

SAMSUNG TECHWIN

4 CHANNEL DVR

User Manual

SDE-120N/SDE-3000N/SDE-3001N
SDE-3170P/SDE-3002/SDE-3002P

The Samsung logo is centered on a dark background with abstract, glowing white and grey lines that swirl and flow around the text, creating a dynamic and futuristic feel.

SAMSUNG



Overview

FEATURES

This product enables you to record 4 channels of camera image and voice source simultaneously. This feature provides an excellent picture quality for both real time monitoring and search.

- You can also monitor remote videos or search for your previous recordings and change the menu settings of the DVR via the network.
- As this product can bypass the Windows operating system to implement the DVR-specific operating system on its hardware components, the overall operation is stable.
- This product compresses the 4 channels of camera input into a format of H.264 before converting analog to digital video, which enables you to make an effective use of your hard disk.
- You can use the remote control, mouse, search buttons on the front panel or a combination of them to perform freeze, fast playback, backward playback as well as monitoring an event of detection such as time, motion and alarm.
- It provides various recording modes including continuous, motion and alarm recordings.
- Supports DDNS (use dynamic IP as like static IP)
- USB Back Up
- Separate resolution settings for each channel
- Separate motion area settings for each channel
- Supports a triplex tasking of Save and Remote View during a search.
- Motion Detection Recording
- Prevents unauthorized user control and data loss using the password system
- Supports operations of the remote control and mouse
- Ordinary DIY or BNC camera are supported
- NTSC : Up to 120 frames(Based on 352 x 240)
PAL : Up to 100 frames(Based on 352 x 288)
- Record and play in high quality
 - NTSC : Based on 704 x 480
 - PAL : Based on 704 x 576
- High/low speed search (search list/speed search)
- Continuous recording in HDD Overwrite mode

IMPORTANT SAFETY INSTRUCTIONS

Read these operating instructions carefully before using the unit.
Follow all the safety instructions listed below.
Keep these operating instructions handy for future reference.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding- type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



overview



CAUTION

RISK OF ELECTRIC SHOCK.
DO NOT OPEN



CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol indicates that dangerous voltage consisting a risk of electric shock is present within this unit.



This exclamation point symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING

- To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.
- To prevent injury, this apparatus must be securely attached to the floor/wall in accordance with the installation instructions.

WARNING

1. Be sure to use only the standard adapter that is specified in the specification sheet. Using any other adapter could cause fire, electrical shock, or damage to the product.
2. Incorrectly connecting the power supply or replacing battery may cause explosion, fire, electric shock, or damage to the product.
3. Do not connect multiple cameras to a single adapter. Exceeding the capacity may cause abnormal heat generation or fire.
4. Securely plug the power cord into the power receptacle. Insecure connection may cause fire.
5. When installing the camera, fasten it securely and firmly. The fall of camera may cause personal injury.
6. Do not place conductive objects (e.g. screwdrivers, coins, metal parts, etc.) or containers filled with water on top of the camera. Doing so may cause personal injury due to fire, electric shock, or falling objects.
7. Do not install the unit in humid, dusty, or sooty locations. Doing so may cause fire or electric shock.
8. If any unusual smells or smoke come from the unit, stop using the product. In such case, immediately disconnect the power source and contact the service center. Continued use in such a condition may cause fire or electric shock.
9. If this product fails to operate normally, contact the nearest service center. Never disassemble or modify this product in any way. (SAMSUNG is not liable for problems caused by unauthorized modifications or attempted repair.)
10. When cleaning, do not spray water directly onto parts of the product. Doing so may cause fire or electric shock.
11. Do not expose the product to the direct airflow from an air conditioner. Otherwise, it may cause moisture condensation inside the Clear Dome due to temperature difference between internal and external of the dome camera.
12. If you install this product in a low-temp area such as inside a cold store, you must seal up the wiring pipe with silicon, so that the external air can not flow inside the housing. Otherwise, external high, humid air may flow inside the housing, pooling moisture or vapor inside the product due to a difference between internal and external temperature.

CAUTION

1. Do not drop objects on the product or apply strong blows to it. Keep away from a location subject to excessive vibration or magnetic interference.
2. Do not install in a location subject to high temperature (over 50°C), low temperature (below -10°F), or high humidity. Doing so may cause fire or electric shock.
3. If you want to relocate the already installed product, be sure to turn off the power and then move or reinstall it.
4. Remove the power plug from the outlet when there is a lightning storm. Neglecting to do so may cause fire or damage to the product.
5. Keep out of direct sunlight and heat radiation sources. It may cause fire.
6. Install it in a place with good ventilation.
7. Avoid aiming the camera directly towards extremely bright objects such as sun, as this may damage the CCD image sensor.
8. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
9. The Mains plug is used as a disconnect device and shall stay readily operable at any time.
10. When using the camera outdoors, moisture may occur inside the camera due to temperature difference between indoors and outdoors. For this reason, it is recommended to install the camera indoors. For outdoor use, use the camera with built-in fan and heater.

CAUTION

1. Risk of explosion if battery is replaced by an incorrect type.
Dispose of used batteries according to the instructions.
2. LAN Ethernet cable should not be extended to outside of building.

overview

BEFORE START

This user's manual provides Information for using DVR such as brief introduction, part names, functions, connection to other equipment, menu setup, and the like.

You have to keep in mind the following notices:

- SAMSUNG retains the copyright on this manual.
- This manual cannot be copied without SAMSUNG's prior written approval.
- We are not liable for any or all losses to the product incurred by your use of non-standard product or violation of instructions mentioned in this manual.
- If you want to open the case of your system for checking problems, please consult the expert from the shop where you bought the product.
- Before installing an additional HDD or connecting an external storage device (USB memory or USB HDD) to this DVR, check the compatibility. Consult your provider for the compatibility list.

Warning

❖ Battery

Exchanging a wrong battery in your product may cause an explosion. Therefore you must use the same type of battery as the one being used in the product.

The following are the specifications of the battery you are using now.

- Normal voltage: 3V
- Normal capacity: 170mAh
- Continuous standard load: 0.2mA
- Operating temperature: -20°C ~ +85°C
(-4°F ~ +185°F)

CALIFORNIA USA ONLY

This Perchlorate warning applies only to primary CR (Manganese Dioxide) Lithium coin cells in the product sold or distributed ONLY in California USA. "Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate."

❖ System Shutdown

Turning off the power while the product is in operation, or taking not permitted actions may cause damage to the hard drive or the product. Also it can cause a dysfunction to the hard disk while using the product.

Please turn off the power using the Remote Controller or Mouse.

After entering password in the pop-up menu, you can turn off the power switch.

You may want to install a UPS system for safe operation in order to prevent damage caused by an unexpected power stoppage. (Any questions concerning UPS, consult your UPS retailer.)

❖ Operating Temperature

The guaranteed operating temperature range of this product is 0°C ~ 40°C (32°F ~ 104°F).

This product may not work properly if you run right after a long period of storage at a temperature below the guaranteed one.

When using the device after a long period of storage at low temperature, place the product at room temperature for a while and run it.

Especially for the built-in HDD in the product, its guaranteed temperature range is 5°C ~ 55°C (41°F ~ 131°F). Likewise, the hard drive may not work at a temperature below the guaranteed one.

❖ Ethernet Port

This equipment is in door use and all the communication wirings are limited to inside of the building.

Standards Approvals



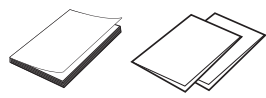


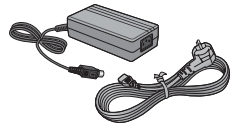

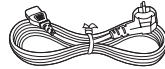


- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

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.

Package Contents

Please unwrap the product, and place the product on a flat place or in the place to be installed. Please check the following contents are included in addition to the main unit.

		
SOC-A100(P)*	SOC-A101(P)*	User Manual / Quick Guide* / Network Setup Guide*
		
CD*	Camera Bracket*	Ethernet Cable / Mini Din Cable (4EA)
		
Mouse	Remote Control / Battery (AAA×2)	Adaptor / Power Cable
SMT-1712SE P*		
		
VGA Cable	Power Cable	MONITOR

	SOC-A100(P)*	SOC-A101(P)*	Quick Guide* / Network Setup Guide*	CD*	Camera Bracket*	SMT-1712SE P*
SDE-120N	SOC-A100* 2EA	SOC-A101* 2EA	○/○	×	4	×
SDE-3000N	SOC-A100* 4EA	—	○/○	×	4	×
SDE-3001N	SOC-A100* 4EA	—	○/○	×	4	×
SDE-3002	SOC-A100* 1EA	SOC-A101* 1EA	○/×	×	2	×
SDE-3170P	SOC-A100P* 4EA	—	○/×	○	4	○
SDE-3002P	SOC-A100P* 2EA	SOC-A101P* 2EA	○/×	○	4	×

overview

CONTENTS

OVERVIEW	2	Features
2	3	Important Safety Instructions
	6	Before Start
	10	Part Names and Functions (Front)
	11	Part Names and Functions (Rear)
	12	Remote Control
	13	DIY Camera
	14	Camera Bracket
CONNECTING WITH OTHER DEVICE	16	Connecting the Camera, Audio, Speaker, Mouse, and Power Cable
16	16	Connecting the Alarm I/O
	17	Network Connection
GETTING STARTED	19	Starting the System
19	19	Log On
	20	Log In
	20	Log Off
	20	Power Off
LIVE	21	Live Screen Configuration
21	22	View the Launcher Menu
	23	Display
	23	Record
	24	Playback
	24	Playback Screen
DVR SETUP	25	Before Starting Setting Up
25	25	System Setup
	26	System
	29	Camera
	32	Display
	35	Sound
	36	User
	38	Network
	42	Event / Sensor
	46	Disk Management
	47	Record Setup

BACKUP 51 Backup

51

SEARCH & PLAY 53 Search

53

WEB VIEWER 55 Introduction

55

- 58 Live Viewer
- 61 Search Viewer
- 62 Search by Time
- 62 Search by Event
- 63 Setup
- 69 Information
- 70 Using the iPhone

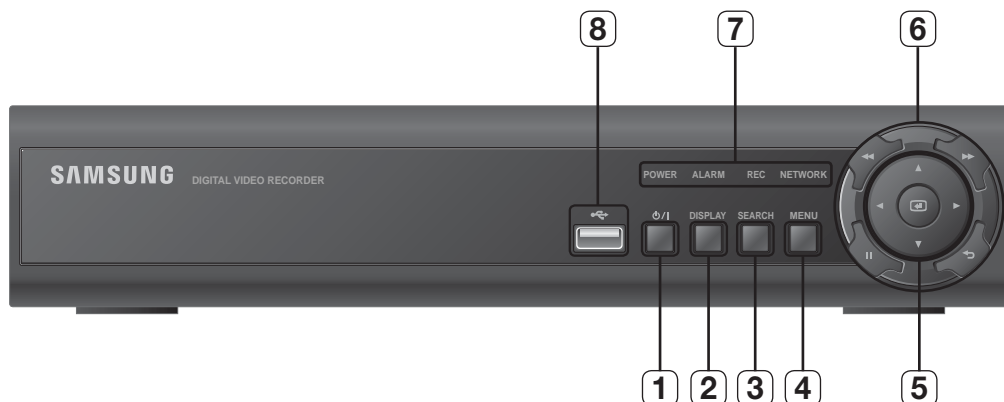
APPENDIX 71 Camera Specification

71

- 72 Product Specification (SDE-120N/SDE-3000N/SDE-3001N)
- 74 Product Specification (SDE-3170P/SDE-3002P/SDE-3002)
- 76 Open Source License Report on the Product

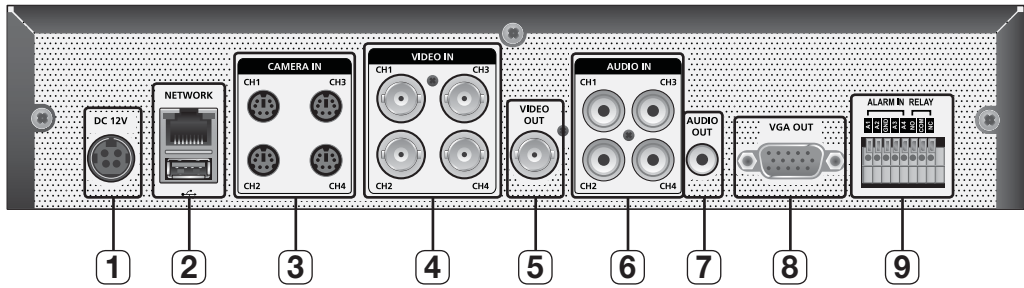
overview

PART NAMES AND FUNCTIONS (FRONT)



Part Names	Functions
1 Power	Used to turn on or off the system.
2 DISPLAY	Each time you press in Live mode, the screen will be switched in the sequence of 4-split, Single and Auto Sequence in order.
3 SEARCH	Goes to the search screen.
4 MENU	Goes to the system menu screen.
5	Direction ▲▼◀▶ : Used to select a system menu item.
	Enter ⏏ : Selects and runs a menu item. This will operate as Book mark (Reverse) button during playback.
6	Speed Playback ▶▶ : Used for quick forward playback. ◀◀ : Used for quick backward playback.
	Freeze ⏸ : Freezes the screen or resumes playing.
	Return ⏪ : Used to move one level up in the menu screen.
7 LED	NETWORK : Displays both network connection and data transfer status.
	REC : Flashes while the recording is in progress.
	ALARM : Flashes if an event occurs.
	POWER : Displays the status (ON/OFF) of power connection.
8 USB Port	Used to connect a USB storage device.

PART NAMES AND FUNCTIONS (REAR)



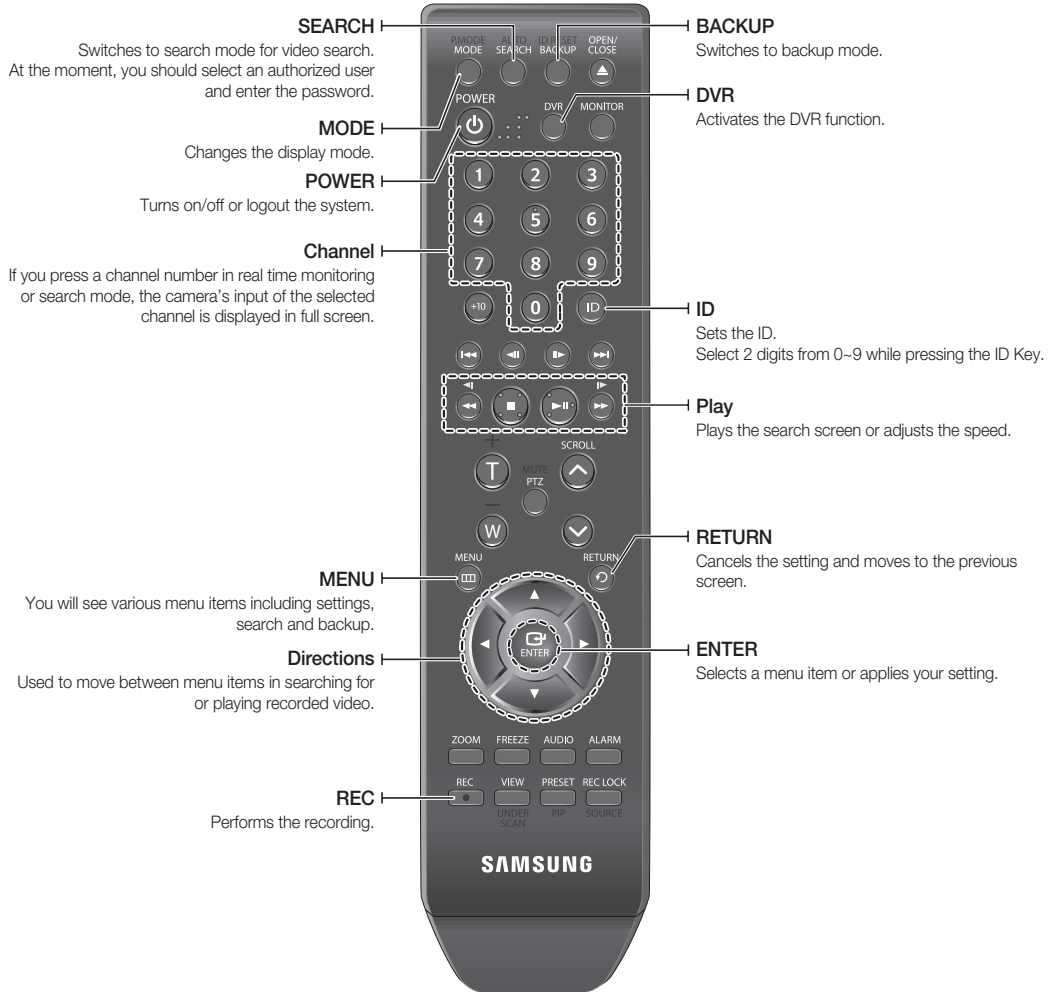
Part Names	Functions	
1 DC Input (DC12V)	Power connection port for 12V/4A adaptor	
2	NETWORK	RJ-45 port for network connection.
	USB	Supports USB 2.0 protocol that enables you to back up the video signal stored in the HDD using an external memory device and to connect USB memory.
3 CAMERA IN (1~4)	Connector linked to the Port DIY CAMERA	
4 VIDEO IN	Composite video signal input port (BNC type port).	
5 VIDEO OUT	Composite video signal output port (BNC type port).	
6 AUDIO IN	Audio signal input port (RCA jack).	
7 AUDIO OUT	Audio signal output port (RCA jack).	
8 VGA OUT	Video output port for video output to a VGA monitor.	
9	ALARM IN	Alarm input port
	RELAY	Alarm output port

overview

REMOTE CONTROL


DVR

Available after switching to DVR mode by pressing the [DVR] button on the remote control.



Changing Remote Control ID

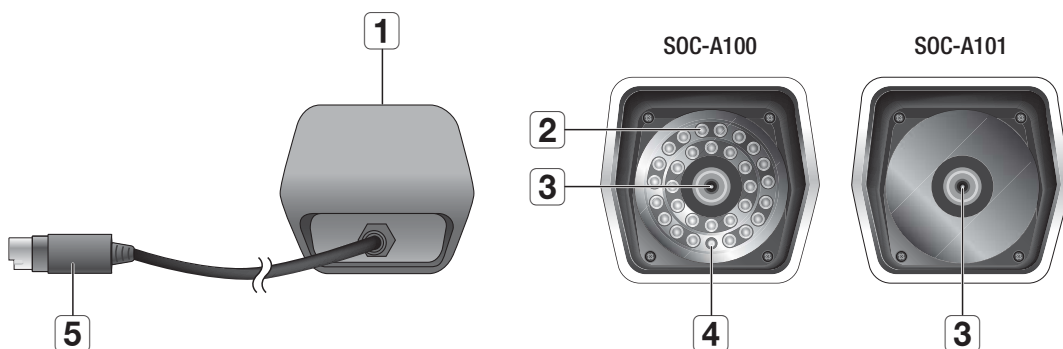
In a multi-DVR system using a single remote control, you can control only the DVR that matches the ID that you have set using the ID button.

1. Press the [ID] button to check the ID of each of "**REMOCON ID**" and "**SYSTEM ID**".
 - The defaults are 00 for the System ID and 00 for the Remote ID, respectively.
 2. To change the Remote ID of the IR REMOTE CONTROLLER, press and hold the [ID] button while entering a desired combination of two digits from 00 to 99.
 3. To change the ID of the DVR, refer to "**REMOTE CONTROLLER > REMOTE CONTROLLER ID**". (Page 28)
 4. Press the ID button of the IR REMOTE CONTROLLER to check the ID.
-  ▪ If the system number defined in "**REMOTE CONTROLLER**" is different from the number specified using the remote control, no other button than the [ID] buttons will operate.

DIY CAMERA

Equipped with the IR LED and the illumination sensor, enables you to monitor at night as well as in daytime. You can also use it indoors as well since it is designed for outdoor use.

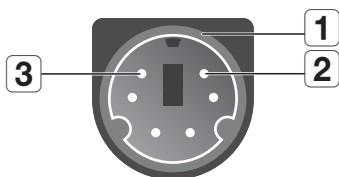
Part Names



Name		Description
1	Camera Fitting Groove	Groove that is used to fit the camera bracket. There exist two grooves; one on the top and one on the bottom.
2	IR LED	These are infrared LED's those are controlled by the illumination sensor.
3	Lens	Focal length of 3.8mm enables you to cover relatively longer range of monitoring.
4	Illumination Sensor	Detects incoming light to control the IR LED.
5	DVR Connection Cable	Connect the cable directly to the DVR without using a particular power cable. You can use the mini DIN cable to connect to a remote camera.

overview

Mini Din Cable



1 SHIELD

2 12V

3 VIDEO

Installing the camera

The camera can be installed on the wall, ceiling, shelf or a desired position using the provided bracket.

1. Select a position where you want to install the camera.
 - Make sure the selected position can sustain the weight of the camera.
2. Use the screw bolts (M4 × L15) to mount the camera bracket onto the wall or ceiling.
3. Place the camera on the selected position and fit the hole either on the top or the bottom of the camera into the fixing bolt of the bracket, and turn the camera clockwise.

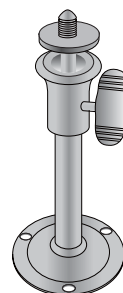


CAMERA BRACKET

The camera bracket can be used to install the camera on the wall, ceiling or shelf.

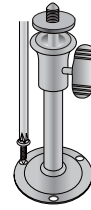
Camera Bracket Specification

Name	Description
Use	Indoor
Installation	Wall or Ceiling
Dimensions	57(W) × 47.2(H) × 100.5(L) mm/ 2.25(W) × 1.86(H) × 3.95(L) inch
Weight	130g (0.29 lbs)
Operating Temperature	-10°C ~ 50°C (14°F ~ 122°F)
Accessories	SCREW (M4 × L15) : 3 pcs



Adjusting the Camera Bracket

1. Choose an installation site that can sufficiently support the weight of the equipments to be installed.
2. Attach the camera bracket to the wall using the supplied screws (M4 × L15). 4×15 sized screws wall or ceiling.



3. Adjust the camera to target the video location and tighten the camera bracket handle on the camera bracket. Install the camera on to the male screw of the camera bracket by rotating the camera in clockwise.

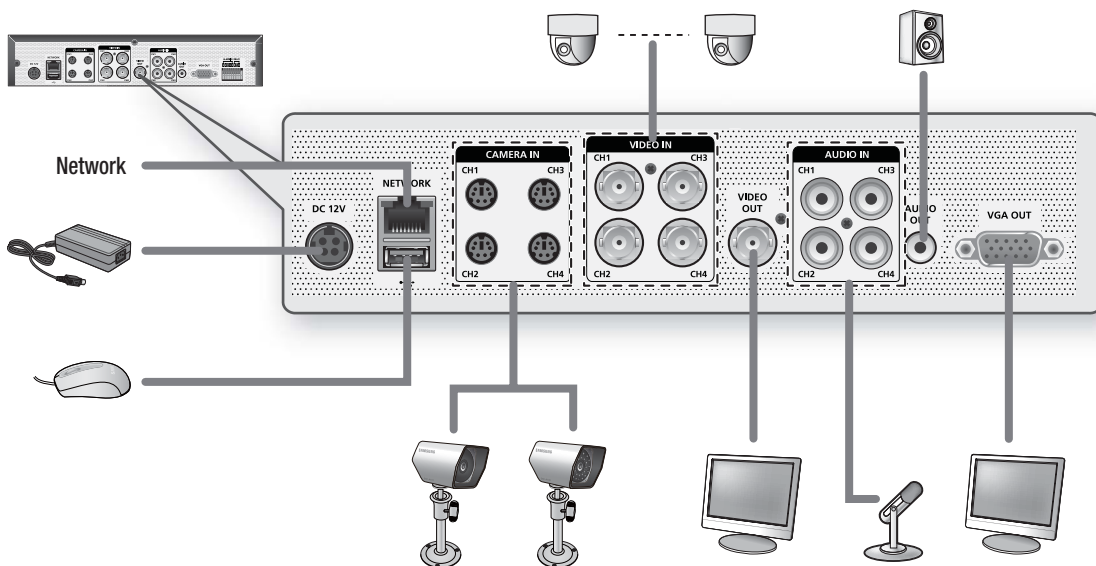


4. Loosen the handle by turning it in counter clockwise direction and then adjust the camera position. Tighten the handle, turning it clockwise, and lock the camera in position.
5. Connect the camera cable to the camera.



connecting with other device

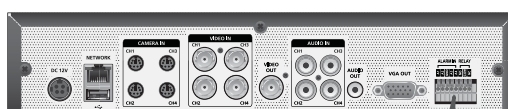
CONNECTING THE CAMERA, AUDIO, SPEAKER, MOUSE, AND POWER CABLE



CONNECTING THE ALARM I/O

Connecting the alarm Input signal

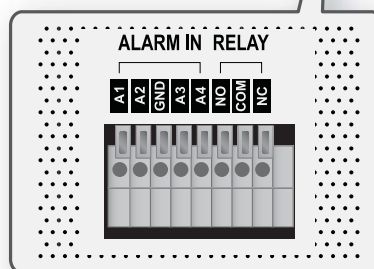
Connection port for the alarm input signal.
Connect one strand of the sensor signal line (two strands) to the alarm input port and connect the other to the [G] port.



Connecting the alarm output signal

Connection port for the alarm output signal.

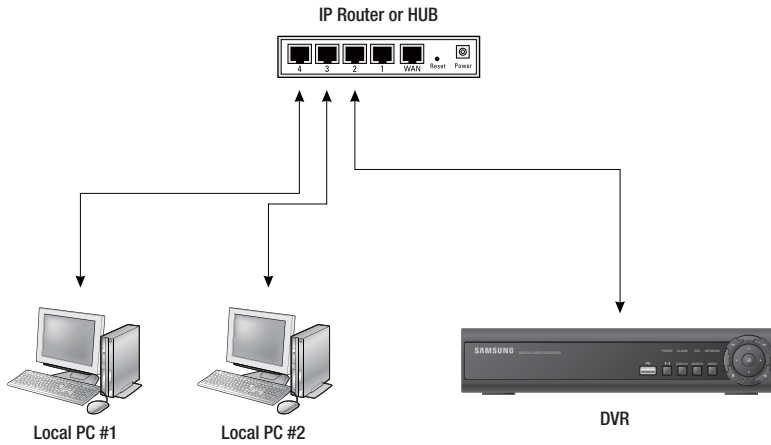
- **NO** (Normal Open) : Sensor is open in normal condition, it generates alarm if the sensor is closed.
- **COM** : Connect the grounding cable.
- **NC** (Normal Close) : Sensor is closed in normal condition, it generates alarm if the sensor is open by interruption.



NETWORK CONNECTION

Local System Configuration

Use the router or hub in the same local network to connect to the DVR and local PC where you can control the remote DVR or check the recording data in the DVR.



1. Connect the network port on the rear DVR panel to the router or hub.
2. Connect the network port on the local PC to the router or hub.
3. Enter "**IP ADDRESS:WEB SERVER PORT**" for the DVR on the local PC.
The Web Viewer screen of the DVR appears.

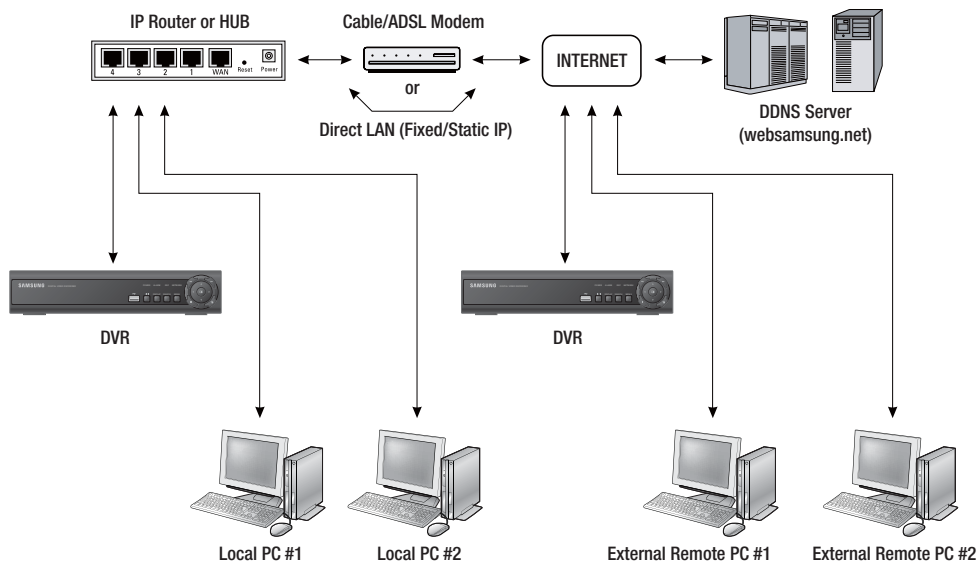


For more information, refer to "**Network Connection and Settings**". (Page 40)

connecting with other device

Total System Configuration

You can use the 10/100 Mbps Ethernet connector on the product to connect to the network. Connecting to the network enables you to perform various functions including remote monitoring, remote search and remote control.



1. Connect LAN cable of Cable/ADSL modem or Direct Fixed/Static IP LAN Line to WAN port of IP Router.
2. Connect LAN ports of IP Router to Ethernet port DVR to be set up and to Ethernet port of Local PC to use during setup.
3. Connect Video cable of Camera to Monitor.
4. Turn on the Monitor power.
 - If you have a Static (Fixed) IP line or Dynamic IP line (Cable Modem or ADSL Modem) with one IP address (whether it's dynamic or fixed), but have more than one internet device to use (such as a PC and a DVR or several DVRs); you must use an IP Router (different from a simple Network Hub); You must set up the Router to work with the DVR and you must use a network capable PC within The local Router network to do the setup.
 - If you are using an existing Router which is already set up, you may not need to redo the basic setup of the Router again, but it is highly recommended that you at least read all the instructions below and go through the steps. Whether you are using an existing Router or a new Router, you must go through the Port Forwarding portion of the setup.

getting started

STARTING THE SYSTEM

1. Connect the power cable of the DVR to the wall outlet.



2. You will see the initialization screen.



LOG ON

To make use of the DVR, you must log on after the system started. You must log on before you can use the features of the DVR.

1. Select a user account that you want to log on with.
2. Enter the password.
 - The default user is "**admin**" and password is "**4321**".



getting started

LOG IN

To access menu items of Logout, System Setup, Record Setup, Backup and Search, you must have logged in.

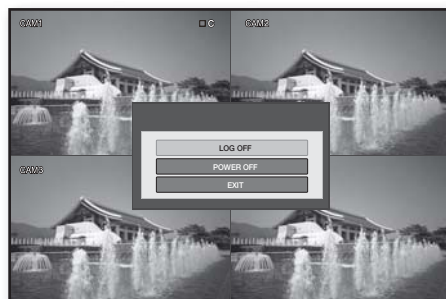
1. If you try to access restricted menus, the login dialog pops up.
2. Select a user account, enter the password and press the <ENTER> button.
 - The default user is “**admin**” and password is “**4321**”.
 - The user who has a limited access to the menu will not be displayed in the user list.
3. The menu screen to access appears.



LOG OFF

If you do not use the system for an extended time, please log out to restrict access from other users.

1. Press the <⏻> button on the launcher menu or press the [POWER] button on the remote control.
2. Press the <LOG OFF> button. It automatically logs off.



POWER OFF

You can shut down the system only if you have logged in to the DVR.

1. Press the <⏻> button on the launcher menu or press the [POWER] button on the remote control.
2. Press the <POWER OFF> button.
3. Enter the password and press the <ENTER> button.
4. Turn off the power switch.



LIVE SCREEN CONFIGURATION

Icons on the Live Screen

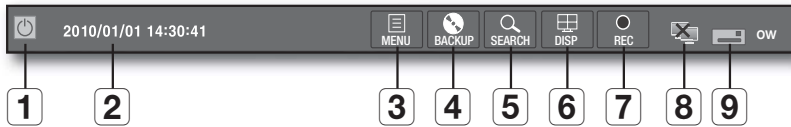


	Name	Description
1	Camera Name	Displays the name of the camera.
2	Recording Modes	<p>Ⓒ : Indicates continuous recording.</p> <p>Ⓐ : Indicates alarm recording.</p> <p>Ⓜ : Indicates motion detection recording.</p> <p>Ⓜ : Indicates instant recording.</p>
3	Launcher Menu	Displays the current time, menu and status.

VIEW THE LAUNCHER MENU

You can use the Launcher menu appearing on the bottom of the live screen to access it.

1. On the Live screen, move the cursor or press the [MENU] button on the remote control to display the Launcher menu.
2. Use the direction buttons or the cursor to select a desired menu.
 - You can adjust the display time of the Launcher in "DISPLAY > OSD > STATUS BAR TIMEOUT". (Page 32)



Name	Description
1 Logout/Power off	The logout or power-off dialog appears.
2 Date/Time	Displays the current time.
3 MENU	Displays the system, record setup menu window appears.
4 BACKUP	Accesses the backup screen.
5 SEARCH	Accesses the search screen.
6 DISP	Displays a dialog to switch between split mode and sequence.
7 REC	Starts the manual recording.
8 Network Status	Indicates the Web Viewer connection status.
9 HDD	Displays HDD mode whether it is overwrite or not.

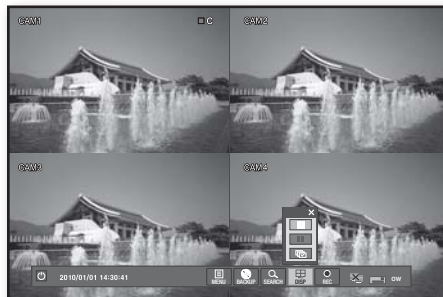
DISPLAY

You can select a screen split mode or perform the auto sequence function.

Switching the screen mode

You select a screen mode from single and 4-split.

1. Press the <DISP> button from the Launcher menu.
2. Select a split mode in the split option menu.
Press the [MODE] button on the front panel or the remote control to switch the mode in the sequence of the launcher menu items.

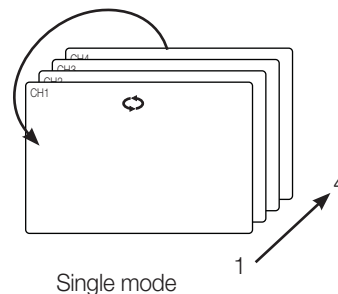


Auto Sequence

You can perform the auto sequence function.

1. Press the <DISP> button from the Launcher menu or press the [MODE] on the remote control.
2. When the split mode selection menu appears, press the <[img alt="Auto Sequence icon"]> button.
The screen mode switches to Single while transition.

- You can adjust the screen transition interval in “SYSTEM SETUP > DISPLAY > MONITOR > SEQUENCE DWELL”. (Page 33)
- You can also add a sequence using the same menu.



RECORD

In addition to the existing recording, you can proceed with recording directly in Live mode.

1. Press the <REC> button from the Launcher menu or press the [REC] on the remote control.
 - This can be done by right-clicking any area to display the context menu where you select <RECORD START>.
 - When the recording starts, <RECORD START> will switch to <RECORD STOP>.
2. The recording starts immediately with the <[img alt="Record Start icon"]> mark displayed on the top right corner.
3. To stop recording, press the <REC> button or click <RECORD STOP>.



PLAYBACK

In Live screen, you can immediately play any of the previous recordings in the selected channel.

To playback by time option

1. Select a channel to play, and right-click it to display the context menu where you select <PLAYBACK>.
2. Select a desired start time of playback.



To playback by time selection

1. You can select <GO TO...> if you want to select a playback start time.
2. When the "TIME SELECTION" window appears, specify the start time and click <OK>.
3. The playback screen appears from the selected time point.



PLAYBACK SCREEN

You can adjust the play speed of the instant recording screen that is currently played.

- 2010/01/01 10:28:02 : Shows the playback time.
- ◀ : Plays backward in the following speed
X2, X4, X8, X16, X32, X64
Reduces the speed in forward playback.
 - ◀ : Plays backward.
 - ⏸ : Pauses playing temporarily.
 - ▶ : Plays forward.
 - ▶ : Plays forward in the following speed
X2, X4, X8, X16, X32, X64
Reduces the speed in backward playback.
 - ✕ : Closes the playback screen.



 In "INSTANT PLAYBACK" mode, SDE-120 plays the video without the audio.

DVR setup

BEFORE STARTING SETTING UP

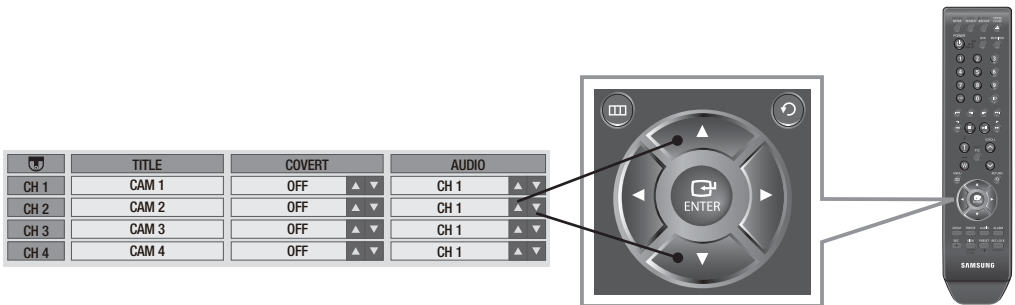
You can configure the DVR settings to your preference.

How to use remote control and mouse

You can use either the remote control or the cursor to select or change the setting of each menu item.

To change the setting using the remote control

1. Use the four direction (▲▼◀▶) buttons to move to a desired item and press the [ENTER] button.
 - You must press the [ENTER] button to confirm the selected item.
2. Use the up/down (▲▼) buttons to adjust the given option values.
 - UP (▲) : Adjusts to the previous value of the selected item.
 - DOWN (▼) : Adjusts to the next value of the selected item.
3. Change the setting and press [ENTER] before your change can be applied.
4. To return to the previous menu, press the [RETURN] menu.
The player will return to the previous menu without saving your changes.

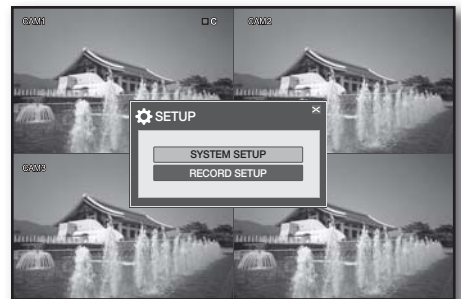


SYSTEM SETUP

You can configure the System menu settings to your preference.

To start the SYSTEM SETUP

1. Press the [MENU] button on the remote control or press the <MENU> button on the launcher menu.
The SETUP menu screen appears.
2. Use the direction buttons to move to <SYSTEM SETUP> and press the [ENTER] button.
The login dialog appears.
3. Select a user account and enter the password.
 - Only those users who have the right permissions can access the Setup menu.



DVR setup

SYSTEM

You can configure the settings of DATE/TIME, SYSTEM MANAGEMENT and REMOTE CONTROLLER. See the previous section to repeat steps 1~3. (Page 25)

DATE/TIME

You can specify the display time.
Using the mouse may help easy setup.

1. Use the direction buttons to move to the upper <SYSTEM> icon and press the [ENTER] button. The DATE/TIME setup screen appears.



2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.

- DATE TIME: Set the current time and date.
- DATE FORMAT: Set the date format.
YYYY/MM/DD, DD/MM/YYYY, MM/DD/YYYY
- TIME FORMAT: Set the time format to either AM/PM or 24 hours.
- NETWORK TIME SERVER SETUP: Set the current time using the time server.

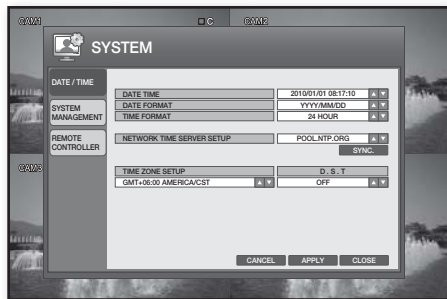
If you press the <SYNC.> button while connected to Internet, the time will be set from the time server.

If the player has an existing recording data in the same time schedule, you are prompted to delete it.

- Please check the followings if NTP does not work properly.

IP ADDRESS, GATEWAY, SUBNET MASK, 1st DNS SERVER, 2nd DNS SERVER of IP SETUP in NETWORK menu.

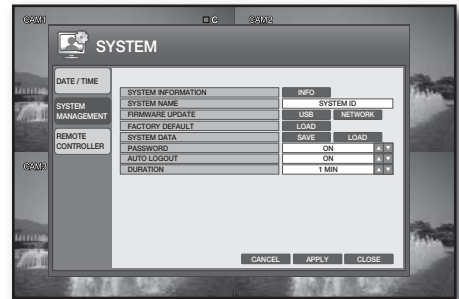
- TIME ZONE SETUP: Set the GMT standard time of your area.
 - D.S.T: Turn on or off the daylight saving time.
3. When your settings are completed, press the <APPLY> button on the bottom. Your settings will be applied.
 4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



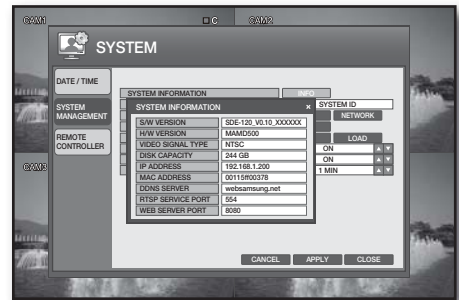
SYSTEM MANAGEMENT

You can check, update and initialize the system information.
Using the mouse may help easy setup.

1. Use the direction buttons to move to <**SYSTEM MANAGEMENT**> in the left corner of the SYSTEM setup menu and press the [ENTER] button.
2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.



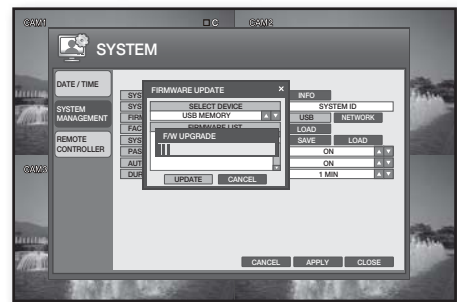
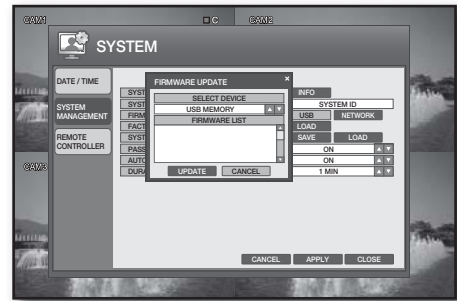
- **SYSTEM INFORMATION:** Can check the current system version and system-related settings. Press the <INFO> to display the “**SYSTEM INFORMATION**” window.
 - S/W VERSION: Displays the software version.
 - H/W VERSION: Displays the hardware version.
 - VIDEO SIGNAL TYPE: Displays the signal type of the current video.
 - DISK CAPACITY: Displays the capacity of the HDD.
 - IP ADDRESS: Displays the IP address of the DVR.
 - MAC ADDRESS: Displays the DVR’s MAC address.
 - DDNS SERVER: Displays the domain name of the appropriate set.
 - RTSP SERVICE PORT: Indicates the number of a port used when the remote management software program accesses the DVR.
 - WEB SERVER PORT: Indicates the number of a port used to connect to the DVR using the web browser.
 - **SYSTEM NAME:** Set the system name using virtual keyboard. You can type in up to 15 bytes.
 - **FIRMWARE UPDATE:** You can upgrade the current software version.
 - For more information about the firmware update, refer to “**To update the firmware**”. (Page 28)
 - **FACTORY DEFAULT:** Restore the DVR settings to the factory default.
 - **SYSTEM DATA:** Save the system setup data or import the system information of other device.
 - **SAVE :** Stores the setting information of the DVR into the storage device. Connect the storage device to the USB port of the system.
 - **LOAD :** Applies the setting information in the storage device to the DVR. Connect the device to store the system data to the USB port.
 - **PASSWORD:** Turns on or off the popup of the “**LOG IN**” dialog if you access a menu item such as Power Off, System Setup, Record Setup, Backup, Search.
 - **AUTO LOGOUT:** Select to set the auto logout when no input is made after you logged in.
 - **DURATION:** Specify the period for the auto logout.
3. When your settings are completed, press the <**APPLY**> button on the bottom. Your settings will be applied.
 4. Press the <**CLOSE**> button to display the confirmation dialog and return to the previous menu.



DVR setup

To update the firmware

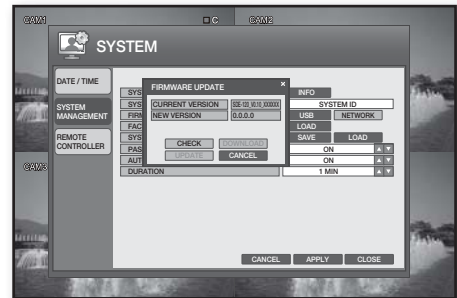
1. Connect the device storing the update files to the USB port.
2. Press **<USB>** button in system management menu.
3. Select device, you will see the firmware list.
4. Select update file in **<FIRMWARE LIST>**.
5. Press **<UPDATE>** button in the Firmware upgrade window.
6. The update status bar appears and the system will perform the upgrade.
7. When the upgrade is completed, the system restarts.



To update the network

Search the network system for an updateable file before proceeding with the update. Check if the network connection is made properly.

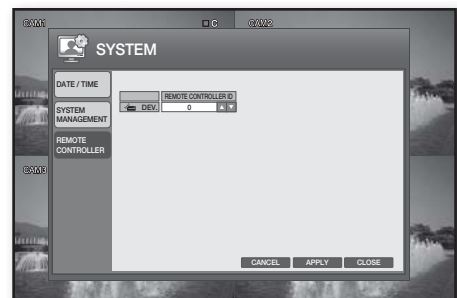
1. Press the **<NETWORK>** button.
2. Click **<CHECK>** to check if there is any new updateable file in the network.



REMOTE CONTROLLER

Using the mouse may help easy setup.

1. Use the direction buttons to move to **<REMOTE CONTROLLER>** in the left corner of the SYSTEM setup menu and press the **[ENTER]** button.
2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and set the **<REMOTE CONTROLLER ID>**.
3. When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
4. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.



CAMERA

You can configure the settings of each connected CAMERA, COLOR and MOTION SENSOR.

CAMERA

You can configure the camera settings of TITLE, COVERT and AUDIO to your preference.

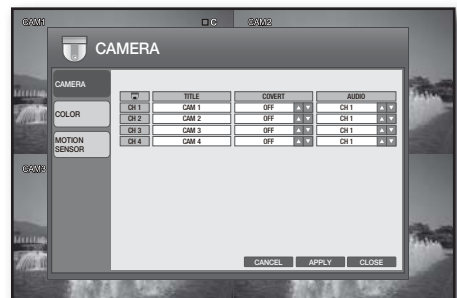
Using the mouse may help easy setup.

1. Use the direction buttons to move to the upper <CAMERA> icon and press the [ENTER] button. The CAMERA setup screen appears.



To change the camera title

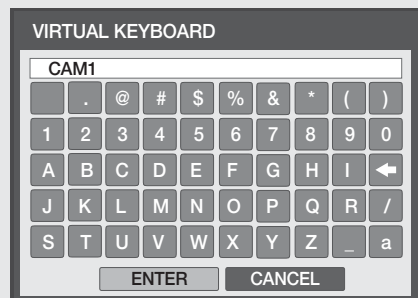
2. Select an item in the title column. The virtual keyboard appears.
3. Use the remote control or the cursor to select a desired character. You can enter up to 8 bytes.



Using the Virtual Keyboard

To enter alphanumeric characters for the ID, password and camera name, you can use the cursor or the remote control.

1. Use the direction buttons on the remote control to move to a desired item and press the [ENTER] button. Or simply double-click a desired item.
2. Use the direction button to move to a desired character and press the [ENTER] button, or simply click the character. Selecting < a > will switch the selected character to the lower case. Selecting < ← > will erase the previous character.
3. When done, press the <ENTER> button on the bottom.



DVR setup

Covert

1. Select a camera channel to covert.
2. Use the up/down (▲▼) buttons in the right corner to select either <ON> or <OFF> and press the [ENTER] button.
 - If set to <ON>, no information of the corresponding channel will be displayed. However, it continues recording.
 - If set to <OFF>, video input from the corresponding camera will be displayed.

Audio Connection

1. Select a camera channel to connect to the audio source.
2. Select an audio input port.
3. When your settings are completed, press <APPLY> button on the bottom. Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.

COLOR

You can adjust the brightness, contrast, tint and color of the image input to each camera channel. Using the mouse may help easy setup.

1. Use the direction buttons to move to <COLOR> in the left corner of the CAMERA setup screen and press the [ENTER] button.
2. Use the direction buttons to move to a desired item of the camera channel to adjust its color and press the [ENTER] button.
The color adjustment menu appears.



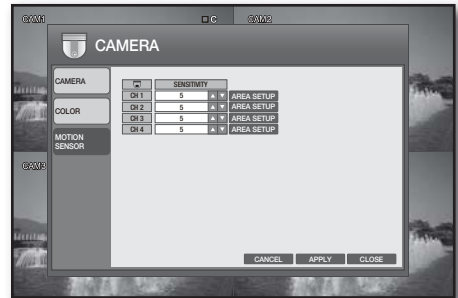
3. Use the up/down (▲▼) button in the bottom right corner to select a channel that you want to adjust the color of.
4. Select an item and use the numeric values to adjust the color option values.
 - BRIGHTNESS : Adjusts the brightness of the monitor.
 - CONTRAST : Adjusts the contrast of the monitor.
 - TINT : Adjusts the luminance of the monitor.
 - COLOR : Adjusts the display color of the monitor.
5. To complete your changes and exit the menu, click <X> in the upper right corner.
6. When your settings are completed, press <APPLY> button on the bottom. Your settings will be applied.
7. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



MOTION SENSOR

You can set the event recording so that the DVR can detect the event and specify the recording area. Using the mouse may help easy setup.

1. Use the direction buttons to move to **<MOTION SENSOR>** in the left corner of the CAMERA setup menu and press the **[ENTER]** button.
2. Select a channel and specify the sensitivity of the motion detection.
3. Press the **<AREA SETUP>** button. The motion area setup screen appears.



To select a motion area

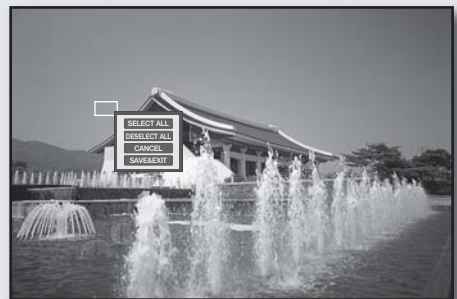
- ① Move the cursor to display a white rectangle box.
- ② Move the box to the motion area and click the yellow box.
- ③ The selected area will be marked in a white box.

To deselect the motion area

- ① Move the cursor to the selected area.
- ② Click the yellow cell again.
- ③ The yellow rectangle will disappear with the motion area deselected.

To select / deselect all

- ① Right-click any area or press the **[RETURN]** button on the remote control.
- ② From the context menu that pops up, select a desired item.
 - **SELECT ALL** : Selects all areas.
 - **DESELECT ALL** : Deselects all areas.
 - **CANCEL** : Cancels your settings.
 - **SAVE & EXIT** : Saves your settings and exits the menu.



4. When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
5. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.

DVR setup

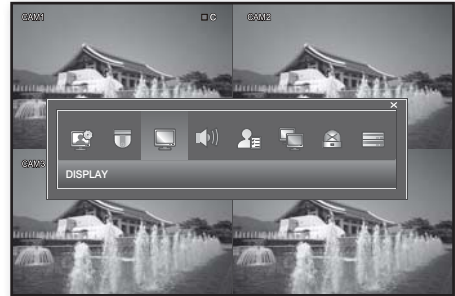
DISPLAY

You can configure the settings of OSD, MONITOR and SEQUENCE.
See the previous section to repeat steps 1~3. (Page 25)

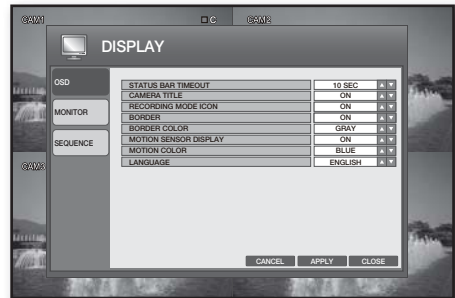
OSD

You can specify the color and language for the time, title, border and motion displayed on the screen.
Using the mouse may help easy setup.

1. Use the direction buttons to move to the upper <DISPLAY> icon and press the [ENTER] button.
The OSD setup screen appears.



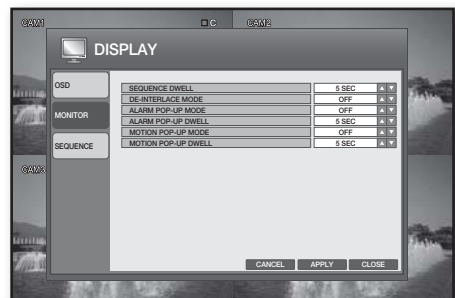
2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - STATUS BAR TIMEOUT: Specify the display time of the Launcher that appears on the screen.
 - CAMERA TITLE: Set to display the camera name on the screen.
 - RECORDING MODE ICON: Set to display the recording mode icon on the screen.
 - BORDER: Set to display the inter-channel borders in a split mode.
 - BORDER COLOR: Select a color for the border.
 - MOTION SENSOR DISPLAY: Set to display the motion event in the motion sensor area when it occurs.
 - MOTION COLOR: Select a color of a detected motion that is displayed on the screen.
 - LANGUAGE: Select a menu language.
3. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



MONITOR

You can specify the items and time interval that are displayed on the monitor.
Using the mouse may help easy setup.

1. Use the direction buttons to move to <MONITOR> in the left corner of the DISPLAY setup screen and press the [ENTER] button.



2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - SEQUENCE DWELL: Specify the auto sequence dwell time.
 - DE-INTERLACE MODE: Set to correct option of the screen trembling during playing in 4CIF size.
 - ALARM POP-UP MODE: Set to turn on or off the display of the alarm channel if an alarm occurs.
 - ALARM POP-UP DWELL: Set the duration of the alarm dwell time if an alarm occurs.
 - MOTION POP-UP MODE: Set to turn on or off the switching to the motion detecting channel's full screen mode if a motion is detected.
 - MOTION POP-UP DWELL: Set the dwell time of the motion pop-up.
 - This will display the motion pop-up for as much time as you specified and return to the split screen.
 - If an alarm occurs or a motion is detected in more than one channel, the screen will switch to a split mode for the display.
3. When your settings are completed, press the <APPLY> button on the bottom. Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.

SEQUENCE

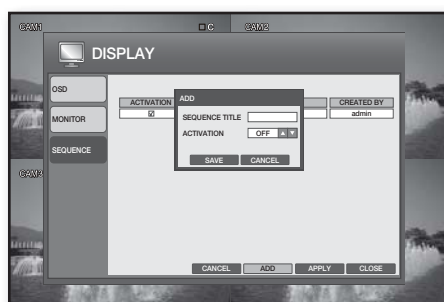
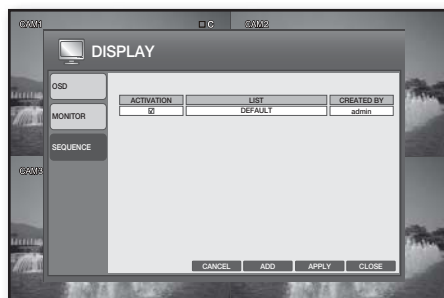
You can select a split mode of the sequence and add or adjust the sequence dwell time. Using the mouse may help easy setup.

ADDING SEQUENCE

1. Use the direction buttons to move to the <SEQUENCE> in the left corner of the DISPLAY setup screen and press the [ENTER] button.
2. Press the <ADD> button on the bottom.
3. When the "ADD" window appears, select the TITLE input box.
4. Use the virtual keyboard to enter the name and press the <SAVE> button.



- For using the virtual keyboard, refer to "Using the Virtual Keyboard". (Page 29)

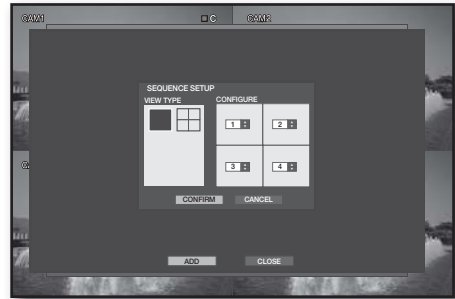


DVR setup

- When the ADD SEQUENCE window appears, press the <ADD> button.



- When the SEQUENCE SETUP window appears, Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - VIEW TYPE: Select a split mode to sequence.
 - CONFIGURE: Select a channel to display on each split screen.

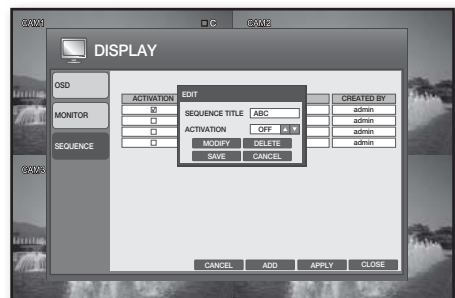


- Press the <CONFIRM> button.
The set sequence mode will be confirmed and displayed on the ADD window.
- When completed, press the <ADD> button on the bottom.
The set sequence type will be saved and you will move to the previous screen.



EDITING SEQUENCE

- Select a list to edit.
The EDIT window appears.
- Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - SEQUENCE TITLE : Select the TITLE input box.
 - ACTIVATION : Set to perform the sequence.
 - MODIFY : You can change the sequence mode setting.
 - For setting the sequence mode, refer to "ADDING SEQUENCE". (Page 33)
 - DELETE : Deletes the selected sequence list.
 - CANCEL : Cancels your changes.
- When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
- Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



SOUND

You can configure the settings of AUDIO and BUZZER.
See the previous section to repeat steps 1~3. (Page 25)

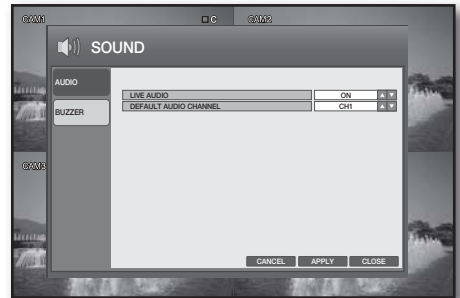
AUDIO

You can select to input the live audio source and select an audio channel.
Using the mouse may help easy setup.

1. Use the direction buttons to move to the upper <SOUND> icon and press the [ENTER] button.
The AUDIO setup screen appears.



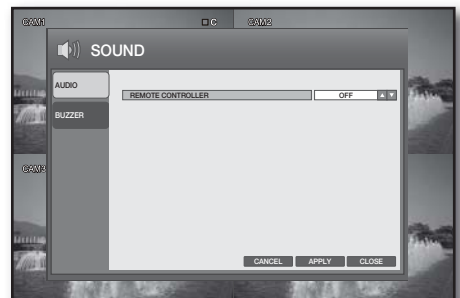
2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - LIVE AUDIO: Turn on or off the audio output.
However, the channel that is set to COVERT does not output sound. (Page 30)
 - DEFAULT AUDIO CHANNEL: Select an audio channel to monitor among voice signals incoming from audio ports 1 through 4.
3. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



BUZZER

You can use the remote control to activate the buzzer.
Using the mouse may help easy setup.

1. Use the direction buttons to move to <BUZZER> in the left corner of the SOUND setup screen and press the [ENTER] button.
2. Use direction buttons (▲▼◀▶) to move to <REMOTE CONTROLLER> and press the [ENTER] button to set the value.
3. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



DVR setup

USER

You can configure the settings of USER MANAGEMENT, USER AUTHORITY and LOGOUT.
See the previous section to repeat steps 1~3. (Page 25)

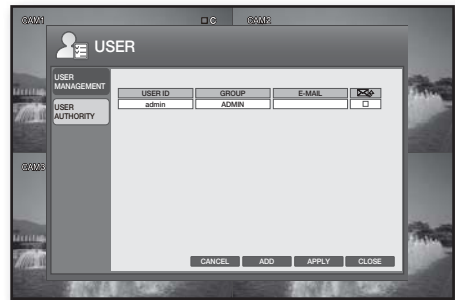
USER MANAGEMENT

Add a user account whose information you can edit later.
Using the mouse may help easy setup.

1. Use the direction buttons to move to the upper **<USER>** icon and press the **[ENTER]** button.
The USER MANAGEMENT setup screen appears.



2. Use the direction (**▲▼◀▶**) buttons to move to a desired item and add, delete or change the user account.



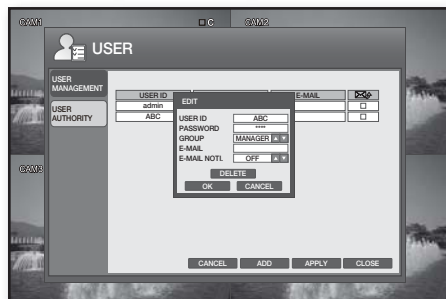
To add a user account

1. Press the **<ADD>** button on the bottom of the USER MANAGEMENT menu screen.
2. Use the direction (**▲▼◀▶**) buttons to move to a desired item and press **[ENTER]** to select it.
 - Provide necessary information for the user to add.
 - USER ID: Enter the user ID.
 - PASSWORD: Enter the password.
 - GROUP: Select a group where the user belongs from **<MANAGER>** and **<USER>**.
 - E-MAIL: Enter the email address at which you will be notified that an event occurs.
 - E-MAIL NOTI.: You can select to receive the email notification when an event occurs.
3. When done, press the **<OK>** button.
The added user account will be listed.
4. When your settings are completed, press the **<APPLY>** button on the bottom.
Your settings will be applied.
5. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.



To change the user information

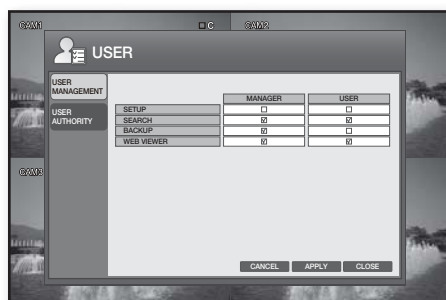
1. Select a user account that you want to change in the user list.
The "EDIT" window appears.
 - The "admin" ID can not be removed.
2. Make necessary changes and press the <OK> button.
3. To remove a user account, press the <DELETE> button.
4. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
5. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



USER AUTHORITY

You can set to allow or deny access of a user according to the user group.
Using the mouse may help easy setup.

1. Use the direction buttons to move to <USER AUTHORITY> in the left corner of the USER setup screen and press the [ENTER] button.
2. Select all the menu items that a user can access with the MANAGER or USER account by checking the applicable checkboxes.
3. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



DVR setup

NETWORK

You can configure the settings of IP SETUP, DDNS and E-MAIL.
See the previous section to repeat steps 1~3. (Page 25)

IP SETUP

You can specify the IP of the DVR according to the network connection.

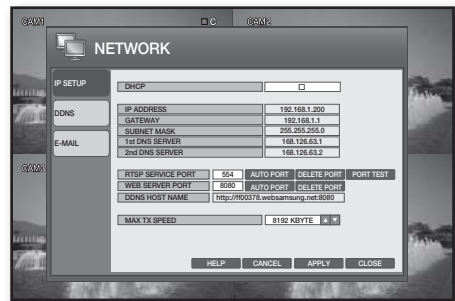
Using the mouse may help easy setup.

1. Use the direction buttons to move to the upper <NETWORK> icon and press the [ENTER] button.
The IP Setup screen appears.



2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.

- DHCP: Set the IP address of the DVR to a dynamic IP.
 - If <DHCP> is selected, the setting values of IP ADDRESS, GATEWAY, SUBNET MASK, 1st DNS SERVER and 2nd DNS SERVER will be automatically filled.
 - If <DHCP> is not selected, you should manually enter the setting values of IP ADDRESS, GATEWAY, SUBNET MASK, 1st DNS SERVER and 2nd DNS SERVER.
 - For the IP address, contact the network administrator.



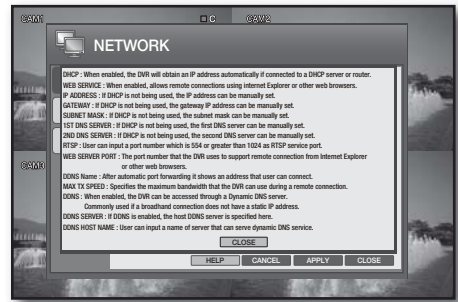
- IP ADDRESS: Enter an IP address.
- GATEWAY: Enter a gateway address.
- SUBNET MASK: Enter a subnet mask address.
- 1st DNS SERVER: Enter the first DNS server address.
- 2nd DNS SERVER: Enter the second DNS server address.
- RTSP SERVICE PORT: Indicates a port used when the remote management software program accesses the DVR.
- WEB SERVER PORT: Indicates a port used to connect to the DVR using the web browser.
- AUTO PORT: Registers connectable address from outside to DDNS HOST NAME automatically.
- DELETE PORT: Unblock registered port forwarding status.
- PORT TEST: Check the current RTSP PORT, HTTP PORT status by itself whether it is connectable.
- DDNS HOST NAME: Displays the MAC address of the DVR that connects to the DDNS.
- MAX TX SPEED: Set the network transfer speed.
Select one from 56, 128, 256, 512, 1024, 2048, 4096, 8192KBYTE.
The video will be transferred below the set speed, which may differ according to the network connection status.

3. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.

To view the HELP

You can view the explanation of each item of the IP SETUP menu.

1. Press the <HELP> button in the lower corner of the IP SETUP menu.
2. Read through the help and press the <CLOSE> button to close the window.



DDNS

You can specify a DDNS site to access when a remote user connects to the network.

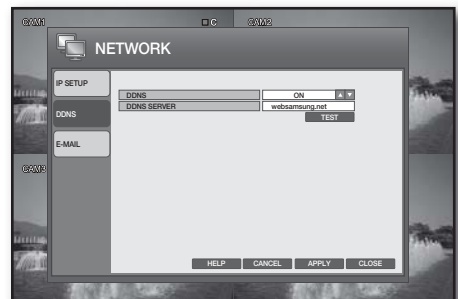
Using the mouse may help easy setup.

DDNS is an acronym for Dynamic DNS(Domain Name System).

DNS is a domain service that directs the character-based (easy to remember) domain name (ex: www.google.com) to the number-based IP address (64.233.189.104).

DDNS(Dynamic DNS) is the IP registration service that registers a domain name that the user remembers and a changed IP address with the DDNS server so that the user can redirect to the registered domain name if the previous IP address is changed in a dynamic IP environment.

1. Use the direction buttons to move to <DDNS> in the left corner of the NETWORK setup menu and press the [ENTER] button.
2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - DDNS: Select to set the DDNS connection.
 - DDNS SERVER: Select a DDNS server to connect to.
 - TEST: Try a test connection to the DDNS server.
3. When your settings are completed, press the <APPLY> button on the bottom. Your settings will be applied.



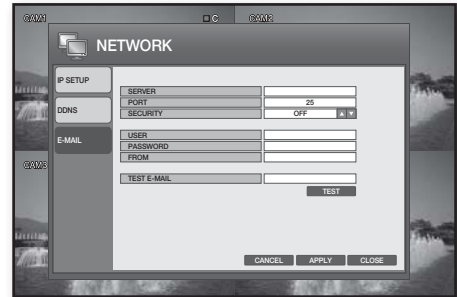
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.

DVR setup

E-MAIL

You can send an email notice to DVR registered users at a certain interval or when an event occurs. Using the mouse may help easy setup.

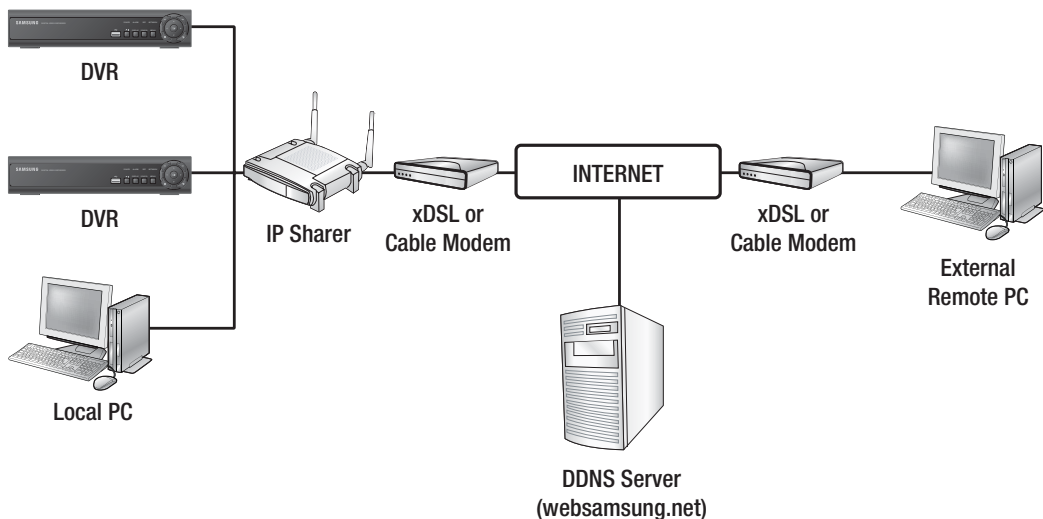
1. Use the direction buttons to move to <**E-MAIL**> in the left corner of the NETWORK setup menu and press the [ENTER] button.
2. Use direction buttons (▲▼◀▶) to move to a desired item, and set the value.
 - **SERVER**: Set the mail server. This is a mail server used when the DVR notifies with email. You must use the mail server that supports Microsoft Outlook. Enter the mail server using the virtual Keyboard. (Page 29)
 - **PORT**: Enter the mail server port.
 - **SECURITY**:
 - If set to <**ON**>, your email will be sent in secure mode.
 - However, the email will not be sent if the server you entered does not support SSL.
 - If set to <**OFF**>, this will send emails of the server that does not support SSL.
 - **USER**: Enter the mail account ID of the sender.
 - **PASSWORD**: Enter the mail account password of the sender.
 - **FROM**: Provide the sender email that will be displayed in the email notice.
 - **TEST E-MAIL**: Sends a test email to check if the current setting can send emails normally.
3. When your settings are completed, press the <**APPLY**> button on the bottom. Your settings will be applied.
4. Press the <**CLOSE**> button to display the confirmation dialog and return to the previous menu.



Network Connection and Settings

According to the user network connection, configure a proper network settings so as to change the settings of a remote DVR and to search and play the recording data via a local or external Internet connection.

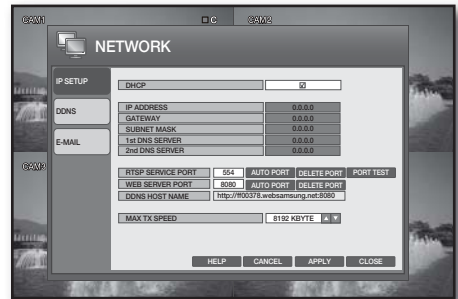
-  For more information, refer to "Network Setup Guide" that comes with the DVR.



If not using a router for network connection

Static IP Setup Mode

- Internet Connection: Use ADSL or the dedicated line for the static IP, or connect between DVR and remote users in the LAN environment.
- DVR Network Setup: Check the network status of the connected DVR.
 - For other options of IP, gateway and subnet mask, contact the network administrator.



Dynamic IP (DHCP) Setup Mode

- Internet Connection: Connect the DVR directly to the cable modem, to a DHCP-based ADSL modem, or to the optical LAN.
- DVR Network Setup: Check the <DHCP> checkbox of the <IP SETUP> menu.

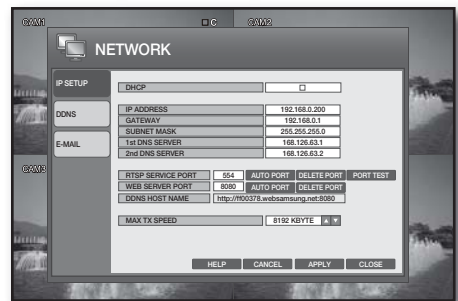
If using a router

Connect the DVR to the IP router that is connected to the ADSL/Cable modem, or connect the DVR to the IP router in the LAN environment.

- For more information, refer to "Network Setup Guide" that comes with the DVR.

Router DHCP IP Address Setup

1. To access the setup menu of the IP router, provide the IP address of the router in the address bar of the Internet browser on a local PC that is connected to the IP router. (ex: http://192.168.0.1)
2. First, check the local connection properties from the "Network Connection" on the local PC.
Ex) IP : 192.168.0.200
Subnet mask : 255.255.255.0
Gateway : 192.168.0.1
3. Provide the IP router address to display the login dialog where you enter the router ID and password.
4. Access the DHCP setup menu to switch the router mode to DHCP server mode and provide the start address and the end one.
Enter the start (192.168.0.100) and the end (192.168.0.200) addresses.



- The addresses mentioned above may differ depending on the router so refer to the router manual for more information.

DVR setup

DVR Connection

1. Use the direction buttons to move to the upper **<NETWORK>** icon in the SYSTEM SETUP menu screen and press the **[ENTER]** button.
The IP SETUP screen appears.
2. Deselect the **<DHCP>** checkbox.
3. Locate the local PC in connection with the same router and check information of gateway, subnet mask 1st DNS and 2nd DNS server.
4. Provide the IP address, gateway, subnet mask 1st DNS, 2nd DNS server as appropriate.

- If the DHCP server has the start address (192.168.0.100) and the end one (192.168.0.200) specified, change each of them to one between "192.168.0.2~ 192.168.0.99" and "192.168.0.201 ~ 192.168.0.254".

Router Port Forwarding

To access the PC or DVR in the local LAN area of the router, set the port forwarding for the router. The DVR will use **<RTSP SERVICE PORT>** and **<WEB SERVER PORT>** for this purpose. You must set the port forwarding for both ports.

- For more information, refer to "Network Setup Guide" that comes with the DVR.

To check the connection status

1. Provide the IP address for the local PC or remote PC.
2. When the login dialog appears and prompts you to enter the ID and password, this means you have set the connection properly.

EVENT / SENSOR

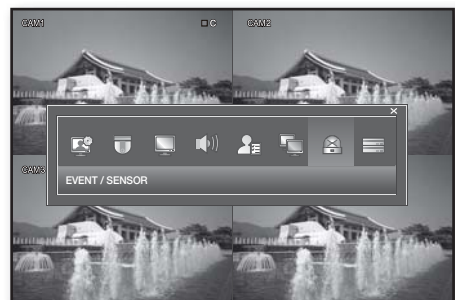
You can configure the settings of HDD EVENT, ALARM INPUT, ALARM OUTPUT and BUZZER OUTPUT. See the previous section to repeat steps 1~3. (Page 25)

HDD EVENT

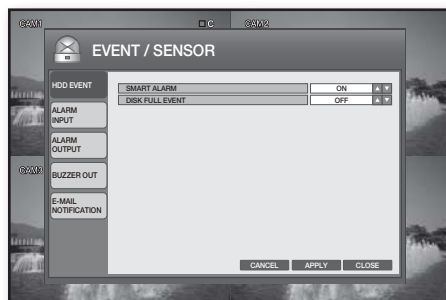
You can set to sound the alarm if the HDD has a problem or is full.

Using the mouse may help easy setup.

1. Use the direction buttons to move to the upper **<EVENT / SENSOR>** icon and press the **[ENTER]** button.
The HDD EVENT screen appears.



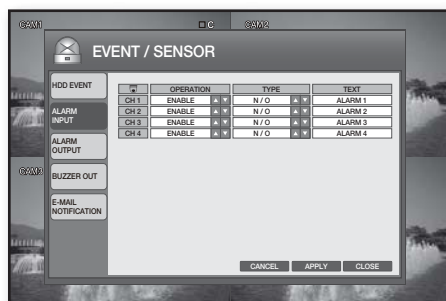
2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - SMART ALARM: Specify the availability of the alarm if the HDD has a problem.
 - DISK FULL EVENT: Set to notify the user when the HDD is full.
3. When your settings are completed, press the <APPLY> button on the bottom. Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.



ALARM INPUT

You can specify the availability of the alarm input and the alarm operation type. Using the mouse may help easy setup.

1. Use the direction buttons to move to <ALARM INPUT> in the left corner of the EVENT/SENSOR setup screen and press the [ENTER] button.
2. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button.
 - OPERATION: Set the connection status of the alarm sensor to either ENABLE or DISABLE.
 - If the alarm sensor is set to <ENABLE> and you have set to perform recording if an alarm occurs, the Live screen displays the alarm recording standby mode. (Page 49)
 - TYPE: Specify the sensor type.
 - N/O (Normal Open) : The sensor stays open at all times while the alarm operates if the sensor is closed.
 - N/C (Normal Close) : The sensor stays closed at all times while the alarm operates if the sensor is open.
 - TEXT: To easily locate the alarming point when an event occurs, rename the alarming point.
3. When your settings are completed, press the <APPLY> button on the bottom. Your settings will be applied.
4. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.

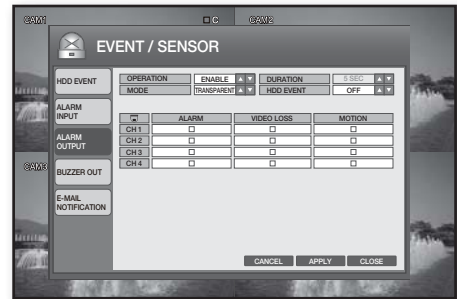


DVR setup

ALARM OUTPUT

You can specify the alarming conditions and the operating time.
Using the mouse may help easy setup.

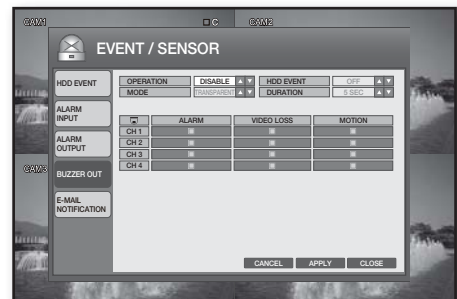
1. Use the direction buttons to move to **<ALARM OUTPUT>** in the left corner of the EVENT/SENSOR setup screen and press the **[ENTER]** button.
2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.
 - OPERATION: Set the operation of the alarm output.
 - If set to **<ENABLE>**, the applicable menu is activated where you can set other options.
 - If set to **<DISABLE>**, other items will be disabled.
 - MODE: Set the output mode of the alarm.
 - If set to **<LATCHED>**, the alarm will sound for as much time as defined in DURATION.
 - If set to **<TRANSPARENT>**, the DURATION item will be disabled.
 - DURATION : Set the duration of the alarm output.
 - If you select **<UNTIL KEY>**, the buzzer will be stopped when you press any button on the front panel or the remote control.
 - HDD EVENT: Set to use the alarm output if the HDD is full.
 - ALARM, VIDEO LOSS, MOTION: Set the alarm output for each channel if an event of alarm, video loss or motion detection occurs.
3. When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
4. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.



BUZZER OUT

You can specify the alarm input channel and the event conditions for the buzzer.
Using the mouse may help easy setup.

1. Use the direction buttons to move to **<BUZZER OUT>** in the left corner of the EVENT/SENSOR setup screen and press the **[ENTER]** button.
2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.
 - OPERATION: Set the operation of the buzzer output.
 - HDD EVENT: Set the buzzer output if a HDD event occurs.
 - MODE: Set the output mode of the buzzer.
 - If set to **<LATCHED>**, the buzzer will sound for as much time as defined in DURATION.
 - If set to **<TRANSPARENT>**, the DURATION item will be disabled.
 - DURATION : Set the duration of the buzzer output.
 - If you select **<UNTIL KEY>**, the buzzer will be stopped when you press any button on the front panel or the remote control.
 - ALARM, VIDEO LOSS, MOTION: Set the buzzer output for each channel if an event of alarm, video loss or motion detection occurs.



3. When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
4. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.

E-MAIL NOTIFICATION

You can specify the conditions so that you can send an email notice to DVR registered users at a certain interval or when an event occurs.

Using the mouse may help easy setup.

1. Use the direction buttons to move to **<E-MAIL NOTIFICATION>** in the left corner of the EVENT/SENSOR setup screen and press the **[ENTER]** button.

2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.

- **NOTIFICATION:** Turn on or off the notification of an event if it occurs.

- If set to **<ON>**, the applicable menu is activated where you can set other options.

- If set to **<OFF>**, other items will be disabled.

- **SETUP CHANGE:** Turn on or off the notification of a setup change if it occurs.

- **HDD EVENT:** Turn on or off the notification of a HDD event if it occurs.

- **BOOTING EVENT:** Turn on or off the notification of an email when the system boots.

- **SNAPSHOT NOTI.:** Specify the sending of the snapshot when an event occurs.

- **ALARM, VIDEO LOSS, MOTION:** Set the event notification for each channel if an event occurs such as alarm, video loss or motion detection.

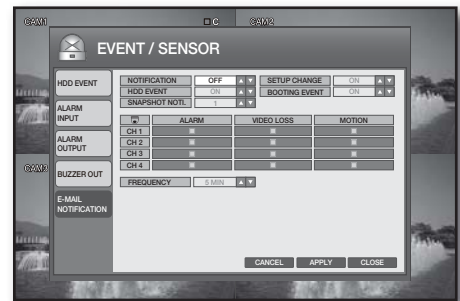
- **FREQUENCY:** Set the notification interval for events occurred.



- A photo taken in a low contrast scene naturally causes a lot of noise, and often occurs an unnecessary motion event, which may cause damage to the camera set. In such case, set a function of E-MAIL NOTIFICATION to OFF, or set FREQUENCY to a longer time (ex: 30 MIN).

3. When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.

4. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.



DVR setup

DISK MANAGEMENT

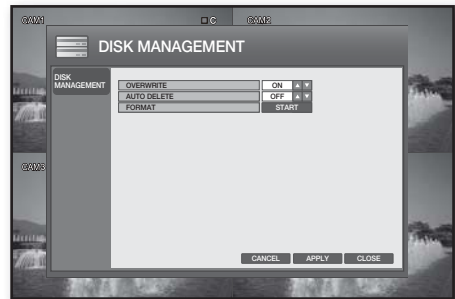
You can specify the recording auto deletion and overwrite options and format the HDD recording data. See the previous section to repeat steps 1~3. (Page 25)

1. Use the direction buttons to move to the upper **<DISK MANAGEMENT>** icon and press the **[ENTER]** button. The DISK MANAGEMENT screen appears.



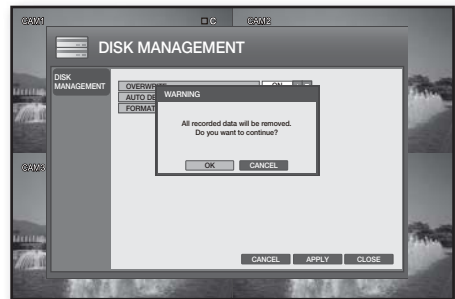
2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.

- **AUTO DELETE:** Specify the auto deletion period. You can search for recording data only in that specified period.
 - The Auto Delete function is available only if **OVERWRITE** is set to **ON**.
 - The NTSC-type model does not support the function of **AUTO DELETE**.



- !
 - If there remains a large-sized data file, setup may take a while. Note that recording will be disabled until setup is completed.
 - It will be disabled if **OVERWRITE** is set to **OFF**.

- **OVERWRITE**
 - If set to **<ON>**, recording will proceed by overwriting the existing data even if the size of the recording data exceeds the HDD capacity.
 - If set to **<OFF>** and the HDD is full, the DVR stops recording and sounds the buzzer or alarm that is set to operate in **<EVENT / SENSOR>**. (Page 42) A message of **"DISK FULL"** is displayed on the screen.



- **FORMAT:** Format the hard disk drive.
 - ① Press the **<START>** button.
 - ② You will see the alert that recording data can be deleted.
 - ③ Press the **<OK>** button.

- !
 - Note that formatting the HDD will delete all existing data.

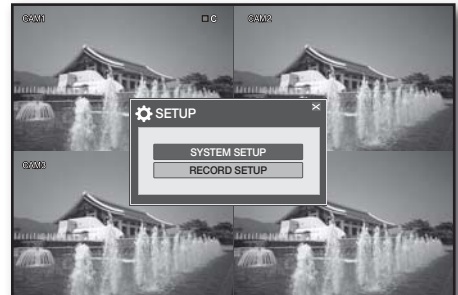
3. When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
4. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.

RECORD SETUP

You can configure the settings of record-related options such as RECORDING OPERATIONS, CONTINUOUS/MOTION RECORDING, ALARM RECORDING, INSTANT RECORDING.

To start the RECORD SETUP

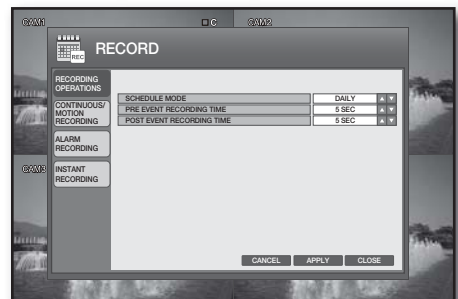
1. Press the **[MENU]** button on the remote control or click **<MENU>** button on the launcher menu. The **SETUP** menu screen appears.
2. Use the direction buttons to move to **<RECORD SETUP>** and press the **[ENTER]** button. The login dialog appears.
3. Select a user account and enter the password.
 - Only those users who have the right permissions can access the Setup menu.



RECORDING OPERATION

You can specify the recording period with the pre and post recording times.

1. Access **<RECORD SETUP>** to display the **RECORDING OPERATIONS** setup screen.
2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.
 - **SCHEDULE MODE**: Specify the schedule mode. The specified schedule mode will be applied to Continuous/Motion Record and Alarm Record.
 - **PRE EVENT RECORDING TIME**: Specify the pre event recording time that will be applied if an event occurs. Recording will start before the specified time if an event occurs.
 - **POST EVENT RECORDING TIME**: Specify the end recording time that will be applied if an event occurs. Recording will continue after the specified time if an event occurs.
3. When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
4. Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.



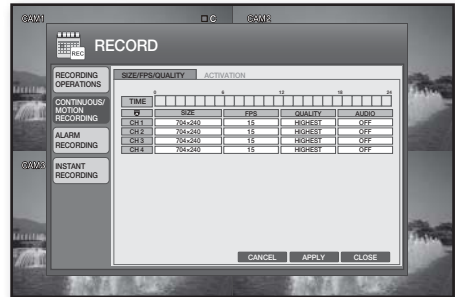
DVR setup

CONTINUOUS/MOTION RECORDING

You can specify the continuous recording time, the recording size and the quality.

Using the mouse may help easy setup.

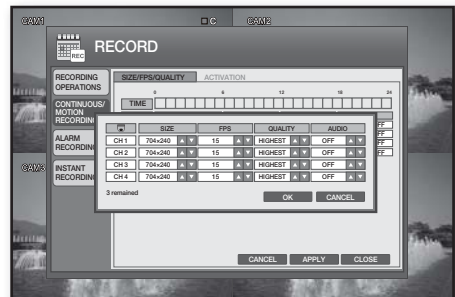
1. Use the direction buttons to move to **<CONTINUOUS/MOTION RECORDING>** in the left corner of the RECORD setup screen and press the **[ENTER]** button.
2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.



To specify the recording size/FPS/quality

You can specify the recording size and the quality.

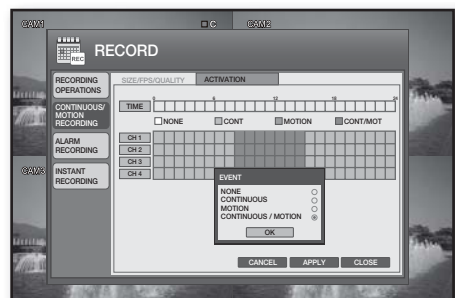
1. From the **<TIME>** bar, select a cell that you want to adjust the size.
The size adjustment window appears.
2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.
 - SIZE: Set the recording resolution.
 - FPS: Set the frame rate per second.
 - QUALITY: Set the recording quality. Select one from LOW/STANDARD/HIGH/HIGHEST. The recordable time may differ, depending on the recording quality.
 - AUDIO: Select whether to include audio input to the recording.
 - Remaining Rate: If you change the settings of the resolution and the remaining rate, the frame rate available for each resolution will be recalculated.
3. Press the **<OK>** button.
Your changes are saved and the window is closed.
4. When your settings are completed, press the **<APPLY>** button on the bottom.
Your settings will be applied.



To set the record mode

You can specify the record mode for each channel or time range.

1. From the CONTINUOUS/MOTION RECORDING menu screen, select **<ACTIVATION>**.
 - Your change to the recording size will be applied to the time bar.
2. Drag the cell that you want to adjust the size, or use the direction buttons (**▲▼◀▶**) on the remote control and press the **[ENTER]** button.

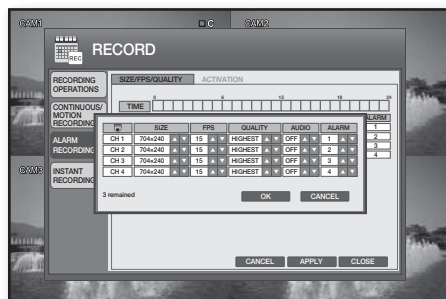


3. Select a desired event recording mode.
 - NONE: Does not perform recording.
 - CONTINUOUS: Performs the recording continuously.
 - MOTION: Performs the recording only if a motion is detected.
To record a motion, set both <SENSITIVITY> and <AREA SETUP> in "CAMERA > MOTION SENSOR". (Page 31)
 - CONTINUOUS/MOTION: Performs both continuous and motion recording modes.
4. Press the <OK> button.
The color of the specified area will be changed to the color of the specified record type.
5. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
6. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.

ALARM RECORDING

You can specify the recording size and the quality that will be applied if an alarm event occurs.
Using the mouse may help easy setup.

1. Use the direction buttons to move to <ALARM RECORDING> in the left corner of the RECORD setup screen and press the [ENTER] button.
2. From the <TIME> bar, select a cell that you want to adjust the size.
The size adjustment window appears.



3. Use direction buttons (▲▼◀▶) to move to a desired item, and press the [ENTER] button to set the value.
 - SIZE: Set the recording resolution.
 - FPS: Set the frame rate per second.
 - QUALITY: Set the recording quality.
Select one from LOW/STANDARD/HIGH/HIGHEST.
The recordable time may differ, depending on the recording quality.
 - AUDIO: Select whether to include audio input to the recording.
 - ALARM: Select an alarm input port.
 - Remaining Rate: If you change the settings of the resolution and the remaining rate, the frame rate available for each resolution will be recalculated.
4. Press the <OK> button.
5. When your settings are completed, press the <APPLY> button on the bottom.
Your settings will be applied.
6. Press the <CLOSE> button to display the confirmation dialog and return to the previous menu.

DVR setup

To specify the alarm recording time

You can specify the alarm recording time for each channel.

- From the ALARM RECORDING menu screen, select **<ACTIVATION>**.
 - Your change to the recording size will be applied to the time bar.
- Drag the cell that you want to adjust the size, or use the direction buttons (**▲▼◀▶**) on the remote control and press the **[ENTER]** button.
- The specified cells will turn light green.
- When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
- Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.

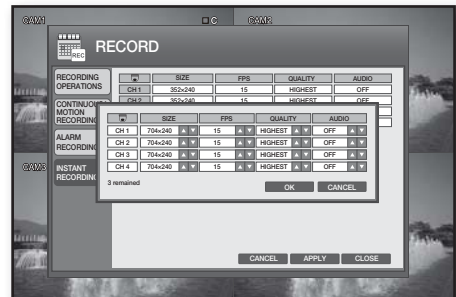


INSTANT RECORDING

You can specify the recording size in manual recording mode.

Using the mouse may help easy setup.

- Use the direction buttons to move to **<INSTANT RECORDING>** in the left corner of the RECORD setup screen and press the **[ENTER]** button.
- Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value. The size adjustment window appears.
 - SIZE:** Set the recording resolution.
 - FPS:** Set the frame rate per second.
 - QUALITY:** Set the recording quality. Select one from LOW/STANDARD/HIGH/HIGHEST. The recordable time may differ, depending on the recording quality.
 - AUDIO:** Select whether to include audio input to the recording.
 - Remaining Rate:** If you change the settings of the resolution and the remaining rate, the frame rate available for each resolution will be recalculated.
- When the size adjustment is done, press the **<OK>** button.
- When your settings are completed, press the **<APPLY>** button on the bottom. Your settings will be applied.
- Press the **<CLOSE>** button to display the confirmation dialog and return to the previous menu.



backup

You can check the backup data size and perform backup of a desired channel or at a desired time.


BACKUP

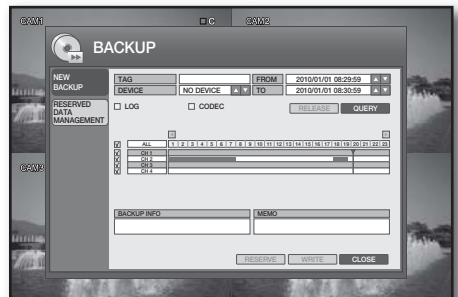
1. Press the **[MENU]** button on the remote control or select **<BACKUP>** button on the launcher menu.
The login dialog appears.
2. Select a user account and enter the password.
 - Only those users who have the backup permission can access the BACKUP menu.
 - Web Viewer doesn't support data backup including the neighborhood of DST transition (ON → OFF) time.
If you want to back up this period, do it on the DVR set, please.



NEW BACKUP

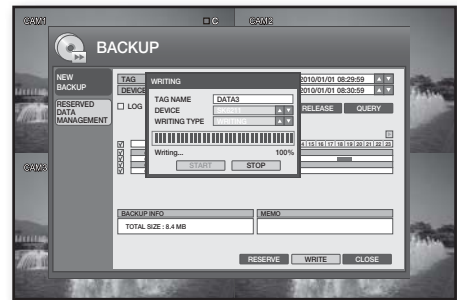
You can backup the reserved data to the connected storage device.
Using the mouse may help easy setup.

1. Access the BACKUP menu to display the **<NEW BACKUP>** setup screen.
 2. Use direction buttons (**▲▼◀▶**) to move to a desired item, and press the **[ENTER]** button to set the value.
 - TAG: Enter a name for each data item that you want to reserve.
 - DEVICE: Select an external storage device to which you save the backup data.
 - FROM: Specify the backup start time.
 - TO: Specify the backup end time.
 - LOG: If you want to receive the system log file, check the log item and proceed with the query session.
 - CODEC: Before you can play the backup data properly with Media Player, check the item that you want to play and download the codec as well. Check before proceeding with the query session. (PAL Only)
- 
 - If **<D.S.T>** set to **<ON>**, you can see overlapped time by pressing **<◀, ▶>**.
 - By double-clicking the backup codec, install it in your PC. Then, get started with Media Player. If you forget to check the codec, it will not be backed up properly.
3. Press the **<QUERY>** button.
The recorded data will be displayed in the backup information column.
 4. Check the data size in **<BACKUP INFO>**.
 5. To change the search criteria, press the **<RELEASE>** button.



backup

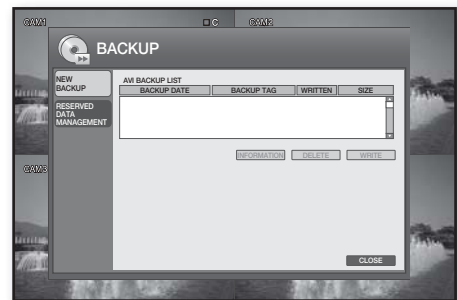
6. Press the **<RESERVE>** or **<WRITE>** button on the bottom.
 - **RESERVE**: The selected data will be backup to the HDD, which you can check in **<RESERVED DATA MANAGEMENT>**.
 - **WRITE**: Backs up the selected data to the connected storage device.
7. Press **<CLOSE>** to exit the backup.



RESERVED DATA MANAGEMENT

You can check the reserved data in **<NEW BACKUP>** and check/delete or back up the data to a storage device.

1. Use the direction buttons to move to **<RESERVED DATA MANAGEMENT>** in the left corner of the **BACKUP** menu and press the **[ENTER]** button.
2. Use the direction buttons (**▲▼◀▶**) to select a backup data item in the list.
3. To check the data information, press the **<INFORMATION>** button.
4. Select **<DELETE>** if you want to delete data, and select **<WRITE>** if you want to save the data.
5. Press **<CLOSE>** to exit the backup.

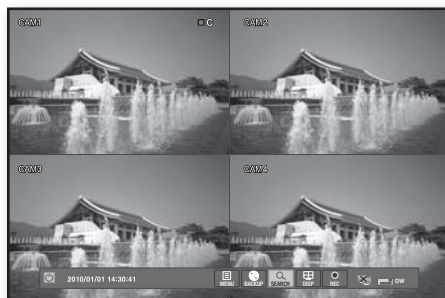


search & play

You can perform the search for recorded data by the time or by the search criteria such as an event.

SEARCH

1. Press the [SEARCH] button on the remote control or press the <SEARCH> button on the launcher menu. The login dialog appears.
2. Select a user account and enter the password.
 - Only those users who have the search permission can access the SEARCH menu.

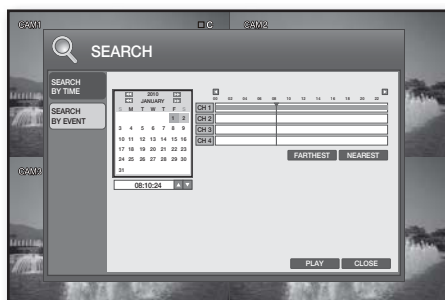


SEARCH BY TIME

You can schedule to search for recording data at a desired time.

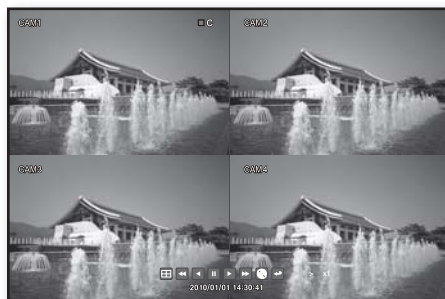
Using the mouse may help easy setup.

1. Access the SEARCH menu to display the <SEARCH BY TIME> screen. If any recording data is found for the search date, the recording portion in the time bar of each channel on that specific time will be highlighted blue.
2. Use the direction buttons to move to the search date and press the [ENTER] button. The date with a recording schedule will be marked in orange on the left calendar of the search bar.



Playback

1. Select a data item to play.
2. Press the <PLAY> button on the bottom.
3. The data item will be played. Use the lower play bar to adjust the speed or switch the play mode.
 - [Grid Icon] : It will turn orange when you place the cursor over it. Each time you right-click it, the screen mode will switch to 1 → 4 split mode in sequence. Click it to return to the Single mode, and click it again to move to the next channel.



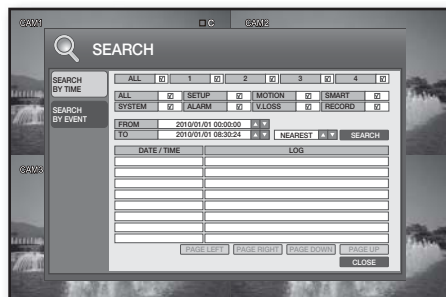
- [Backup Icon] : Click it to display the backup window where you can specify the search criteria and perform backup of any satisfied data.
 - You can check the backup data in "BACKUP > RESERVED DATA MANAGEMENT" and save it to a USB storage media.
- [Back Arrow Icon] : Returns to the previous screen.
- For more information about the play bar, refer to "Playback Screen". (page 24)

search & play

SEARCH BY EVENT

You can search for events and play data for a specific channel.
Using the mouse may help easy setup.

1. Use the direction buttons to move to **<SEARCH BY EVENT>** in the left corner of the SEARCH screen and press the **[ENTER]** button.
2. Use the direction buttons (**▲▼◀▶**) to move to a desired item and press the **[ENTER]** button.
Specify the channel to search and the event period.
3. Specify the search sequence.
 - NEAREST: Displays the list items with the most recent one on the top.
 - FARTHEST: Displays the list items with the oldest one on the top.
 - PAGE LEFT: Moves to the leftmost of the log list.
 - PAGE RIGHT : Moves to the rightmost of the log list.
4. Use the direction buttons (**▲▼◀▶**) to move to a search item or simply double-click it.
The selected data item will be played.



■ For using the play button bar, refer to **"Playback"**. (Page 53)

web viewer

INTRODUCTION

What is web viewer?

Web Viewer a user friendly software program that enables you to connect to the DVR in a remote area and control the live or existing video data.

System Requirements

The following lists the minimum suggested hardware and operating system requirements needed to run the Web Viewer.

OS	Windows XP Professional Windows Vista Home Basic /Premium Windows 7
Web Browser	Internet Explorer 5.5 or higher
CPU	Intel Pentium 2.0 GHz
Memory	512 MB
Monitor	High Color 16-bit 1024 × 768
HDD	50 MB(Installation space required) * Additional HDD space required for recording. Recorded file size will vary depending on recording quality settings.

web viewer

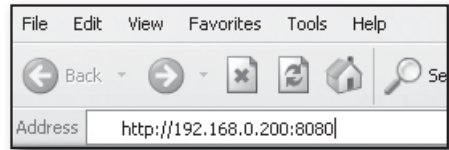
To connect to the Web Viewer

1. Open the browser and provide the IP address of the DVR, or URL in the address bar.

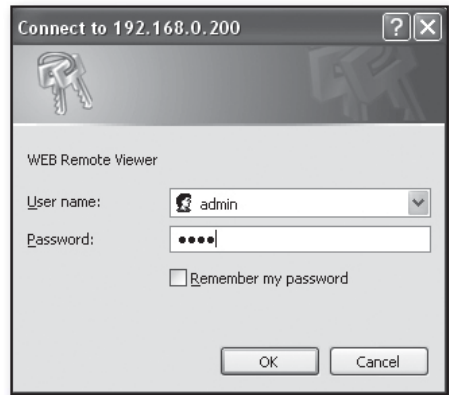


- You must have specified the IP address in "**NETWORK > IP SETUP**".

The initial URL of the DVR is the last 6 digits of the MAC address, which you can check in "**SYSTEM > SYSTEM MANAGEMENT > SYSTEM INFORMATION**". (Page 27)



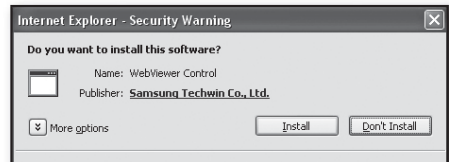
2. As the administrator, you should provide the admin ID and the password.
As a registered user, you should provide the user ID and the password.



3. Click <Install ActiveX Control...>.



4. Click <Install>.



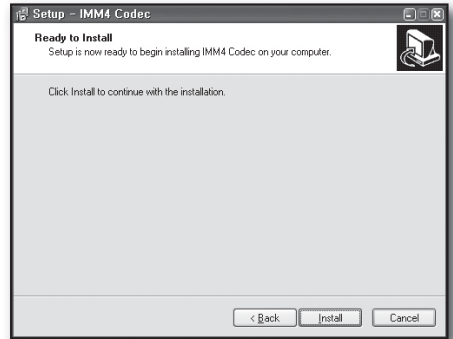
5. When you see the Security Alert popup due to the Windows firewall function, click <Unblock> to access the Web Viewer.



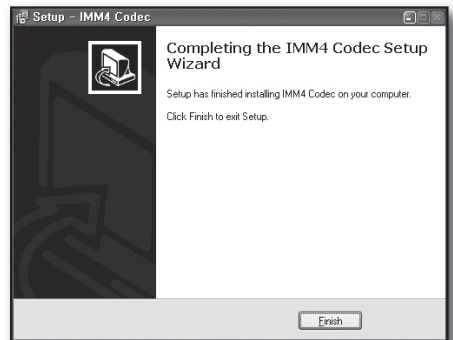
6. Click <Next> when IMM4 Codec Setup Wizard appears.



7. Click <Install>.



8. Click <Finish> to exit setup.



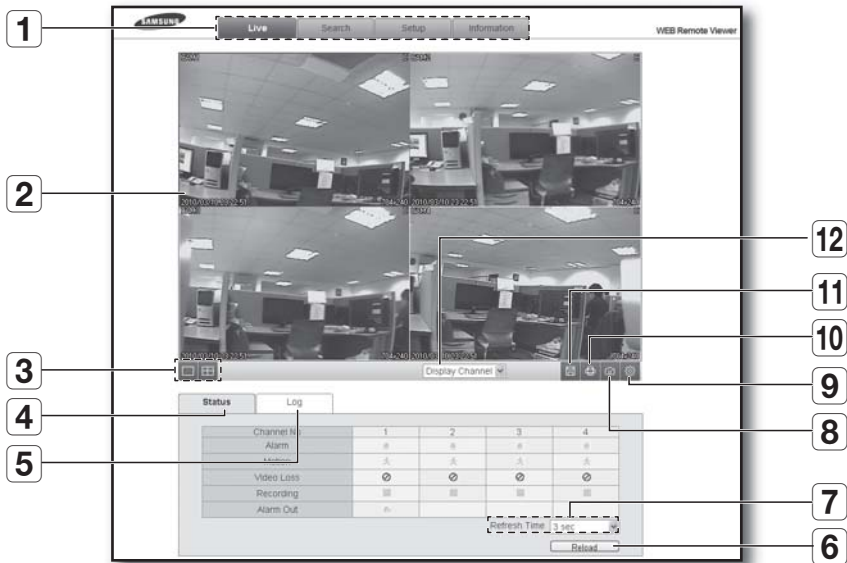
9. The installation is completed. You will see the main screen of the Live Viewer.



web viewer

LIVE VIEWER

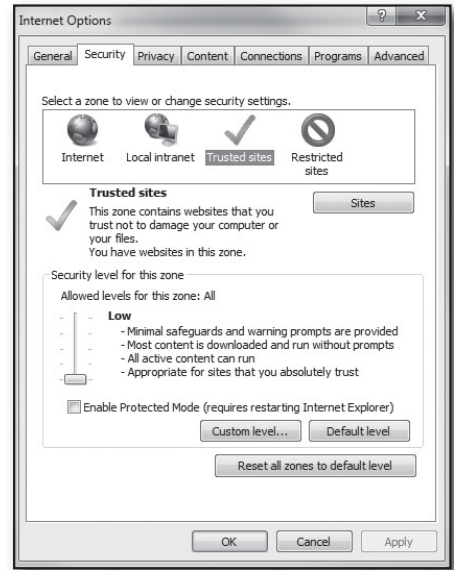
Live Viewer At a Glance



Name	Description
1 Viewer Selection Area	Consists of 4 tabs: <Live>, <Search>, <Setup> and <Information>.
2 Live Viewer Screen	Displays the Live screen of the currently connected DVR.
3 Split Screen	Switches the screen mode to Single, 4-split mode.
4 Status	Indicates the status of each channel.
5 Log	Shows the log.
6 Reload	loads the DVR information again.
7 Refresh Time	Specify the refresh time.
8 Capture Image	Captures the selected screen.
9 ActiveX Setting	Specify the saving path of the recorded or captured screen.
10 Print	Prints out the current screen.
11 Save	Saves the Live video that is displayed on the screen.
12 Channel Selection	Select a channel to display on the screen.



- When you can't save the image, check if the following is applied in your Internet Explorer.
"Tools > Internet Option > Security" Tab Uncheck "Enable Protected Mode(requires restarting Internet Explorer)"
 and restart Internet Explorer, please!



Switching between split modes

Click the mode switch buttons to switch the screen mode as follows.




SINGLE



4-SPLIT

To record video

- Click .
- The video of the selected channel will be saved in the default saving path of the PC.

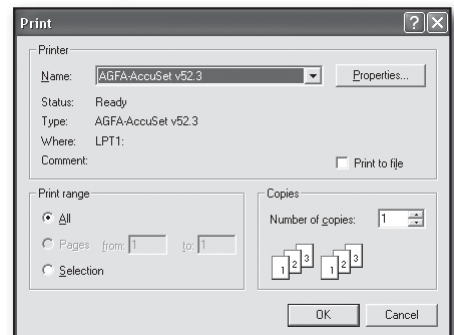


- Click **<ActiveX Setting>** to display the Settings menu where you can change the default path.

To print the screen



You can print out the Live screen that is currently displayed.

- Click .
- When the Print dialog appears, click **<OK>**.





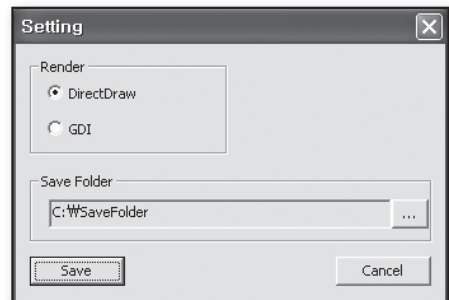
web viewer

Screen Capture

1. Click .
2. The current screen of the selected channel will be saved in the default saving path of the PC.
 ▪ Click **<ActiveX Setting>** to display the Settings menu where you can change the default path.

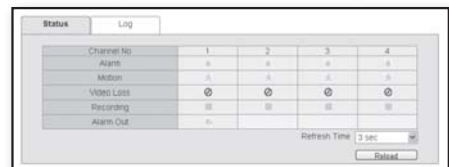
ActiveX Setting

1. Click .
2. When the Setting window appears, specify **<Render>** and **<Path>** for the video or the screen to capture.
3. To change the saving path, click **<Save Folder (...)>** and specify a new path.
 ▪ In Windows Vista, you can not change the file path.
4. Click **<Save>**.
Your changes will be saved.



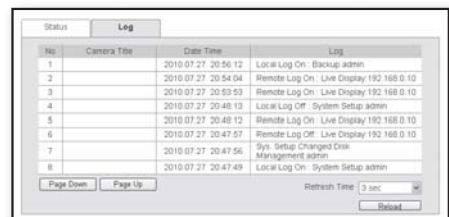
To view the status

Click the **<Status>** tab on the bottom.
You can check the event occurrence status on each channel of the connected DVR.



To view the log

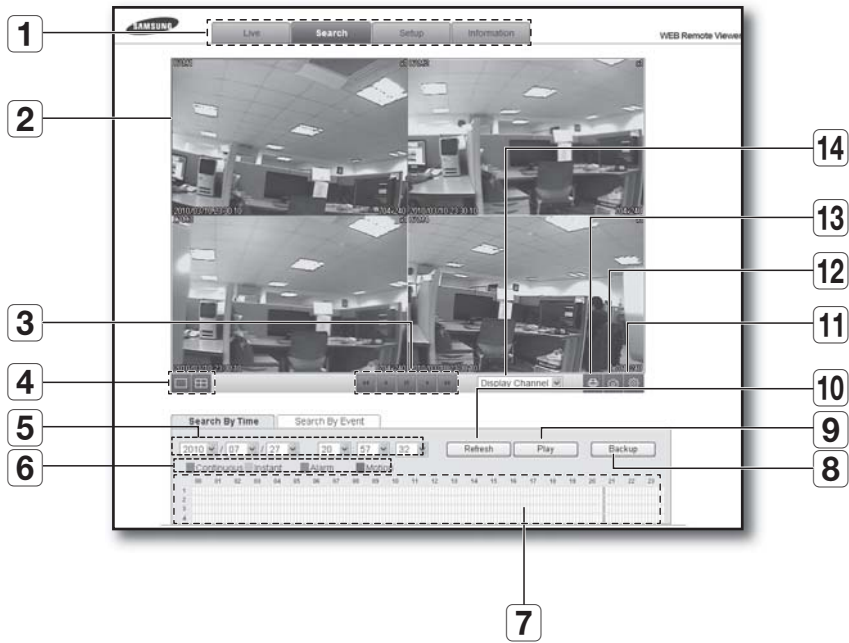
Click the **<Log>** tab on the bottom.
You can check the log of the connected DVR.



SEARCH VIEWER

Click the <Search> tab to display the remote play screen of the DVR.

Search Viewer At a Glance



Name	Description
1 Viewer Selection Area	Consists of 4 tabs: <Live>, <Search>, <Setup> and <Information>.
2 Search Screen	Displays the playback screen of the recorded video.
3 Play Bar	Buttons used to control the playback screen.
4 Split Screen	Switches the screen mode to Single or 4-split mode. For more information, refer to "Live Viewer At a Glance".
5 Date & Time	Select a time range to play.
6 Record Properties	Set the recording properties as necessary.
7 Timeline	Shows the playback channel, time range and recording properties which you can change.
8 Backup	Backs up the current video.
9 Play	Plays the video that matches the search criteria.

web viewer

Name		Description
10	Refresh	Refreshes the screen
11	ActiveX Setting	Specify the saving path of the recorded or captured screen.
12	Capture Image	Captures the current screen.
13	Print	Prints out the current screen.
14	Channel Selection	Select a channel of the camera that is connected to the DVR.



- For details about the ActiveX setting/Capture Image/Print menus, refer to “Live Viewer”.

SEARCH BY TIME

You can search for recording data in the DVR using the time range.

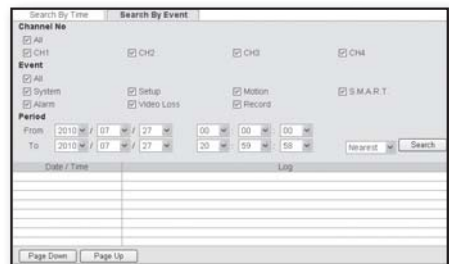
- Specify the time range to play.
- Click <Play>.
- Use the play bar to adjust the play direction and speed as necessary.
 - For more information about the play bar, refer to “Playback Screen”. (Page 24)



SEARCH BY EVENT

You can search for recording data in the DVR by sorting them by the event.

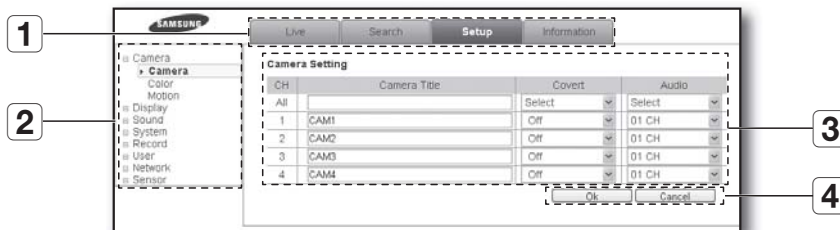
- Select an event to search by clicking the checkbox.
- Specify the time range in <Period>.
- Specify the display sequence of the items found.
 - Nearest: Displays the most recent event on the top.
 - Farthest: Displays the oldest event on the top.
- Click <Search>.
The event data will be listed in the lower pane.
- Double-click a desired item.
- Use the play bar to adjust the play direction and speed as necessary.
 - For more information about the play bar, refer to “Playback Screen”. (Page 24)



SETUP

Click the <Setup> tab to display the DVR remote setup screen.

Setup Viewer At a Glance



Name	Description
1 Viewer Selection Area	Consists of 4 tabs: <Live>, <Search>, <Setup> and <Information>.
2 Menu Tree	Select a desired menu item.
3 Details	Detailed information of the selected menu item.
4 Ok/Cancel	Saves or cancels your settings.

Camera Setting

You can configure the settings of the camera that is connected to the DVR.

1. From the left menu tree, select <Camera>.
2. Make your changes as necessary in details.
 - For more information, refer to "CAMERA". (Page 29)
3. Click <Ok>.
Your changes will be saved.



web viewer

Color setting

You can adjust all settings from 0 to 100 for each channel in fine tune mode, and the default is 50.

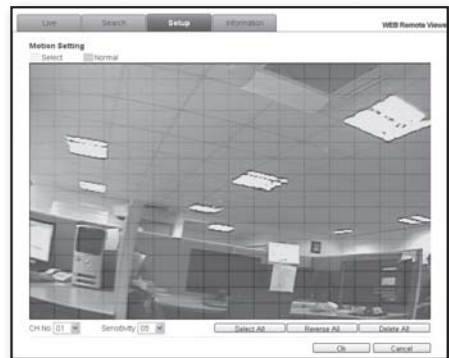
1. From the left menu tree, select <Camera>.
2. Click <Color>.
3. Make your changes as necessary in details.
 - For more information, refer to “COLOR”. (Page 30)
4. Click <Ok>.
Your changes will be saved.



Motion setting

You can specify the motion detection area, and specify the use of the alarm output if a motion is detected. If a detection area is specified, the system will detect a motion in that area if it occurs.

1. From the left menu tree, select <Camera>.
2. Click <Motion>.
3. Click a motion area and drag it up to a desired point. The selected cells will turn in a different color, which will be specified as a detection area.
 - For more information, refer to “MOTION SENSOR”. (Page 31)
4. Click <Ok>.
Your changes will be saved.



OSD setting

You can change the display information.

1. From the left menu tree, select <Display>.
2. Click <OSD>.
3. Make your changes as necessary in details.
 - For more information, refer to “OSD”. (Page 32)
4. Click <Ok>.
Your changes will be saved.



Monitor setting

You can adjust the position of the displayed items.

1. From the left menu tree, select **<Display>**.
2. Click **<Monitor>**.
3. Make your changes as necessary in details.
 - For more information, refer to **"MONITOR"**. (Page 32)
4. Click **<Ok>**.
Your changes will be saved.



Audio/Buzzer setting

You can configure the audio and buzzer related settings.

1. From the left menu tree, select **<Sound>**.
2. Make your changes as necessary in details.
 - For more information, refer to **"AUDIO"** and **"BUZZER"**. (Page 35)
3. Click **<Ok>**.
Your changes will be saved.



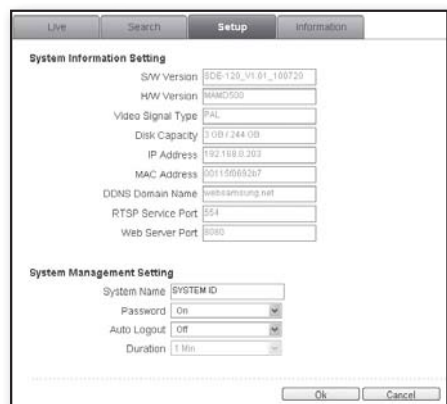
Date/Time setting

1. From the left menu tree, select **<System>**.
2. Make your changes as necessary in details.
 - For more information, refer to **"DATE / TIME"**. (Page 26)
3. Click **<Ok>**.
Your changes will be saved.



Management setting

1. From the left menu tree, select **<System>**.
2. Click **<Management>**.
3. Check the system information in **<System Information Setting>**.
 - For more information, refer to **"SYSTEM MANAGEMENT"**. (Page 27)
4. Change the System Name in **<System management Setting>**.
5. Click **<Ok>**.
Your changes will be saved.



Control Device Setting

1. From the left menu tree, select <System>.
2. Click <Remote Controller>.
3. Make your changes as necessary in details.
 - For more information, refer to "REMOTE CONTROLLER". (Page 28)
4. Click <Ok>. Your changes will be saved.



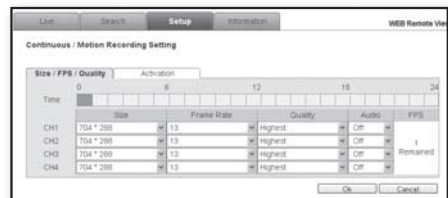
Recording Operation Setting

1. From the left menu tree, select <Record>.
2. Click <Operation>.
3. Make your changes as necessary in details.
 - For more information, refer to "RECORDING OPERATION". (Page 47)
4. Click <Ok>. Your changes will be saved.



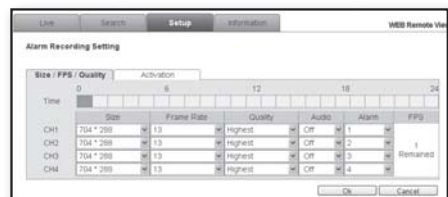
Continuous/Motion Recording Setting

1. From the left menu tree, select <Record>.
2. Click <Continuous/Motion>.
3. Make your changes as necessary in details.
 - For more information, refer to "CONTINUOUS/MOTION RECORDING". (Page 48)
4. Click <Ok>. Your changes will be saved.



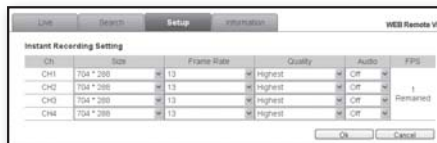
Alarm Recording Setting

1. From the left menu tree, select <Record>.
2. Click <Alarm>.
3. Make your changes as necessary in details.
 - For more information, refer to "ALARM RECORDING". (Page 49)
4. Click <Ok>. Your changes will be saved.



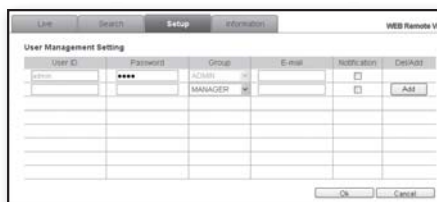
Instant Recording Setting

1. From the left menu tree, select <Record>.
2. Click <Instant>.
3. Make your changes as necessary in details.
 - For more information, refer to "INSTANT RECORDING". (Page 50)
4. Click <Ok>.
Your changes will be saved.



User Management Setting

1. From the left menu tree, select <User>.
2. Click <Management>.
3. Make your changes as necessary in details.
 - For more information, refer to "USER MANAGEMENT". (Page 36)
4. Click <Ok>.
Your changes will be saved.



User Authority Setting

1. From the left menu tree, select <User>.
2. Click <Authority>.
3. Make your changes as necessary in details.
 - For more information, refer to "USER AUTHORITY". (Page 37)
4. Click <Ok>.
Your changes will be saved.



web viewer

IP Setup Setting

1. From the left menu tree, select <Network>.
2. Click <Network>.
3. Check the network connection status and make your changes as necessary in details.
 - For more information, refer to “IP SETUP”. (Page 38)
4. Click <Ok>.
Your changes will be saved.

Live Search Setup Information

IP Setup Setting

DHCP

IP Address 192.168.0.203

Subnet Mask 255.255.255.0

Gateway 192.168.0.1

DNS 1st Server 198.120.83.1

DNS 2nd Server 198.120.83.2

RTSP Service Port 554

Web Server Port 8080

Max TX Speed 8192 kbyte

DDNS On

Ok Cancel

E-mail Setting

1. From the left menu tree, select <Network>.
2. Click <E-mail>.
3. Make your changes as necessary in details.
 - For more information, refer to “E-MAIL”. (Page 40)
4. Click <Ok>.
Your changes will be saved.

Live Search Setup Information

E-mail Setting

Server

Port 25

Security Off

User

Password

From

Ok Cancel

HDD Event Setting

1. From the left menu tree, select <Sensor>.
2. Click <HDD Event>.
3. Make your changes as necessary in details.
 - For more information, refer to “HDD EVENT”. (Page 42)
4. Click <Ok>.
Your changes will be saved.

Live Search Setup Information

HDD Event Setting

S.M.A.R.T Alarm On

Disk Full Event Off

Ok Cancel

Alarm Input Setting

1. From the left menu tree, select <Sensor>.
2. Click <Alarm Input>.
3. Make your changes as necessary in details.
 - For more information, refer to “ALARM INPUT”. (Page 43)
4. Click <Ok>.
Your changes will be saved.

Live Search Setup Information

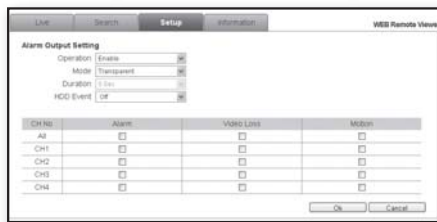
Alarm Input Setting

CH No	Operation	Select	Type	Text
All	Select	<input checked="" type="checkbox"/>		
CH1	Enable	<input checked="" type="checkbox"/>	N/O	ALARM 1
CH2	Enable	<input checked="" type="checkbox"/>	N/O	ALARM 2
CH3	Enable	<input checked="" type="checkbox"/>	N/O	ALARM 3
CH4	Enable	<input checked="" type="checkbox"/>	N/O	ALARM 4

Ok Cancel

Alarm output setting

1. From the left menu tree, select <Sensor>.
2. Click <Alarm Output>.
3. Make your changes as necessary in details.
 - For more information, refer to “ALARM OUTPUT”. (Page 44)
4. Click <Ok>.
Your changes will be saved.



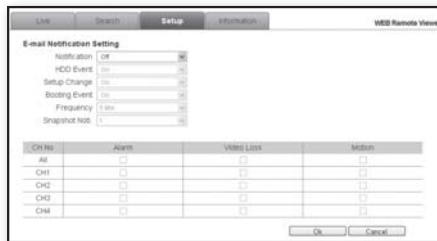
Buzzer out setting

1. From the left menu tree, select <Sensor>.
2. Click <Buzzer Out>.
3. Make your changes as necessary in details.
 - For more information, refer to “BUZZER OUT”. (Page 44)
4. Click <Ok>.
Your changes will be saved.



E-mail notification setting

1. From the left menu tree, select <Sensor>.
2. Click <E-mail Notification>.
3. Make your changes as necessary in details.
 - For more information, refer to “E-MAIL NOTIFICATION”. (Page 45)
4. Click <Ok>.
Your changes will be saved.



INFORMATION

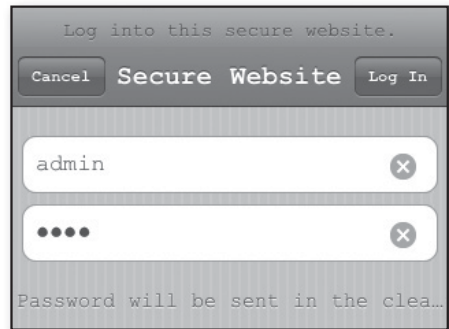
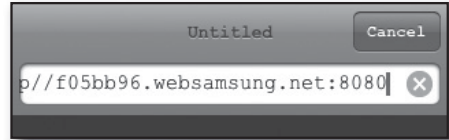
Click the <Information> tab to display the DVR model name and the version of the Web Viewer.



web viewer

USING THE iPhone

1. Select the Safari browser.
2. Enter the IP address or URL to connect.
And touch the <Go> button.
http:// set IP Address: Port No(Default 8080)
Ex)http://f05bb96.websamsung.net:8080
3. Enter the User name and Password then user can see the Image. (Default ID: admin, PW: 4321)
4. Touch <Refresh> button to get the image.



CH select — 01 CH ▾ Max F ▾ Refresh Info

Frame Rate — Manual, Max, 2, 1, 0.5, 0.3, 0.1

In choosing Manual, it updates picture.

DVR Information

appendix

CAMERA SPECIFICATION

Item	Details			
Model	SOC-A100	SOC-A101	SOC-A100P	SOC-A101P
Day/Night	0	X	0	X
Power Source	Voltage DC 12V			
Broadcasting	NTSC		PAL	
Image Device	CCD			
Effective Pixels	380K		430K	
Line Frequency	Horizontal: 15,734Hz / Vertical: 59.94Hz		Horizontal: 15,625Hz / Vertical: 50Hz	
Weather Resist	IP66			
Synchronization	INT			
Resolution	600TVL			
S/N Ratio	52db			
Color Temperature	ATW			
Signal Output	Composite Video: MINI DIN TYPE (JACK)			
Lens	Focal Length: 3.8mm Aperture(f): 2.0			
Light Condition	Light Sensor Auto	X	Light Sensor Auto	X
DNR	0			
Body	Metal			
IR LED	30 EA	X	30 EA	X
Physical Size (L×W×H)	100×67×64			
Weight	413g	396g	413g	396g

appendix

PRODUCT SPECIFICATION (SDE-120N/SDE-3000N/SDE-3001N)

Item		Details		
Model		SDE-120N	SDE-3000N	SDE-3001N
General	System Format	NTSC / PAL		
	Remote Control	Yes		
Operation System		Embedded Linux		
Video	Input	4CH BNC, 4CH MINI DIN (CH1~4 Common)		
	Output	1EA BNC 1 CH(CVBS)		
Audio	Input	4CH(1Vp-p)		
	Output	RCA Type : 1CH		
Live	Display Mode	1/4/Sequence		
Alarm/Motion	Input	4CH		
	Output	Relay : 1CH		
	Pre Alarm	1sec~5sec		
	Post Alarm	Select between 5 sec to 180 sec		
	Buzzer	Yes		
	Motion Detection	4CH		
	Video Pop-up	Support		
Rec/Play/Search	Video Codec	H.264 (Base profile)		
	Audio Codec	G.711(64kbps)		
	Video REC/PB Speed	NTSC : 120ips(352×240), 60ips(704×240), 30ips(704×480) PAL : 100ips(352×288), 50ips(704×288), 25ips(704×576)		
	Rec. Quality	Level: Highest/High/Standard/Low		
	Performance	Pentaplex (Live, Playback, Recording, Network, Smart Phone)		
	# of Video Record	4CH		
	REC Mode	<ul style="list-style-type: none"> • Continuous REC • Schedule REC • Alarm REC • Motion REC • Time Laps REC <ul style="list-style-type: none"> - NTSC : 1, 2, 3, 7, 15, 30ips - PAL : 1, 2, 3, 7, 13, 25ips • Instant REC (Panic REC) 		
	Play Speed	<ul style="list-style-type: none"> • Play, Pause, Stop • Fast Forward/Reverse - 2x, 4x, 8x, 16x, 32x, 64x • Step Play - Forward/Reverse 		
	Storage	500GB	500GB	1TB
	Search Mode	<ul style="list-style-type: none"> • Time Search - Data/Time - Calendar • Event - Continuous, Alarm, Motion, Other 		

Item		Details		
Model		SDE-120N	SDE-3000N	SDE-3001N
Web Viewer	Client PC SPEC	<ul style="list-style-type: none"> MS Explorer 5.5 up (32 bit only) 		
	Support OS	Windows XP, Windows Vista, Windows 7		
	Web Viewer Function	<ul style="list-style-type: none"> Live / Backup / Search Support multi language NTSC : ENGLISH/FRANÇAIS/ESPAÑOL PAL : ENGLISH/FRANÇAIS/DEUTSCH/ESPAÑOL/ITALIANO/TÜRK/ РУССКИЙ/SVENSKA/ČESKÝ 		
	Security	Password / User Name Protection		
	Remote Monitoring	4		
	Remote Searching	Date/Time, Event List Search		
	Connection No	4 (1 Web Viewer/1 PC)		
Network	Interface	LAN 1 port (10/100 Mbps Ethernet)		
	Network Protocol	DHCP, DNS, DDNS, NTP		
Backup	USB 2.0 I/F	<ul style="list-style-type: none"> Front 1, Rear 1 External HDD USB Memory 		
	Back up File Format	AVI		
Time	Time Adjustment	GMT Time Zone, DST, NTP Support		
Other Functions	Other Functions	<ul style="list-style-type: none"> S/W upgrade(USB memory, Network) Live & Network monitoring without HDD Support multi language NTSC : ENGLISH/FRANÇAIS/ESPAÑOL PAL : ENGLISH/FRANÇAIS/DEUTSCH/ESPAÑOL/ITALIANO/TÜRK/ РУССКИЙ/SVENSKA/ČESKÝ E-MAIL(JPEG) : Alarm /Motion/Video Loss 		
Control	Mouse	Support(USB)		
	Front Key	Support		
	Remote Control	Support		
Mechanical (Set)	Weight	1.88Kg	1.88Kg	2.05Kg
	Dimensions (W x H x D)	290 X 60 X 224.3mm		
Mechanical (Package)	Weight	9.48Kg	9.48Kg	9.69Kg
	Dimensions (W x H x D)	471 X 193 X 385mm		
Environmental	Operating Temperature	0°C ~ +40°C		
	Operating Humidity	20% ~ 90%		
Electrical	Input Voltage	100~240VAC, 50/60Hz		
	Power Consumption	TYP: 16.8W, MAX: 25.2W		
Camera	SOC-A100	2EA	4EA	4EA
	SOC-A101	2EA	—	—
Adaptor	Input Voltage	100~240V, 50/60Hz		
	Power Consumption	12V, 4A (MAX 48W)		

appendix

PRODUCT SPECIFICATION (SDE-3170P/SDE-3002P/SDE-3002)

Item		Details		
Model		SDE-3170P	SDE-3002P	SDE-3002
General	System Format	PAL	PAL	NTSC
	Remote Control	Yes		
Operation System		Embedded Linux		
Video	Input	4CH BNC, 4CH MINI DIN (CH1~4 Common)		
	Output	1EA BNC 1 CH(CVBS)		
Audio	Input	4CH(1Vp-p)		
	Output	RCA Type : 1CH		
Live	Display Mode	1/4/Sequence		
Alarm/Motion	Input	4CH		
	Output	Relay : 1CH		
	Pre Alarm	1sec~5sec		
	Post Alarm	Select between 5 sec to 180 sec		
	Buzzer	Yes		
	Motion Detection	4CH		
	Video Pop-up	Yes		
Rec/Play/Search	Video Codec	H.264 (Base profile)		
	Audio Codec	G.711(64kbps)		
	Video REC/PB Speed	NTSC: 120ips(352×240), 60ips(704×240),30ips(704×480) PAL : 100ips(352×288), 50ips(704×288), 20ips(704×576)		
	Rec. Quality	Level: Highest/High/Standard/Low		
	Performance	Pentaplex (Live, Playback, Recording, Network, Smart Phone)		
	# of Video Record	4CH		
Rec/Play/Search	REC Mode	<ul style="list-style-type: none"> • Continuous REC • Schedule REC • Alarm REC • Motion REC • Time Laps REC <ul style="list-style-type: none"> - NTSC : 1, 2, 3, 7, 15, 30ips - PAL : 1, 2, 3, 7, 13, 25ips • Instant REC (Panic REC) 		
	Play Speed	<ul style="list-style-type: none"> • Play, Pause, Stop • Fast Forward/Reverse - 2x, 4x, 8x,16x, 32x, 64x • Step Play - Forward/Reverse 		
	Storage	500GB		
	Search Mode	<ul style="list-style-type: none"> • Time Search - Data/Time - Calendar • Event - Continuous, Alarm, Motion, Other 		

Item		Details		
Model		SDE-3170P	SDE-3002P	SDE-3002
Web Viewer	Client PC SPEC	• MS Explorer 5.5 up (32 bit only)		
	Support OS	Windows XP, Windows Vista, Windows 7		
	Web Viewer Function	<ul style="list-style-type: none"> • Live / Backup / Search • Support multi language NTSC : ENGLISH/FRANÇAIS/ESPAÑOL PAL : ENGLISH/FRANÇAIS/DEUTSCH/ESPAÑOL/ITALIANO/TÜRK/ РУССКИЙ/SVENSKA/ČESKÝ 		
	Security	Password / User Name Protection		
	Remote Monitoring	4		
	Remote Searching	Date/Time, Event List Search		
	Connection No	4 (1 Web Viewer/1 PC)		
Network	Interface	LAN 1 port (10/100 Mbps Ethernet)		
	Network Protocol	DHCP, DNS, DDNS, NTP		
Backup	USB 2.0 I/F	<ul style="list-style-type: none"> • Front 1, Rear 1 • External HDD • USB Memory 		
	Back up File Format	AVI		
Time	Time Adjsutment	GMT Time Zone, DST, NTP Support		
Other Functions	Other Functions	<ul style="list-style-type: none"> • S/W upgrade(USB memory, Network) • Live & Network monitoring without HDD • Support multi language NTSC : ENGLISH/FRANÇAIS/ESPAÑOL PAL : ENGLISH/FRANÇAIS/DEUTSCH/ESPAÑOL/ITALIANO/TÜRK/ РУССКИЙ/SVENSKA/ČESKÝ • E-MAIL(JPEG) : Alarm /Motion/Video Loss 		
Control	Mouse	Support(USB)		
	Front Key	Support		
	Remote Control	Support		
Mechanical (Set)	Weight	1.88Kg		
	Dimensions (W x H x D)	290 X 60 X 224.3mm		
Mechanical (Package)	Weight	16.3Kg	9.48Kg	7Kg
	Dimensions (W x H x D)	453 x 365 x 418mm	471 x 193 x 385mm	471 x 193 x 385mm
Environmental	Operating Temperature	0°C ~ +40°C		
	Operating Humidity	20% ~ 90%		
Electrical	Input Voltage	100~240VAC, 50/60Hz		
	Power Consumption	TYP: 16.8W, MAX: 25.2W		
Camera	SOC-A100(P)	4EA	2EA	1EA
	SOC-A101(P)	—	2EA	1EA
Adaptor	Input Voltage	100~240V, 50/60Hz		
	Power Consumption	12V, 4A (MAX 48W)		

OPEN SOURCE LICENSE REPORT ON THE PRODUCT

The software included in this product contains copyrighted software that is licensed under the GPL/LGPL. You may obtain the complete Corresponding Source code from us for a period of three years after our last shipment of this product by sending email to help.cctv@samsung.com

If you want to obtain the complete Corresponding Source code in the physical medium such as CD-ROM, the cost of physically performing source distribution might be charged.

- GPL Software : linux kernel, Sysvinit, dosfstools, wget, msmtp, busybox, cdrtools, dvd+rw-tools, iconv, smartctl, uboot, minicom, openssl, bash, lm_sensors
- LGPL Software : glibc, vmstat, inetutils
- OpenSSL License : OpenSSL

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.

51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps:

(1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is

modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all. The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.

51 Franklin S

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients

of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
- b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
- c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

- a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

- b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

- c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

one line to give the program's name and an idea of what it does.

Copyright (C) yyyy name of author

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.

Also add information on how to contact you by electronic and paper mail. If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

Gnomovision version 69, Copyright (C) year name of author Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type 'show w'. This is free software, and you are welcome to redistribute it under certain conditions; type 'show c' for details.

The hypothetical commands 'show w' and 'show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than 'show w' and 'show c'; they could even be mouse-clicks or menu items-- whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program 'Gnomovision' (which makes passes at compilers) written by James Hacker.

signature of Ty Coon, 1 April 1989 Ty Coon, President of Vice This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the

GNU Lesser General Public License instead of this License.

GNU GENERAL PUBLIC LICENSE

Version 3, 29 June 2007

Copyright © 2007 Free Software Foundation, Inc.
<<http://fsf.org/>>

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The GNU General Public License is a free, copyleft license for software and other kinds of works.

The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change all versions of a program--to make sure it remains free software for all its users. We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors. You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for them if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs, and that you know you can do these things.

To protect your rights, we need to prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it.

For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions.

Some devices are designed to deny users access to

install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS

0. Definitions.

"This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To "convey" a work means any kind of propagation that

enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.



The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From Anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

- a) The work must carry prominent notices stating that you modified it, and giving a relevant date.
- b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices".
- c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.
- d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

- a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.
- b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you

offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

- c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.
- d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.
- e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A “User Product” is either (1) a “consumer product”, which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, “normally used” refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

“Installation Information” for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms.

“Additional permissions” are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

- a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or
- b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or
- c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or
- d) Limiting the use for publicity purposes of names of licensors or authors of the material; or
- e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or
- f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors.

All other non-permissive additional terms are considered "further restrictions" within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

An "entity transaction" is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate

litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents.

A “contributor” is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor’s “contributor version”.

A contributor’s “essential patent claims” are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, “control” includes the right to grant patent sublicenses in a manner consistent with the requirements of this License.

Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor’s essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a “patent license” is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To “grant” such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party.

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. “Knowingly relying” means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient’s use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it.

A patent license is “discriminatory” if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license (a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or (b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007.

Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License.

The Free Software Foundation may publish revised and/or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License “or any later version” applies to it, you have the option of following the terms

and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation.

If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program.

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. Disclaimer of Warranty.

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. Limitation of Liability.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

END OF TERMS AND CONDITIONS

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.

51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.



2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a “work that uses the Library”. Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a “work that uses the Library” with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a “work that uses the library”. The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a “work that uses the Library” uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a “work that uses the Library” with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of

the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

- a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)
- b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
- d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
- e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

- a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
- b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER

EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found. one line to give the library's name and an idea of what it does.

Copyright (C) year name of author

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not,

write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the library 'Frob' (a library for tweaking knobs) written by James Random Hacker.

signature of Ty Coon, 1 April 1990 Ty Coon, President of Vice.

OpenSSL LICENSE

Copyright (c) 1998-2006 The OpenSSL Project. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR

TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. This product includes cryptographic software written by Eric Young (ey@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Original SSLeay License

Copyright (C) 1995-1998 Eric Young (ey@cryptsoft.com). All rights reserved. This package is an SSL implementation written by Eric Young (ey@cryptsoft.com). The implementation was written so as to conform with Netscape's SSL. This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by Eric Young (ey@cryptsoft.com)" The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related :-).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR

PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.



Correct Disposal of This Product (Waste Electrical & Electronic Equipment)

(Applicable in the European Union and other European countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.



Correct disposal of batteries in this product

(Applicable in the European Union and other European countries with separate battery return systems.)

This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

Call Us Now!!!



1890 866 900


4 Channel DVR

User Manual

Copyright

©2010 Samsung Techwin Co., Ltd. All rights reserved.

Trademark

 **SAMSUNG TECHWIN** is the registered logo of Samsung Techwin Co., Ltd.
The name of this product is the registered trademark of Samsung Techwin Co., Ltd.
Other trademarks mentioned in this manual are the registered trademark of their respective company.

Restriction

Samsung Techwin Co., Ltd shall reserve the copyright of this document. Under no circumstances, this document shall be reproduced, distributed or changed, partially or wholly, without formal authorization of Samsung Techwin.

Disclaimer

Samsung Techwin makes the best to verify the integrity and correctness of the contents in this document, but no formal guarantee shall be provided. Use of this document and the subsequent results shall be entirely on the user's own responsibility. Samsung Techwin reserves the right to change the contents of this document without prior notice.

Warranty

If the product does not operate properly in normal conditions, please let us know. Samsung Techwin will resolve the problem for free of charge. The warranty period is 3 years. However, the followings are excluded:

- Data loss due to a damaged hard disk
- If the system behaves abnormally because you run a program irrelevant to the system operation.
- Data loss due to virus infection
- Deteriorated performance or natural worn-out in process of time
- Sensory phenomenon that does not affect the performance or quality of the product (ex: working noise).



SALES NETWORK

SAMSUNG TECHWIN CO., LTD.

Samsungtechwin R&D Center, 701, Sampyeong-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea, 463-400
TEL : +82-70-7147-8740~60 FAX : +82-31-8018-3745

SAMSUNG TECHWIN AMERICA Inc.

1480 Charles Willard St, Carson, CA 90746, UNITED STATES
Tol Free : +1-877-213-1222 FAX : +1-310-632-2195
www.samsungcctvusa.com

SAMSUNG TECHWIN EUROPE LTD.

Samsung House, 1000 Hillswood Drive, Hillswood Business Park
Chertsey, Surrey, UNITED KINGDOM KT16 0PS
TEL : +44-1932-45-5300 FAX : +44-1932-45-5325

www.samsungtechwin.com
www.samsungsecurity.com
www.samsungipolis.com

Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>