the DVR menu, as the main video output will display the following DVR menu:

Move the “Active Frame” to the “Preview” icon and press [ENTER] to into the “Preview” menu:
You can select out to setup main output and aux output respectively.

**Preview mode:** For the preview mode item, you can use [↑] [↓] keys to select one mode. If the DVR has only 1 channel, you can select only “1 Screen” option. If the DVR has 4 channels, there are “1 Screen” and “4 Screen” options. If the DVR has more than 4, but less than 9 channels, there are “1 Screen”, “4 Screen”, and “9 Screen” options. If the DVR has 16 channels, there are “1 Screen”, “4 Screen”, “9 Screen”, “12 Screen”, and “16 Screen” options.

**Switch time:** This is image preview switch time. You can use [↑] [↓] keys to select switch time. There are many options, including “5 Seconds”, “10 Seconds”, “20 Seconds”, “30 Seconds”, “1 Minute”, “2 Minutes”, “5 Minutes”, and “Never”. If you select “Never”, the preview image will not be switched automatically. For example, with a 16 channel DVR, if you select “4 Screen” preview mode and “20 Second” switch time, the DVR will cycle display a different 4-channel-set every 20 seconds on each one of the 4 screen.

**Audio preview:** If you enable audio preview (“✓”), when you preview a single camera, the DVR will play the audio of that channel.

**Preview layout setup:** There is a square frame divided into many windows. If you select “4 Screen” preview mode, this frame is divided into 4 windows. Each window represents one camera. You can move “Active
Frame" among the windows. There is one bar under the square to display the preview order of all cameras. First, select the biggest screen preview mode. For example, with a 16-channel DVR, select “16 Screen” preview mode, so that all windows display in the square. Secondly, move the “Active Frame” to one of these windows, and press the numeric keys to input the camera index (If the DVR has less than 10 channels, just use one numeric key, otherwise, use 2 numeric keys). The small window will display that camera number. In this way, you can change the display order. If you press 0 or 00, then the corresponding window will not display live video.

After you define the camera preview order, you can select the preview mode to meet your demands. **Save setup:** Press the “Confirm” button to save the preview configuration. Press “Cancel” or [ESC] key to abort.

Whether in “Main” or “Aux” output control mode, you can press the [PREV] button into a live preview and change the preview screen mode.

### 5.3 Main and Aux Output Playback

Both “Main” and “Aux” output can be used to playback the recorded files on the DVR HDD. Press the [Main/Aux] button to enter into the “Main” or “Aux” control mode, and press the [PLAY] button to enter into the “Playback” menu. Please refer to the “User Manual of the Aventura Technologies Embedded Net DVR” for playback information.

You can use the “Main” output to playback one channel and “Aux” output to playback another channel at the same time.

### 5.4 Main or Aux Output to Control the PTZ

You can press [Main/Aux] button to enter into the “Main” or “Aux” output control mode and press the [PTZ] button to control one PTZ. Please refer to the “User Manual of the Embedded Net DVR” for PTZ control information.

**Please note if you enter into the “PTZ” control mode, the [Main/Aux] button is not effective until you press [ESC] button to exit the PTZ control mode.**

Only the users that have “Parameter Setup” rights need to read this chapter. When the following parameters are modified and saved, you must re-boot the DVR to make the new parameters take effect. Other parameters do not need to re-boot.
Part VI
6 Parameters Setup Guide

Only the users that have “Parameter Setup” rights need to read this chapter. When the following parameters are modified and saved, you must re-boot the DVR to make the new parameters take effect. Other parameters do not need to re-boot.

- Any network parameters
- Stream type, resolution, and record schedule
- External alarm sensor type
- View tampering alarm schedule
- Video lost alarm schedule
- Motion detection alarm schedule
- External alarm schedule
- Alarm output schedule
- Transaction
- RS-232 work mode
- Change video output standard

6.1 Administrator and Password

When the DVR is left from the factory, there is one default administrator. The name is “admin” and the password is “12345”. The name cannot be changed, while the password can be changed.

Password Modification

Press [MENU] key in the login dialog, and select the username as “admin”, use [→] key, and move cursor to the password edit box, input “12345”, and press “Confirm” to enter into the administrator menu.

Move the “Active Frame” to the “User” icon, and press the [ENTER] key into the “User Management” menu.
In the username list box, only “admin” exists. You can use [→] key, and move the “Active Frame” to the password edit box, and press the [EDIT] key into the edit status. Press numeric keys to input the new password. The password is only combined by a maximum of 16 numbers. After you finish inputting the password, press the [ENTER] key to exit. Move the “Active Frame” to the “Verify password” edit box, and input the verify password. Move the “Active Frame” to the “Confirm” button, and press [ENTER]. If the password and verify password are the same, the password will be saved and taken into effect. If the password and verify password are not the same, a warning message box will appear.

In this case, press [ENTER] to return to the password edit box, and input the new password again.

6.2 Add and Delete User

Enter into the “User Management” interface.

Add User
The steps are as follows:

Step 1: Enter into the “User Management” Menu
Please refer to Chapter 5.1
Step 2: Add New Username
In the “User Management” menu, move the “Active Frame” to the “Add” button and press [ENTER], in the pop-up dialog, input the new username (refer to Chapter 3.4), and press [ENTER] and return to the “User Management” menu. (15 users can be added in all.)

Step 3: Setup the Password for a New User
After you add one new user, the password is null. You can skip this step if you do not want to change the password.
In the users list box of the “User Management” menu, use [↑] [↓] keys to select the new username, and then use [→] key to the password edit box. Press the [EDIT] key into the edit box, and use numeric keys to input the new password.

Step 4: Setup the Rights for the New User
The new added user does not have any operational rights. You must set up rights for them.
In the users list box of the “User Management” menu, use [↑] [↓] keys to select the new username, and then use the [→] key to the “Default Rights” button, and press [ENTER], as the user will have the default rights. The default rights include: local playback, remote playback, and view log.
If you want to define the detail rights, move the “Active Frame” to the “Setup Rights” button and press [ENTER] into the set rights menu as follows:
Operational rights are divided into “Local Rights” and “Remote Rights”. You can assign the necessary rights to the user. Use [→] [←] key to move the “Active Frame” to the corresponding rights item, and press [ENTER] or the [EDIT] key to enable or disable the item. “✓” means assigning the right to that user. After you finish, press the “Enter” button, and the user’s rights will be saved and return to the “User Management” menu. If you press the “Cancel” button, the user’s rights will be aborted.

**Step 5: Save the New User’s Password and Rights**

In the “User Management” menu, press the “Confirm” button, and the user’s password and rights will be saved and return to the main menu. If you press the “Cancel” button, the user’s password and rights will be aborted.

**User Rights Description**

“Local Rights”:
- Local rights are for local operation, such as the operation using the front panel, IR controller, and RS-485 keyboard.
- **PTZ Control**: Locally control the PTZ;
- **Record**: Manual start/stop recording;
- **Playback**: Local playback and backup the recorded files;
- **Parameter Setup**: Locally setup the DVR parameters;
- **Log**: Locally view the log on the DVR;
- **Utilities**: Locally upgrade firmware, format HDD, re-boot the DVR, and shut down the DVR.

“Remote Rights”:
- **PTZ Control**: Remote control the PTZ;
- **Record**: Remote manual start/stop recording;
- **Playback**: Remote playback, download the recorded files on the DVR;
- **Parameters Setup**: Remote setup the DVR parameters;
- **Log**: Remote view the log on DVR;
- **Utilities**: Remote upgrade firmware, format HDD, reboot DVR, and shut down the DVR.
- **Voice**: Client communicates with the DVR;
- **Preview**: Network live preview;
- **Alarm**: Remote control DVR alarm output;
- **Local Video Out**: Remote control DVR video output;
- **Com Control**: DVR RS-232 transparent channel function.

**MAC Address**

The MAC address is not the address of the DVR, but the PC that will access the DVR. If you setup the MAC address, only the PC with this specific MAC address can access this DVR. At PC end, in the DOS prompt, you can use the “ipconfig” command to get the PC MAC address (6 bytes).
Delete User

In the “User Management” interface, you can use [↑] [↓] keys to select one user, then use [→], move the “Active Frame” to the “Del” button, and press [ENTER] in the pop-up confirmation dialog, and press the “Confirm” button to delete the selected user and return. Press “Cancel” or [ESC] to abort deleting.

6.3 Unit Name and Device ID

Unit Name

In the “Display” menu:

There is an item named “Unit Name”. The default unit name is “Embedded Net DVR”. Move the “Active Frame” to the unit name edit box, and press the [EDIT] key into the edit status, so you can modify the unit name. Please refer to Chapter 3.4 for the input of characters. Press the [ENTER] key to finish modification. Select the “Confirm” button and press [ENTER], so you can save the new unit name and make it into effect. Press the “Cancel” button or [ESC] key to abort modification.

Device ID:

When you use the IR controller to operate the DVR, you must use the device ID to select the DVR. The default device ID of the DVR is “88”. If there are more than one DVR in one place, please define the different device ID for each DVR. Otherwise, the IR controller will control all DVR units with the same device ID at the same time.

In the “Display” menu, move the “Active Frame” to the device ID edit box in the edit status, so you can use numeric keys to input a new device ID. The device ID value ranges from: 01-100.

After you finish the modification, press the “Confirm” button to save, and take effect, or press “Cancel” to abort the modification.
6.4 Video Output Standard and VGA Setup

**Video Output Standard**

There is one VOUT BNC connector at the rear panel of the DVR. It is used to connect with an analog monitor and can support PAL or NTSC video output. You can modify the video output standard to match the video input.

In the “Display” menu:

There is a list box named “Video Output Standard”, so you can use [↑] [↓] keys to select PAL or NTSC video output.

**VGA Setup**

There is one VGA interface at the rear panel of the DVR. You can use it to connect with the VGA display. You can define VGA resolution, and refresh frequency in the “Display” menu.

There are the following options: 1024 x 768/60Hz, 800 x 600/60Hz, and 800 x 600/75Hz. You can use [↑] [↓] keys to select.

Press the “Confirm” button to Save, or “Cancel” to abort.

6.5 OSD Setup

OSD is the abbreviation of “On Screen Display”. For our embedded DVRDVS, it includes: displaying system time and camera name.

The OSD settings include: system time, time format, time display position, camera name, and camera name display position.

**System Time**

In the “Display” menu, you can setup the DVR system date and time.
Display System Time

You can setup the display properties for each camera, including display status, position, and format. Of course, you can copy the properties of one camera to all cameras.

In the “Image Setup” menu as follows, select one camera:

**Display Mode:** There are several display modes: Opaque&Steady, Transparent&Steady, Transparent&Flashing, and Opaque&Flashing, move the “Active Frame” to the “OSD” item, so you can select one mode.

**Display Position and Format:** Move the “Active Frame” to the “Position” button on the right side of the “OSD”, press [ENTER] into the setup image, you can find there are 22 x 18 (for NTSC, 22 x 15) small panes, and OSD position is in red. You can use [↓] [↑] [→] [←] keys to move the OSD position. Press the [EDIT] key to select the OSD format.

There are the following OSD formats:
- MM DD YYYY W hh:mm:ss (default)
- MM DD YYYY hh:mm ss
- YYYY MM DD W hh:mm:ss
- YYYY MM DD hh:mm:ss

Here YYYY means year, MM means month, DD means day, W means weekday, hh means hour, mm means minute, and ss means second. Press [ENTER] to save and return to the “Image” menu, or press [ESC] to abort modification.
Copy parameters: After you setup the properties of one camera, you can copy it’s parameters to any other camera, or all cameras.

After you save the modification, you can find the modification will be taken into effect. You can press the “Cancel” button, or [ESC] key to abort.

Camera Name

In the “Image Setup” menu, you can define the name for each camera. Please note that the camera’s name cannot be copied.

The steps of the camera name setup:

**Step 1:** Select one camera.
**Step 2:** Move the “Active Frame” to the camera name edit box, and press the [EDIT] key to enter into the edit status, so you can input the digital number, uppercase, and lowercase characters (Refer to Chapter 3.4). The camera name can support 32 characters.
**Step 3:** Press the [ENTER] key to exit the edit status.

Move the “Active Frame” to the “Confirm” button, and press [ENTER] to save the modification, and you can see the new camera name. Press the “Cancel” button, or the [ESC] key to abort.

Setup Camera Name Position

If you do not want to display the camera name, just disable the check box beside the camera name edit box. The disable flag is “X”. If you enable the check box, you can setup the camera name position. You can copy the position to any other camera. The setup steps are:

**Step 1:** Enter into the “Image Setup” menu.
**Step 2:** Select one camera.
**Step 3:** Enable the check box on the right side of the camera name, and then you can move the “Active Frame” to the “Position” button, and press [ENTER] into the camera name position setup interface. In that interface, you can use [↑] [↓] [→] [←] keys to move the camera name position. When the position is fixed, press [ENTER] and return to the “Image Setup” menu, and press the “Confirm” button to save it. In the “Image Setup” menu, press the “Cancel” button, or the [ESC] key, so you can abort the modification.

6.6 Video Parameters Setup

For different camera and different background, in order to get the best video image, you will need to adjust video parameters such as: brightness, saturation, contrast, and hue. You can setup the camera individually, and you can also copy the video parameters of one camera to any other cameras. Here are the setup steps:
Step 1: Enter into the “Image Setup” menu:

Step 2: Select camera: Please use [↑][↓] keys to select one camera.

Step 3: Adjust brightness, contrast, saturation, and hue: Move the “Active Frame” to the “Adjust” button on the right side of Brightness, Contrast, Saturation, and Hue, and press the [ENTER] key, so you will enter into the corresponding adjust interface. In the adjust interface, there is one scroll bar at the bottom, so you can use [↑][↓]keys to adjust and can find the video image that will be changed at the same time. When you are satisfied with the real time video image, press [ENTER] to return to the “Image Setup” menu.

Step 4: You can copy the video parameters of the current camera to any other cameras. You can repeat step 2 and step 3 to adjust for any other camera.

After adjust, in the “Image Setup” menu, press the “Confirm” button to save parameters and make them effective. Otherwise, press the “Cancel” button, or [ESC] key to abort modification.

6.7 Mask Area Setup

In some cases, you may want to mask the sensitive area. This area will not preview and record. The mask area setup steps are as follows:

Step 1: Enter into the “Image Setup” Menu:

Step 2: Select One Camera: You can use[↑][↓]keys to select one camera.
Step 3: Enter into the Mask Area Setup Interface: Enable the check box beside the “Privacy Mask” item, so you can press the [EDIT] key to change the flag into “✓”, and activate the “Area” button. Move the “Active Frame” to the “Area” button on the right side of the mask check box, and press the [ENTER] key into the mask area setup interface.

Step 4: Setup Mask Area: In the mask area setup interface, there is one small yellow pane on the upper left side. For PAL camera, the whole screen is divided into 22 x 18 panes (22 x 15 for NTSC), you can use [↑][↓] [←][→] keys to move the yellow pane to your desired position and press the [EDIT] key, as the yellow pane will turn into red, and then you can use [↑][↓][←][→] keys to extend the red pane. This red area is the mask area.
After you confirm the red mask area, press the [EDIT] key to save the mask area. Press the [ESC] key to cancel the mask area. The maximum mask area size is 8 x 8 panes and the minimum size is only one pane. You can setup 4 mask areas at a maximum.
After you finish setup, press the [ENTER] key to return to the “Image Setup” menu. You can press [A] key to clear all mask areas.

Step 5: Save Mask Area: You can repeat step 2, step 3, and step 4 to setup the mask area for other cameras. In the “Image Setup” menu, press the “Confirm” button to save the mask area, and press the “Cancel” button to abort.

Here is the example for the mask area function.

If you disable the mask check box, you can cancel the mask area.
6.8 View Tampering Alarm

If you enable this function, when someone blocks the camera spitefully, the DVR will produce a warning alarm.

**Step 1: Enter into the “Image Setup” Menu:**

**Step 2: Select Camera:** Please use [↑][↓] keys to select one camera.

**Step 3: Select Sensitivity:** You can use [↑][↓] keys to select the sensitivity for the “View Tampering” item. The sensitivity options are: Low, Normal, and High. Select one of them to activate the “Area Setup” and “Policy Setup” function.

**Step 4: View Tampering Area Setup:** Move the “Active Frame” to the “Area” button, and press the [ENTER] key into the area setup interface. The setup methods are the same as that of the mask area setup. After setup of the area, press the [ENTER] key to return to the “Image Setup” menu. You can press the [ESC] key to abort.

**NOTE:** Only one view tampering area can be set up.

**Step 5: View Tampering Alarm Setup:** In the “Image Setup” menu, move the “Active Frame” to the “Policy” button, and press the [ENTER] key into the “View Tampering Handle” menu:

**Step 6: Alarm Schedule Setup:** When there is view tampering alarm occurs, the DVR will handle the alarm based on the schedule. You can set 4 periods for each day one week. Also, you can copy the schedule of one day to other days.

**NOTE:** Time periods cannot be repeated. Please re-boot the DVR to make the parameters into effect.
Step 7: Setup Alarm Policy: If view tampering alarm occurred in the schedule the DVR will respond based on the policy. You can select one or more solutions including: “On Screen Warning, Audible Warning, Upload to Center, and Trigger Alarm Output”. You can use [↑][↓] and the [EDIT] key to enable or disable them. “×” is disable and “✓” is enable.

Step 8: Save Alarm Setup: After your setup, press the “Confirm” button and return to the “Image Setup” interface. In the “Image Setup” menu, press the “Confirm” button to save current camera parameters and return to the main menu.

Step 9: Save All Cameras: If you want to setup other cameras, please repeat from step 2 to step 8. In the “Image Setup” menu, press the “Confirm” key to save all camera parameters. Press the “Cancel” button, or [ESC] key to abort.

Select the “Off” option for “View Tampering”, so you can delete the view tampering area.

**NOTE:** Only one view tampering area can be setup for each camera. The view tampering area cannot be copied. If the schedule is modified, you must re-boot the device to make the parameters effective.

6.9 Video Loss Alarm

When the video cable or camera has something wrong, the video image is lost. If you enable the video loss alarm, in such a case, the DVR will make an alarm.

**Step 1: Enter into the “Image Setup” Menu:**

**Step 2: Select Camera:** Use [↑][↓] keys to select one camera.

**Step 3: Enter into the “Video Signal Loss Handle” Interface:** Move the “Active Frame” to the list box on the right side of the “Video Loss” item, and use the [↑][↓] key to select the “Handle” option and move the “Active Frame” to the “Policy” button on the right side. Press [ENTER] into the “Video Signal Loss Handle” interface:
Step 4: Setup Alarm Schedule: You can setup the working schedule. Only when video loss has occurred in the schedule, then the DVR will respond.

NOTE: The 4 time periods cannot be repeated. Please re-boot the DVR to make parameters effective.

Step 5: Setup Alarm Policy: You can select one or more response solutions, including “On Screen Warning”, “Audible Warning”, “Upload to Center” and “Trigger Alarm Output”. You can use [↑][↓] and [EDIT] key to enable or disable them. “x” is disable and “✓” is enable.

Step 6: Save Alarm Setup: After your setup, press the “Confirm” button and return to the “Image Setup” interface. In the “Image Setup” menu, press the “Confirm” button to save the current camera parameters and return to the main menu.

Step 7: Save All Cameras: If you want to setup other cameras, please repeat from step 2 to step 6. In the “Image Setup” menu, press the “Confirm” key to save all camera parameters. Press the “Cancel” button or [ESC] key to abort.

6.10 Motion Detection Alarm

If you enable this function, when there is motion detected, the DVR will make an alarm.

Step 1: Enter into the “Image Setup” Menu:

Step 2: Select Camera: Use [↑][↓] keys to select one camera.
Step 3: Select Motion Detection Sensitivity: On the right side of the “Motion Det. Level” item, there is a list box. That is motion detection sensitivity. There are 7 options, from 0 (the lowest) to 5 (the highest), and “Off”. You can use[↑][↓][←][→] keys to select one. If you select the “Off” option, the DVR will not respond even if there is motion detection. If you select other options, it will activate the “Motion Area Setup” button and the “Policy Setup” button. If you select low sensitivity such as 0, only when there is great motion detection, the DVR can respond. On the other side, for high sensitivity such as a 5, the DVR will respond with small motion detection.

Step 4: Motion Area Setup: You must define motion areas, so that the DVR will respond when there is motion in those areas. Move the “Active Frame” to the “Area” button on the right side of the sensitivity list box, and press the [ENTER] key, so you can enter into the “Motion Area Setup” interface.

The whole screen is divided into 22 x 18 panes (NTSC: 22 x 15). There is one yellow panel on the upper left side. The motion area setup steps are the same as that of the mask area setup (refer to Chapter 5.7). The only differences are that you can use the [PTZ] key to set the whole screen as the motion area, and multi motion areas can be defined. Press the [A] key to clear all motion areas.

Setup Multi-Areas: After you setup one motion area, press the [EDIT] key, so the yellow pane will appear again, and then you can setup another motion area.

Clear Motion Area:
Clear Part of Motion Area: Move the yellow pane to the start clear position of the motion area, and press [EDIT], as you will find the yellow pane is turned into the black pane. You can use [↑][↓][←][→] keys to enlarge or shrink the black area. Press the [EDIT] key to clear this partial motion area.
Press the [Enter] key to save and return to the “Image” menu. Press [ESC] to cancel.
Clear All Motion Areas: Press the [A] key to clear all motion areas of this channel.

The keys used to setup the motion areas are as follows:
- [↑][↓][←][→]: Move the yellow panel to any position;
- [EDIT]: Yellow panel and red panel switch key;
- [→]: Right enlarges red pane;
- [←]: Left shrinks red pane;
- [↓]: Down enlarges red pane;
- [↑]: Up shrinks red pane;
- [PTZ]: Sets whole screen as motion area;
- [A]: Clear all motion areas;
- [ENTER]: Save and return to the “Image Setup” menu;
- [ESC]: Cancel setup and return to the “Image Setup” menu;

The motion detection area is displayed as follows:
Step 5: Motion Alarm Policy: Move the “Active Frame” to the corresponding “Policy” button of the motion detection alarm, and press the [ENTER] key into the “Motion Alarm Handle” Menu:

Step 6: Motion Alarm Record Channel Setup: When motion alarm occurs, you can trigger the related camera to start recording. In the “Motion Alarm Handle” menu, you can select one or more record channels. Please use [ENTER] or the [EDIT] key to enable the flag into “✓”.

NOTE: In order to make the cameras start recording, in the “Recording” menu, you must enable the recording schedule and set “Rec Type” as “Motion Detection” or “Motion | Alarm”. Please refer to Chapter 5.12 for recording setup.

Step 7: Motion Alarm Schedule: When motion alarm has occurred in the schedule, the DVR will respond such as: “On Screen Warning, Audible Warning, Upload to Center, and Trigger Alarm Output”. You can setup 4 time periods for one day, and 7 days for one week.

NOTE: Time periods in one day cannot be repeated.

Step 8: Motion Alarm Handle Method Setup: You can select one or more handle methods such as: “On Screen Warning, Audible Warning, Upload to Center, and Trigger Alarm Output”.

Description: If “On Screen Warning” is enabled, when motion alarm has occurred while the DVR is in preview mode, the DVR will pop-up the related camera. If you trigger more than one camera, the DVR will pop them up one by one every 10 seconds. When the motion alarm has disappeared, the DVR will restore into the preview mode.
Step 9: Save Motion Alarm Setup: Press the “Confirm” button to return to the “Image Setup” menu. In the “Image Setup” menu, press the “Confirm” button to save the current camera parameters.

Step 10: Save All Cameras: You can repeat from step 2 to step 8 to setup motion detection parameters for other cameras. Also, you can copy the parameters of one camera to any other cameras.

NOTE: Motion alarm area cannot be copied.

If you want to disable motion alarm area and motion alarm policy, you just need to select the motion alarm sensitivity as “Off”.

6.11 Preview Properties

In the “Preview” menu, you can setup the preview mode, screen switch time, enable or disable audio preview, and preview layout.

Step 1: Enter into the “Preview” Menu: In the Main menu, move the “Active Frame” to the “Preview” icon and press [ENTER], so you can enter into the “preview” menu.

Step 2: Preview Properties:

**Preview Mode:** For the preview mode item, you can use [↑][↓] keys to select one mode. If the DVR has only 1 channel, you can only select the “1 Screen” option. If the DVR has 4 channels, there are “1 Screen” and “4 Screen” options. If the DVR has more than 4, but less than 9 channels, there are “1 Screen”, “4 Screen”, and “9 Screen” options. If the DVR has 16 channels, there are “1 Screen”, “4 Screen”, “9 Screen”, “12 Screen”, and “16 Screen” options.

**Switch Time:** This is the image preview switch time. You can use [↑][↓] keys to select the switch time. There are many options, including “5 Seconds”, “10 Seconds”, “20 Seconds”, “30 Seconds”, “1 Minute”, “2 Minutes”, “5 Minutes”, and “Never”. If you select “Never”, the preview image will not be switched automatically. For example, with a 16 channel DVR, if you select “4 Screen” preview mode and “20 Seconds” switch time, the DVR will cycle display a 4 channel image every 20 seconds.

**Audio Preview:** If you enable audio preview (“✓”), when you preview a single camera, the DVR will play the audio of that channel.

**Preview Layout Setup:** There is a square frame divided into many windows. If you select “4 Screen” preview mode, this frame is divided into 4 windows. Each window represents one camera. You can move the “Active Frame” among the windows. There is one bar under the square to display the preview order of all cameras. First, select the biggest screen preview mode, for example, with a 16-channel DVR, select “16 Screen” preview mode, so that all windows display in the square. Secondly, move the “Active Frame” to one of these windows, and press numeric keys to input the camera index. If the DVR has less than 10 channels, just use one numeric key, otherwise, use 2 numeric keys. The small window will display that camera number. In this way, you can change the display order. If you press 0 or 00, then the corresponding window will not display live video.
After you define the camera preview order, you can select the preview mode to meet your demands.

**Save Setup:** Press the “Confirm” button to save preview properties. Press “Cancel” or the [ESC] key to abort.

### 6.12 Recording Setup

In the Main menu, there is an icon named “Recording”. You can enter into the recording menu as follows:

![Recording Channel Configuration]

**“Recording” Menu Description:**

**If HD Full:** There are two options: “Overwrite” and “Stop recording”. If you select the “Overwrite” option, when all HDD’s in the DVR are full, the DVR will overwrite the earliest recorded files and continue recording. If you select the “Stop recording” option, when all HDD’s are all full, the DVR will handle it as a “Hard Disk Full” exception, please refer to Chapter 5.17 for the exception menu.

**Select Camera:** Here all channels are listed. You can use [↑][↓] keys to select one.

**Stream Type:** There are two options, one is “Audio&Video” stream and the other is “Video” stream only. If you want to record video and audio, please select the “Audio&Video” option, otherwise you can select the “Video” option to record only video.

**NOTE:** If you change this option, please re-boot the DVR to make the parameters effective.

**Resolution:** The higher resolution is, the clearer the image. The resolution options from low to high are: QCIF, CIF, 2CIF, DCIF, and 4CIF.

For standard DHE- Series DVR: All channels can only support: QCIF and CIF resolution.

For standard DHE- Series DVR: All channels support: 2CIF, CIF, QCIF

For professional DHE- Series DVR: All channels can support: QCIF, CIF, 2CIF, DCIF and 4CIF resolution.

**NOTE:** If you change this resolution option, please re-boot the DVR to make it effective.

**Bit Rate Type:** There are two options: “Variable” and “Fixed”. If you select the variable bit rate, the DVR will adjust the actual bit rate according to the video movement. When there is not much movement, the DVR will use a low bit rate, while there is much movement, then the DVR will use high bit rate. In this case, the DVR can save HDD usage and network bandwidth.

If you select the fixed bit rate, the DVR will use the fixed bit rate to compress the image. The bit rate size is defined in the “Max Bit Rate” option. In this case, we can calculate the recorded file size and network bandwidth that we need.

**Max Bit Rate:** If you select variable bit rate, when the video input has great movement, we need to limit the max bit rate. The max bit rate has the following options (bps): 32K, 48K, 64K, 80K, 96K, 128K, 160K, 192K, 224K, 256K, 320K, 384K, 448K, 512K, 640K, 768K, 896K, 1M, 1.25M, 1.5M, 1.75M, 2M, and “User define”. The Max Bit Rate selection is involved with resolution. If you select high resolution, you must select a high bit rate. For CIF resolution, the typical max bit rate is 384K-768Kbps. For DCIF resolution, the typical bit rate is...
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512K-1Mbps. For 4CIF resolution, the typical bit rate is 1.25Mbps-1.75Mbps. Of course, you will select the proper max bit rate based on the camera, background, and image quality requirement.

**Bit Rate:** You can select the bit rate size for the fixed bit rate type. It is the same as “Max Bit Rate”.

**Image Quality:** If you select the variable bit rate type, you can define the image quality. There are 6 options: Highest, Higher, High, Average, Low, and Lowest. High image quality needs high bit rate size.

**Frame Rate:** Frames per second. Options are: Full (PAL is 25 FPS and NTSC is 30FPS), 20, 16, 12, 10, 8, 6, 4, 2, 1, 1/2, 1/4, 1/8, and 1/16. For low frame rate, you can select the low bit rate size.

**PreRecord Time:** When you enable motion detection recording or external alarm recording, you can define prerecord time. The options are: No PreRecord, 5 Seconds (default selection), 10 Seconds, 15 Seconds, 20 Seconds, 25 Seconds, 30 Seconds, and Max PreRecord. MaxPreRecord is to save all data in the PreRecord buffer. The PreRecord time is related with bit rate. The lower bit rate, the longer for the PreRecord time. If the bit rate (Max bit rate) is very low, and you select “PreRecord Time” as “5 Seconds”, the actual prerecord time maybe more than 5 seconds. On the other side, if the bit rate is high, and set “PreRecord Time” as “30 Seconds”, the actual prerecord time maybe is less than 30 seconds.

**PostRecord Time:** When external alarm or motion alarm is stopped, DVR will continue recording time. The options are: 5 Seconds (default), 10 Seconds, 30 Seconds, 1 Minute, 2 Minutes, 5 Minutes, and 10 Minutes.

**Enable Rec:** Enable or disable selected camera record function. “×” means disable and “✓” means enable.

**Schedule:** When you enable the recording function, you can setup the recording schedule.

**NOTE:** When the camera’s recording schedule has been modified, you must re-boot the DVR to make it effective.

**All Day Recording Setup:**

**Step 1:** Enter into the Recording Schedule Menu
In the recording menu, use the [ENTER] or [EDIT] key to enable record function (“✓” flag), and press the “Schedule” button into the recording schedule menu.

**Step 2:** Select One Day and Enable All Day Recording Option
For the “Day” item, there are the following options: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday. Use [↑][↓] keys to select one day. Move the “Active Frame” to the check box on the right side of the “All Day” item, and press the [ENTER] or [EDIT] key to enable “All Day” option. “×” means disable and “✓” means enable.

**Step 3:** Record Type
For “Rec Type” item, the options are: All Time, Motion Detect, Alarm, Motion|Alarm, and Motion&Alarm.
For all day record mode, and only one record type can be selected.

**Step 4: Copy to Other Days**
You can repeat step 2 and step 3 to setup for other days. Also, you can copy the current day to other days.

**Step 5: Save**
Press “Confirm” back to the “Recording” menu. Press “Confirm” again to save the parameters and return to the main menu.

**No All Day Recording Setup**

**Step 1: Enter into the Recording Schedule Menu**
In the recording menu, use the [ENTER] or [EDIT] key to enable the record function (“✓” flag), and press the “Schedule” button to enter into the recording schedule menu.

**Step 2: Select One Day and Disable All Day Recording Option**
For the “Day” item, there are the following options: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday. Use the [1] [2] [3] keys to select one day. And the Move “Active Frame” to the check box on the right side of the “All Day” item, and press [ENTER] or [EDIT] key to disable “All Day” option. “✓” means disable and “✓” means enable.

**Step 3: Setup Time Period and Record Type**
There are 4 time periods for one day, and each time period can select different record type. Input start time and stop time for each time period, and select record type for each period. The record type options are: All Time, Motion Detect, Alarm, Motion&Alarm, and Motion|Alarm.  
**NOTE:** The time periods in one day cannot be repeated.

**Step 4: Copy to other days**
You can repeat step 2 and step 3 to setup for other days. Also, you can copy the current day to other days.

**Step 5: Save**
Press “Confirm” back to the “Recording” menu. Press “Confirm” again to save the parameters and return to the main menu.

**NOTE:**
1) If record type is “Motion Detect” or other related types, you must setup “Motion Detection” for trigger motion recording (Refer to Chapter 5.10).
2) If record type is “Alarm” or other related types, you must setup the “Alarms” in order to trigger alarm recording (Refer to Chapter 5.13).
3) The time period is from: 00:00—24:00.
6.13 External Alarm Input and Relay Output

For an 8-channel DVR, there are 8 external alarm input and 4 relay output. For a 16-channel DVR, there are 16 external alarm input and 4 relay output. In the “Alarms” menu, you can setup each external alarm input. In the Main menu, move the “Active Frame” to the “Alarms” icon and press the [ENTER] key to enter into the Alarms menu:

External Alarm Input Setup:

Step 1: Select One Alarm Input Use the [↑][↓] keys to select one alarm input.

Step 2: Alarm type
This is the sensor type. You can select “Normal Open” or “Normal Close” according to the sensor type.

Step 3: Enter into the “Alarm in Handling” Sub-Menu
In the “Alarms” menu, there are two options for the “Alarm Handling” item. One is “Ignore”, and the other is “Handle”. If you select the “Handle” option, you can activate “Policy” and the “PTZ Linkage” buttons on the right side. Move the “Active Frame” to the “Policy” button and press the [ENTER] key, so you will enter into the “Alarm in Handling” sub-menu:

Step 4: Alarm Trigger Record Channel Setup
You can select channels to record for each alarm input. In the sub-menu, you can use the [ENTER] or [EDIT] key to enable record channel. “×” means disable and “✓” means enable.

NOTE: In order to trigger the channel to record, in the “Recording” menu, you must enable recording and select record type as “Alarm”, or other related types. Please refer to Chapter 5.12.
Step 5: Schedule for the Alarm Handle Method
When an external alarm occurs in the schedule, the DVR will respond according to the handle methods.

Step 6: Alarm Handle Method
You can select one or more handle methods: "On Screen Warning", "Audible Warning", "Upload to Center", and "Trigger Alarm Output".

Description: If “On Screen Warning” is enabled, when an external alarm occurs and the DVR is in preview mode, the DVR will pop-up the related camera. If you trigger more than one camera, the DVR will pop them up one by one every 10 seconds. When the external alarm disappears, the DVR will restore to the preview mode.

Step 7: Save Setup
In the “Alarm in Handling” sub-menu, press the “Confirm” button and return to the “Alarms” menu. In the “Alarms” menu, press the “Confirm” button to save the parameters.

Step 8: PTZ Linkage
Move the “Active Frame” to the “PTZ Linkage” button, and press [ENTER] into the “PTZ Linkage” setup menu:

First, select one camera, and then select one of the following PTZ linkage:
- **Preset**: Set the flag as “✓” to enable preset, in the preset number edit box and input one preset number that has been setup already. Please refer to Chapter 5.15 for preset setup.
- **Sequence**: Set the flag as “✓” to enable sequence and input one sequence number that has been setup already. Please refer to Chapter 5.15 for sequence setup.
- **Cruise**: Set the flag as “✓” to enable cruise. Please refer to Chapter 5.15 for cruise setup.

Press the “Confirm” button to save and return to the “Alarms” menu. Press the “Cancel” button or [ESC] key to abort and return to the “Alarms” menu.

**NOTE**: Please make sure that the PTZ you are using can support preset, sequence, and cruise functions. One external alarm input can trigger many PTZ camera linkage.

Step 9: Copy the parameters to other external alarm input
You can copy the parameters of the alarm input to other external input.

Step 10: Save Setup in the “Alarms” menu, and press the “Confirm” button to save the parameters. Press the “Cancel” button, or the [ESC] key to abort.

**Alarm Relay Output Setup**

**Step 1**: In the “Alarms” menu, use [↑][↓] keys to select one alarm output.
Step 2: Select Delay Time
The delay time is when the alarm has disappeared, and the alarm output will continue output time. The delay time options are: 5 Seconds, 10 Seconds, 30 Seconds, 1 Minute, 2 Minutes, 5 Minutes, 10 Minutes, and Manual Stop. If you select the “Manual” option, the alarm output will not stop until you press the “Clear Alarm” button in the “Utilities” menu. So, the actual alarm output time is made up of alarm input time and the delay time.

Step 3: Enter into Alarm Out Schedule
You can set the schedule to make the alarm output into effect. Move the “Active Frame” to the “Schedule” button on the right side of the “Alarm Out Time” item, and press the [ENTER] key into the corresponding schedule menu:

![Alarm Out Schedule](image)

Step 4: Setup Alarm Out Schedule
Like other schedule setup, you can set 4 time periods for one day and 7 days for one week. When you finish setup, press the “Confirm” button to return to the “Alarms” menu.

Step 5: Copy One Alarm Output Parameters To Other Alarm Output
In the “Alarms” menu, you can copy the parameters of the current alarm output to other alarm output.

Step 6: Save Setup
When you finish the setup, in the “Alarms” menu, press the “Confirm” button to save all parameters.

NOTE: If any schedule is modified, you must re-boot the DVR to make it effective.

6.14 Network Parameters
If you want use the network to access the DVR, you must setup the network parameters. Note: If any network parameter is modified, you must save and re-boot the DVR to make it effective. In the main menu, move the “Active Frame” to the “Network” icon and press [ENTER], so you can enter into the “Network” menu as follows:
“Network” Menu Description:

*NIC type: Default is “10M/100M Auto”, the other options are: 10M Half-Dup, 10M Full-Dup, 100M Half-Dup, and 100M Full-Dup.

*IP address: This IP address must not be conflict with other IP addresses. If there is a DHCP server in network, you can set the IP as “0.0.0.0”, save and re-boot the DVR. In the reboot process, the DVR will search the DHCP server and receive one dynamic IP address. This item will display the dynamic IP address. If the DVR uses PPPoE function, the DVR can also dial-up into the internet and this item will display the dynamic internet IP address.

*Port: Network access port number, must be greater than 2000.

*Mask: This is the subnet mask.

Gateway: The gateway IP is used to communicate in different network segments.

DNS Address: If the DVR uses PPPoE function, and receives one dynamic IP address. If you set the DNS IP with one fixed Internet IP, the DVR will send some information such as the DVR name, DVR serial number, and the DVR current IP to that fixed IP address. We call that fixed Internet IP as DNS IP. The DNS server with that fixed Internet IP can receive the DVR information and use it to resolve the DVR dynamic IP address. This DNS is a special type of software, and not the normal domain name server. You can use the provided SDK to develop the DNS software.

Multicast IP: It is a one D-class IP address, from 224.0.0.0 - 239.255.255.255. If you do not use the multicast function, you do not need it to be set. Some routers will prohibit multicast function in case of network storm.

Remote Host IP and Port: If you set this IP address and port, when an alarm and exception occurs, the DVR will send information to that host IP. The center with this IP can receive the alarm and exception information from the DVR. You can use the SDK to develop this center software.

NAS: Network access storage. The DVR will regard network HDD as local HDD. If you enable this function, the DVR will send and save the real time image to that network HDD.

NFS IP: The IP of that network storage server.

Dir: The directory name shared by that network storage server.

This function is not available.

HttpPort: The port is for the Internet Explorer browser. The default value is 80. It can be modified.

PPPoE: The DVR supports PPPoE dial-up function.

Example: Use PPPoE function
Step 1: Enter into the “Network” menu.

Step 2: Select NIC type.

Step 3: Input Port Number. In the port edit box, use numeric keys to input the port number. The port number must be more than 2000.

Step 4: Input DNS IP. Input one fixed Internet IP address where the IP analyst software (IPServer) has run.

Step 5: Input PPPoE Parameters. Use [ENTER] or the [EDIT] key to enable PPPoE function (set PPPoE flag as “✓”). Input PPPoE username, password, and verify password that the ISP has been provided.

Step 6: Save Parameters. In the “Network” menu, press “Confirm” to save the parameters. Re-boot the DVR to make the parameters into effect. In the reboot process, the DVR will start dial-up using the PPPoE function. If the DVR dial-up to the internet is successful, then the DVR will display the dynamic internet IP address in the “Network” menu.

6.15 PTZ

There is one RS-485 port at the DVR rear panel used for PTZ control. You can setup RS-485 parameters to match your PTZ protocol. In the main menu, move the “Active Frame” to the PTZ icon and press the [ENTER] key, so you can enter into the PTZ menu as follows:

![PTZ Menu Description](image)

**PTZ Menu Description**

Select Channel: Select one PTZ camera.

**RS-485 Parameters:** Including baud rate, data bit, stop bit, parity, and flow control. These parameters must be the same as those of the protocol of the PTZ.

**PTZ Address:** Each PTZ has one different address.


**NOTE:** In the DVR “PTZ” menu, if you select Pelco-P protocol, when you setup the PTZ address, please plus or minus one compared with the Camera ID. For example, if the camera ID is 2, the DVR PTZ
address is set as ID 3.

**Preset Setup:** Preset is using one number to represent the camera’s position, zoom, focus, and iris. Move the “Active Frame” to the “Setup” button on the right side of the “Preset” item, and press the [ENTER] key into the preset setup menu. You can save 128 preset numbers. Please confirm the PTZ support preset function before you setup preset.

**Sequence Setup:** Each sequence is made up of several cruise points. Each cruise point includes: one preset number, dwell time, and dwell speed. Please make sure that the PTZ you are using can support sequence function before you start to setup. You can save 16 sequences.

**Cruise Setup:** Cruise is remembering the track of the PTZ movement. Please make sure the PTZ you are using can support cruise function.

**Preset Setup**

In the “PTZ” menu, move the “Active Frame” to the “Setup” button on the right side of the “Preset” item, press [ENTER], so you can enter into the “Preset” setup menu:

![Preset Setup Interface](image)

Add Preset Number: You can input preset number (from 1-128) in the edit box. Then press the “Adjust” button to enter into the PTZ control interface. In the PTZ control interface, you can use directional keys to adjust the PTZ position, and use [IRIS+][IRIS-][FOCUS+][FOCUS-][ZOOM+][ZOOM-] keys to adjust iris, focus, and zoom. After you finish adjusting, press [ENTER], and then press the “Save” button to save the preset number. You can repeat this step to setup other preset numbers. After you setup all preset numbers, press the “Return” button to return to the “PTZ” menu. In the “PTZ” menu, press the “Confirm” button to save all parameters.

Delete Preset Number: In the “Preset” setup menu, input one preset number, and press the “Delete” button, so you can delete this preset number. After deleting, press the “Return” button to the “PTZ” menu. In the “PTZ” menu, press the “Confirm” button to save all modifications.

Please make sure that the PTZ you are using can support preset function.

**Sequence Setup**

In the “PTZ” menu, press the “Setup” button on the right side of the “Sequence No.” item, so you can enter into the “Sequence” setup menu:
In the “Sequence” setup menu, first input the sequence number. The sequence is from 1 - 16. Each sequence is made up of cruise points, and each cruise point includes preset number, dwell time, and dwell speed. Dwell time is the time staying at that preset number. Dwell speed is the speed that is moved to that preset number.

Press the “Add” button to add one cruise point.
Press the “Confirm” button to save the cruise point into the sequence.
After you finish setup of the sequence number, press the “StartSeq” to check the current sequence. Press the “StopSeq” button to stop checking.
You can delete cruise points in one sequence.

After you finish the sequence setup, press the “Return” button back into the “PTZ” menu. In the “PTZ” menu, press the “Confirm” button to save the modifications.

Please make sure that the PTZ you are using can support sequence function.

**Cruise Setup**

In “PTZ” menu, press the “Setup” button on the right side of the “Cruise” item, so you can enter into the “Cruise” setup menu:

Press “RecCru” button, so you will enter into “PTZ control” interface. You can start controlling the PTZ with directional keys, and press [ENTER] to save the operation track and return to the “Cruise” setup menu.
Press the “StartCru” button to repeat the PTZ track until you press the “Stop” button.
Press the “Return” button back into the “PTZ” menu. In the “PTZ” menu, press the “Confirm” button to save this cruise.
Please make sure the PTZ you are using can support cruise function.

6.16 RS-232 Setup

There is one RS-232 port at the DVR rear panel. In the Main menu, move "Active Frame" to the "RS-232" icon and press [ENTER] key, so you can enter into the "RS-232" setup menu:

RS-232 Menu Description

RS-232 Parameters: Including baud rate, data bit, stop bit, parity, and flow control.

Work Mode: The RS-232 can be used as “Console”, “PPP”, or “Transparent Channel”.
Console: Connect with PC serial port. You can use HyperTerminal or NetTerm to control it.
PPP: Connect modem, using PSTN to transfer the video image.
Transparent channel: Connect serial devices. Remote PC can control these serial devices through the network.

PPP Mode: Only used when the work mode is “PPP”. There are two options: “Active” and “Passive”. “Active” means that the DVR will dial-up through PSTN. The “Active” function is not available. “Passive” means that the DVR will wait for dial-up.

Callback mode: Only used when the work mode is “PPP”. There are two options: “By Dialer” and “Preset Tel”. This function is not available.

Remote IP: Only used when the work mode is “PPP”. This IP is defined for remote PC that will connect the DVR through PSTN.

Local IP: Only used when the the work mode is “PPP”. This IP is defined for the DVR.

Mask: Only used when work mode is “PPP”. Remote IP and Local IP are in the same subnet.

Username, Password, and Verify Password: Only used when the work mode is “PPP”. Used for login when remote PC dial-up through PSTN.

Phone: Only used when the work mode is “PPP” and the PPP mode is “Active”. It is the phone number of the remote PC.

Callback and Data Encryption: Only used when work mode is “PPP”. They are not available.

Confirm: Save parameters and return to the main menu.

Cancel: Abort modification and return to the main menu.
Example: PPP (Modem) Passive Dial-up through the PSTN

There are two modems. One is connected to the DVR RS-232 port with a DCE cable. The other is connected with PC COM port.

Setup at DVR End

Step 1: RS-232 Setup: Setup baud rate, data bit, stop bit, parity, and flow control. They must be the same as those of the modem connected with the PC.

Step 2: Video Setup: In the “Recording” menu, select the camera you want to transfer through PSTN. If you set CIF resolution, we suggest you set the frame rate as 1 FPS. If you set QCIF resolution, the frame rate can be selected under 4FPS. You can adjust bit rate, resolution, and frame rate according to actual conditions.

Step 3: Save Setup In the “Recording” menu, press the “Confirm” button to save the parameters.

Step 4: Setup Modem used on the DVR side Use the DCE cable to connect the modem with the PC serial port. You can use HyperTerminal or NetTerm to setup the modem:
   - AT&F - Retore default parameters (Generally, modem is hard flow control)
   - AT&S0=1-Set modem as answer
   - ATE0 –Does not display the input characters
   - ATQ1 - Commit instruction and no display
   - AT&W&W1 - Save parameters

Step 5: Use the DCE cable to connect the modem with the DVR RS-232 port.
Setup at PC End

Step 1: Setup Modem used on PC Side. Use the DCE cable to connect the modem with the PC serial port. You can use HyperTerminal or NetTerm to setup the modem:
- AT&F - Restore default parameters (Generally, the modem is hard flow control)
- AT&W&W1 - Save parameters

Step 2: Open the “Network and Dial-up Connections” in the Control Panel, and then press “New Connection…”, and Select “Dial-up to private network” according to the guide. Select the corresponding MODEM, input the telephone no. to be dialed in the next step, and finish it according to the guide. At this time, you will find a new program named “Dial-up Connection” in the “Network and Dial-up Connections” folder.

NOTE: Setup should pay special attention to the following details:

Open the Properties of the newly established dial-up program, Select “Advanced”(Custom settings) in the security option, press setup, set it in the pop-up dialogue box that is “Advanced Security Settings” as follows:

![Dial-up Connection Properties](image)
Step 3: Establish the Dial-up Connection
Select the modem connected with the PC just like the dial-up network connection, and input the telephone number connected with the DVR’s modem. Input the username and password. They must be the same as the DVR PPP setup.

Step 4: During the dial-up connection, it will give the message of “Verification of username and password”, after successful verification; the message will be given “on process of register in PC”. The process is the same as the common dial-up connection.

Step 5: After successful dial-up, the network will designate the “remote IP” address for the PC, For example: Set as: 192.1.0.1. The user can ping-link the assigned IP address through the ping command, and can ping-link the DVR. Please refer to the following picture.
Step 6: You can preview the image of 192.1.0.2 by using client-end software.

6.17 Exceptions

The exceptions can be handled at present include: hard disk full, hard disk error, illegal access, IP address conflict, network failure, and NTSC/PAL differ. Enter into the “Exceptions” menu:

This includes: the following handle methods:
Audible Warning: DVR beep warning.
Upload to Center: Send exception information to center host PC.
Trigger Alarm Output: Trigger local relay output.

You can select more than one handle methods.

After you finish the setup, press the “Confirm” button to save parameters. Press the “Cancel” button or [ESC] key to abort.
6.18 Transaction Information

The DVR can actively obtain or passively receive the credit card number from the ATM machine linked through network or serial port, and the credit card number can overlay on live video, record, and playback. The following description indicates how to carry out relevant parameter settings according to different links to the ATM machine.

In “Transaction Information” menu, there are 4 kinds of text capture solutions:

1. **Network Sniff**: Obtain the transaction information such as a credit card number actively through the network.
   
The network connection is as follows:

![Network Diagram](image)

The corresponding setup menu is as follows:

![Transaction Information Menu](image)

You need to setup the following information:
- **IP address of ATM machine**
- **Type of ATM machine**
Start & end position, length and the content of data message
Start & end position and length of credit card number
Start & end position and length of transaction type
Transaction type and code

When the ATM machine is sending transaction information to the bank center, the DVR will capture the data package through the network, and analyze the data according to the format. Then, the DVR will overlay the correspond text on live video.

2. Network Receive: The DVR receives data sent by the ATM machine through the network. You only need to setup the DVR listen port. The default port value is: 10000.

In this case, you must develop the software that is run in the ATM machine based on the protocol. The software will send the transaction information directly to the DVR. The DVR will receive, analyze, and overlay the text on live video.

3. Receive Data Sent by the ATM Through Serial Port
The connection is as follows:
The corresponding setup menu is as follows:

**You only need to setup the ATM machine type.**

In this case, you must set the RS-232 of the DVR as transparent channel mode as follows:
A software must be run in the ATM machine, and send the credit card number, transaction code to the DVR through RS-232 port.
Please provide detail to the ATM machine communication protocol for actual projects.

4. Receive the Command Sent By ATM Through The Serial Port

In this case, you must set the RS-232 of the DVR as transparent channel mode as follows:
Also, software must run in the ATM machine, and send the command to the DVR through the RS-232 port based on the communication protocol.
Part VII
7 Utilities


Enter into the “Utilities” menu:

7.1 Save Parameters

Save factory default parameters into FLASH memory. You can re-boot the DVR to make them effective.

7.2 Restore Parameters

Restore factory parameters for the DVR. The IP address, gateway, and port number will not be restored.

7.3 Upgrade

You can use this function to upgrade the firmware. Please confirm that the language is matched. Press the “Upgrade” icon, in the pop-up dialog, so you can select either “FTP” or the “USB” upgrade mode.
If you select the “FTP” mode, you will enter into the “FTP Upgrade” menu:

Input the ftp server IP and press the [ENTER] key. The DVR will connect with the FTP server through the network and download the firmware file.

If you select the “USB” mode, please make sure you connect one USB flash memory with the DVR and the firmware file is in it’s root directory.

Re-boot after successfully upgrading, and the system will use the new firmware.

### 7.4 Hard Disk Management

**Check HDD Work Status**
Capacity, Free space, Stand by or not, Normal status, or not.

**Format HDD**
Before formatting, stop all recording. After formatting, you must re-boot the DVR, otherwise the DVR will not work normally.

### 7.5 Clear Alarm Out

Clear the alarm output manually.
7.6 Re-boot

Re-boot the DVR.

7.7 Power Off

Shut down the DVR.

7.8 View Log

To view the log recorded in the DVR HDD.

In the “Utilities” menu, press the “View Log” to enter into the “Log” menu:

If you want to view the log based on default option, just press the [ENTER] key. The DVR will list all matched information. Also, you can select options to search (By Type, By Date, By Type&Date).

By Type

To view log information of the assigned type.
Type is divided into “Major type” and “Minor type”. Major type includes: operation, alarm, exception, and all.
For operation major type, there are many minor types, including Power On, Shut Down, Abnormal Shut, Panel Login, Panel Logout, Panel Config, Panel File Play, Panel Time Play, Local Start Record, Local Stop Record, Panel PTZ, Panel Preview, Panel Set Time, Local Upgrade, Net Login, Net Logout, Net Start Record, Net Stop Record, Net Start Transparent Channel, Net Stop Transparent Channel, Net Get Parameter, Net Config, Net get Status, Net Alert On, Net Alert Off, Net Reboot, BiComStart (Start Voice Talk), BiComStop (Stop Voice Talk), Net Upgrade, Net File Play, Net Time Play, Net PTZ.
For alarm major type, the minor type includes: External Alarm In, External Alarm Out, Motion Detect Start, Motion Detect Stop, View Tamper Start, View Tamper Stop. For exception major type, the minor type includes: Video Signal Loss, Illegal Access, Hard Disk Error, Hard Disk Full, IP Conflict, DCD Lost.

For example: The Steps of Viewing the Alarm Log.

Step 1: For the “Query” item, select “By Type” to activate “Major Type” and “Minor Type” items.

Step 2: For “Major Type” option, select “Alarm” option. For “Minor Type” option, select one of following options: All, External Alarm In, External Alarm Out, Motion Detect Start, Motion Detect Stop, View Tamper Start, and View Tamper Stop.

Step 3: Move the “Active Frame” to the “Search Log” button, and press the [ENTER] key to start searching.

Step 4: When the searching has finished, the DVR will list all matched alarm information. In the list box, the information includes: Index, Occur Time, Major Type, Minor Type, Panel User, Net User, Host Address, Para. Type, Channel No, HDD No, Alarm In, and Alarm Out. You can press the “More Info” button for
more information, also select page number to view more information.

**Step 5:** Press the “Return” button back to the “Utilities” menu.

### By Time

View the log between one time period.

**Step 1:** Select “By Time” for “Query” option to activate “Start Time” and “Stop Time” items.

**Step 2:** Input Start time and Stop time.

**Step 3:** Move the “Active Frame” to the “Search Log” button and press the [ENTER] key to start searching.

**Step 4:** After finished searching, the DVR will list the matched log information.

**Step 5:** Press the “Return” button back to the “Utilities” menu.

### By Type&Date

View one kind of log in the assigned time period.

**Step 1:** Select “By Type&Time” for “Query” option to activate “Major Type”, “Minor Type” “Start Time”, and “Stop Time” items.

**Step 2:** Select “Operation” for major type and select one option for minor type.

**Step 3:** Input start time and stop time.

**Step 4:** Move “Active Frame” to “Search Log” button and press [ENTER] key to start searching.

**Step 5:** After finished searching, the DVR will list the matched log information.

**Step 6:** Press the “Return” button back to the “Utilities” menu.

### 7.9 System Information

The “System Info” icon in the “Utilities” menu, will provide DVR system information:

![System Info]

Unit Name: Embedded Net DVR
Device Model: DS8016HC-S
Serial Number: 0220070207ABCH000301012WCVY
Firmware Version: V2.6, build 070206
Encode Version: V4.0, build 070206

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Part VIII
8  Firmware Upgrade

The DVR firmware is stored in FLASH ROM. You can use the DVR upgrade function to write the firmware file (digicap) into FLASH.

There are two cases when you will need to upgrade the DVR firmware. One is to update the old firmware. The other is when the code in DVR FLASH has crashed.

NOTE: Make sure that the DVR and the firmware are compatible before the upgrade.

8.1  FTP Server Setup

You can download the FTP server software through the internet. Here we use wftpd32.exe as the example:

1. Run wftpd32.exe (FTP server software).

2. Select “Logging” in the menu, and choose Log Options in the sub-menu, and give the choice as follows:
3. Select “Users/Rights” under the “Security” menu item. The following dialog box will pop-up.

4. Create a New User. Click "New User". The New User dialog pops up. Input the username “target”. Click “OK”.

5. In the password dialog, input password as “target” in the “New Password” and “Verify Password” edit box. Click “OK” to save and exit the dialog box.

6. In the “User/Rights Security” Dialog, select “User Name” as “target”. In the “Home Directory” edit box, input the path where the firmware file (digicap) is placed. Then press “Done” to exit.
7. Next time, you will not need to setup again, just double-click and open “wftpd32.exe” to upgrade the DVR/DVS firmware.

8.2 Upgrade Mode

1. Use client software to upgrade the firmware file. You do not need to use the ftp server software. Please refer to the client software User Manual for detail information.
2. Use the “FTP” function of “Upgrade” sub-menu in the “Utilities” menu. You will need one host PC to run the FTP server software and place the firmware file (digicap), and make sure that the DVR and PC are in the same subnet.
3. Use the “USB” function of the “Upgrade” sub-menu in the “Utilities” menu. Please make sure that the firmware file (digicap) is placed under the root directory of the USB flash memory.
4. After you re-boot the DVR, if you can only hear the startup sound, but cannot see the startup picture, you can input shell commands under HyperTerminal. You will need one host PC to run the FTP server and HyperTerminal software, and make sure that the DVR and host PC are in the same subnet. Please use the DTE cable to connect the DVR with the host PC.

   **Step 1:** Setup and Run HyperTerminal  
The parameters are: Baud rate: 115200bps, Data bit: 8 bits, Stop bit: 1 bit, Parity: No, Flow Ctrl: None.

   **Step 2:** Press “Ctrl” and “U” keys of the PC keyboard. Do not release them.

   **Step 3:** Switch off and on the power supply of the DVRDVS. In the HyperTerminal, the following sentence appears: Please input [u/U] or [ESC] key Release “Ctrl” and “U” keys.

   **Step 4:** Press the “U” key. In the message line of the “IP address of the NET DVR”, input any one ip, and just make sure that the DVR IP and FTP server IP are in the same subnet.

   **Step 5:** In the message line of the “IP address of the FTP server”, input the FTP server IP.

   **Step 6:** In the message line of “Confirm? (y/n)”, Press “y”. The DVR will connect with that FTP server, and download the firmware file (digicap) through the network. Please make sure the FTP server and firmware file are setup and run correctly. After the upgrade has finished, press any key to re-boot the DVR.
9 Appendix

9.1 Appendix A HDD Capacity Calculation

Calculate the total capacity needed by each DVR according to video recording (video recording type and video file storage time).

**Step 1:** According to Formula (1) to calculate storage capacity \( q_i \) that is the capacity of each channel needed for every hour, unit Mbyte.

\[
q_i = d_i \div 8 \times 3600 \div 1024
\]

(1)

In the formula: \( d_i \) means the bit rate, unit Kbit/s

**Step 2:** After video time requirement is confirmed, according to Formula (2) to calculate the storage capacity \( m_i \), which is storage of each channel needed unit Mbyte.

\[
m_i = q_i \times h_i \times D_i
\]

(2)

In the formula: \( h_i \) means the recording time for each day (hour)
\( D_i \) means number of days for which the video shall be kept

**Step 3:** According to Formula (3) to calculate total capacity (accumulation) \( q_T \) that is needed for all channels in the DVR during scheduled video recording.

\[
q_T = \sum_{i=1}^{c} m_i
\]

(3)

In the formula: \( c \) means total number of channels in one DVR

**Step 4:** According to Formula (4) to calculate total capacity (accumulation) \( q_T \) that is needed for all channels in the DVR during alarm video recording (including motion detection).

\[
q_T = \sum_{i=1}^{c} m_i \times a\%
\]

(4)

In the formula: \( a\% \) means alarm occurrence rate
9.2 Appendix B DVR Connect Cable Definition

9.2.1 RS-485 Connect Cable Made Method

Material and Tool
One twist cable (8 pins), one standard RJ-45 connector and one tool for RJ-45.

RJ-45 introduction

Pin definition
To make the connect cable according as follows. As to the left point of the RJ-45 head, 1st and 2nd cables are the anode and cathode line for sending. The 3rd and 4th cables are the anode and cathode line for receiving, 7 is the shared grounding line:

- RXD+ 3
- RXD− 4
- TXD+ 1
- TXD− 2
- GND 7

Pin definition for Standard RS-485 Serial Port RJ-45 Plug-in

9.2.2 UTP Network Connect Cable Made Method

Material and Tool
One twist cable (8 pin, the length can be defined as to the actual demand, but must be within 100m), 2 standard RJ-45 head, and one tool for RJ-45.

Suggestion: Please have a network cable tool to test each cable made.

Pin Definition
To make the network cable according to the actual situation, there are two options:
(1) Use the following method to make the network cable when the DVR is connected with the network hub or switch.
### The corresponding relationship of cross-cable

1. **(white-orange)** 1 (white-orange) 1
2. **(Orange)** 2 (Orange) 2
3. **(white-green)** 3 (white-green) 3
4. **(blue)** 4 (blue) 4
5. **(white-blue)** 5 (white-blue) 5
6. **(green)** 6 (green) 6
7. **(white-brown)** 7 (white-brown) 7
8. **(brown)** 8 (brown) 8

The corresponding relationship of cross-cable

1. **(white-orange)** 1 (white-orange) 1
2. **(orange)** 2 (orange) 2
3. **(white-green)** 3 (white-green) 3
4. **(blue)** 4 (blue) 4
5. **(white-blue)** 5 (white-blue) 5
6. **(green)** 6 (green) 6
7. **(white-brown)** 7 (white-brown) 7
8. **(brown)** 8 (brown) 8

The corresponding relationship of the direct cable

(2) Use the following method to make the cross network cable when the DVR is directly connected with the client-end PC.
9.2.3 RS-232 Connect Cable Made Method

**Material and Tool**
One twisted cable (8 pins), one standard RJ45 head, one or more DB25 or DB9 plug-in, a tool for RJ45, one electric iron, and some soldering tin.

**Pin definition**
To make the RJ45 according to the following pin definition; I means DVR input, O means DVR output.

<table>
<thead>
<tr>
<th>Pin index</th>
<th>Name</th>
<th>I/O</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DCD</td>
<td>I</td>
<td>Carrier Detect</td>
</tr>
<tr>
<td>2</td>
<td>RxD</td>
<td>I</td>
<td>Receive Data</td>
</tr>
<tr>
<td>3</td>
<td>TxD</td>
<td>O</td>
<td>Transfer Data</td>
</tr>
<tr>
<td>4</td>
<td>CTS</td>
<td>I</td>
<td>Clear Data</td>
</tr>
<tr>
<td>5</td>
<td>RTS</td>
<td>O</td>
<td>Request to Send</td>
</tr>
<tr>
<td>6</td>
<td>DTR</td>
<td>O</td>
<td>Terminal Device Ready</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
<td></td>
<td>Ground</td>
</tr>
<tr>
<td>8</td>
<td>Null</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to demand, the following three situations are considered to make the serial port plug-in according to the corresponding relationship of the pin definition.

1. When the serial port of the DVR is connected with the DTE device with DB25 plug-in (For example: terminal type computer, annunciator, and door access), the corresponding relationship is as follows:

   ![Image](image1)

   **RJ45** ↔ **DB25 (DTE)**
   
   - DCD 1 ↔ 20 DTR
   - RxD 2 ↔ 2 TxD
   - TxD 3 ↔ 3 RxD
   - CTS 4 ↔ 4 RTS
   - RTS 5 ↔ 5 CTS
   - DTR 6 ↔ 8 DCD
   - GND 7 ↔ 7 GND
   - DTR 8 ↔ 6 DSR

   Connection for RJ-45 and DB-25 (DTE)

2. When the serial port of the DVR is connected with the DTE device with DB-9 plug-in, the corresponding relationship is as follows:
### Connection for RJ-45 and DB-9

<table>
<thead>
<tr>
<th>RJ45</th>
<th>DB9 (DTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCD 1</td>
<td>4 DTR</td>
</tr>
<tr>
<td>RXD 2</td>
<td>3 TXD</td>
</tr>
<tr>
<td>TXD 3</td>
<td>2 RXD</td>
</tr>
<tr>
<td>CTS 4</td>
<td>7 RTS</td>
</tr>
<tr>
<td>RTS 5</td>
<td>8 CTS</td>
</tr>
<tr>
<td>DTR 6</td>
<td>1 DCD</td>
</tr>
<tr>
<td>GND 7</td>
<td>5 GND</td>
</tr>
<tr>
<td>DTR 8</td>
<td>6 DSR</td>
</tr>
</tbody>
</table>

Connection for RJ-45 and DB-9

25-pin to 9-pin converter internal connection is defined as follows:

<table>
<thead>
<tr>
<th>DB25</th>
<th>DB9</th>
</tr>
</thead>
<tbody>
<tr>
<td>TXD 2</td>
<td>3 TXD</td>
</tr>
<tr>
<td>RXD 3</td>
<td>2 RXD</td>
</tr>
<tr>
<td>RTS 4</td>
<td>7 RTS</td>
</tr>
<tr>
<td>CTS 5</td>
<td>8 CTS</td>
</tr>
<tr>
<td>DSR 6</td>
<td>6 DSR</td>
</tr>
<tr>
<td>GND 7</td>
<td>5 GND</td>
</tr>
<tr>
<td>DCD 8</td>
<td>1 DCD</td>
</tr>
<tr>
<td>DTR 20</td>
<td>4 DTR</td>
</tr>
<tr>
<td>22</td>
<td>9</td>
</tr>
</tbody>
</table>

Connection for DB-25 and DB-9

(3) When the serial port of the DVR is connected with the DCE device (Example: modem), one end of the cable is 8-pin RJ45 plug-in, and the other end is DB-25 pin plug-in, the corresponding relationship is as follows:

<table>
<thead>
<tr>
<th>RJ45</th>
<th>DCE (DB25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCD 1</td>
<td>8 DCD</td>
</tr>
<tr>
<td>RXD 2</td>
<td>3 TXD</td>
</tr>
<tr>
<td>TXD 3</td>
<td>2 RXD</td>
</tr>
<tr>
<td>CTS 4</td>
<td>5 RTS</td>
</tr>
<tr>
<td>RTS 5</td>
<td>4 CTS</td>
</tr>
<tr>
<td>DTR 6</td>
<td>20 DTR</td>
</tr>
<tr>
<td>GND 7</td>
<td>7 GND</td>
</tr>
<tr>
<td>DTR 8</td>
<td></td>
</tr>
</tbody>
</table>

Connection for RJ-45 and DB-25 (DCE)
## 9.3 Appendix C Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>4-Channel</th>
<th>8-Channel</th>
<th>12-Channel</th>
<th>16-Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video compression</strong></td>
<td>H.264</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Preview resolution</strong></td>
<td>4CIF real time (PAL: 704 x 576, NTSC: 704 x 480)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Playback resolution</strong></td>
<td>CIF/QCIF real time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Video input</strong></td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>BNC (1.0Vp-p, 75Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main video output</strong></td>
<td>1 channel, BNC (1.0Vp-p, 75Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frame rate</strong></td>
<td>PAL: 1/16—25FPS, NTSC: 1/16—30FPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stream type</strong></td>
<td>Video/ Video&amp;Audio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max bit rate</strong></td>
<td>32Kbps-2Mbps, self-define</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Audio input</strong></td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>BNC (2.0Vp-p, 1kΩ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main audio output</strong></td>
<td>1 channel, BNC (Linear Electrical Level, 6000Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Audio compression</strong></td>
<td>OggVorbis, 16Kbps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voice talk</strong></td>
<td>1 channel, BNC (Linear Electrical Level, 1kΩ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Communication interface</strong></td>
<td>1 RJ-45 10M/100M Self-adaptive Ethernet Interface</td>
<td>1 RJ-45 RS-232 Port</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RS-485 Port</strong></td>
<td>1 Port (T+, T-, R+, R-)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Keyboard interface</strong></td>
<td>1 Port (D+, D-)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SATA interface</strong></td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td><strong>USB interface</strong></td>
<td>1 USB interface, USB1.1, can support USB flash memory, USB HDD, USB CD-R/W, USB DVD, or USB mouse.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VGA interface</strong></td>
<td>1 VGA interface, support resolution: 800×600/60Hz, 800×600/75Hz, 1024×768/60Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>External alarm in</strong></td>
<td>4</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td><strong>Relay output</strong></td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>100<del>240VAC, 6.3A, 50</del>60Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>20-42W (without HDD and CD-R/W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working temperature</strong></td>
<td>-10°C ~ +55°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working humidity</strong></td>
<td>10%~90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>19” Standard (450mm x 450mm x 95mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>8Kg (without HDD and CD-R/W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Video compression</strong></td>
<td>H.264</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Preview resolution</strong></td>
<td>4CIF real time (PAL: 704 x 576, NTSC: 704 x 480)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Playback resolution</strong></td>
<td>4CIF/DCIF/2CIF/CIF/QCIF real time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Video input</strong></td>
<td>8/16 channels BNC (1.0Vp-p, 75Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main video output</strong></td>
<td>1 channel, BNC (1.0Vp-p, 75Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frame rate</strong></td>
<td>PAL: 1/16—25FPS, NTSC: 1/16—30FPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stream type</strong></td>
<td>Video/ Video&amp;Audio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max bit rate</strong></td>
<td>32Kbps-2Mbps, self-define</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Audio input</strong></td>
<td>8/16 channels BNC (2.0Vp-p, 1kΩ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feature</td>
<td>Specification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main audio output</td>
<td>1 channel, BNC (Linear Electrical Level, 600O)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux audio output</td>
<td>1 channel, BNC (Linear Electrical Level, 600O)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio compression</td>
<td>OggVorbis, 16Kbps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voice talk</td>
<td>1 channel, BNC (Linear Electrical Level, 1KO)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication interface</td>
<td>1 RJ-45 10M/100M Self-adaptive Ethernet Interface</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 RJ-45 RS-232 Port</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS-485 Port</td>
<td>1 Port (T+, T-, R+, R-)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyboard interface</td>
<td>1 Port (D+, D-)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATA interface</td>
<td>8 SATA interfaces, max support 8 SATA HDD. Each HDD can support a maximum of 2000GB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB interface</td>
<td>1 USB interface, USB1.1, can support USB flash memory, USB HDD, USB CD-R/W, USB DVD, or USB mouse.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VGA interface</td>
<td>1 VGA interface, support resolution: 800×600/60Hz, 800×600/75Hz, 1024×768/60Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External alarm in</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay output</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>100-240VAC, 6.3A, 50-60Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>20-42W (without HDD and CD-R/W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working temperature</td>
<td>-10ºC-+ 55ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working humidity</td>
<td>10%-90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>19&quot; Standard (450mm x 450mm x 95mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>≈8Kg (without HDD and CD-R/W)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PAL: 176 x 144(QCIF), 352 x 288(CIF), 704 x 288(2CIF), 528 x 384(DCIF), 704 x 576(4CIF);
NTSC: 176 x 120(QCIF), 352 x 240(CIF), 704 x 240(2CIF), 528 x 320(DCIF), 704 x 480(4CIF).
## Appendix D Quick Search Function Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety Function</strong></td>
<td>User Management</td>
<td>Create and delete users. System has one default administrator. The administrator can create 15 users and define their rights.</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>Password Management</td>
<td>Modify password.</td>
<td>4.3&amp;5.1</td>
</tr>
<tr>
<td><strong>HDD Recording</strong></td>
<td>HDD Management</td>
<td>Format HDD, and HDD information.</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td>Recording Mode</td>
<td>Manual record, All time record, Motion detection record, Alarm record, Motion&amp;Alarm record, Motion</td>
<td>Alarm record.</td>
</tr>
<tr>
<td></td>
<td>Recording Parameters</td>
<td>Bit rate, Frame rate, and Image quality</td>
<td>5.12</td>
</tr>
<tr>
<td></td>
<td>Playback</td>
<td>Playback by time, Playback by file. Fast, Slow, Pause, Frame by frame, 2-channel synchronized.</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>Backup</td>
<td>Backup record files and video clips.</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Local Monitoring</strong></td>
<td>Preview mode</td>
<td>Monitor and VGA display. 1 screen/4 screen/9 screen/16 screen preview mode. Auto switch or manual switch.</td>
<td>5.11</td>
</tr>
<tr>
<td></td>
<td>PTZ control</td>
<td>Control pan, tilt, zoom, focus, and iris. Setup and adjust preset, sequence, and cruise.</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>Motion Detection</td>
<td>Motion detect area, sensitivity and response policy setup.</td>
<td>5.10</td>
</tr>
<tr>
<td></td>
<td>Alarm Input</td>
<td>Alarm input response policy, schedule setup.</td>
<td>5.13</td>
</tr>
<tr>
<td></td>
<td>Relay Output</td>
<td>Alarm output parameters setup.</td>
<td>5.13</td>
</tr>
<tr>
<td></td>
<td>Mask</td>
<td>Sensitive mask area setup.</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>View Tampering</td>
<td>Camera spiteful block setup.</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>Exceptions</td>
<td>Exception response, such as HDD error, HDD full, and illegal access.</td>
<td>5.17</td>
</tr>
<tr>
<td></td>
<td>Camera status</td>
<td>Recording, and video loss status display.</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td>ASDL</td>
<td>Using PPPoE dial-up function, and support DNS.</td>
<td>5.14</td>
</tr>
<tr>
<td></td>
<td>Preview</td>
<td>TCP, UDP, RTP, and Multicast.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Control DVR through network.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Alarm</td>
<td>Send alarm information to the host PC through the network.</td>
<td>5.14</td>
</tr>
<tr>
<td></td>
<td>PTZ Control</td>
<td>Remote control the PTZ.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Remote Setup</td>
<td>Remote setup of the DVR parameters.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Remote Record</td>
<td>Remote record real time stream.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Remote Playback</td>
<td>Remote playback the recorded files in the DVR.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Download</td>
<td>Download recorded files in the DVR.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Remote Upgrade</td>
<td>Remote upgrade firmware.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Transparent Channel</td>
<td>Remote control serial device connected with the serial port of the DVR.</td>
<td>5.16</td>
</tr>
<tr>
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<td>Two-way voice talk or one-way voice broadcast</td>
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*[NOTE] The network SDK and client demo source code are included in the attached CD.*
9.5 Appendix E Troubleshooting

<table>
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| After plugging in power, and turning on the power switch, the “POWER” light on the front panel does not turn on, and the fan does not work. | 1) Power cable is broken.  
2) Power supply is broken. |
| After plugging in power while turning on the power switch, the “POWER” light on the front panel turns to green while the fan does not work. | 1) Front panel cable is broken.  
2) Fan is broken. |
| After plugging in power, turning on switch, the “POWER” light turns to green, the indicator lights in the panel turn on at the same time, but the fan does not work. | The ATX plug in the main board is plugged in properly. |
| The DVR continuously re-boots after start up, and makes a sound like “Beep” every 10 seconds. | 1) Upgrade the wrong firmware  
2) Compression board has problems.  
3) Main board has problems. |
| There are no images in the monitor connected with VOUT after the DVR has started. | 1) The cable connected with the monitor is broken.  
2) Real board of DVR has problems.  
3) Main board of DVR has problems. |
| Cannot find the hard disk in re-boot process. | 1) Hard disk cable is broken.  
2) The power cable of hard disk is not connected.  
3) Hard disk is broken. |
| No response in HyperTerminal interface. | 1) Baud rate is not matched.  
2) RS-232 cable is broken.  
3) Serial port of PC is broken.  
4) RS-232 port of DVR is broken. |
| The DVR cannot control the PTZ through RS-485 port. | 1) RS-485 cable is not connected correctly, or broken.  
2) PTZ parameters error.  
3) RS-485 port of DVR is broken. |
| Client software cannot view the DVR live image. | 1) The network has an error.  
2) Connected wrong DVR (wrong IP, port number, username, or password).  
3) Old player SDK (playm4.dll) |

NOTES:  
1) Place the DVR in a well-ventilated space, so that it operates within the allowed range of temperature and humidity as in the specification.  
2) If the circuit board is wet, dust on the circuit board can cause a short circuit. The circuit board, plug and socket, housing fan, and housing should be cleaned by brushing regularly.
Appendix F Product Service

Thank you for choosing our products.
All of our product users can enjoy a conditional free repair guarantee service for hardware within 12 months starting from purchase date, and a free exchange service within one month (valid for the damage caused by non-personal acts). Permanent upgrading service is provided for the software.

Liability Exclusions:
Any product malfunction, abnormalities in operation or damage caused by following reasons are not within the free service scope of our company. Please select payable service.
(1) Equipment damage caused by improper operation
(2) Improper environment and conditions in/on which the equipment operates, (For example: improper power, environment temperature, humidity, and lightning strike that can cause equipment damage.)
(3) Force damage, (For example: earthquake and fire that can cause equipment damage.)
(4) Equipment damage caused by the maintenance of personnel unauthorized by our company.
(5) Product sold 12 months ago.

In order to provide various services to you, please fill out the relevant registration procedure provided by us after you purchase the product. Please cut off the User’s Information Card and fax, or post it to us after the card has been filled out.

Address:
Post Code:
Fax:
### Appendix G Customer Information Card

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<td>Suggestions:</td>
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Notes: