Rugged CCTV
Industrial Grade Digital

ELX16-240

Installation Guide

(v 1.0)

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FCC Compliance Statement

Caution : Any changes or modifications in construction of this device which are not expressly approved the party responsible for compliance could void the user's authority to operate the equipment.

NOTE : This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Thes e limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses , and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications, Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures

CAUTION

1. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.
2. Disposal of used batteries according to the general recommendations against the environmental pollution.
3. Do not throw the batteries into a fire, and do not heat, short-circuit or attempt to disassemble the batteries.
4. Do not attempt to recharge the batteries.

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Important Notice

1. Do not place heavy objects on the top of the ELX16-240.

2. ELX16-240 is for indoor use. It is not weatherproof. Use ELX16-240 with referring to its environmental specifications (Temperature & Humidity). To clean the ELX16-240, gently wipe the outside with a clean dry cloth.

3. ELX16-240 uses AC power of 110V ~ 220V. Be cautious not to cause electric damages to ELX16-240.

4. Be careful not to drop the ELX16-240. Physical shocks may harm the product. In addition, be sure the ELX16-240 is secured after installation.

5. ELX16-240 is made of metal. Therefore you can hurt human beings if yu throw it to them or hit on them. When installing ELX16-240, be cautious to locate on safe places where children are unreachable.

6. If ELX16-240 does not operate properly, please contact the closest Rugged CCTV distributor for after sales service. Tampering or disassembling the product will void the warranty.

7. Security surveillance laws may differ for each country. Therefore, please contact the local region first to avoid any surveillance law violations.

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OVERVIEW

1. What is ELX16-240?

The ELX16-240 is an 16-analog channels network digital video recorder. Video, Audio, and Text Event -Logs are digitized and stored on two internal hard-drives.

- 16 analog video channels
- 1 channel audio recording & playback
- Max. 240 / 200 ips (NTSC / PAL) recording speed
- Realtime (30 / 25 ips for each channel) monitoring
- Built-in software multiplexer for all 16 live monitoring channels (1 / 4 / 9 / 13 / 16 Ch Mode on CCTV Monitor as well as PC)
- Maximum 4TB storage capacity (IEEE 1394 for extemal HDD)
- ATM/POS transaction information text recording and search with corresponding video
- 16 sensor inputs and 4 relay outputs
- Built-in hardware motion detection with search function (64-division comparison)
- Various efficient back-up methods (IEEE 1394(FiWi), Ethernet)
- PTZ Control (Preset support) via RS 232 and RS 485/RS422
- User-friendly 32bit True-colored Graphic OSD Menu
- Dynamic IP (DHCP, Floating IP) support
- IR remote controller (User controls PTZ with remote controller)
- Management Software over Network (DVR manager)
- Dual CCTV monitor support (1 Normal, 1 Spot)

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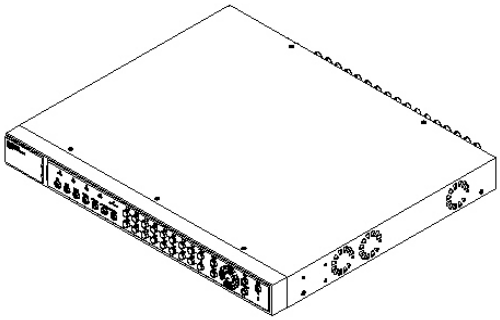
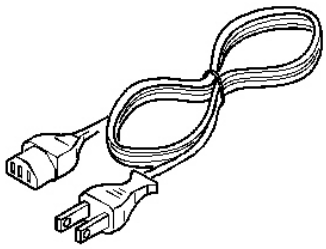
2. Supplied Accessories

Unpack and check all the items as below.

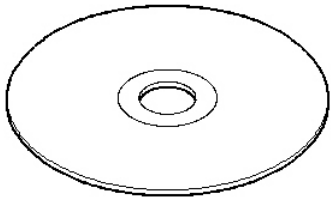
1. ELX16-240 (1EA)



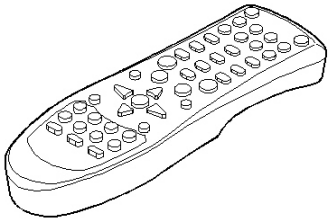
2. AC Power Cord (1EA)



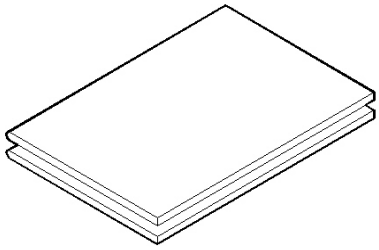
3. CD-ROM (Including DVR manager) (1EA)



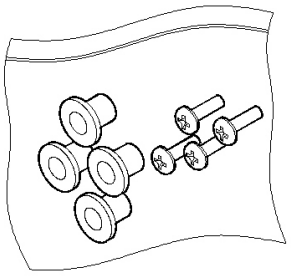
4. Remote Controller (1EA)



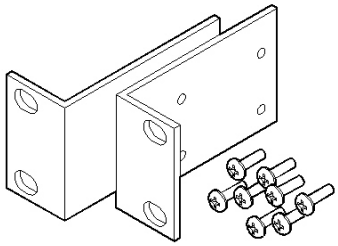
5. Guide (2EA)



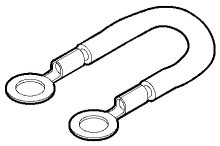
6. HDD Fixing KIT (1SET)



7. 19” RACK FIXING KIT (1SET)



8. HDD EARTH CABLE (1EA)



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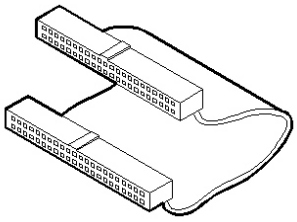
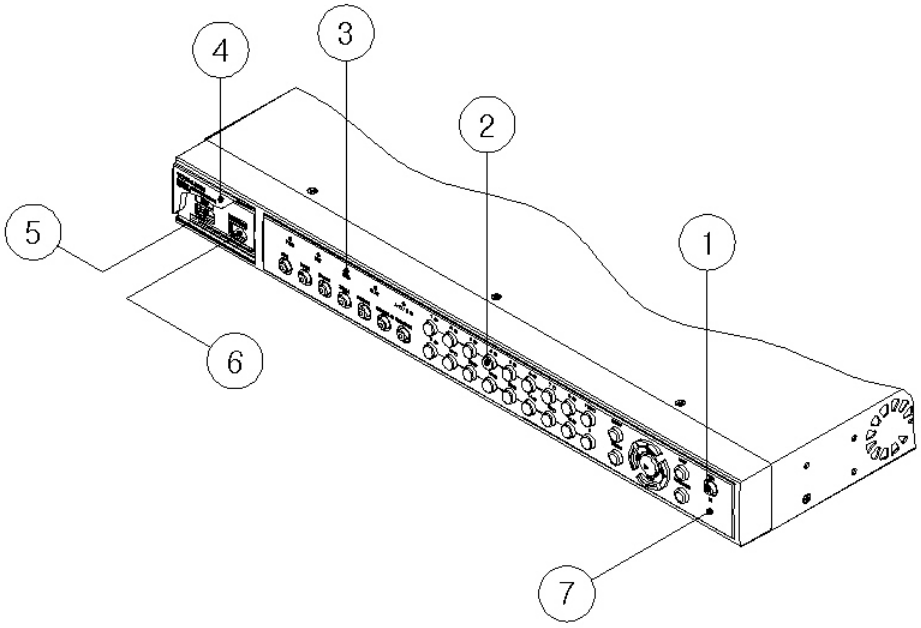
9. HDD DATA CABLE (1EA)



3. Description & Function

ELX16-240 Front



(1) Power switch

(2) Function buttons

(3) LED

(4) I/O Port cover

(5) USB connector

(6) IEEE1394 connector

(7) Remote controller receiver

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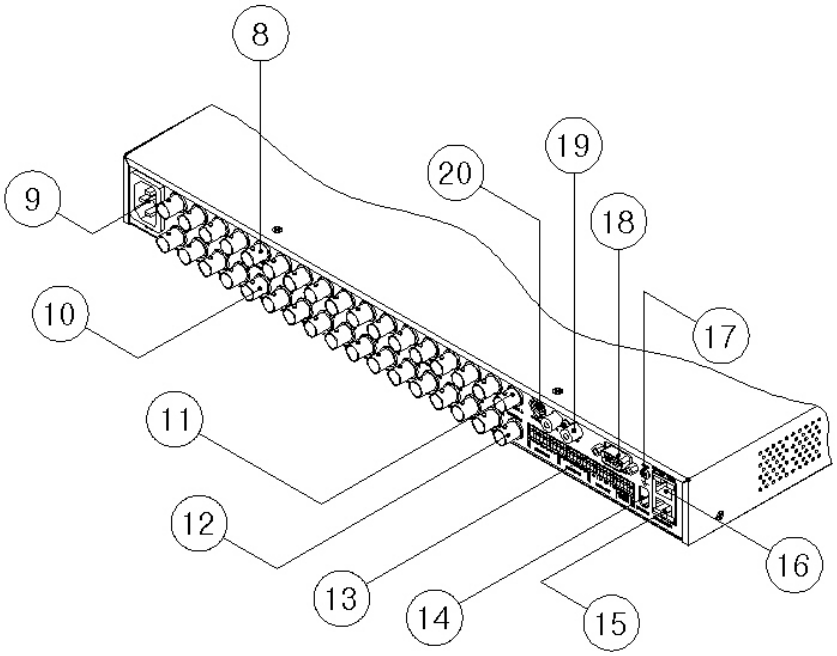
ELX16-240 Rear



(8) BNC connector for video input

(9) AC power connector

(10) BNC connector for video output

(11) BNC connector for monitor A output

(12) BNC connector for monitor B output

(13) Terminal block for sensor, relay, and serial input/output

(14) IEEE1394 connecter

(15) Terminal block for RS232 & 422/485

(16) Ethernet connector

(17) GND

(18) RS232 connecter (9Pin D-Sub)

(19) Audio input / output connector

(20) S-VHS connector

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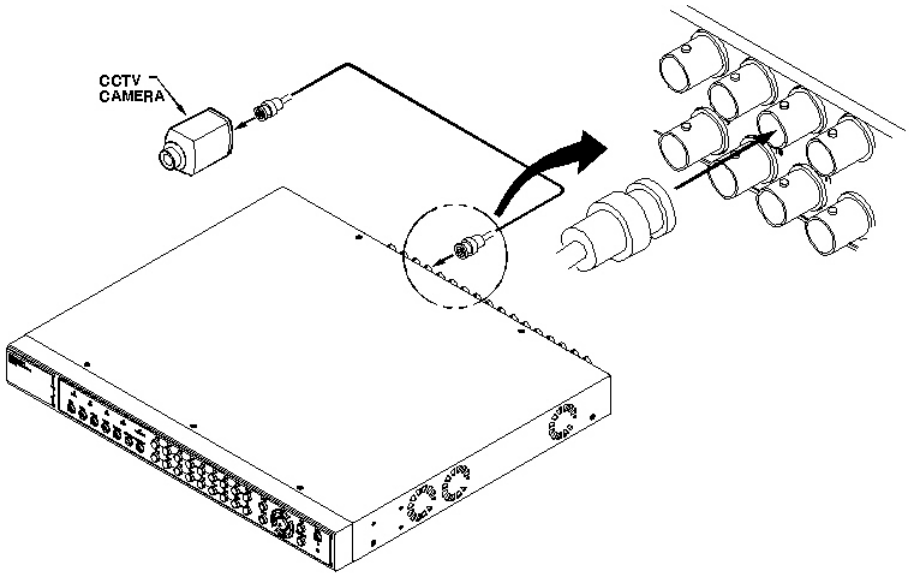
INSTALLATION AND CONNECTION

4. Connecting & Running

4.1. Connecting camera

(1) Connect CCTV camera to ELX16-240 with BNC cable as shown below.



<Note>

1. The video type for all channels should be either NTSC or PAL
2. ELX16-240 sets video signal's impedance (75Ù) automatically.
   Impedance is set as 75Ù basically. If connecting a device to video output, impedance will be "Hi-z" status.
3. Video type (NTSC/PAL) should be changed after disassembling ELX16-240.
   So in order to change video type, it is recommended to contact the cloest local Rugged CCTV. distributor. When changing it, refer to **"Appendix #2. Changing Video Type"**. Rugged CCTV. is not responsible for any service warranty about a problem due to careless change.

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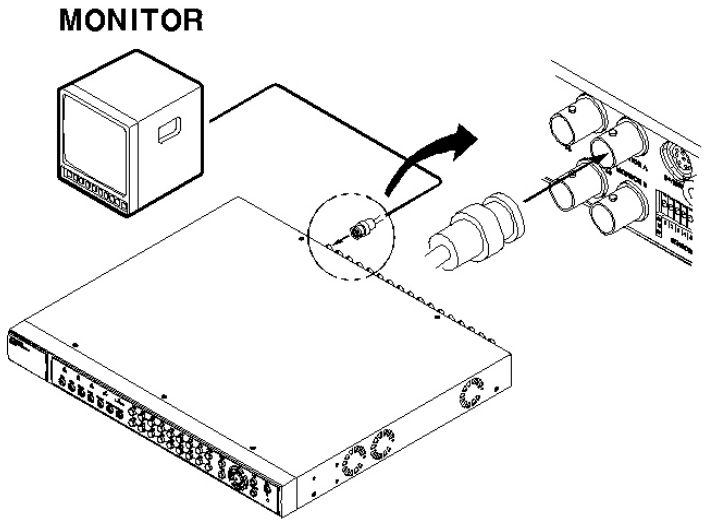
4.2. Connecting Monitor

(1) Connect CCTV monitor to ELX16-240 with BNC cable as shown below.

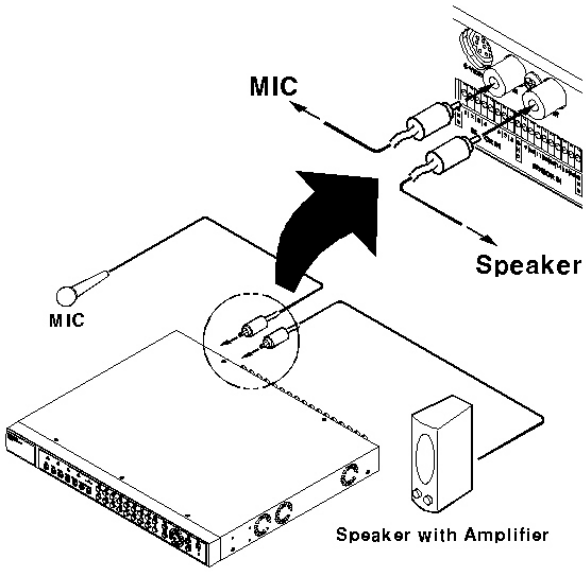
〈Note〉

ELX16-240 has two monitor output ports ; for A(Normal) and B(Spot). When connecting only one monitor, use monitor A.



4.3. Connecting Audio

(1) Connect audio signal to ELX16-240 with using RCA cable.



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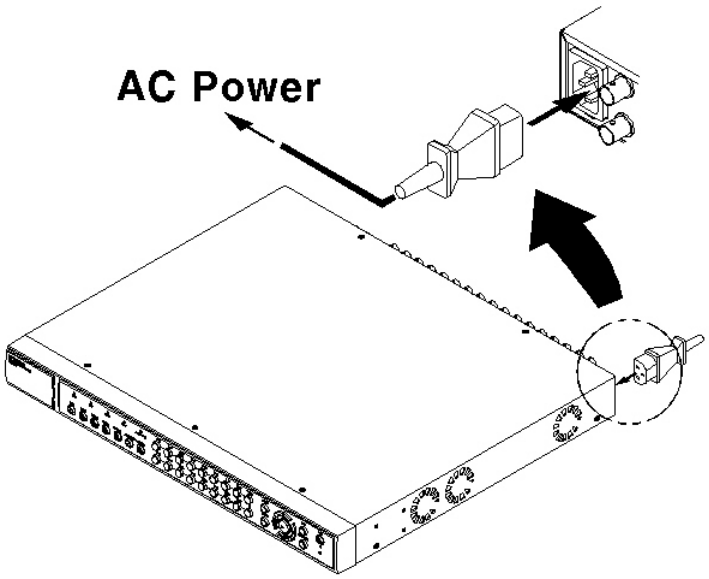
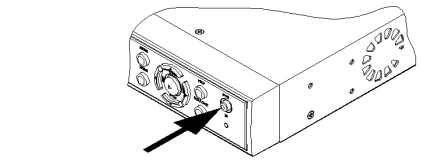
4.4. Supplying Power

(1) Connect power cable.



<Note>

1. When supplying power, ELX16-240 starts booting automatically.
2. When pressing the power switch during 5 seconds, a dialogue for entering admin password occurs. In order to cut off power, key in the password.
3. For supplying power again, push the power switch.



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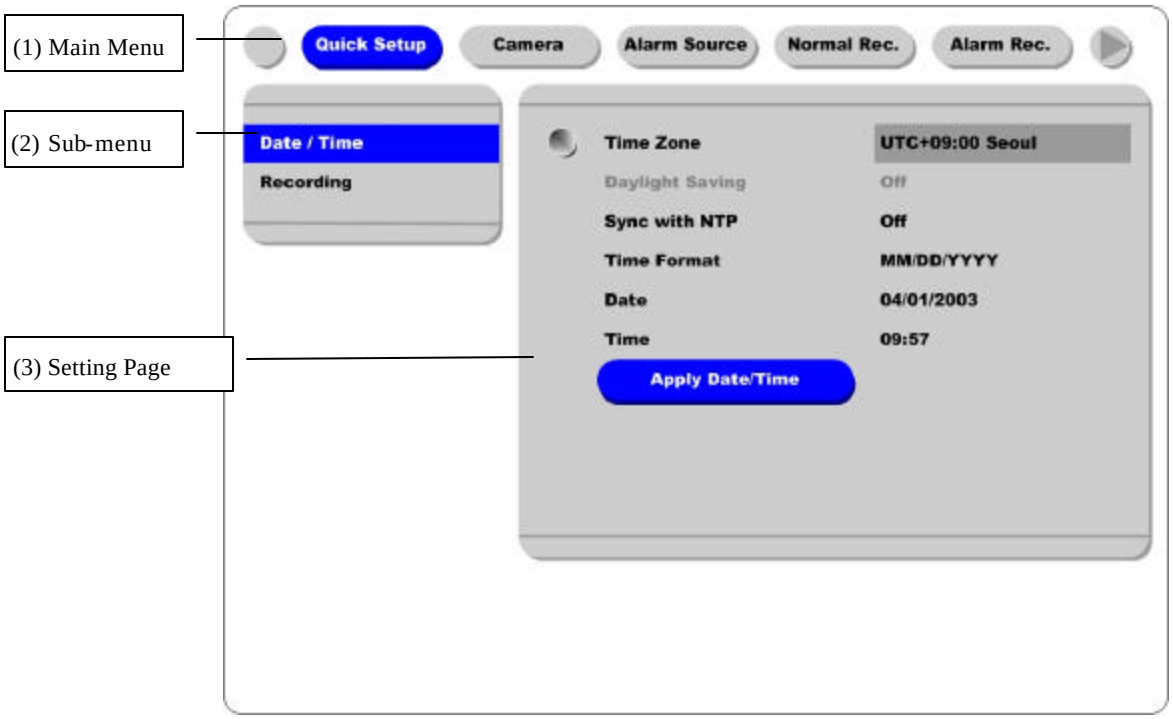
5. Running OSD menu

5.1. Using menu

Press the [MENU] button to open the OSD Configuration Menu.



(1) Main Menu Tabs: The selected tab is shown in blue and the related sub-menus will be shown below the tab. To move to the previous/next Main Menu Tab, use the [/] arrow buttons. To move to a sub-menu, press the [ENTER] or [ ] buttons.

(2) Sub-menu: The selected sub-menu is shown in blue and the related setting page will be shown to the right of the sub-menu. Use the [/] arrow buttons to move within the sub-menu list. To move to the setting page press the [ENTER] button. To exit the setting page, press the [EXIT] button.

(3) Setting Page: The selected item is shown in gray. To move within each page, use the [/] or [/] arrow buttons. Press the [ENTER] button to change the value of a setting. When the setting value is a word, a dialogue box to edit the word will open. When setting value is a number, it should be set with using the [/] or [/] arrow buttons. After the value is set, press the [EXIT] button. To exit the Setting Page, press the [EXIT] button.

(4) Help message : Related information for each menu/setting will be displayed here.

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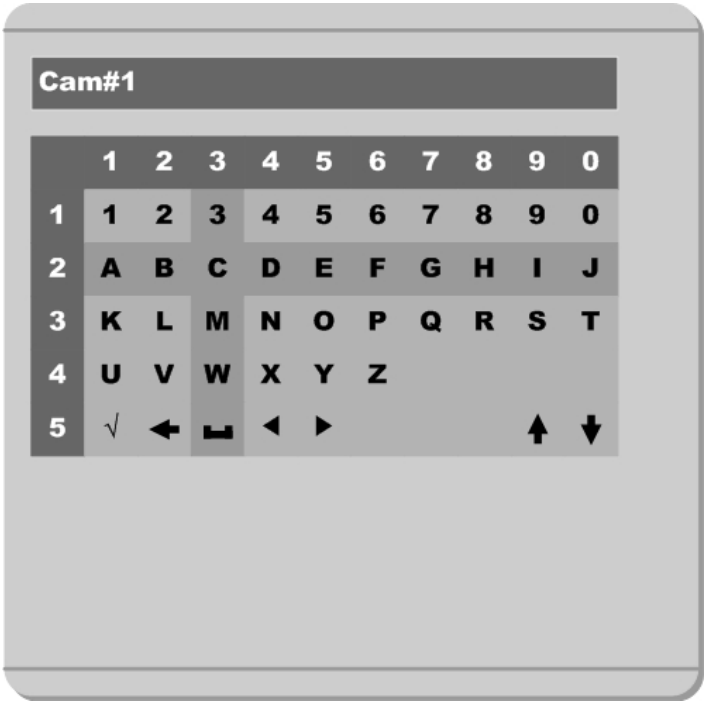
5.2. Dialogue Box to Edit a Word

There are two methods to set word.



(1) Using number button

Enter the related numbers in order of horizontal/vertical . (For example, in order to select "C", press [3] and [2] buttons.)

(2) Using arrow button

Select a value using the [/] or [/] buttons. The intersection of the horizontal and vertical bar is selected value. Press the [ ] button to confirm the selected value.

(3) Function word

The following symbols are for executing specific functions:

✓ : Enter

: Back Space & delete

: Space

: Move to left

: Move to right

: Previous Code Page

: Next Code Page

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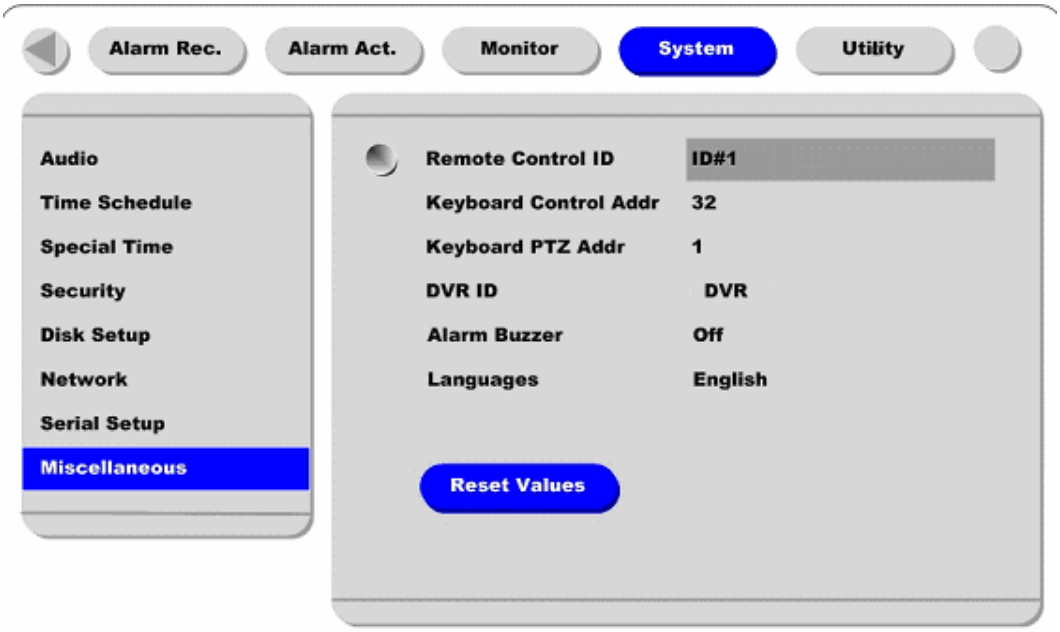
6. Setting remote controller

6.1. Setting ID of ELX16-240

When controlling several DVRs with one remote controller, set Remote Control ID as follows.



(1) Press the [MENU] button.

(2) Select "System" with using [ ] button and press the [ENETR] or [ ] button.

(3) Select "Miscellaneous" from the sub-menu list using the [ ] button and press the [ENETR] button.

(4) Select "Remote Control ID," and press the [ENETR] button.

(5) Select a value using the [/] buttons and press the [EXIT] button.

(6) Press the [EXIT] button to exit the Settings Page and return to Monitor mode.

<Note> Remote Control ID

Up to 16 DVRs can be controlled with a single remote controller.

When not using remote controller, set the Remote Control ID as "Off".

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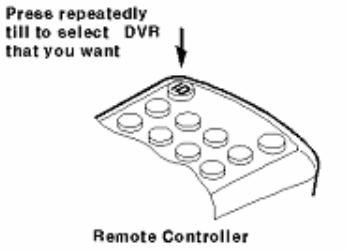
6.2. Selecting ELX16-240

If several DVRs are set with unique ID numbers, they can be controlled with one remote controller. To select a specific (ELX16-240), keep pressing the ID button of remote controller until a buzzer sounds during 2 seconds.

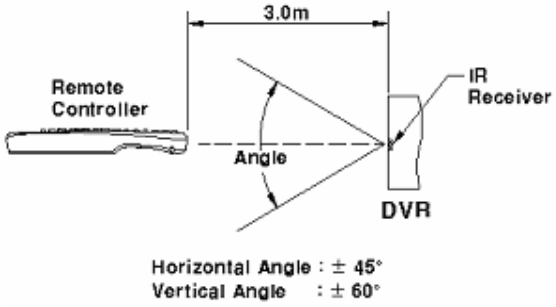


Unselected	PWR NET REC PLAY A/B +10
Selected	PWR NET REC PLAY A/B +10 LED Blink One Time

<Note>

Because remote controller ID is sixteen, DVR will correspond until pressing ID button sixteen times.

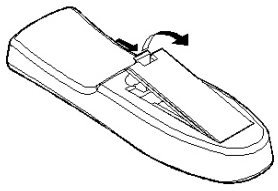
6.3. Operable range of remote controller



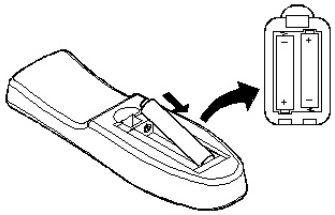
Horizontal Angle : ± 45°
Vertical Angle : ± 60°

6.4. Loading the batteries into remote controller

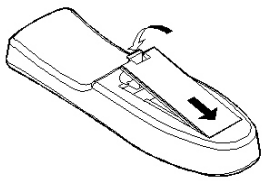
Remote controller requires two AAA-type batteries.



1. Remove the battery cover.



2. Taking care that the poles(+/-) are correctly positioned.



3. Replace the battery cover.

<Note>

Batteries are not included as a packing accessory.

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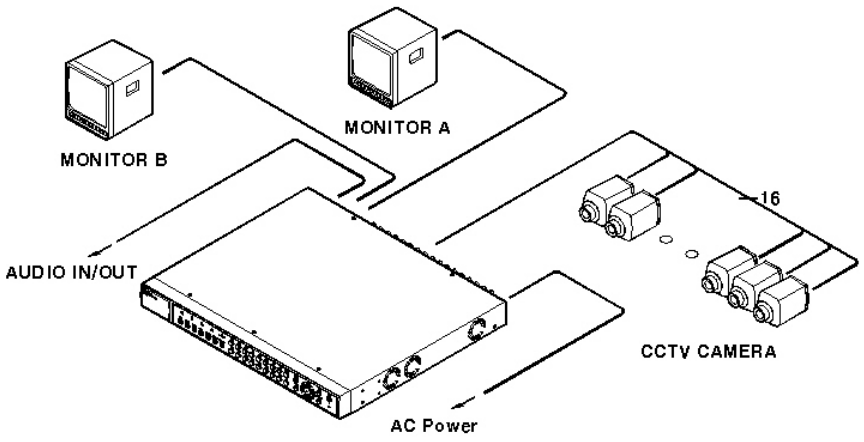
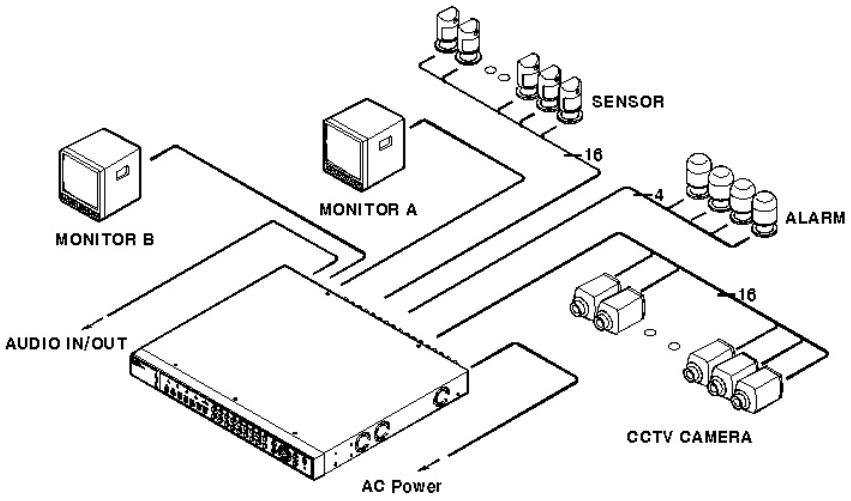
7. ELX16-240 Configuration

7.1. Basic Configuration



7.2. Advanced Configuration



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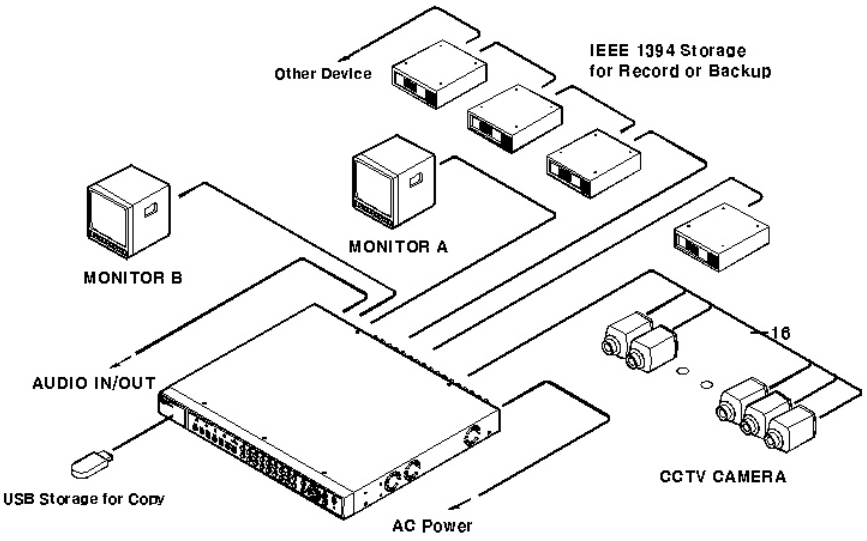
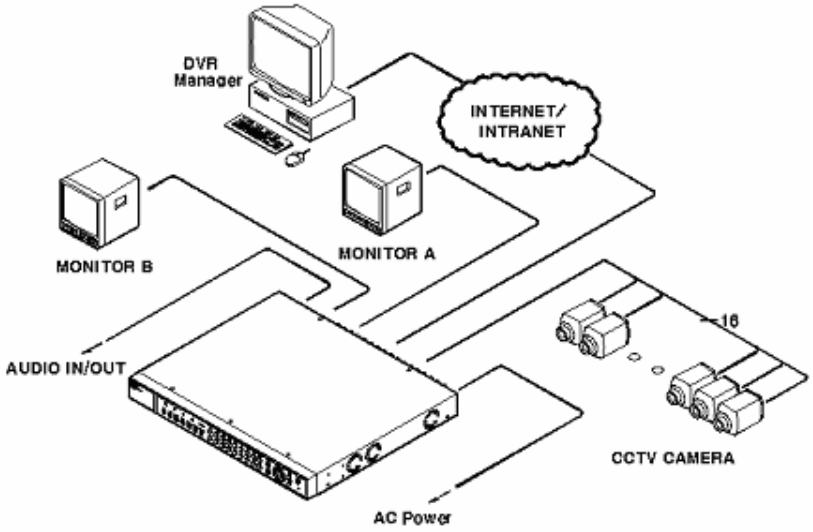
7.3. External Storage & Backup Configuration



7.4. Internet/Intranet Configuration



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8. ELX16-240 Basic Setting

8.1. Viewing Image

After initial start-up, images are displayed in multi-split screen according to the connected channels. The following example is when 4 channels are connected.

<Note>

If user password is set, a prompt for entering the password will appear.

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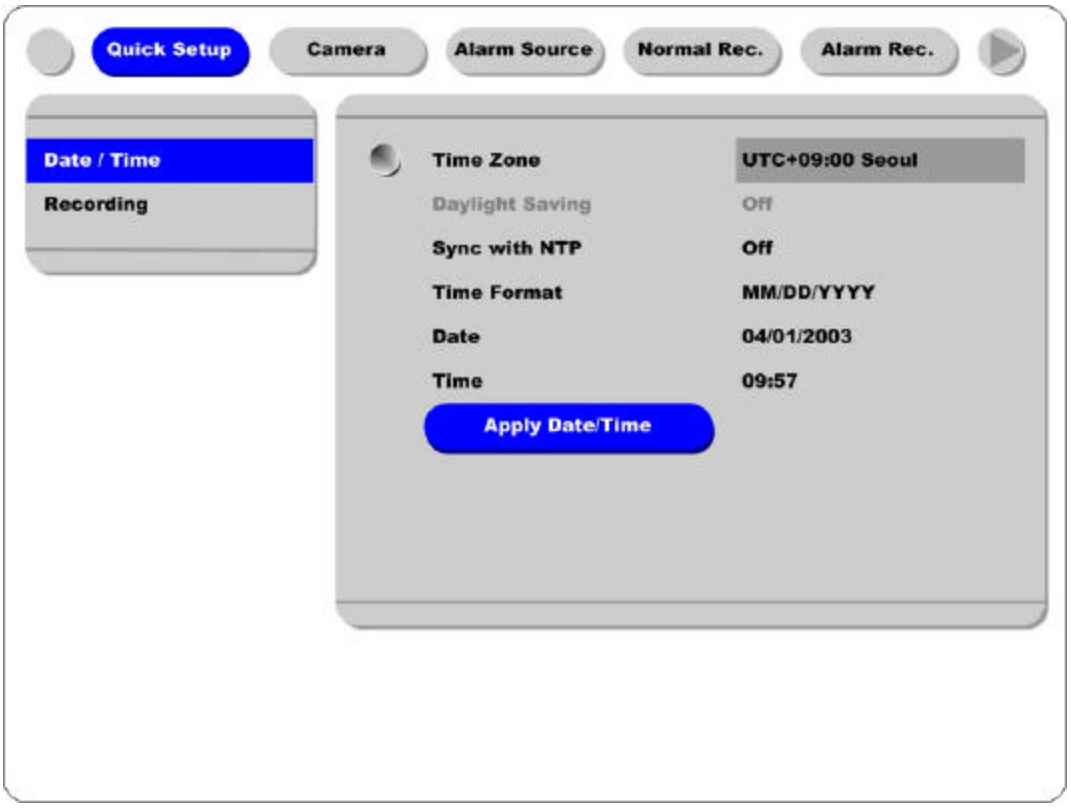
8.2. Setting Date & Time



(1) Press [MENU] button, and select "Quick Setup" tab.

(2) Select "Date/Time" and enter the Settings Page by pressing [ENTER].

8.2.1. Time Zone

(1) Select "Time Zone" and press [ENETR] button to configure.

(2) Select a value using the [/] button and press the [EXIT] button when finished.

8.2.2. Daylight Saving

(1) "Daylight Saving Time" is only activated for time zones that use Daylight Savings. If activated, press [ENTER] to enter a new value.

(2) Select "On/Off" using the [/] button and press the [EXIT] button when finished.

8.2.3. Sync with NTP

In order to synchronize time with NTP (Network Time Protocol) server, select "On".

(1) Select "Sync with NTP" using the [/] or the [/] buttons and press [ENTER] button.

(2) Select "On/Off" using the [/] button and press the [EXIT] button.

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8.2.4. Time Format

(1) Select "Time Format" using the [/] or the [/] buttons and press [ENTER].

(2) Two Time Formats are available; 'MM/DD/YYYY' and 'YYYY/MM/DD'. Select a value using [/] buttons, and press the [EXIT] button when finished. (Default value is 'MM/DD/YYYY'.)

8.2.5. Date

(1) Select "Date" using the [/] or the [/] buttons and press [ENTER].

(2) Select 'MM'/'DD'/'YYYY' using the [/] buttons, and select the value using the [/] buttons.

(3) Press the [EXIT] button when finished.

8.2.6. Time

(1) Select "Time" using the [/] or the [/] buttons and press [ENTER].

(2) Select 'HH'/'MM' using the [/] buttons, and select the value using the [/] buttons.

(3) Press the [EXIT] button when finished.

8.2.7. Apply Date/Time

Most setting values are applied automatically, when exiting from the related menu page. But "Date" & "Time" settings are not applied automatically because they may critically affect the file system of the recorded HDD. To apply Date/Time settings confirm settings with [Apply Date/Time] button.

(1) Select "Apply Date/time" using the [/] or the [/] buttons and press [ENTER]. A warning message will appear.

(2) Select "OK" using the [/] or the [/] buttons and press [ENTER]. To cancel, press the [EXIT] button.

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8.3. Setting Recording Condition

Recording conditions under the "Quick Setup" menu tab apply the same values to all analog channels 1~16. All settings are applied for 24 hours/day regardless of the values set for "Time Schedule" or "Alarm Rec."

(1) Press [MENU] button, and select "Quick Setup."

(2) Move to sub-menu by pressing [ENTER] or the [ ] button.

(3) Select "Recording" using the [/] buttons and press the [ENTER] button.

8.3.1. Configuration Status

Displays the recording configuration status. When setting up through the "Quick Setup" menu, "Quick Setup" will be shown. When setting up through "Normal Rec." or "Alarm Rec.," "Custom Setup" will be shown.

<Note>

Only when all the 16 channels' normal recording conditions are set through Macro Setup' and maintained, it is marked as 'Macro Setup'. Otherwise, it will be marked as 'Custom Setup'.

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8.3.2. Channel Status

(1) Select "Channel Status" using [/] buttons and press the [ENTER] button.

(2) Select a value using the [/] button. Press the [EXIT] button when finished.

8.3.3. Recording Speed/Quality

(1) Select "Recording Speed/Quality" using [/] buttons and press the [ENTER] button.

(2) Select a value using the [/] button. Press the [EXIT] button when finished.

<Note> Recording Speed/Quality means

Low : Speed=1ips and Quality=Q5

Std. : Speed=5ips and Quality=Q5

High : Speed=15ips and Quality=Q5

Custom : Speed and Quality = Manually defined by User.

8.3.4. Speed(ips)

When "Recording Speed/Quality" is set as "Custom," values can be set manually.

(1) Select "Speed" using [/] buttons and press the [ENTER] button.

(2) Select a value using the [/] button. Press the [EXIT] button when finished.

8.3.5. Quality

When "Recording Speed/Quality" is set as "Custom," values can be set manually.

(1) Select "Quality" using [/] buttons and press the [ENTER] button.

(2) Select a value using the [/] button. Press the [EXIT] button when finished.

8.3.6. Audio Recording

(1) Select "Audio Recording" using [/] buttons and press the [ENTER] button.

(2) Select a value using the [/] button. Press the [EXIT] button when finished.

8.3.7. Apply

(1) Select "Apply" using [/] buttons and press the [ENTER] button.

(2) Setting values are applied and the previous menu will be displayed.

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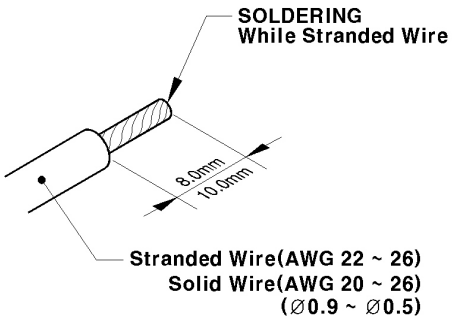
9. Connecting and Configuring DIO Ports

<Note> Wire Handling

Trimming Wire

When connecting a wire to a terminal block, follow the instructions below. Note the different types of wire that can be used.

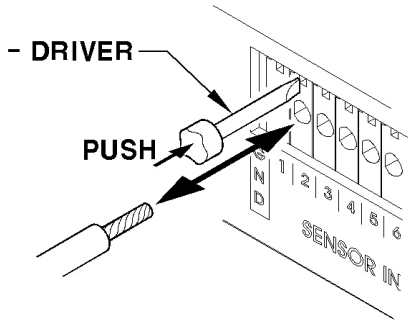


Stranded Wire: Peel off the wiring cover 8~10mm and solder it. Wire gage should be AWG 22 ~ 26.

Solid Wire: Peel off the wiring cover 8~10mm and solder it. Wire gage should be AWG 20 ~ 26.

Inserting & removing wire

To insert the wire, use a screwdriver as shown in the diagram to the right.



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9.1. Connecting and Configuring Sensor

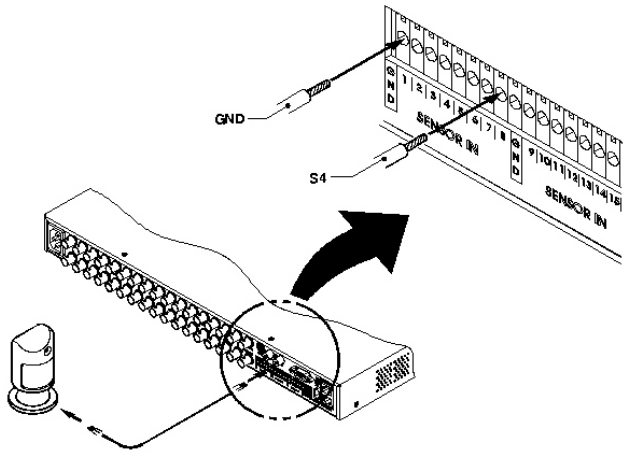
9.1.1. Specification

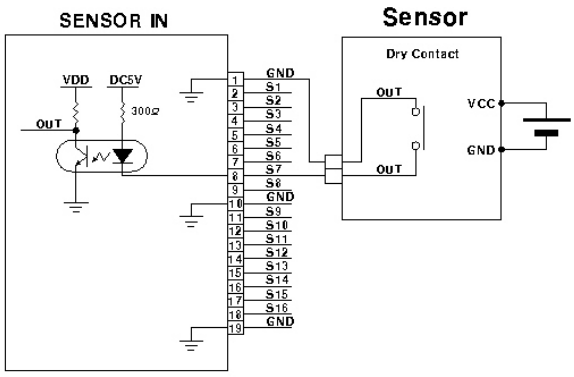
In order to run sensor input of ELX16-240 series normally, the following conditions are required.

Spec.	Input Ch.	16Ch. Photo coupler inputs
	Input type	N.C. (Normal Close) / N.O. (Normal Open) type
	Supported sensor	Dry contact
	Connecting	Connecting the trimmed wire to terminal block
Performance	Available input pulse range	Min. 500ms
	Output current	Typical DC 12mA

9.1.2. Connecting Sensor Input

Connect S1 ~ S16 with referring to the followings. It shows to connect a dry contact. When connecting a non-dry contact type of sensor (e.g. Open collector output) please contact Customer Support team.





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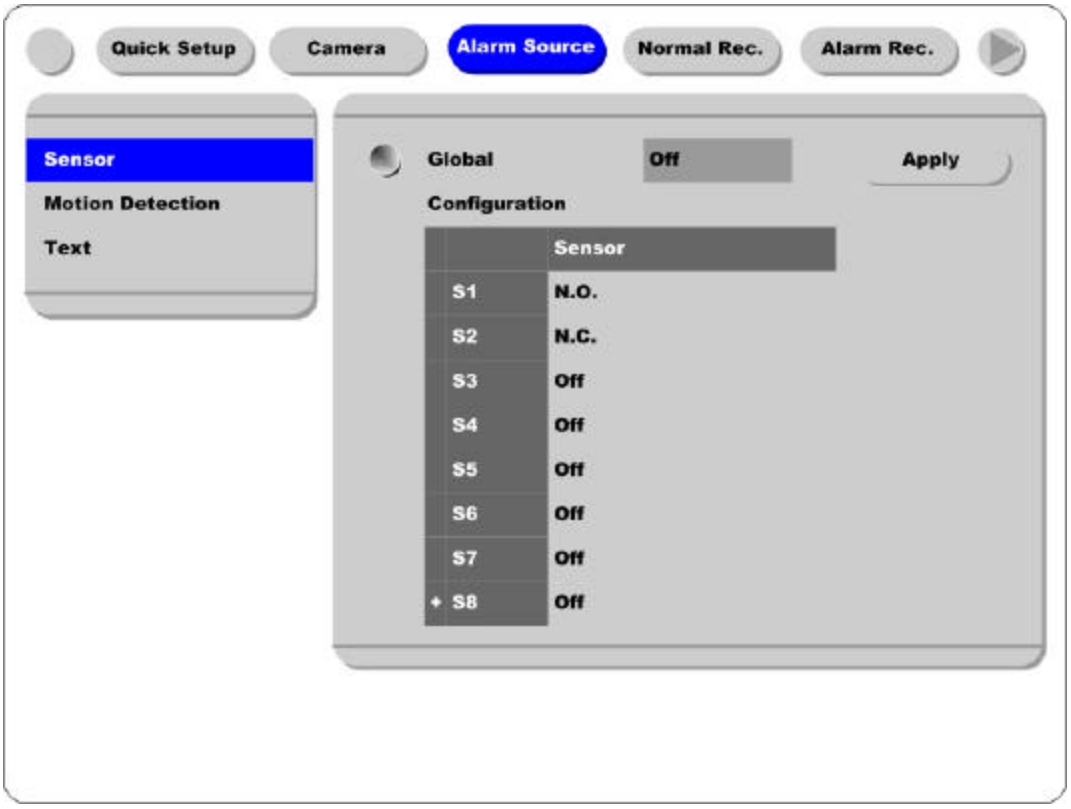
9.1.3. Configuring Sensor at OSD menu



(1) Press the [Menu] button, and select the "Alarm Source" among OSD menus.

(2) Select "Sensor" menu and press the [Enter] button for moving to the sub-menu.

9.1.3.1. Global

It is for setting 16 sensors simultaneously. It has three types; Off / Normal Open (N.O.) / Normal Close (N.C.)

(1) Select "Global" and set a type.

(2) Press the "Apply" button in order to confirm the setting value.

9.1.3.2. Configuration

It is for setting 16 sensors separately. Select and set each sensor.

(1) Select "Configuration" and press the [Enter] button.

(2) Select a sensor (S1 ~ S16) and set its type.

(3) Press the [Exit] button after setting.

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<Note>

1. This menu is to set sensor using and sensor type. However recording by sensor input and relay output should be set in another menu.

2. For recording setting by sensor input, refer to the "Alarm Rec." part of "**ELX16-240 User's Guide**", and for relay output, refer to the "Alarm Act." part.

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9.2. Connecting & Configuring Relay Out

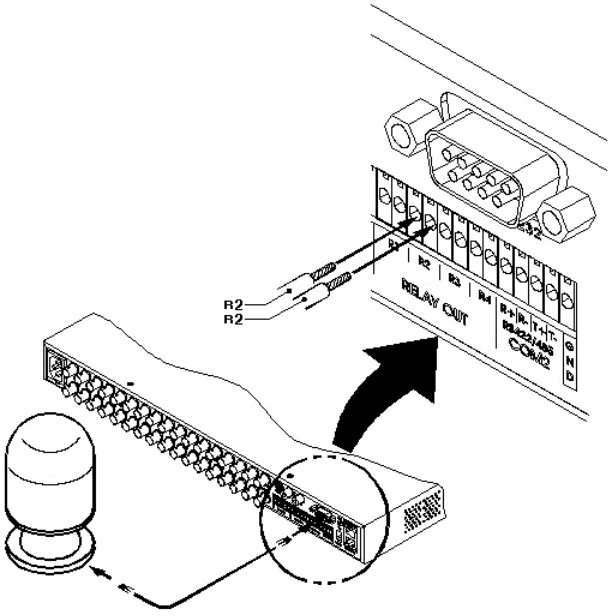
9.2.1. Specifications

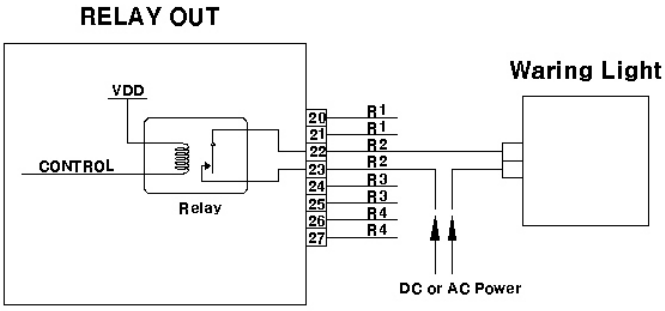
In order to run relay output of ELX16-240 series normally, the following conditions are required.

Spec.	Output Ch.	4Ch. Rrelay differential outputs
	Output type	Dry Contact
	Connecting type	Connecting the trimmed wire to terminal block
Rating	DC	24V DC, 1.25A, 30W
		125V DC, 0.24A, 30W
	AC	125V AC, 0.5A, 62.5VA

9.2.2. Connecting Relay Out

Connect R1 ~ R4 with referring to the followings. It shows to connect a warning light.





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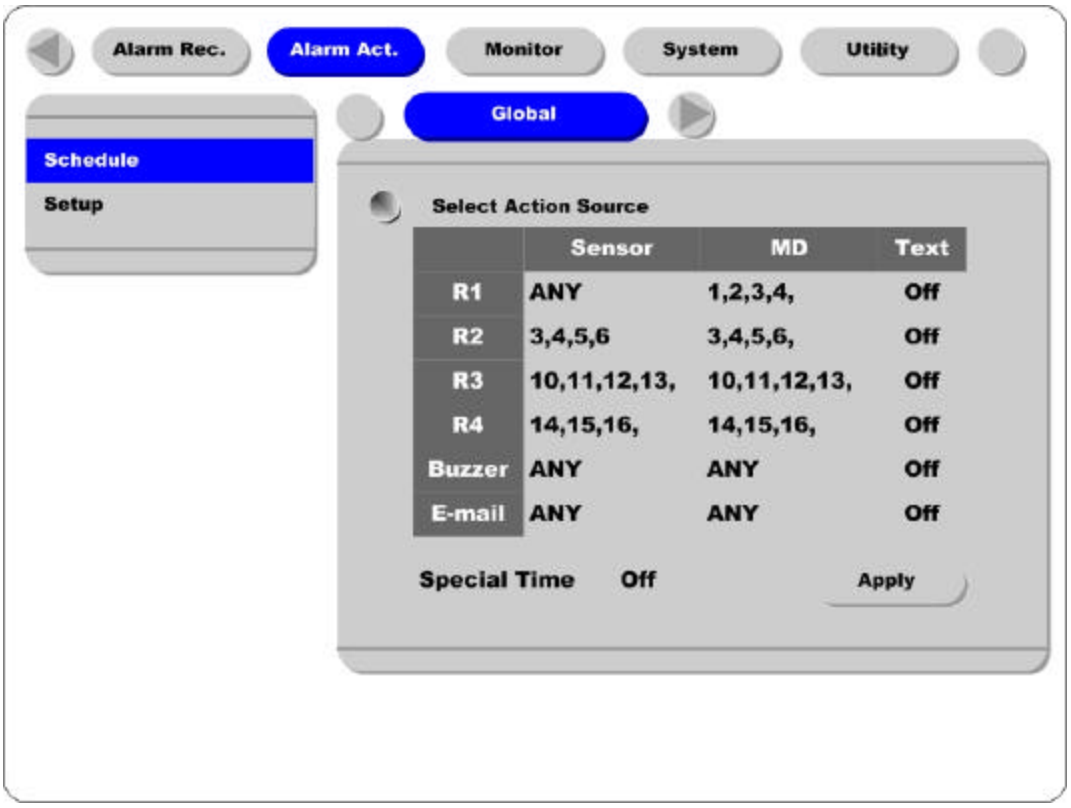
9.2.3. Configuring Relay Out at OSD menu



Relay can run by sensor or MD, and its condition can be set differently according to schedule. When using the [Relay] button + [Number] button on the front panel or Manager S/W, relay can be operated from remote site.

<Note>

For detailed information for setting, please refer to "**ELX16-240 User's Guide**".

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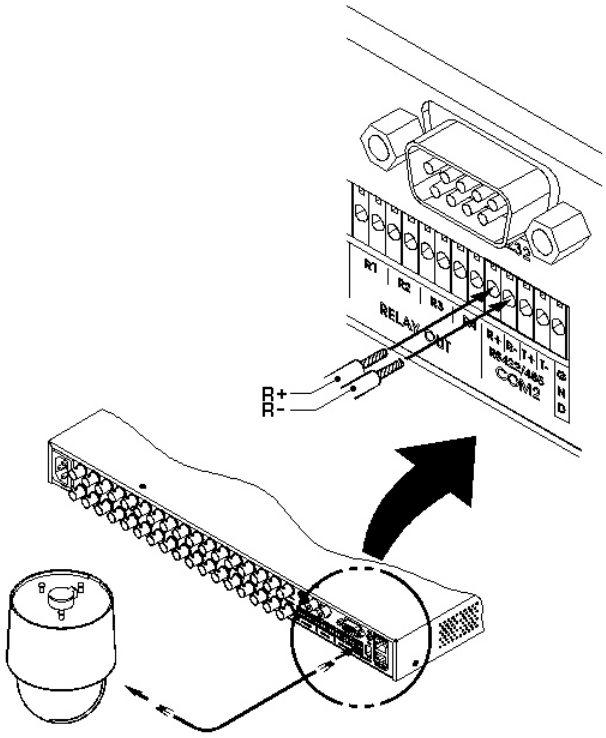
9.3. Connecting Serial Port

9.3.1. Configuring Serial Ports for Pan/Tilt/Zoom

The ELX16-240 series have most major PTZ protocols already pre-programmed. Makes and models not supported can still be controlled using the Transparent Protocol. For a list of supported protocols, refer to the list on the OSD Configuration menu.

The following figure shows how to connect PTZ camera to RS485 (COM2). When using another serial port, connect it with referring to each connection diagram below.



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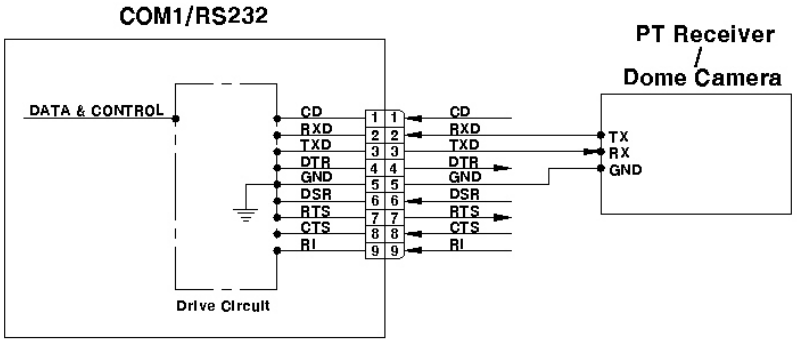
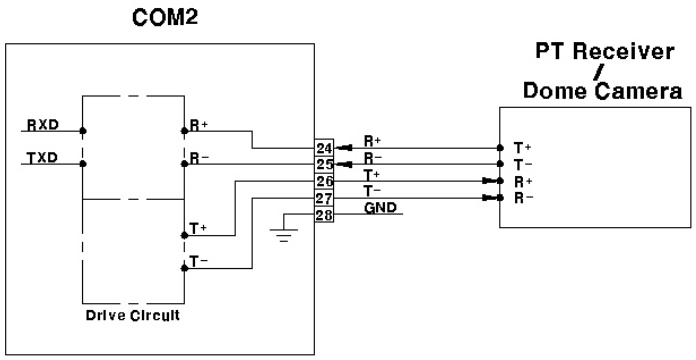
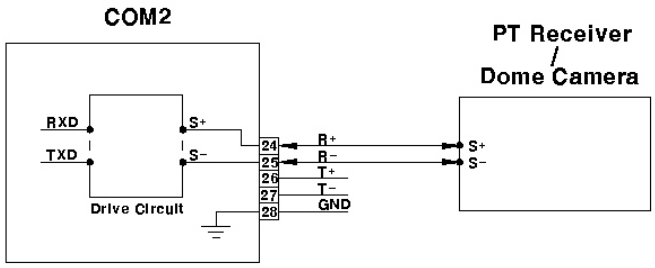
9.3.2. Diagrams of serial ports

9.3.2.1. Diagram of COM1



9.3.2.2. Diagram of COM2





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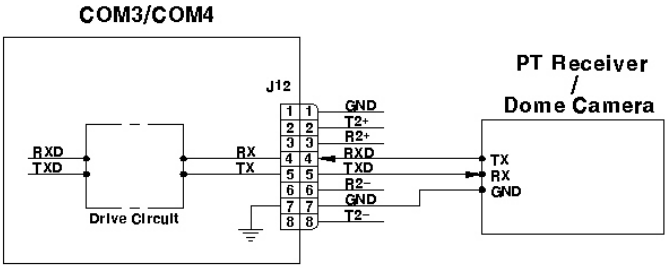
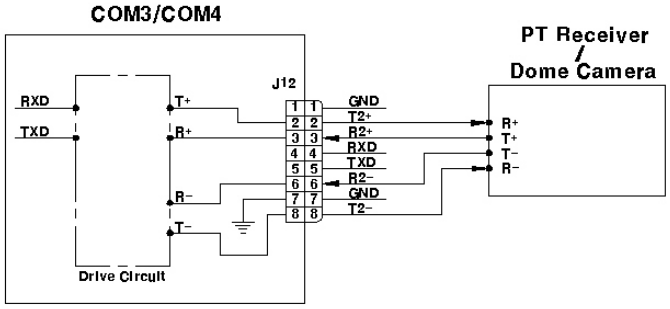
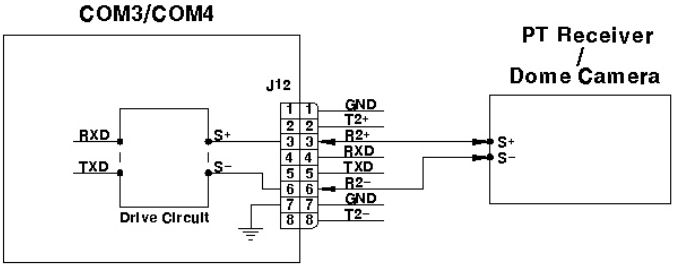
9.3.2.3. Diagram of COM3

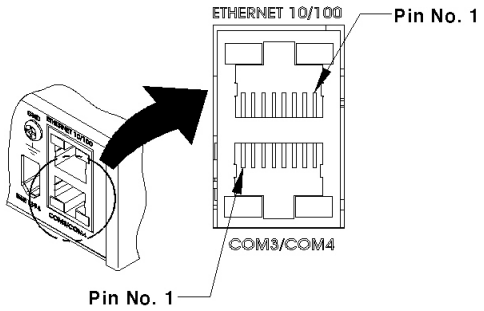


9.3.2.4. Diagram of COM4





9.3.3. View of COM3/COM4 Serial Ports



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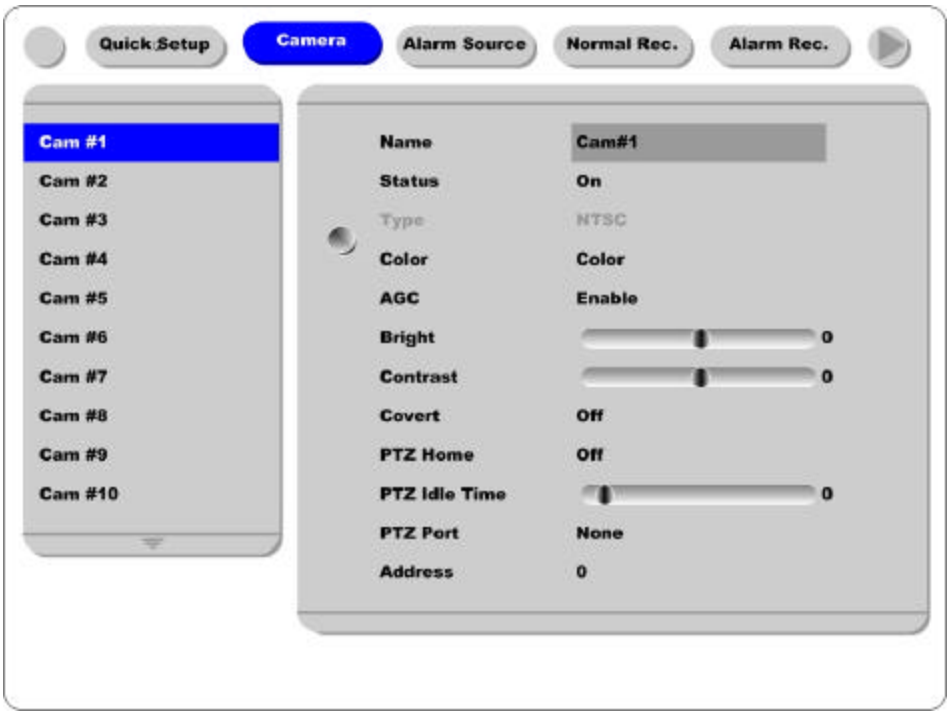
9.3.4. Configuring COM Port at OSD menu

Configure PTZ COM ports and available modes at “System / Serial Setup ”.

After completing serial setup, configure base address and port for each channel under the “Camera” menu tab. When connecting PTZ devices to several cameras, be sure the base address matches the address for the camera.



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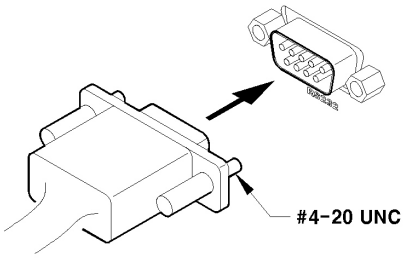
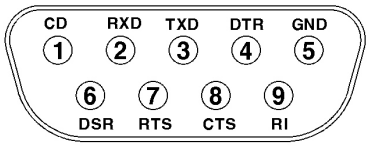
9.4. Connecting External Device with Serial Port

9.4.1. Connecting Text Input Device (ATM / POS / Access Control)

In addition to images, the ELX16-240 can record text data received from POS/ATM through the COM1/RS232 serial port.





Connect to COM1/RS232 (9pin D-Sub) of ELX16-240, and configure the "Serial Setup" sub-menu under the "System" tab and "Text" sub-menu under the "Alarm Source" tab.

9.4.2. Configuring Serial Setup (COM1) at OSD menu

(1) Set the "System" in OSD menus, and move to "Serial Setup" menu.

(2) Select COM1 in "Serial Setup", set Device as "Text".

(3) Set Baud Rate/Parity/Stop bit/Data bit with referring to manual of the connected external device.

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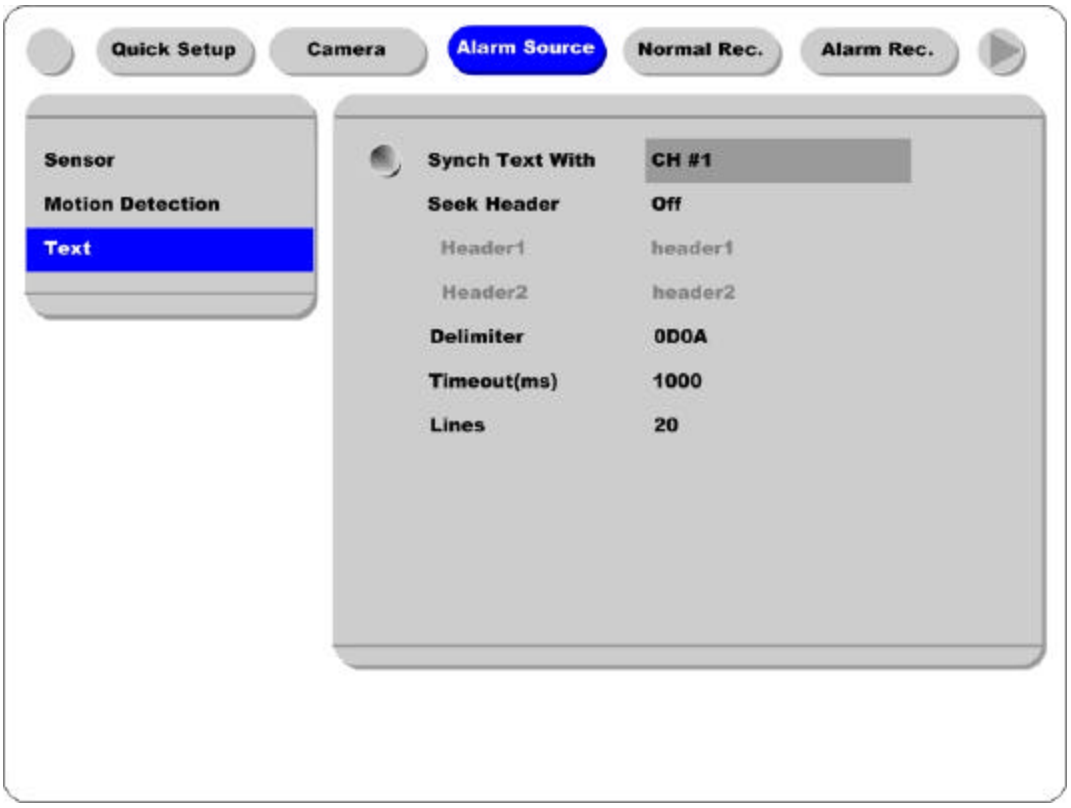
9.4.3. Configuring Text



(1) Select the "Alarm Source" menu among OSD menus.

(2) Select the "Text", and set each value.

<Note>

Before installing any external device, consult with the local distributor. Some external devices may not be compatible with the DVR.

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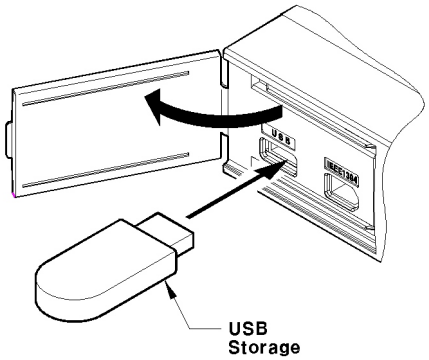
9.5. Connecting USB Device

USB port can be used to copy up to 1 minute of images to aUSB Flash memory disk. When connecting USB device, do not exceed the rated values of USB device.

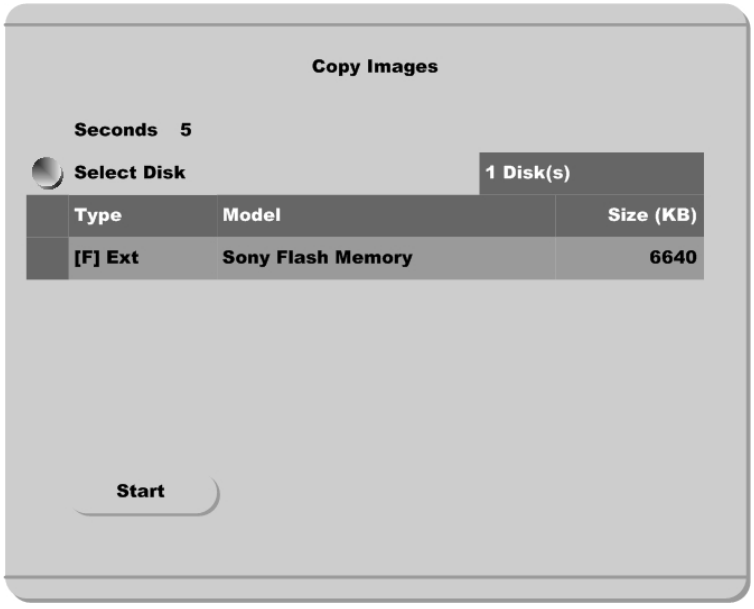
USB Spec.	Ver 1.1 (Max 12M bps)
Available Device	USB Memory Stick,
Output Voltage/Current	Max. 200mA per DC 5V / Port



〈Note〉

The disk should be formatted with FAT32 type.

If properly connected, the disk is recognized automatically as in the following picture. To copy images, the process is as follows: Set copy range (up to 1 minute) → Select drive → Copy (press "Start").



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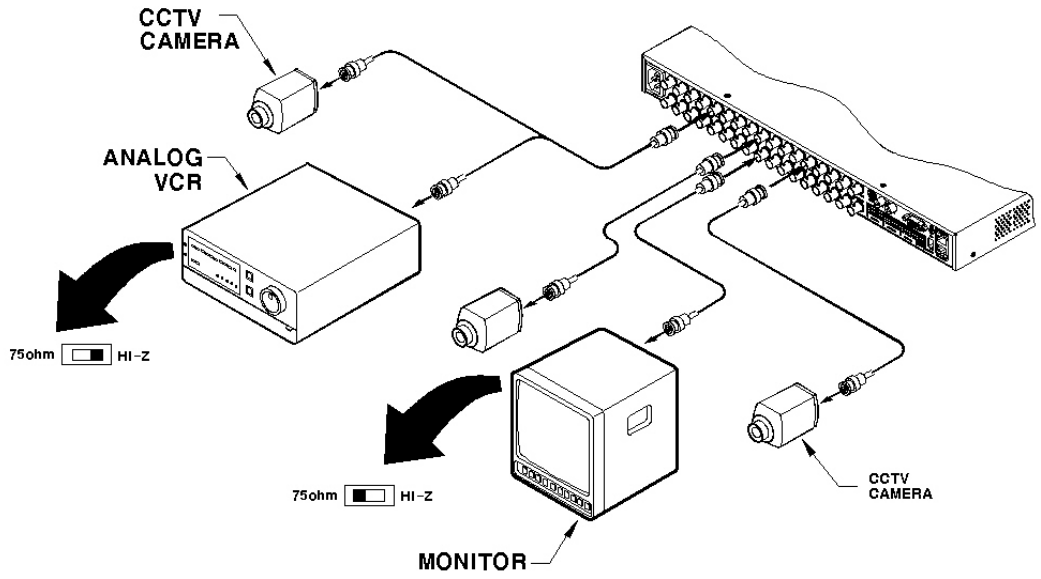
〈Note〉

1. USB Flash products that require a Windows program to operate may not be recognized by the DVR.
2. For more information about copy function, refer to the "**ELX16-240 User's Guide**".

9.6. Connecting Video In/Output

DVR's video in/output is composed of loop through. DVR recognizes the connection status and video impedance automatically.

For example, when DVR is connected by only video input, the video impedance is set as 75Ù. And when video in/output is connected simultaneously, the video impedance is changed as Hi-z. So in this case, video impedance of external video input device(e.g CCTV monitor) should be set as 75Ù.



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10. Connecting External Storage

10.1. IEEE1394 Port

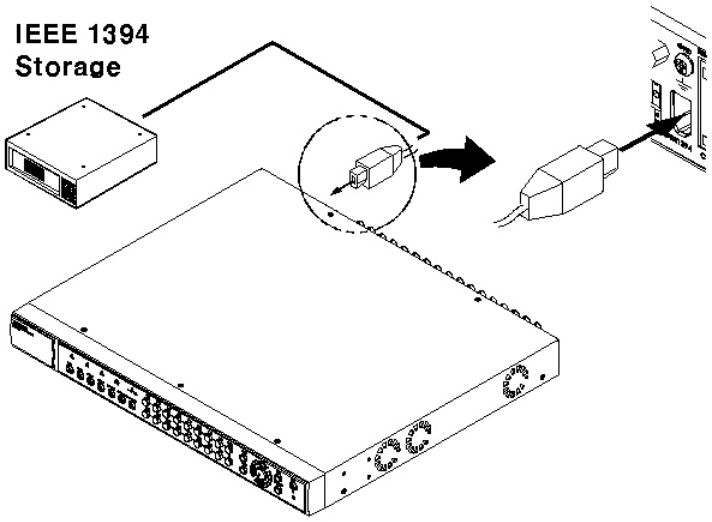
ELX16-240 series have two IEEE1394 ports for external storage device interface. With them, ELX16-240 series can expand storage capacity up to 4TB.

<Note>

Some IEEE1394 Bay may not be recognized by the ELX16-240 series. Before purchasing, consult the local distributor.

10.2. Connecting IEEE1394 Device

When using FireWire supported external HDD, hard drive bays can be connected to 1 port in the front panel or 1 port in the rear panel. The ELX16-240 series does not supply power to the hard drive bay; therefore only bays that use external power can be used.



<Note>

ELX16-240 series detect external HDD, even though ELX16-240 series run. If not, it is recommended to connect as follows.

1. Power off ELX16-240.
2. Connect external HDD to IEEE1394 port.
3. Power on external device.
4. Power on ELX16-240.

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10.3. Available HDD

It is recommended to use the following HDD models with the ELX16-240. If a non-recommended HDD is used, Rugged CCTV will not guarantee the warranty.

Manufacturer : MAXTOR

Series	Model No	Size	Series	Model No	Size
DiamondMax Plus 9 (7200rpm)	6Y060L0	60GB	DiamondMax 16 (5400rpm)	4R060L0	60GB
	6Y080L(P)0	80GB		4R080L0	80GB
	6Y120L(P)0	120GB		4R120L0	120GB
	6Y160L(P)0	160GB		4R160L0	160GB
	6Y200P0	200GB			
	6Y250P0	250GB			

<Note>

Buffer for DiamondMax Plus 9's model "L" is 3MB; for model "P" the buffer is 8MB.

10.4. Registering & Formatting HDD

"Disk Manager" will automatically run on start-up after installing a HDD.

If "Disk Manager" does not automatically run on start-up, make sure the HDD is properly installed.

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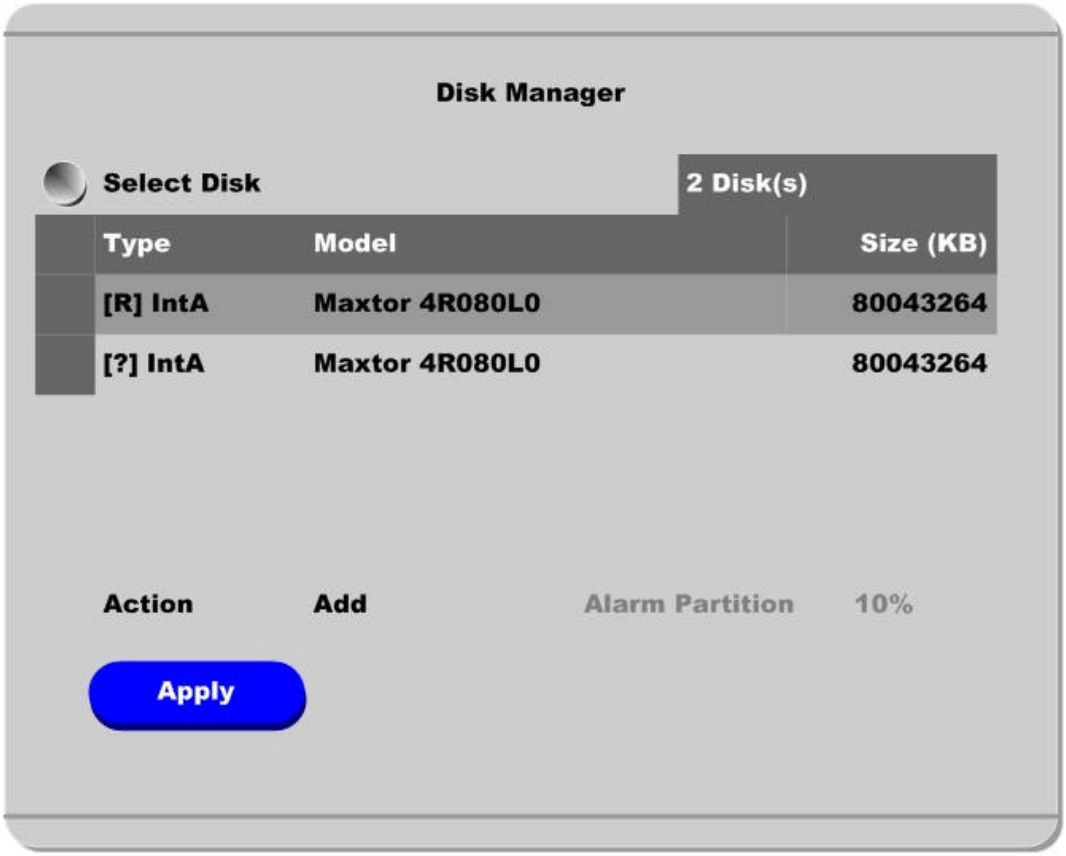

(1) Press [ENTER] button at "Select Disk".

(2) Select new added HDD (indicated as "[F]") using [/] button and press [EXIT] button

(3) Select "Action" using [/] button and press [EXIT] button.

(4) Select "Add" using [/] button and press [EXIT] button.

(5) Select "Apply" using [/] button and press [EXIT] button. The HDD status is changed to "[*]".

(6) Select "Action" using [/] button and press [EXIT] button.

(7) Select "Format" using [/] button and press [EXIT] button.

(8) Select "Apply" using [/] button and press [EXIT] button. The HDD status is changed to "[R]" after formatting.

(9) Shut down "Disk Manager" by pressing [EXIT] button.

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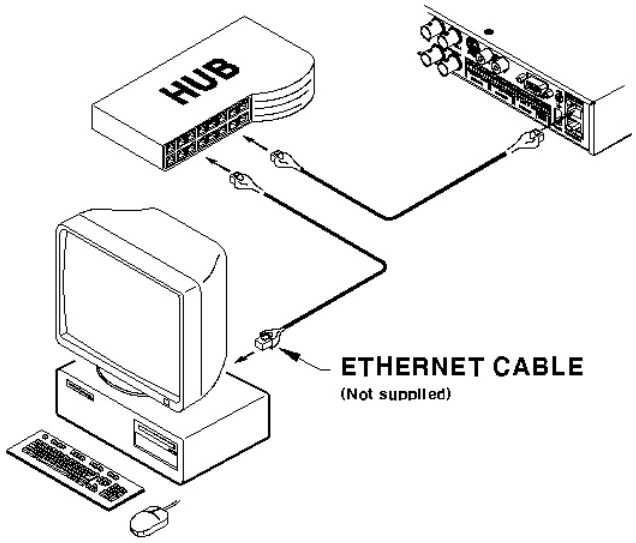
11. Network Monitoring & Managing

ELX16-240 can be accessed, controlled, and managed from remote site via Internet/Intranet.

11.1. Connecting Ethernet



(1) Turn off ELX16-240's power switch.

(2) Connect ELX16-240 to hub with Ethernet cable.

(3) Turn on ELX16-240's power switch.

<Note>

1. Supply power to ELX16-240 after connecting Ethernet cable to protect against electrical damage to ELX16-240.

2. Check cable connection status.

3. Check LED on ELX16-240's rear panel after supplying power.

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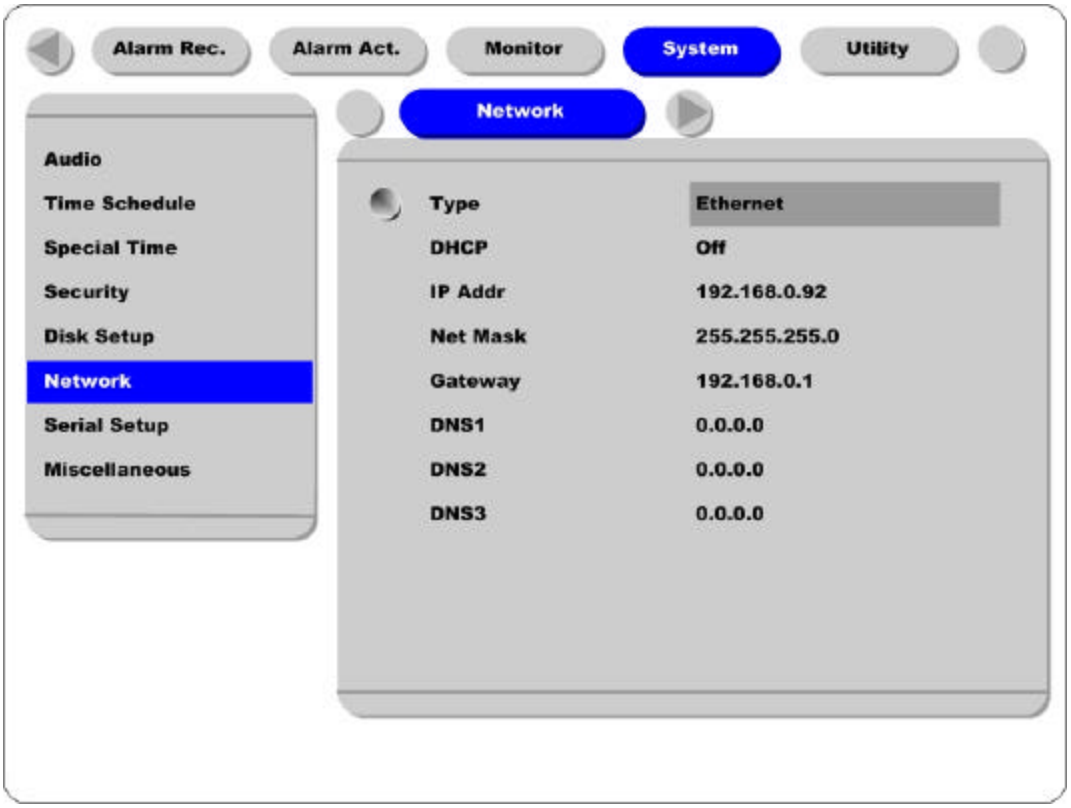
11.2. Configuring ELX16-240's Network Information

The following description is on based on Ethernet connection. For more detailed information on the Network Settings Page, please refer to "**ELX16-240 OSD User's Guide**".



(1) Press [MENU] button.

(2) Select "System" using the [/] buttons and press [ENTER].

(3) Select "Network" using the [/] buttons and press [ENTER].

(4) Select "IP Addr" using the [/] buttons and press [ENTER].

(5) Press [EXIT] button after entering IP address in the dialogue box.

(6) Select "Net Mask" using the [/] buttons and press [ENTER].

(7) Press [EXIT] button after entering Net Mask in the dialogue box.

(8) Select "Gateway" using the [/] buttons and press [ENTER].

(9) Press [EXIT] button after entering Gateway in the dialogue box.

(10) Select "DNS" using the [/] buttons and press [ENTER].

(11) Press [EXIT] button after entering DNS in the dialogue box.

(12) Press [EXIT] button to exit the page.

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12. Using DVR manager

12.1. PC System Requirements for running DVR manager

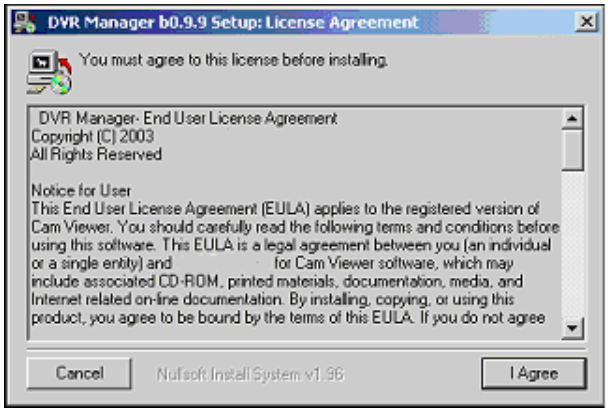
	Minimal Requirements	Recommended Requirements
CPU	P- 600MHz or above	P- 1GHz or above
RAM	128 MB or above	256 MB or above
VGA	16 MB or above	32 MB or above
OS	Windows 2000/XP	Windows 2000/XP
Resolution	1024 X 768 pixels or above	1024 X 768 pixels or above
Network	100 Base TX Fast Ethernet	100 Base TX Fast Ethernet

12.2. Installing DVR manager

(1) Insert Setup CD-ROM into CD-ROM drive of administrator's PC

(2) Doubleclick the DVR manager setup file. Install Shield Wizard will be automatically installed.

(3) Click the "I Agree" button to accept the license agreement



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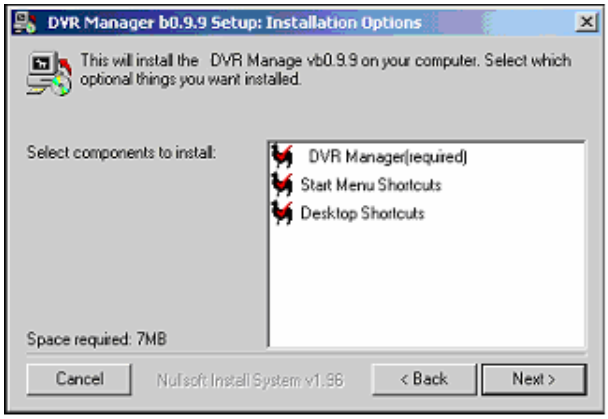
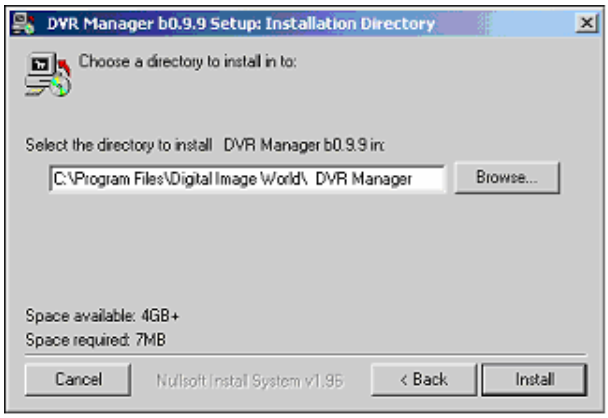
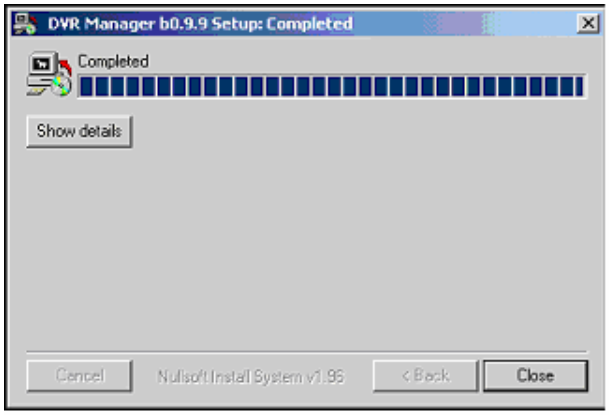
(4) Select which components to install and press the "Next" button.



(5) Browse and choose a directory if the default directory is not preferred. Click the "Install" button, after selecting a directory to install.



(6) Click the "Close" button after DVR manager program is installed successfully.



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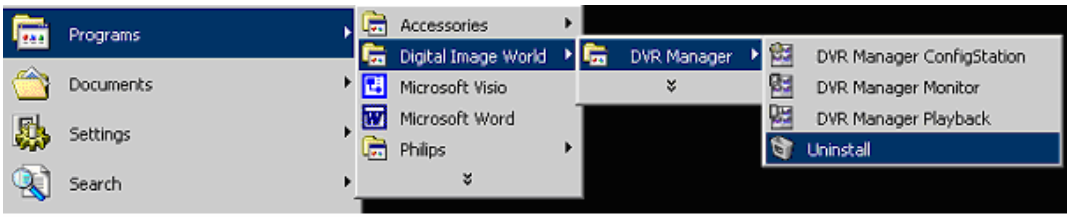
12.3. Uninstalling DVR manager

(1) Click Windows "Start" Button.

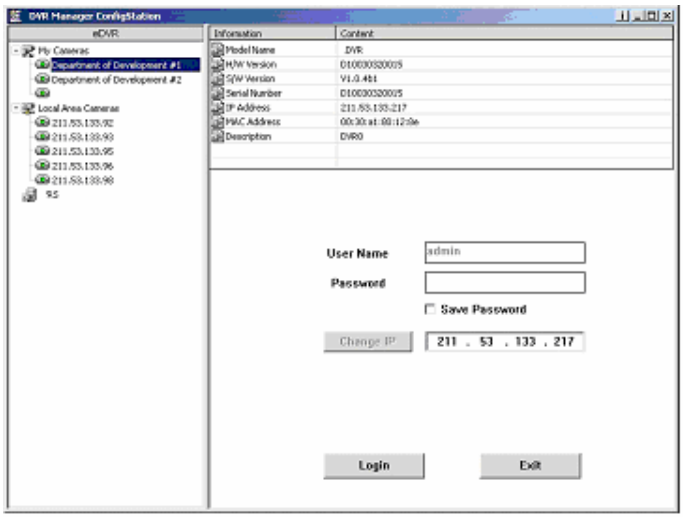
(2) Select and Click 'Uninstall' icon to run Uninstall Shield.



(3) DVR manager program will be automatically deleted.

12.4. Configstation

Click icon on desktop to run "DVR manager Configstation" program.



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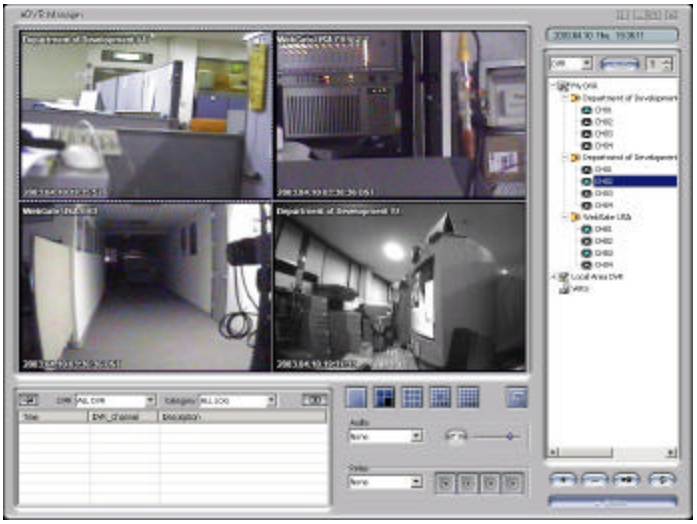
12.5. Monitor

Click the related icon and run the "DVR manager Monitor" program.



12.6. Playback

Click the related icon and run the "DVR manager Playback" program.

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APPENDIX

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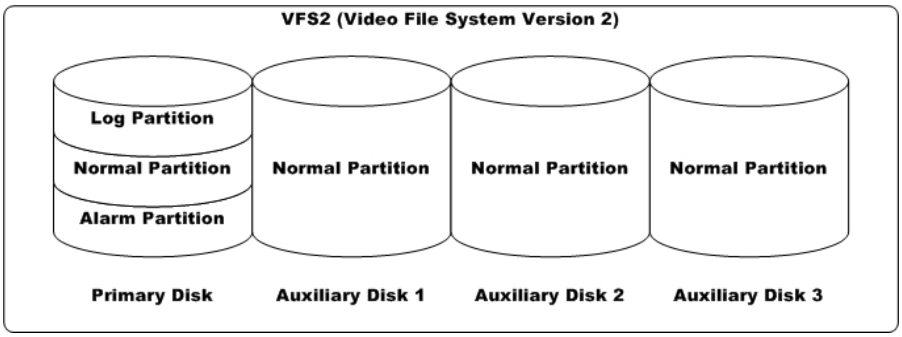
#1. HDD

#1.1. Fundamental Notions & Terms

DVR Storing Constructure (VFS2)



DVR series has a peculiar storing constructure, and its features are as follows.

(1) It is possible to connect 2 sets of HDD internally (Internal, ATA Interface) and 63 sets of HDD externally (External, 2 ports of IEEE1394).

(2) All of the connected HDDs is recognized as one virtual disk, and DVR supports upto 4TB.

(3) Hdds are divided into primary disk (connected firstly) and auxillary disk.

<Note>

ATA(or EIDE) supports two channel interfaces (Primary/Secondary). Each channel can be connected to two devices (Master/Slave, HDD/CD-ROM). However DVR supports 1 channel interface internally and total two HDDs. In order to prevent confusing VFS2's Primary Disk, we will not use the terms (Primary/Secondary).

(4) Primary disk is composed of log partition, normal partition, and alarm partition, and auxillary disk is composed of only normal partition. So if primary disk has some problem, all of the recorded data will be lost.

<Note>

Log Partition	To store the information of recorded data
Normal Partition	To store the data as normal recording schedule
Alarm Partition	To store the data as alarm recording condition (MD or Sensor)

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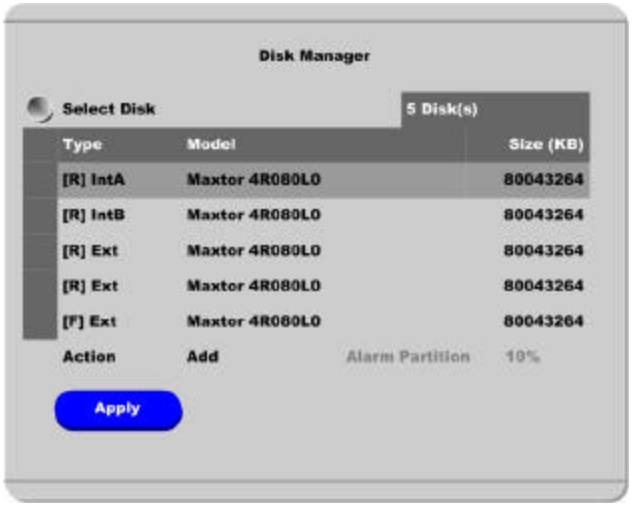
Backup

(1) Backup is possible only through IEEE1394 port, and HDD for backup should be formatted as FAT32 type. (Its type is indicated as [F] in Disk Manager.)

Disk Manager

(1) When HDD is added or deleted physically, Disk Manager runs automatically after rebooting. If not, you can run "Disk Manager" manually with moving "Menu→Utility→Disk Manager".



(2) HDD Type at Disk Manager

[R]	Available of recording
[V]	Connected and formatted as ELX16-240's file system. If using 'Add used' command, it will be changed to [R]. There is no need to reformat.
[F]	Connected but not available file system. After using 'Add', need to format for making as [R].
[*]	Connected and added using the 'ADD' command. If formatting, it will be [R]. If there is a disk of [*], DVR will record nothing.
[X]	HDD cable is not connected or has some problem. In case of that, HDD should be removed with using 'Confirm Removed' menu.
IntA	Internal Master HDD
IntB	Internal Slave HDD
Ext	External HDD

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(3) HDD Managing Command

Format	Format as ELX16-240's file system. Not available to PC file system.
Add	Add HDD for recording. Need to format.
Add Used	Add a HDD that has been used and formatted. There is no need to reformat . It is possble only when HDD is added as Primary Disk.
Remove	Remove current HDD. HDD can be reused without data loss by the 'Add Used' command.
Confirm Removed	Used when a removed HDD is still listed. ALL DATA WILL BE LOST!

#1.2. Installing HDD

Compatible HDD

It is recommended to use the following HDD models with the ELX16-240. If a non-recommended HDD is used, Rugged CCTV will not guarantee the warranty.

Manufacturer : MAXTOR

Series	Model No.	Size	Series	Model No.	Size
DiamondMax Plus 9 (7200rpm)	6Y060L0	60GB	DiamondMax 16 (5400rpm)	4R060L0	60GB
	6Y080L(P)0	80GB		4R080L0	80GB
	6Y120L(P)0 6Y160L(P)0	120GB 160GB		4R120L0 4R160L0	120GB 160GB
	6Y200P0	200GB			
	6Y250P0	250GB			

<Note>

L series of DiamondMax Plus 9 has 2MB buffer memory, while P model has 8MB

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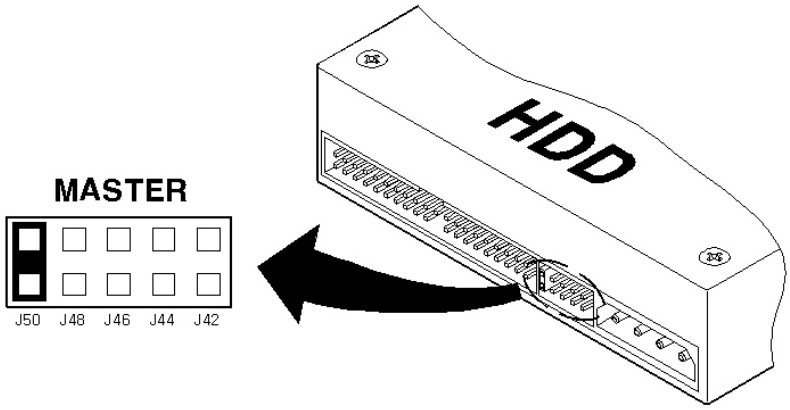
Installing & Expanding Internal HDD

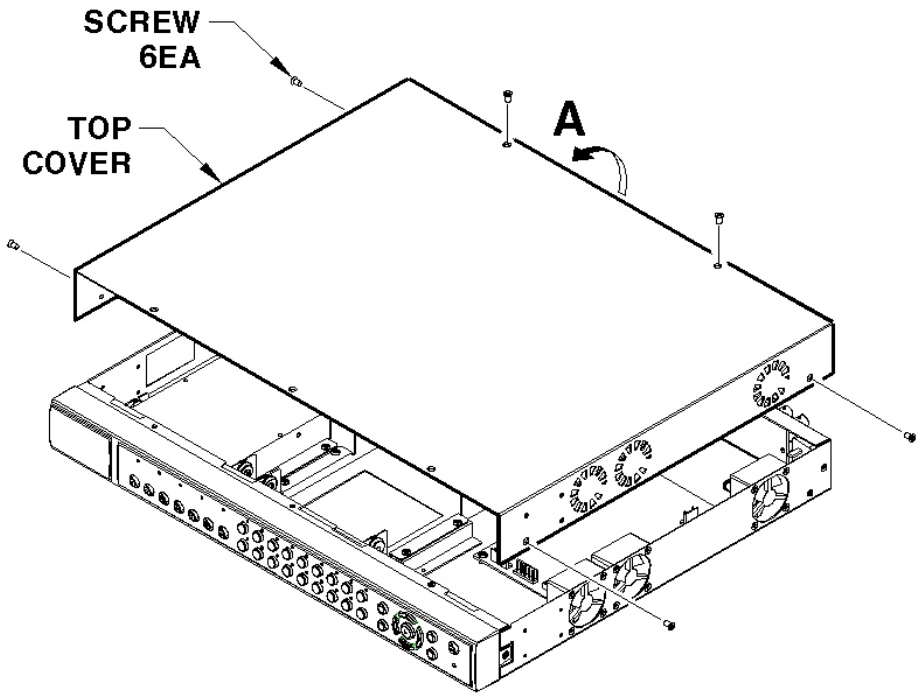
Adding or replacing HDD should follow below process.

(1) Turn off the power of ELX16-240.

(2) Check whether the dip switches are set as illustrated below.



(3) Remove the 6 screws as illustrated below and pull up the cover from the rear part to open.



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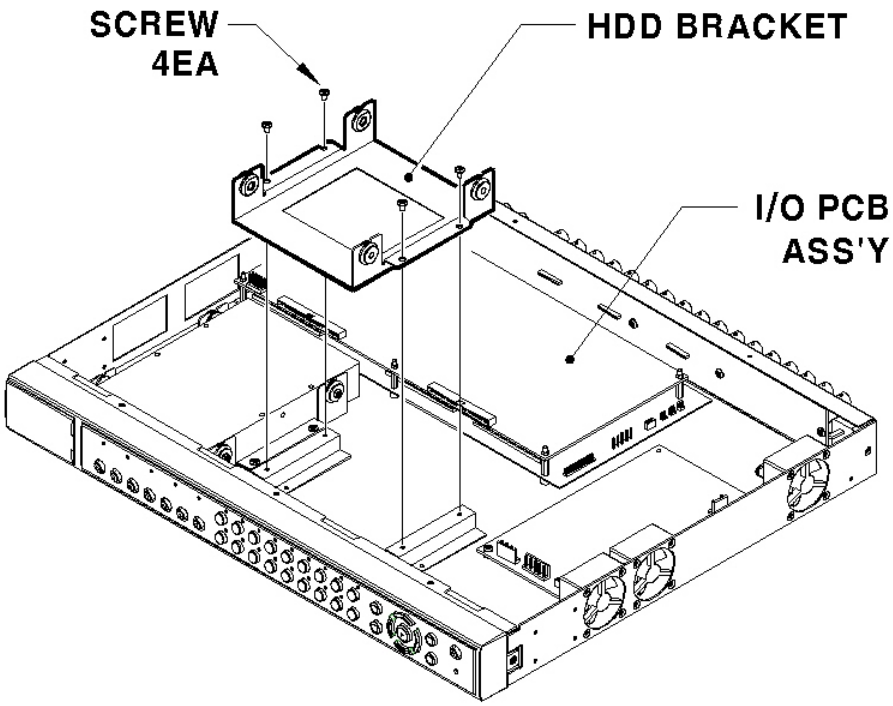
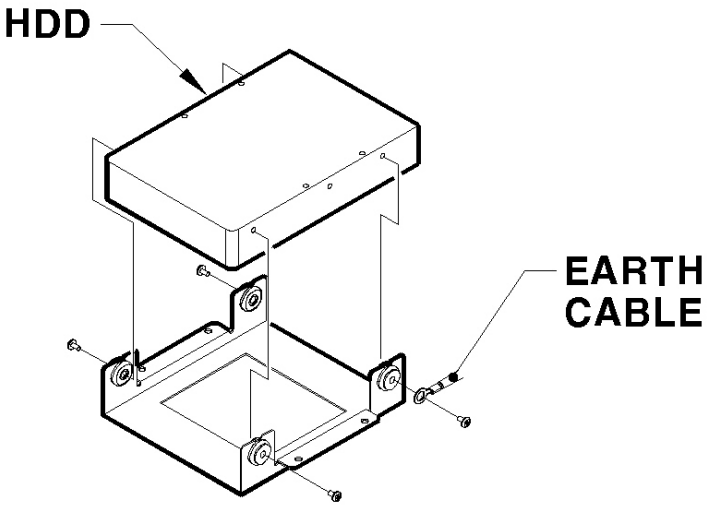
(4) Take out power and data cable of HDD from Main PCB ASS'Y. Remove 4 HDD Bracket screws and take out HDD ASS'Y.



(5) Fix the HDD into HDD Bracket with provided screws. Assemble an earth cable with HDD.



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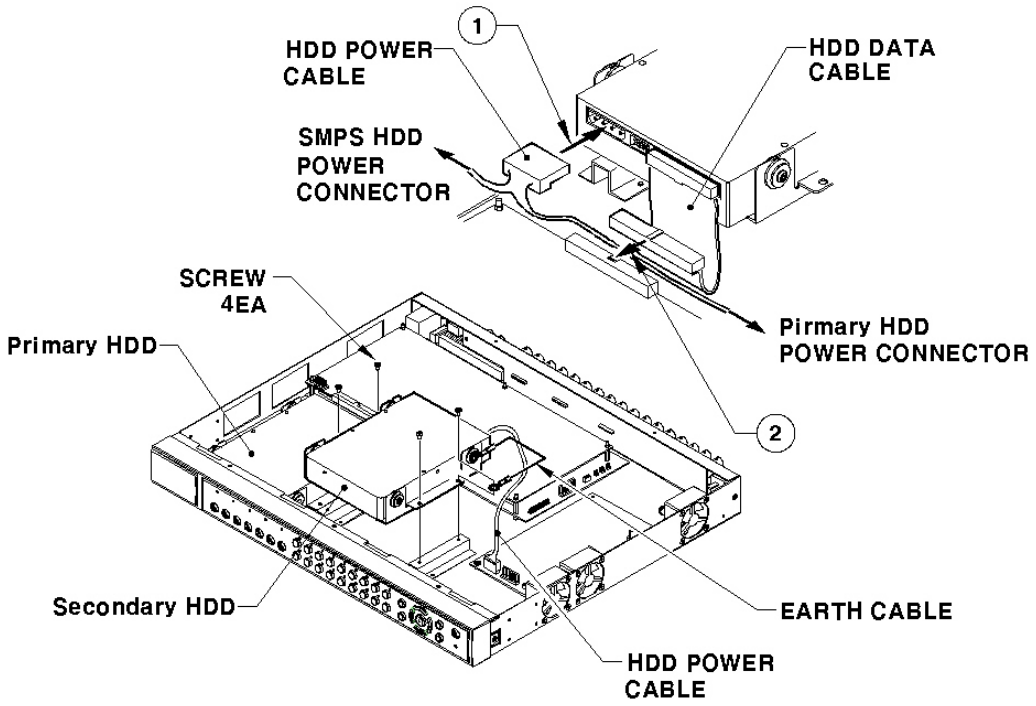
(6) Assemble cables according to the following numbers.



<Note> Caution in connecting HDD data cable

The supplied HDD cables have two kinds of colors. When connecting to PCB Ass'y, use blue cable.

(7) Fix the assembled HDD and earth cable into case with screws.

(8) Assemble the top cover.

<Note> Caution for HDD Management

1. Replacing 'SLAVE' HDD of internal 2 HDDs causes permanent data loss in the SLAVE HDD.
2. MASTER HDD has all the index of stored data including 'SLAVE' HDD. Corruption on 'MASTER' HDD may cause total data loss. Be careful when handling the main HDD.
3. It is strongly recommended that all data within HDDs should be backed up before replacing.

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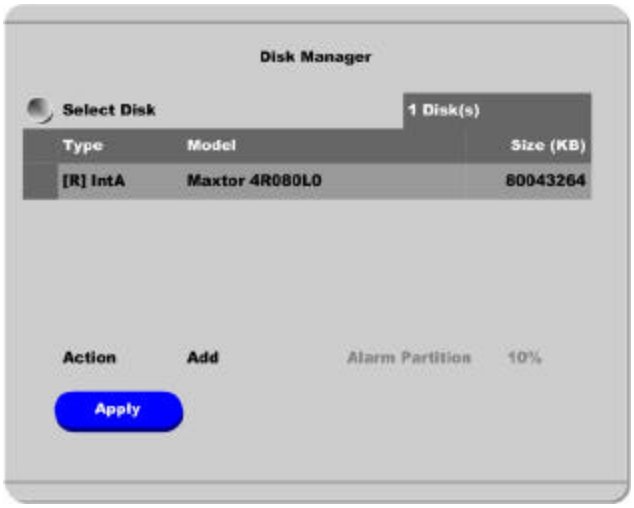
When installing one primary disk



(1) When power is supplied to ELX16-240, "Disk Manager" runs automatically after rebooting. If not, run it manually in "Menu→Utility→Disk Manager".

(2) There is a HDD that is indicated as "[F] IntA". Select it.

(3) Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

(4) Press the "Apply" button after selecting action as "Format" and setting the size of alarm partition. Then [*] is changed to [R].

<Note>

Alarm partition can be set from 10% to 90% within the size of primary disk.

(5) Press the [EXIT] button to shut down "Disk Manager". (If recording schedule is set, ELX16-240 will start recording.)

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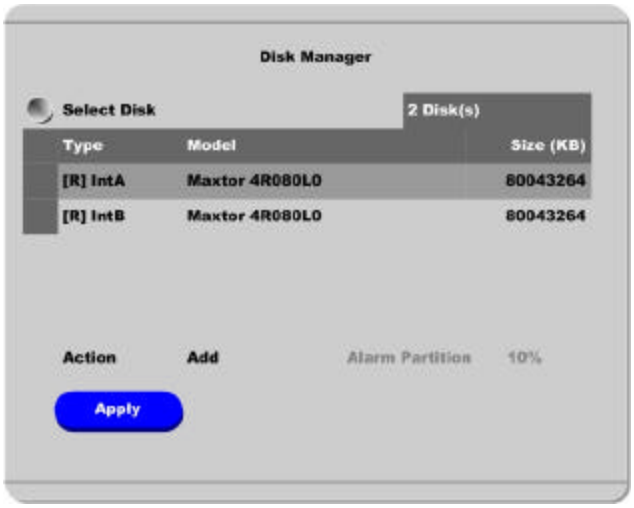
When installing one primary disk and auxiliary disk



(1) When power is supplied to ELX16-240, "Disk Manager" runs automatically after rebooting. If not, run it manually in "Menu→Utility→Disk Manager".

(2) There is a HDD that is indicated as "[F] IntA".

(3) Select a HDD for installing as primary disk. (IntA or IntB)

(3) Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*]. If IntB is added as primary disk, it will be placed at upper list.

(5) Select a HDD for installing as auxiliary disk.

(6) Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

(7) Select a primary disk, and press the "Apply" button after selecting action as "Format" and setting the size of alarm partition. Then [*] is changed to [R].

(8) Select an auxiliary disk, and press the "Apply" button after selecting action as "Format" and setting the size of alarm partition. Then [*] is changed to [R].

<Note>

Alarm partition can be set at only primary disk. So it is indicated as "Disable" in case of formatting.

(9) Press the [EXIT] button to shut down "Disk Manager". (If recording schedule is set, ELX16-240 will start recording.)

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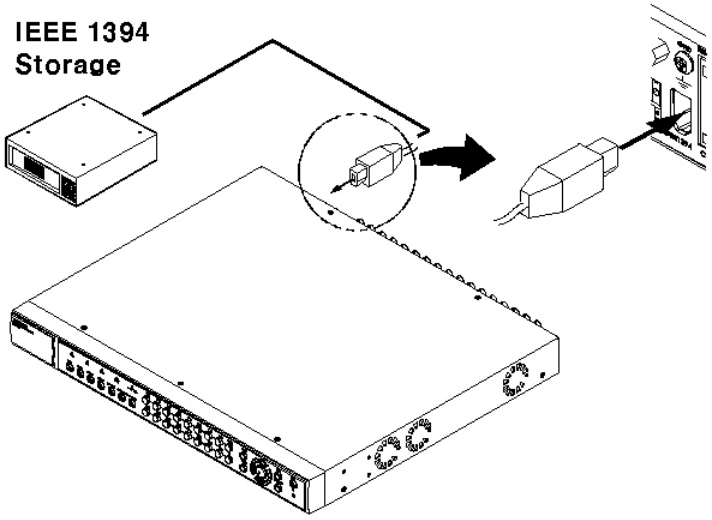
Expending External HDD (When using internal HDD as primary disk)

ELX16-240 use IEEE1394 as external storage device interface, and has two ports of IEEE1394. ELX16-240 supports upto 4TB storage.

<Note>

1. Some IEEE1394 ports may not be recognized by the ELX16-240. Before purchasing, consult the local distributor.
2. External storage should use external power.
3. For connection and setup of IEEE1394, please refer to the manual of related device.

Connect IEEE1394 interface cable as follows.



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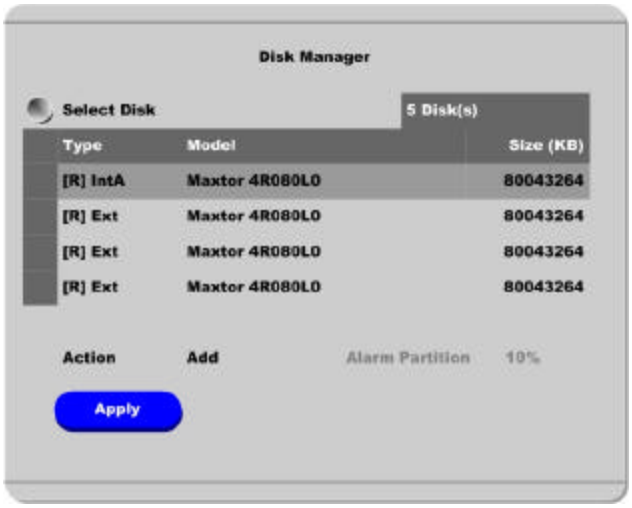
When using Disk Farm



The following description is when ELX16-240 has internal primary disk and 3 sets of IEEE1394 HDD.

(1) When external HDD farm is connected to IEEE1394 port, "Disk Manager" runs automatically. If not, run it manually in "Menu→Utility→Disk Manager".
(2) Select a second HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

<Note>

If connecting the device that is used in ELX16-240, type will be indicated as [V].

(3) Select a third HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].
(4) Select a fourth HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].
(5) Select a second HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].
(6) Select a third HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].
(7) Select a fourth HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].
(8) Press the [EXIT] button to shut down "Disk Manager".

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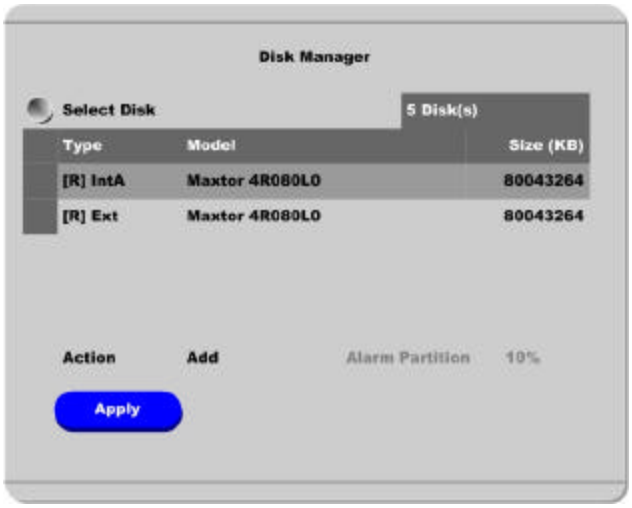
When using RAID



The following description is when ELX16-240 has internal primary disk and 1 set of IEEE1394 HDD.

<Note RAID>

Even though several HDDs are connected to RAID, ELX16-240 will recognize them as only one HDD. For connection and setup of RAID, please refer to the manual of related device.

(1) When external HDD RAID is connected to IEEE1394 port, "Disk Manager" runs automatically. If not, run it manually in "Menu→Utility→Disk Manager".

(2) Select a second HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

<Note>

If connecting the device that is used in ELX16-240, type will be indicated as [V].

(3) Select a second HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].

(4) Press the [EXIT] button to shut down "Disk Manager".

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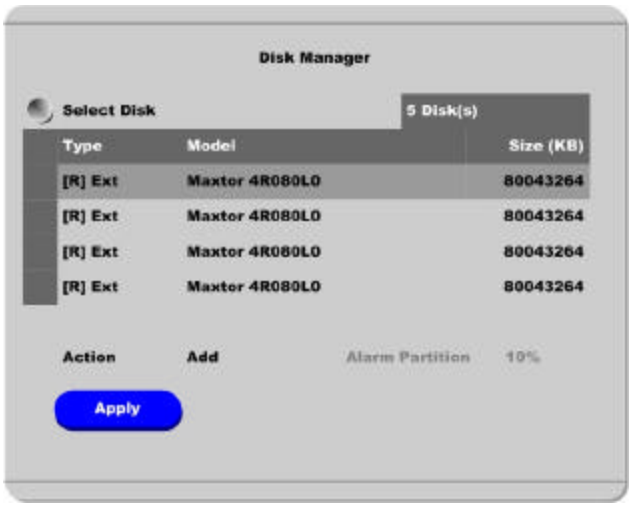
Installing & Expending External HDD (When using external HDD as primary disk)

When using Disk Farm



The following description is when ELX16-240 does't have internal primary disk and 4 sets of IEEE1394 HDD.

(1) When external HDD farm is connected to IEEE1394 port, "Disk Manager" runs automatically. If not, run it manually in "Menu→Utility→Disk Manager".

(2) Select a first HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

<Note>

It is when ExtA is added as primary disk.

If connecting the device that is used in ELX16-240, type will be indicated as [V].

(3) Select a second HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

(4) Select a third HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

(5) Select a fourth HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

(6) Select a first HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].

(7) Select a second HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].

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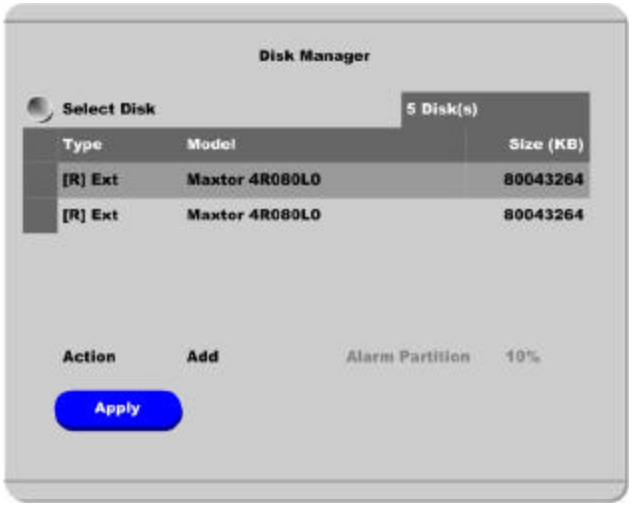
(8) Select a third HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].

(9) Select a fourth HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].

(10) Press the [EXIT] button to shut down "Disk Manager".

When using RAID



The following description is when ELX16-240 does't have internal primary disk and 2 sets of IEEE1394 HDD.

(1) When external HDD RAID is connected to IEEE1394 port, "Disk Manager" runs automatically. If not, run it manually in "Menu→Utility→Disk Manager".

(2) Select a first HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

<Note>

It is when ExtA is added as primary disk.

If connecting the device that is used in ELX16-240, type will be indicated as [V].

(3) Select a second HDD of [F] Ext. Press the "Apply" button after selecting action as "Add". Then [F] is changed to [*].

(4) Select a first HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].

(5) Select a second HDD of [*] Ext. Press the "Apply" button after selecting action as "Format". Then [*] is changed to [R].

(6) Press the [EXIT] button to shut down "Disk Manager".

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#1.3. Replacing HDD

Checking HDD

ELX16-240 file system (VFS2) sensors bad sector automatically, and the sensored bad sector is not used.

The following means when HDD is broken or has some problem in connection.

(1) When replaying is stopped or ELX16-240 is rebooted in specific playback range.

(2) When image searching per event is impossible.

(3) When recording is stopped and "Disk Manager" shows HDD type as [X].

When primary disk is broken

When primary disk is broken, all of the connected HDD data can't be used. So the broken HDD should be replaced and all connected HDDs should be reinstalled in "Disk Manager". ("Remove" -> "Add" -> "Format").

When auxiliary disk is broken

The broken auxiliary disk should be replaced and reinstalled in "Disk Manager". ("Add" -> "Format").

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#1.4. Keeping Data

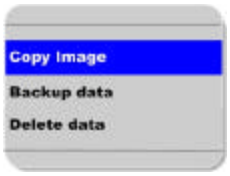
To keep the stored data, you should back up or reserve as HDD itself.

Backup

(1) Connect backup HDD to IEEE1394 port.

(2) Go to playback mode with pressing the [Playback] button.

(3) Press the [SELECT] button and then [MENU] button.



(4) Run "Backup Manager" with selecting the "Backup Data" menu.

(5) Set backup range and press the "Start" button after selecting backup HDD.

<Note>

1. Backup HDD should be formatted as FAT32 type.
2. Backup data can be replayed with specific S/W, DVR manager or MiniPlayer.
3. Backup data is made as "*.re3" file. If file size is over 2GB, it may not be recognized normally.
4. In course of backup, "Auto Delete" function doesn't run. If HDD is full, recording may be stopped instantly.
5. For more detailed information of DVR manager's backup, please refer to the "DVR manager User's Guide".

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How to preserve as HDD itself

To keep HDD itself, it is possible only when HDD is installed and used in ELX16-240 (including primary disk and RAID).

And it is recommended to use external HDD instead of internal HDD. Namely, connect only one external HDD, and then keep it after data is full.

<Note>

The preserved HDD's data is possible to replaying only when it is connected to ELX16-240.

#1.5. Caution in using HDD

For handling or guaranteeing HDD, Rugged CCTV. follows HDD guaranty condition. Rugged CCTV. doesn't bear the responsibility about data loss by user's mistake in operating.

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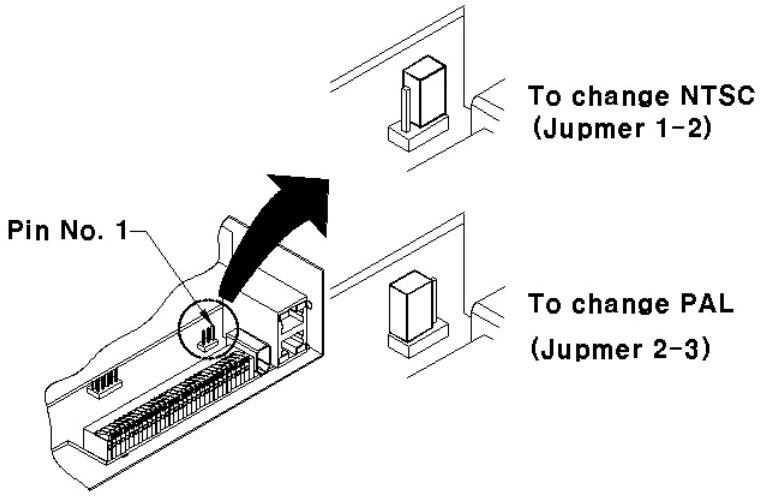
#2. How to Change Video Type

In order to change video type of ELX16-240 series, jumper setting should be changed inside the case.

Jumper Setting	Video Type	Remark
1-2	NTSC Video	
2-3	PAL Video	



<Note>

In order to change video type, contact the closest local Rugged CCTV distributor. Rugged CCTV is not responsible for service warranty about user's careless changing.

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#3. Using CD-ROM

Components of CD- ROM disc

Installation Guide	: ELX16-240 Installation Guide
User's Guide	: ELX16-240 User's Guide
DVR manager	: DVR manager User 's Guide (ELX16-240 Remote Management Program)
Acrobat Reader	: Version 5.1

Preparation

To read manual of CD-ROM disc, Adobe Acrobat 5.0 should be installed in client's PC.

<Note>

If Adobe Acrobat Reader is not installed within client's PC, use the Acrobat Reader program of CD-ROM.

Reading manual of CD-ROM

Follow the steps to read user's guide.

(1) Insert the supplied CD-ROM into CD-ROM drive of PC.

(2) Open the user's guide, PDF file.

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#4. Specification

General

CPU	32bit RISC Processor (200MIPS)
Flash Memory	8MB
Main Memory	64MB
OS	Embedded LINUX
Video Channel	16 Analog Channel
Storage Device	Internal 3.5” IDE HDD 2EA (default 1EA)
	External 2EA for IEEE1394 Interface
	Support Max. 4Tbytes
Intelligent File System	Data-loss protection against power failure

Image Compression

Technology	Differential Wavelet
Average File Size	1~5KB (Standard Quality)
Image Quality Level	5 Level
Image Compression Rate	20:1~500:1
Recording Speed	Max. 240ips in total at NTSC

Network

Browser	DVR manager
Protocol	TCP/IP, ARP, ICMP, DHCP, PPPoE
Connector	10/100Mbps Ethernet (RJ-45)
S/W Upgrade	Firmware upgrade via Network
Simultaneous Users	Monitoring : Max. 5 Users
	Playback : Max. 5 Users
Security	Password (User or Administrator Authenticantion)

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Display

Monitoring	Max. 120ips (60 for Monitor A, 60 for Monitor B)
Viewer	1ch, 4ch, 9ch, 13ch, 16ch, Auto & Custum Sequence for Monitor A
	1ch, Auto & Custume Sequce for Monitor B
Playback Performance	Max. 60ips in Monitor A or Monitor B
Playback Speed	1x, 2x, 4x, 8x, 16x (Forward & Reverse Play)
Function	Step-Forward, Step-Reverse

Environment

Operation Temperature	5~45
Storage Temperature	-10~55
Operation Humidity	30~80%, free of condensation
Storage Humidity	93% below, free of condensation

Data Backup/Expansion/Copy

HDD Expandable Data Backup	IEEE1394
Analog VCR	VHS Video output for VCR
Backup Reminder	Daily / Weekly / Monthly
Data Copy	USB Flash memory disk

Input/Output

Video	1 BNC and S-VHS output for Monitor A
	1 BNC output for Monitor B
	16 Loop through video
Audio	1Input : Line-in, 1 Vpp
	1 Output : Line-out, 1Vpp
	Level : -7~8(16 Step) Recording level
	AMP : 20dB amplifier for low level audio
	Monitoring : Local and remote
Digital Output	4 Relay outputs (Max DC 30W, AC 62.5VA)
Digital Output Schedule	Daily : Day / Night
	Weekly : Weekdays / Weekends
	Conditions : MD, Sensor inputs
Sensor Input	16 Sensor inputs (Support Dry contact)

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PTZ Control

Serial Port	RS232(2),RS422/485(2)
Control Method (Local)	Front panel button & IR remote controller
	(control IP video channel a s well)
Control Method (Remote)	On-the-screen PTZ control on PC
Preset Mode	16 points preset per channel
Group Mode	1 group per channel

Others

Digital Zoom	2x (Live & PlayBack Mode)
Alarm Trigger	Motion Detection or Sensor input
Alarm Data Preservation	Alarm triggered Video Data Preservation
Alarm Log	Log search
	Log monitoring via OSD & Network
Pre/Post Alarm	Pre : 1~10 seconds
	Post : 1~60 seconds
Schedule Recording	Daily : Day / Night
	Weekly : Weekdays / Weekends
	Conditions : Normal / Event
Text Data Recording	POS/ATM transaction information archived along with corresponding video data

Electricity

Power (Applied Adaptor)	AC Free Volt
Power Consumption	Max. 85W
	Typical 50W

Mechanical

Dimension (W,D,H)	430.0 x 362.0 x 44.0
Weight	5.5kg (with one 120GB HDD)

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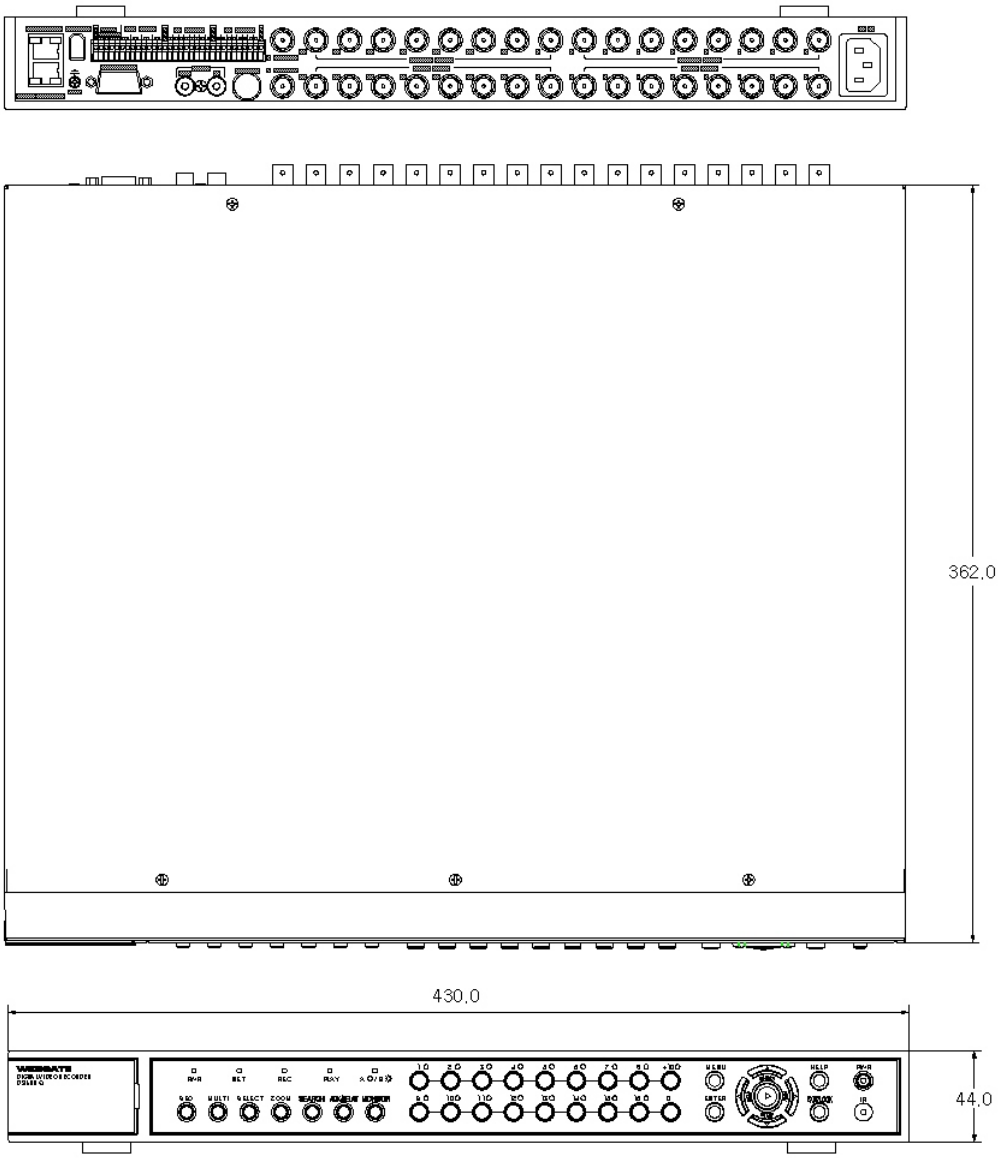

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