SAMSUNG TECHWIN

NETWORK VIDEO RECORDER

User Manual

SRN-4000

CE

SAMSUNG

Network Video Recorder
User Manual

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❖ **Design and specifications are subject to change without prior notice.**

❖ **The initial administrator ID is "admin" and the password should be set when logging in for the first time.**
Set password for your wireless network if you use the product with a wireless router. Being not protected with password or using the default wireless router password may expose your video data to potential threat.
Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.
Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

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.

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.

overview

BEFORE START

This manual provides operational information necessary for using the product and contains a description about each component part and its function as well as menu or network settings.
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.
- Prior to opening the case, please consult a qualified technician first. Whenever this is needed power must be removed from the unit.
- Before adding a hard disk drive or external storage (USB memory, USB HDD, etc), check if it is compliant with this product. For the compatibility list, contact the retailer.

Warning

Battery

It is essential that when changing the battery in the unit, the replacement battery must be of the same type otherwise there may be a possibility of an explosion.

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."

Caution

- Connect the power cord into a grounded outlet.
- The Mains plug is used as a disconnect device and shall stay readily operable at any time.
- Batteries shall not be exposed to excessive heat such as sunshine, fire or the like.
- Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

System Shutdown

Turning off the power while the product is in operation, or undertaking improper actions may cause damage or malfunction to the hard drive or the product.
To safely cut off power, press the front Power button on the product to display the confirmation message.
Click <**OK**> and then unplug the power cable.
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.)

- If powered off abnormally, restarting may take more time for restoring data from hard disk drive for proper operation.

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.
Prior to using a device that has been stored for a long period in low temperatures, allow the product to stand at room temperature for a period.
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.

Security Precautions

The initial administrator ID is "**admin**" and the password should be set when logging in for the first time.
Set password for your wireless network if you use the product with a wireless router. Being not protected with password or using the default wireless router password may expose your video data to potential threat.
Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.
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overview

FEATURES

The product records video and audio from network cameras to a hard disk, and enables playback from the hard disk. It also provides remote monitoring environment for video and audio over the network using a remote computer.

- User-friendly UI
- VGA, 4CIF, record in a max of 2592X1944 (5M pixel) supported
- Record and play video
- Record and play audio
- Supports ONVIF Pofile S standard and RTP / RTSP protocols
- Play high-definition video using the HDMI cable
- Display the HDD operation status by HDD SMART
- HDD overwrite enabled
- Backup using USB 2.0 protocols and external HDD
- Simultaneous play of 16 channels
- Various Search Modes (Search by Time, Event, Backup and Heatmap)
- Various Recording Modes (Normal, Event, Scheduled Recording)
- Alarm Input / Output
- Remote Monitoring function by Windows Network Viewer
- Live monitoring of the network camera
- Advanced Motion Detection (AMD)/Heat Map (Car/Person Detection) Function
- Installation Wizard Function (Easy Setup, Quick Setup)

Package Contents

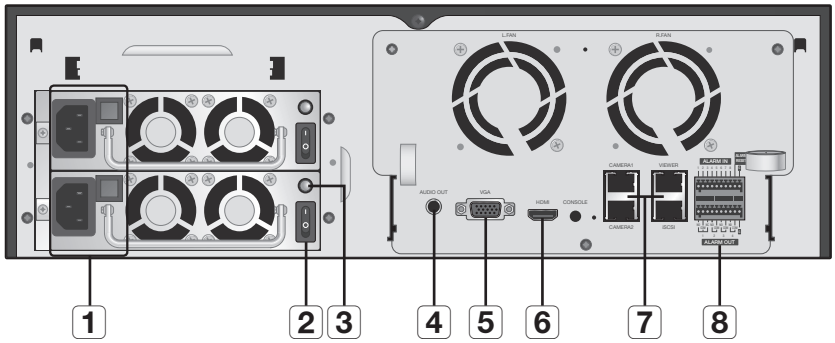
Please unwrap the product, and place the product on a flat place or in the place to be installed.
Please check the following contents are included in addition to the main unit.

NVR	Mouse	Power Cable
Network Viewer Software / User Manual CD	User Manual or Quick Manual	HDD mounting screw
Terminal block	Rack mount	Rack mounting screw
HDD door lock key		

PART NAMES AND FUNCTIONS (FRONT)

Part Names		Functions
1	HDD door lock key	This is a locking device used to restrict access to the HDD. Use the product key provided when you purchased the product.
2	Power	Used to turn the ON/OFF.
3	LED Indicator	**REC** : Lights on when recording is in progress.
		ALARM : Lights on when an event occurs.
		POWER : Shows the power ON/OFF status.
		BACKUP : Displays when Backup is in progress.
		NETWORK : Displays both network connection and data transfer status.
		RAID : Displays ongoing RAID operation.
4	HDD	Displays the normal access to HDD. LED turns on when accessing the hard disk.
5	USB	Connects the USB devices.

PART NAMES AND FUNCTIONS (REAR)



Part Names		Functions
1	Power	Terminal to connect power to. ■ With duplex power supply, even if you connect only one power supply, it can operate properly. However, for reliability, it is recommended you use separate power supplies. If a single power supply is not connected during operation, the SMPS buzzer will go off and you can press the red box button to turn off the buzzer.
2	Power Switch	It is a switch to control power supplies.
3	SMPS Status LED	Displays the SMPS by using color LED. A red light means that the power supply is cut off and the green light means that it is normal.
4	AUDIO OUT	Audio Signal Output Port (RCA jack).
5	VGA	VGA Video Signal Output Port.
6	HDMI	HDMI connector port.
7	CAMERA1	Port for camera connections; it receives video from a camera.
	CAMERA2	Port for camera connections; it receives video from a camera.
	VIEWER	Port used to send video to the web viewer.
	iSCSI	Port to make a connection to the external iSCSI.
8	ALARM	- ALARM IN : Alarm input ports. - ALARM RESET : Alarm Reset port - ALARM OUT : Alarm output ports.

■ [**CONSOLE**] is designed for the service repair purpose only.

installation

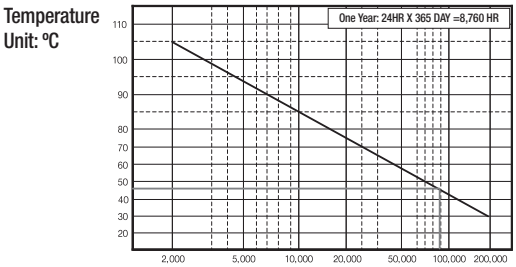
Please take note of the followings before using this product.

- Do not use the product outdoor.
- Do not spill water or liquid in the connection part of the product.
- Do not impose the system to excessive shock or force.
- Do not pull out the power plug forcefully.
- Do not disassemble the product on your own.
- Do not exceed the rated input/output range.
- Use a certified power cord only.
- For the product with an input ground, use a grounded power plug.

CHECKING THE INSTALLATION ENVIRONMENT

This product is a top-notch security device that is equipped with a high-capacity HDD and other key circuit boards.

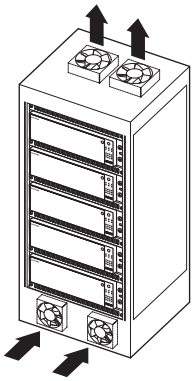
Note that an excessive internal temperature of the product may cause a system failure or a shortened product life (see the right figure). Keep in mind the following instructions before installing the product.

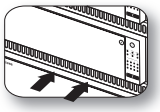


[Figure 1]

When mounting the product on a rack, comply with the following instructions.

1. Please ensure that the rack inside is not sealed.
2. Please ensure the air is circulated through the inlet/outlet as shown in the picture.
3. If you pile up the prudcts or other rack-mount devices as shown in figure 2, secure room for ventilation or install a vent.
4. For natural air convection, place the inlet at the bottom of the rack and the outlet on top.
5. It is strongly recommended that a fan motor is installed at the inlet and the outlet for air circulation. (Please fit a filter at the inlet to screen dust or foreign substances.)
6. Please maintain the temperature inside the rack or surrounding areas between 0°C ~ 40°C (32°F ~ 104°F) as shown in the figure 1.





[Figure 2]

Rack Mount Instructions - The following or similar rack-mount instructions are included with the installation instructions :

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

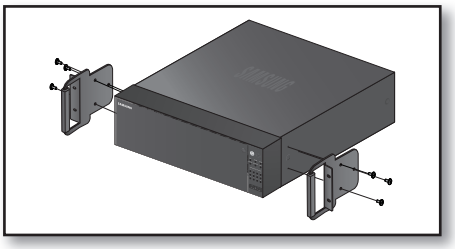
D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

RACK INSTALLATION

Install the Bracket-Rack as shown in the figure, and then fasten the screws on both sides (3 screws on each side).

- Fix the screws not to be loosened by vibrations.



HDD ADDITION

Make sure to unplug the power cord from the wall outlet to prevent possible electric shock, injury or product damage. Please consult your provider for further information on HDD installation since improper installation or settings may damage the product.

- Number of HDDs supported : Up to 12 HDDs supported
- Make sure to unplug the power cord from the wall outlet before proceeding with the installation.

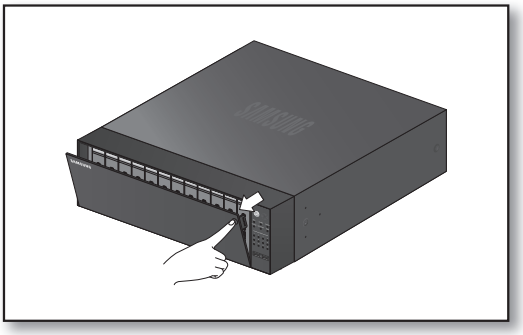
- **Cautions for data loss (HDD care)**
  Please pay attention so that the data inside the HDD is not damaged.
  Before adding a HDD, please check the compatibility with this product.
  HDD is vulnerable to malfunction due to its sensitive nature especially against shock when operating.
  Please ensure that the HDD is free from such shock.
  We are not liable for any damage to the HDD incurred by user's carelessness or miss use.
- **Cases might cause damage to HDD or recorded data**
  To minimize the risk of data loss from a damaged HDD, please backup data as often as possible.
  If exposed to shock when disassembling or installing, data stored in the hard disk may be damaged.
  A sudden power failure or turning off the product while in HDD operation may damage the hard disk drive.
  HDD or files stored inside may be damaged if the main body is moved or impacted during the HDD operation.

Cautions when installing a HDD

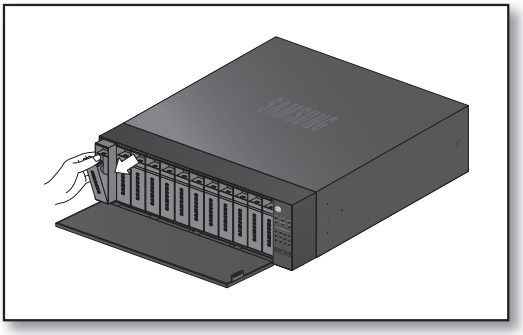
1. Do not apply excessive force to the HDD.
2. Pay attention so as not to lose the disassembly screws or accessories.
   - If the screws or accessories are not put together correctly, the product may breakdown or not operate properly.
3. Please check the HDD compatibility before adding a HDD.
   - Please contact your nearest dealer to obtain the list of compatible devices.

When you mount an HDD

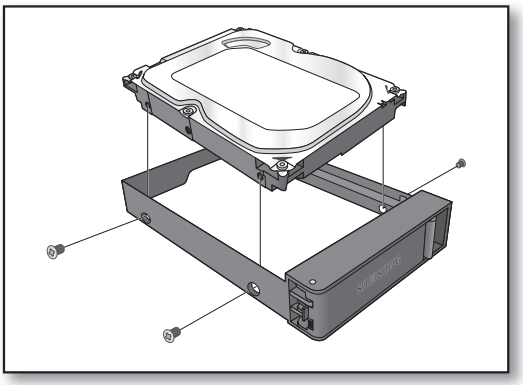
1. Press the <**PUSH**> button on the front to open the front cover.



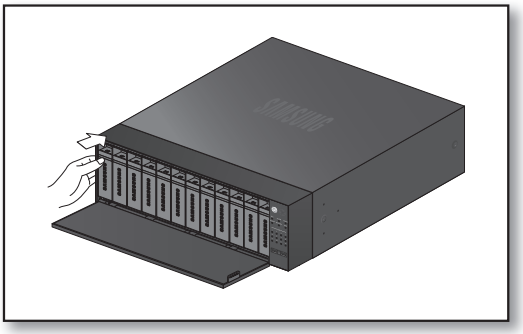
2. After pressing the blue button in the HDD bracket, pull it manually to separate the HDD bracket from the main body.



3. Mount a HDD in the HDD bracket and screw it in using the screws provided.

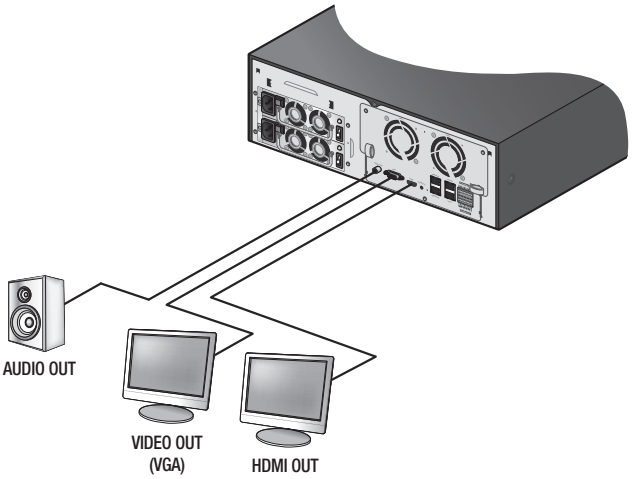


4. Once the HDD is mounted in the bracket, push the bracket into the main body and close the front cover.



connecting with other device

CONNECTING TO AN EXTERNAL DEVICE



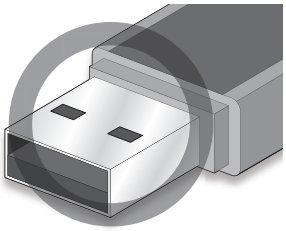
- Unrated or improper power source may cause damage to the system. Ensure that you use only the rated power source before pressing the POWER button.

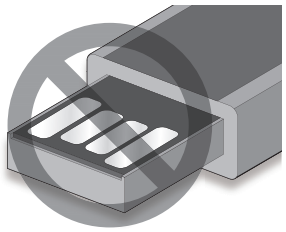
connecting with other device

CONNECTING THE USB

1. On the front of the product, there is a USB port.
2. You can connect a USB HDD, USB memory or mouse to the USB port.
3. If a USB HDD is connected to the system, recognition and settings are available in "**Menu** > **Device** > **Storage Device**". (Page 67)
4. The product supports hot plugging function that enables connecting/disconnecting USB devices while in operating the system.

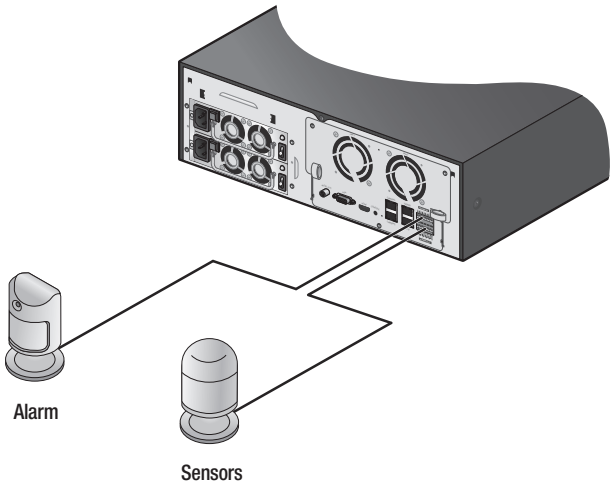
- If you use the USB device for Backup purposes, format it with FAT32 on PC if it is not formatted on the NVR.
- Some USB devices may fail to function properly due to compatibility issue, please check the device before using.
- Only USB storage devices that comply with the standards (having a metal cover) are guaranteed for data transfer.
- In case if the USB device's electric contacts have been worn out, data transfer between the devices may not properly function.

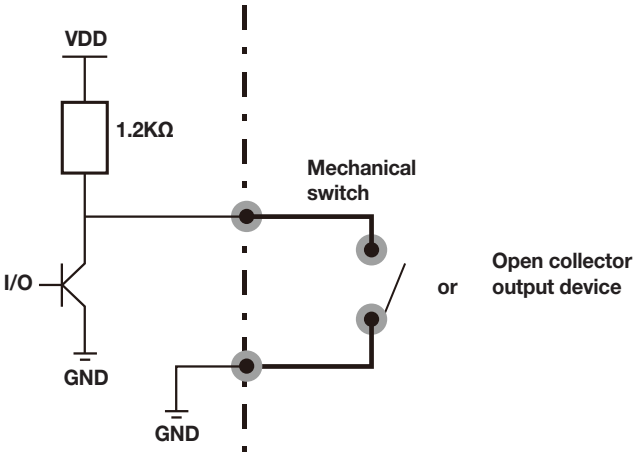




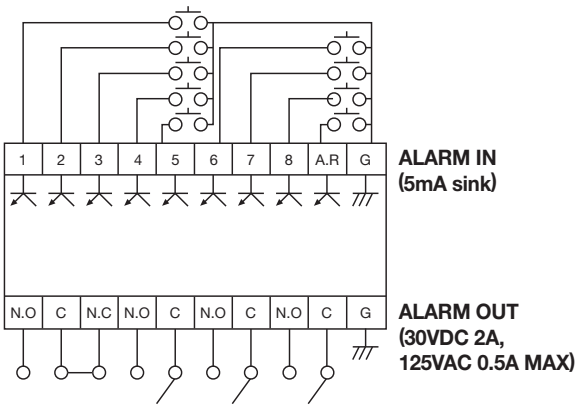
CONNECTING THE ALARM INPUT/OUTPUT

The Alarm In/Out port at the back is composed of the following.





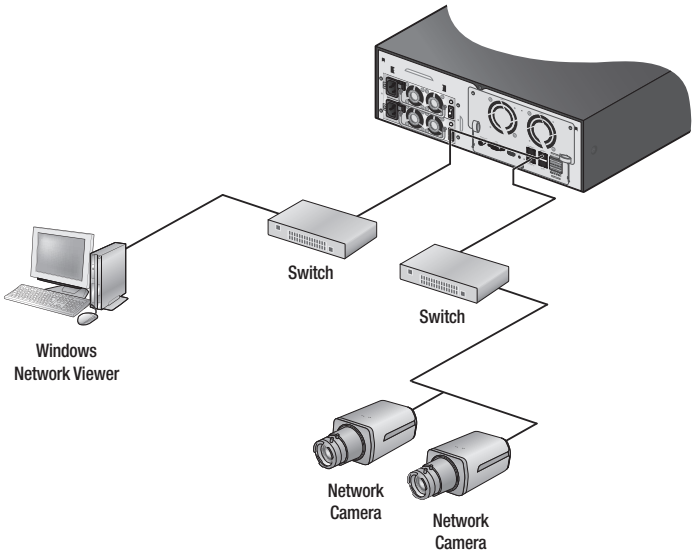
- ALARM IN 1 ~ 8 : Alarm Input Port
- ALARM RESET : On receiving an Alarm Reset signal, the system cancels the current Alarm Input and resumes sensing.
- ALARM OUT 1 ~ 4 : Alarm Output Port



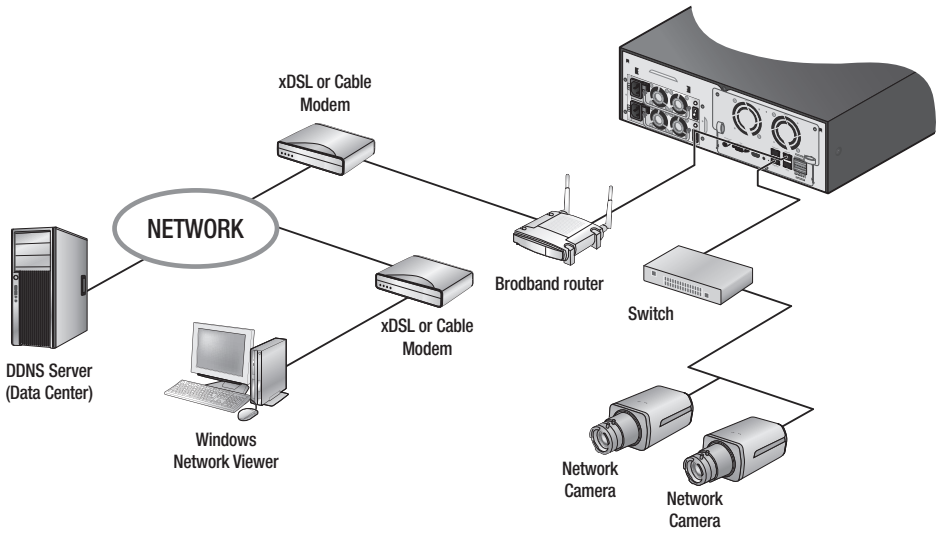
CONNECTING THE NETWORK

- For more information about network connection, refer to "**Network Configuration**". (Page 85)

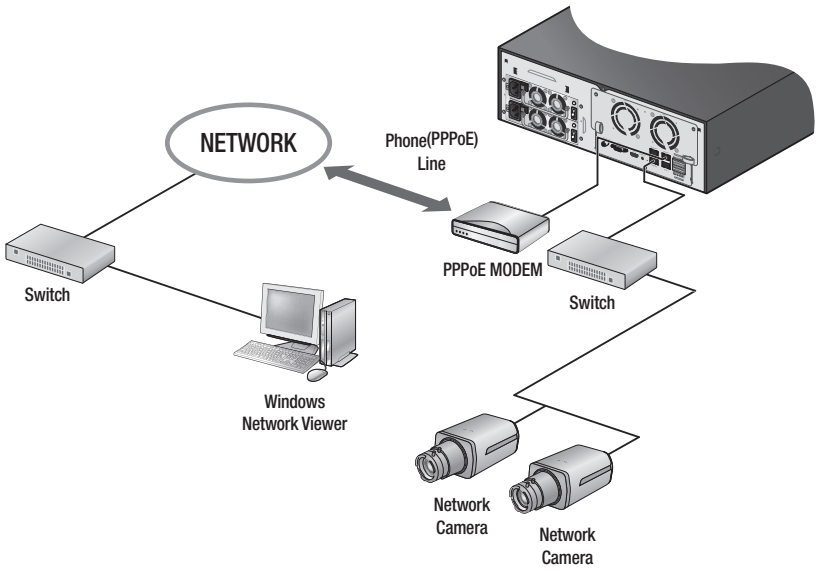
Network connection via Ethernet (10/100/1000BaseT)



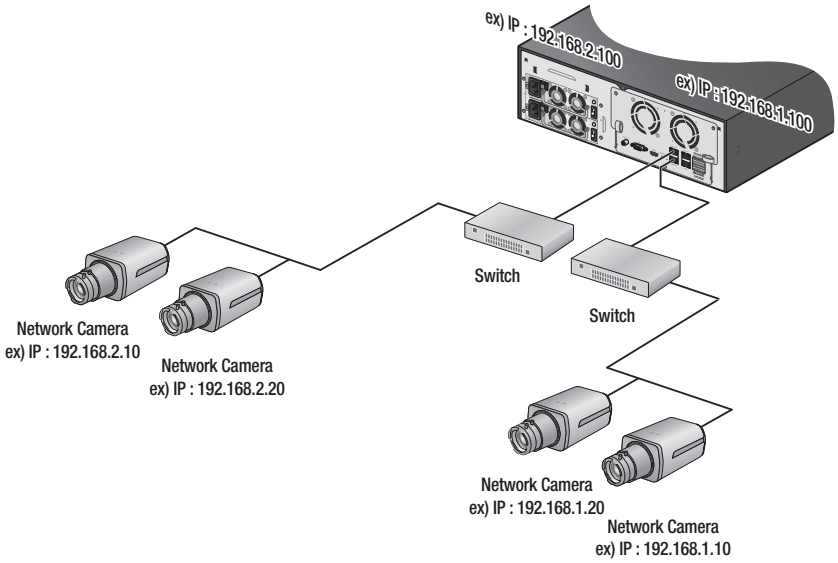
Network connection via router



Connecting to Internet through PPPoE

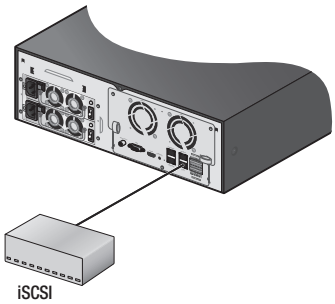


Connecting the network camera

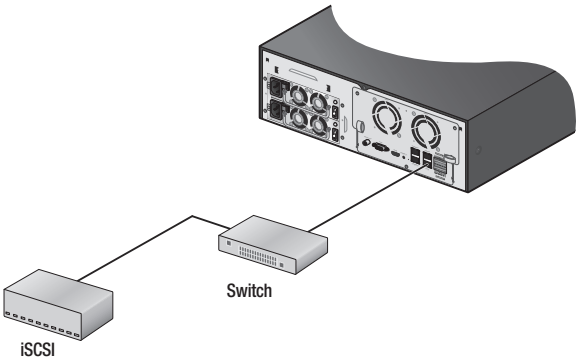


Connecting the iSCSI

Directly connecting to the NVR



A switch can be used for connection



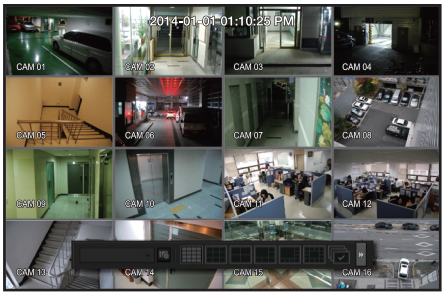
GETTING STARTED

Starting the system

1. Connect the power cable of the NVR to the wall outlet.
   If the power supply is connected, long press the power button on the front.

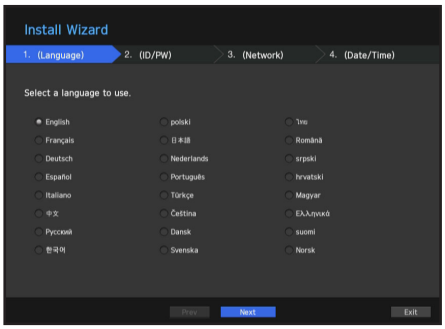
2. You will see the initialization screen.
   The initialization process will last about 2 minute.
   If a new HDD is installed, the initialization process may take longer.

3. The live screen appears with a beep.



Install Wizard

As shown below, proceed through each step of the <**Install Wizard**>.



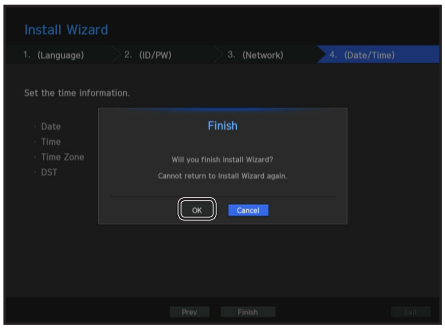
1. In the <**Language**> screen, select the language and press the <**Next**> button.
2. In the <**ID/PW**> screen, set the password and press <**Next**>.

   - Your password must be more than 8 characters and include numbers and letters.

3. In the <**Network**> screen, set the network access method and the access environment. To use a simple intranet, click <**Next**>.

- Network 1 (Camera) / Network 2 (Camera) : Connects to the camera and receives the video feed from the camera
- Network 3 (Viewer) : This is a port for transmitting an image to the webviewer.
- Network 4 (iSCSI) : This is a port for connecting an external iSCSI.
- Network 1 / Network 2 / Network 3 / Network 4 Setup
  - IP Type : Choose the network connection method.
  - IP Address, Subnet Mask, Gateway, DNS

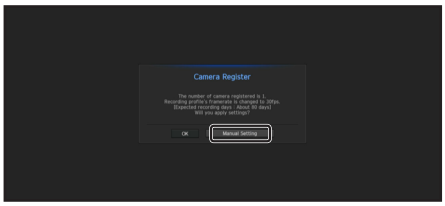
- If the LAN cable is not connected to the port, the setting button will not be activated for use. Check the LAN cable connection.
- The built-in DHCP Server in NVR will turn on automatically at stage 3. At this stage, using the existing DHCP server in the same network may cause a problem, as two DHCP servers would be simultaneously operating.
- For more details on network settings, refer to the user manual.



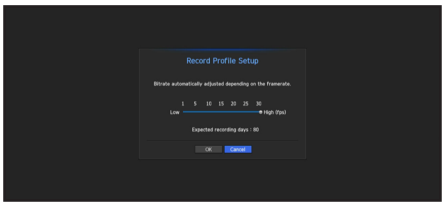
4. After setting the date/time settings in the <**Date/Time**> screen, click on the <**Finish**> button to launch the setting completion window.
5. In the setting completion window, click on the <**OK**> button to finish camera setting and launch the camera registration screen.

6. If there are 64 or less cameras searched, it will be automatically registered and the camera information(fps, days of recording) will be displayed.

- **If there are 64 or less cameras searched**

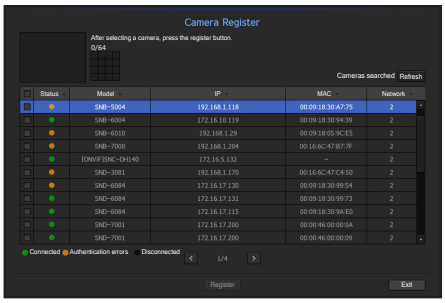


1. The searched camera will be automatically registered and the initial recording value will be displayed.



2. In the camera registration window, click the <**Cancel**> button to modify the recording settings automatically set.

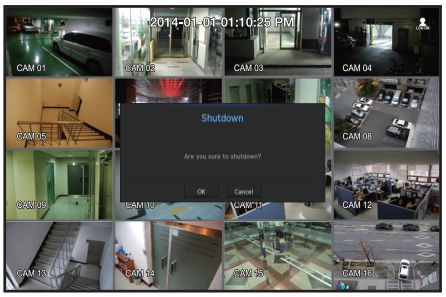
- **If there are more than 64 cameras searched**



Select a camera to register and click the <**Register**> button. Once camera registration is finished, proceed in the same steps as after auto registration.

Shutting Down the System

1. In the live screen menu, select <**Shutdown**>.
2. The “**Shutdown**” confirmation pop-up window will appear.
3. Click on <**OK**>.
   The system will shut down.

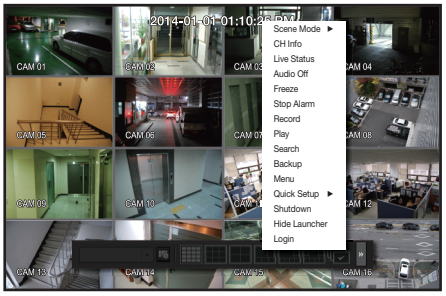


- Only the user with the "**shutdown**" permission can shut down the system.
- For the permission management, refer to "**User** > **Setting Permissions**". (Page 48)

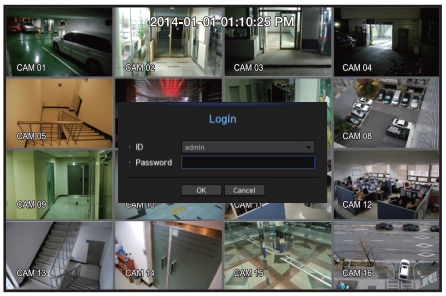
Login

If you want to access a specific NVR menu or restricted menu, you must obtain the applicable permissions to do so.

1. Right click with your mouse button on the live mode screen.
   You will see the context menu on the screen as shown.



2. Select <**Login**>.
   The login dialog appears.



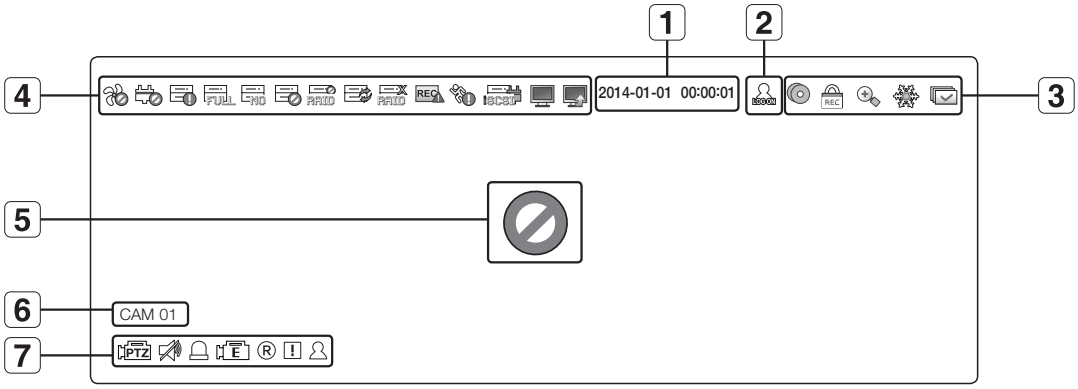
- The initial administrator ID is “**admin**” and the password should be set when logging in for the first time.
- Set password for your wireless network if you use the product with a wireless router. Being not protected with password or using the default wireless router password may expose your video data to potential threat.
- Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.
  Please, take note that it’s a user’s responsibility for the security and any other problems caused by mismanaging a password.

- For the restricted permission, refer to "**User** > **Setting Permissions**". (Page 48)

LIVE SCREEN CONFIGURATION

Icons on the Live Screen

You can check the status or operation of the NVR with the icons on the live screen.



Name			Description
1	Current Date, Time		Displays the current time and date.
2	Login Information		When you are logged in, the "**LOG ON**" icon will be displayed.
3	Screen Mode		It is displayed when there is ongoing backup in the live condition.
			If access to the recording canceling menu is restricted, then it is only displayed when there is ongoing manual recording. ■ Only a user with the right to cancel recording can do so.
			It is displayed when the magnifying function is in operation.
			This icon is displayed when you press the Freeze button.
			It is displayed when all the channels are switched at the set time interval.
4	System Operation		It is displayed when there is a problem with the fan.
			It is displayed when there is a problem with the power supply.
			It is displayed when the recording data cannot be received properly due to a device problem.
			Displayed if the HDD is full and the NVR has an insufficient space to record.
			Displayed if no HDD is installed or the existing HDD should be replaced.
			Displayed if the HDD needs a technical examination.

Name			Description
4	System Operation		It is displayed when there is a malfunctioning HDD in the RAID. ■ There are one or two HDD malfunctions but you can still read or write to it.
			It is displayed when recovering a RAID Error.
			It is displayed when you cannot write RAID due to a malfunction of HDD.
			It is displayed when the max permitted amount of data for each channel is exceeded.
			It is displayed when due to a deterioration in network performance (10fps or less), the AMD function fails.
			It is displayed when an iSCSI device is disconnected.
			It is displayed when the network is overloaded. ■ It occurs when the max receiving allowance is exceeded, causing an overload to the CPU. It will disappear if you modify the camera settings or delete a camera to reduce the performance burden.
			It is displayed when there is firmware to update the server.
5	Video Input Status		Displayed if no input is entered in the condition that the camera is set to <**ON**>.
			Displayed if no permission to live view is granted.
			If a camera is <**OFF**>, or if no camera is registered, or it is in <**Covert2**> mode, nothing will be displayed on the screen. If the camera is set to <**Covert1**>, the video will be displayed but the OSD menus will not be displayed.
6	Camera Title / Channel		Display the camera title and channel number.
7	Camera Operation		This icon is displayed for a channel that a PTZ-featuring camera is connected to.
			Displays AUDIO ON/MUTE. Not displayed in video mode if deactivated.
			If the sensor is set to <**ON**>, the input signal will be displayed on the screen of the connected channel.
			This icon is displayed when Motion Detection is set to <**ON**> and a camera motion or camera event occurs.
		Ⓡ / Ⓔ / Ⓢ	It displays the status of general/event/scheduled recording.
			It is displayed when it fails to decode all the frames due to limited decoding performance and in this case only the I-Frame is decoded.
			It is displayed when a AMD event occurs.

Error Information

- If the built-in HDD is not connected, the “NO HDD” icon ( ) will be displayed in the top left corner. In this case, make sure you contact the service center for assistance as this may cause a failure of recording, playback or backup.
- If the cooling fan does not work properly or has a problem, the <**Fan Information**> window will appear and the fan error icon ( ) will be displayed on the top left corner.
  In this case, check to see if the internal fan works.
  As a fan error can shorten the product life, make sure you contact the service center for assistance.

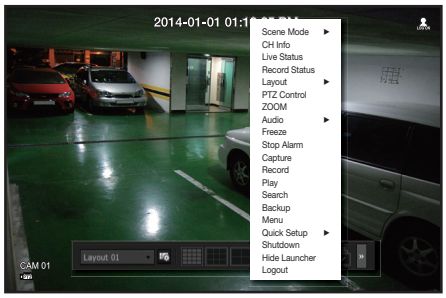
■ If you see the fan error icon or NO HDD, HDD FAIL icons on the screen, contact the service center for more details.

Live Screen Menu

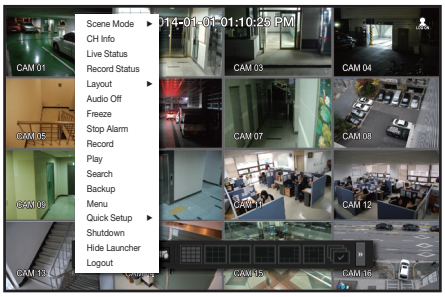
If you right click with your mouse button in live screen mode, it will launch the live screen menu where you can access each menu.

The context menu differs depending on the state of Log in/out, split mode, and NVR operation status.

■ Depending on the user permissions, you may have limited access to menu items of Live View, Backup, Stop Recording, Search, PTZ, Remote Alarm Output, and Exit.



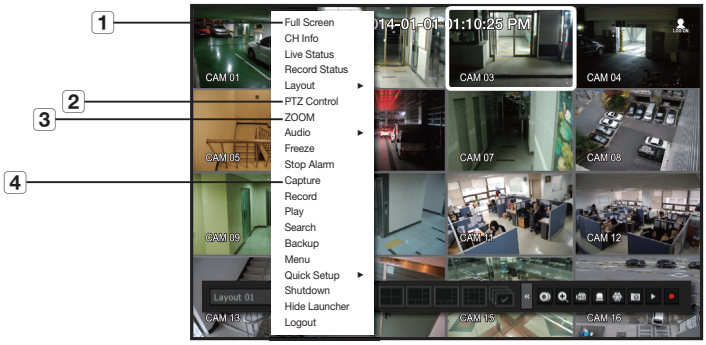
< Single Mode Menu >



< Split Mode Menu >

Single Mode Menu

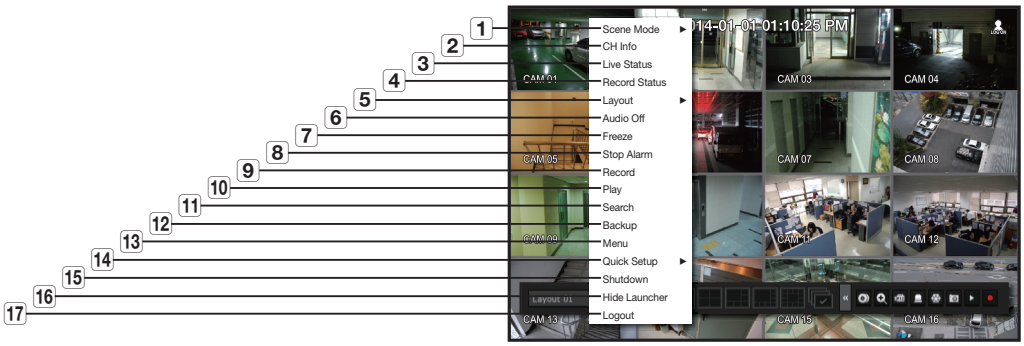
The single mode menu is available only in Single Mode.
The context sensitive menu for the One Channel mode, in Split mode is different from that of the Single mode.



Menu		Description
1	Full Screen	Select and click a desired channel in Split mode to switch to the full screen of the selected channel.
2	PTZ Control	Accesses the PTZ Control menu. The PTZ menu will be active on the Live screen after you select a single channel. (Page 41)
3	ZOOM	You can enlarge the selected screen. (Page 37)
4	Capture	Captures the screen of the selected channel.

Split Mode Menu

In Live split mode, right-click to display this context menu as shown.
The context sensitive menu in split mode differs, depending on the login/logout status.



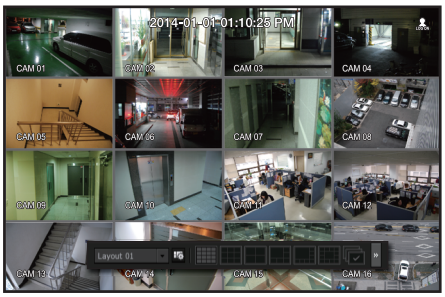
Menu		Description
1	Screen Mode	Select a screen mode for the Live screen. Refer to "**Live screen mode**". (Page 32)
2	CH Info	It displays the camera connection information for each channel. Refer to the "**Channel Information**". (Page 34)
3	Live Status	Shows the live status of connected camera to each channel. Refer to "**Live Status**". (Page 36)
4	Record Status	Shows the record status of each channel. Refer to "**Record Status**". (Page 36)
5	Layout	Set the layout of each channel. Refer to "**Layout**". (Page 38)
6	Audio On/Off	Turns ON/MUTE the sound of the selected channel. Refer to "**Audio ON/OFF**". (Page 39)
7	Freeze	Stop playing the video temporarily. Refer to "**Freeze**". (Page 39)
8	Stop Alarm	Stop the alarm output, deactivate the event icon and release the auto sequencing. Refer to "**Event Monitoring**". (Page 40)
9	Record/Stop	Starts/stops the standard recording.

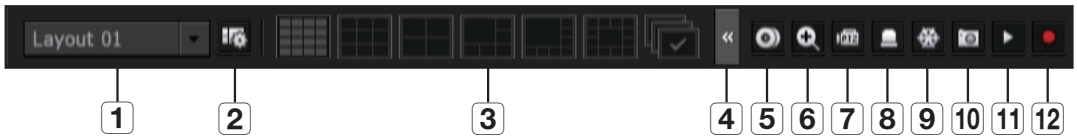
Menu		Description
10	Play	Refer to "**Search & Play** > **Play**". (Page 101)
11	Search	Refer to "**Search & Play** > **Search**". (Page 97)
12	Backup	Searches for a backup device and runs backup for each channel or schedule backup later at a more preferable time.
13	Menu	Enter the main menu. Refer to the menu settings. (Page 44)
14	Quick Setup	The "**Camera Register**" & "**Recording Setup**" screen will immediately appear.
15	Shutdown	The system shutdown dialog will appear.
16	Show/Hide Launcher	Shows or hides the launcher. Refer to "**View the Launcher Menu**". (Page 31)
17	Login/Logout	You can log in or out.

View the Launcher Menu

The Launcher menu appears on the bottom of the live screen.

1. Select <**Show Launcher**> in the context menu of the Live screen.
2. Move the cursor to the bottom and click a desired item in the Launcher menu.





- If no input is entered for 10 seconds, the menu will disappear.
- The Launcher menu can be accessed only by using the mouse.

Menu		Description
1	Layout	Select the layout to be displayed on the screen.
2	Layout Setup	You can set, change or delete the new layout of each channel.
3	Screen Mode	Displays a list of split modes available in a bar type. The current screen mode will be displayed grey.
4	Menu Expansion Button	Click to display the hidden menu to the right.
5	Backup	Searches for a backup device and runs backup of each channel or schedule it for later at a more desirable time.
6	Zoom	Enlarges the selected area. This is available only in Single Live mode.
7	PTZ	If the network camera connected to the selected channel supports the PTZ operations, this will run the PTZ control launcher. This is active only in Live single mode.
8	Alarm	Stops the alarm if it's activated.

Menu		Description
9	Freeze	Freezes the Live screen temporarily.
10	Capture	Captures the screen of the selected channel.
11	Play	Enters Play mode if a file to play exist, and if not, enters Search mode.
12	Record	Start/End recording the Live screen.

LIVE SCREEN MODE

You can play up to 64 live video channels in single, 6-split, or auto sequence mode.

- When you register a camera, the Live4NVR profile is created to set H.264 900*600 30fps as default. If necessary, you can change it in **Menu** > **Device** > **Camera** > **Camera Settings**. If the performance is exceeded, it may play one frame only. If you cannot create an additional profile for the camera specifications, then sometimes you cannot create Live4NVR. In this case, you need to modify the camera profile. Refer to "**Camera Setting**". (Page 61)

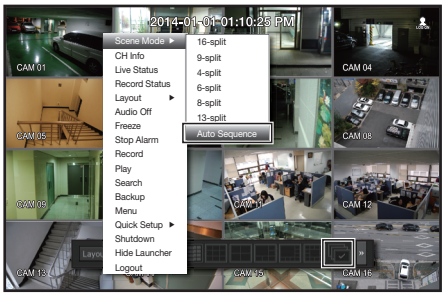
Switching the split mode

You can also play 64 Live channels in the sequence of: Single, 4-split, 9-split and 16-split mode.

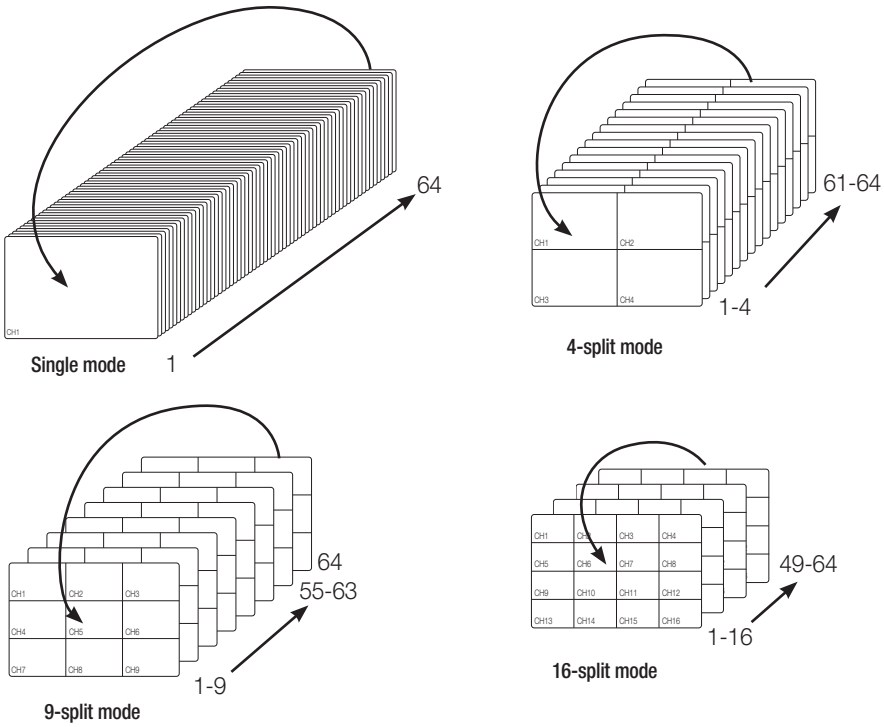
Press the button in the launcher or use the right menu to automatically switch the screen.

Mouse right button menu ➞ Screen mode ➞ Auto switching mode

If you reach the end of the steps as outlined in the previous page, you will be moved to the first page and no automatic switching will be performed.



Auto Sequence

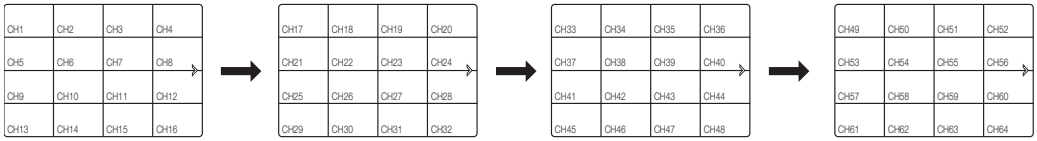


- In a split mode, If you have set <**Sequence switching time**> in "**Setting the Device** > **Monitor**", Auto Sequence will be conducted at the set interval. (Page 75)
- When you switch the channel, the video may be delayed depending on the network condition.

Manual Switching

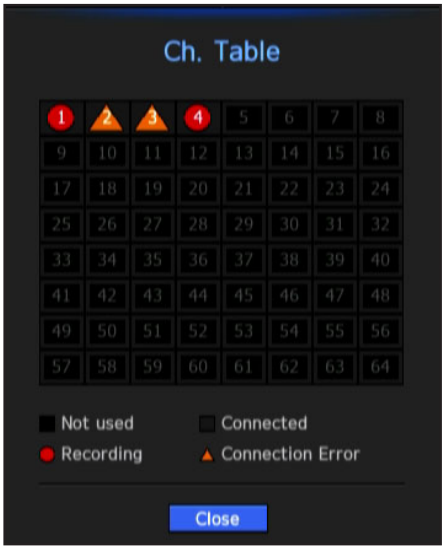
Click the arrow <◄/►> key to move to the next split mode.

- If pressing the right [►] button in 16-split mode :
  Channel (CH 1~16) ➞ Channel (CH 17~32) ➞ Channel (CH 33~48) ➞ Channel (CH 49~64)



Channel information

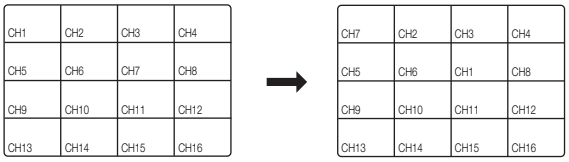
Select the <**CH info**> in the live screen menu to check the status of camera connection to each channel.



Channel Setting

You can display the channel in a desired area of a split screen.

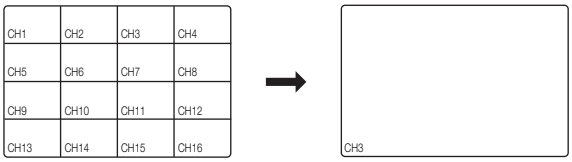
1. Place the cursor over the camera name of each channel to display the <▼> key to the right on the screen.
2. Click a camera name to display a channel list where you can select a different channel.
3. Select a desired channel and click it.
   The current channel will be switched to the selected one.
   Use the cursor to select a channel to move, and drag and drop it to a desired channel; this can also change the channel position.
   - Ex : if switching CH 1 to CH 7



Switching to Single Mode

When in split mode, select and double-click a desired channel to switch to its Single mode.

- Ex : If double-clicking CH 3.



Live Status

Select <**Live Status**> from the live screen menu to display status and transfer information of connected camera to each channel.

- Model : Displays the camera model name connected to each channel.
- Status : Displays the status of camera connection set to each channel.
- IP Address : Displays the IP address of a camera set to each channel.
- Codec : Displays the live profile codec information for a camera set to each channel.
- Resolution : Displays the live profile resolution of a camera set to each channel.
- Frame Rate : Displays the live profile transmission rate for a camera set to each channel.
- Quality : Displays the live profile transmission quality of a camera set to each channel.

Record Status

Select <**Record Status**> from the live screen menu to display camera profile, input/recording frame rates, input/limit/recording bps of each channel.

Select <**Record Status**> from the live screen menu to display camera profile, input/recording frame rates, input/limit/recording bps of each channel.

- Total Bitrate (Record/Max) : Record bitrate shows the amount of actual data recording while Total bitrate shows the maximum data transfer allowed by the NVR.
- Profile : Shows the video profile configured to each channel.
- Frame (fps) : Show the input/record frames per second for each channel.
- Bitrate (bps)
  - Limit / Input / Record : Shows the amount of limit/input/recording data for each channel.
  - Input / Limit : Shows the data ratio of actual data transferred from the camera and allowed maximum defined by user.
- Current : Shows the recording status information of currently transferred data.
- MAX : Shows recording information of the most biggest recording data out of configured standard and event recordings.
- : Reloads the recording information.
- Record Setup : The menu screen will switch to the record setting screen.

- The warning message on the list's bottom means the NVR replaced the selected recording profile with other available profile, since the selected one does not produce video data which prohibits screen saving. If the screen displays video, it automatically resets to the selected profile and its name turns to yellow in the list.
- If Key Frame recording exceeds the allowed data amount specified by limit bitrate, a popup alert and icon appear on the screen.
  The limited recording alert popup does not repeat after displaying once unless camera or recording settings are changed; it may appear again if settings were changed to notify such status.
  If you want to set the alert popup not to appear, change your setting of <**Setup Warnings**> not to display a message popup.
  For further information on bitrate limit of recording data, refer to "**Record Setting**". (Page 78)

ZOOM

This is activated only in Live Single mode.
After selecting a single screen, if you use the Magnify function, the selected area will be magnified by 2.

1. In the live screen menu, select <**ZOOM**>.
   You can also click on < ⊕ > in the launcher menu.
   The Magnify icon in the middle of the screen will be displayed.
2. Drag and drop with your mouse to select the area to magnify.
3. Double click on it to magnify the selected area by 2.
   - In the magnified screen, you can drag and drop the selected area for magnification.
4. In the live screen menu, select <**Zoom Out**>.
   Click on < ⊖ > in the launcher menu to release the magnification function.

<Normal>

<Enlarged twice>

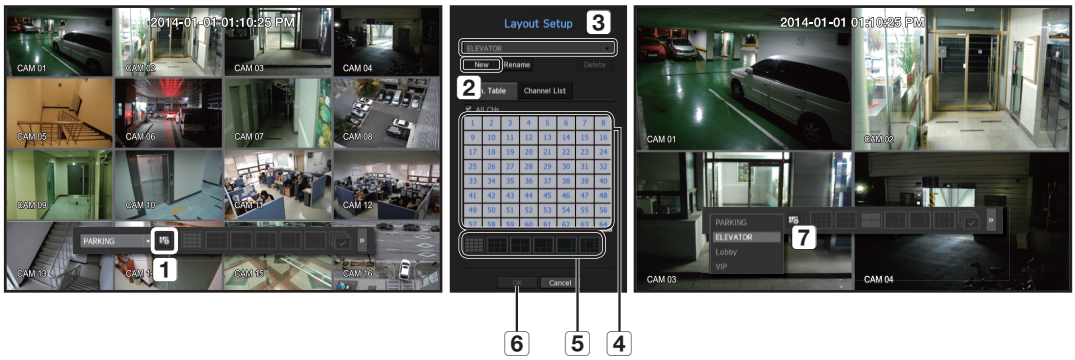
LAYOUT

In the live screen, you can set the layout for each channel.

Setting Up the Live Layout

This section outlines how to select a series of channels based on their purpose/accessibility and monitor them in a single layout.

Example) Layout "Lobby" - Lobby camera 1, Lobby camera 2, Front entrance camera 2
Layout "VIP" - Directors' meeting room 1, Directors' meeting room 2, Directors' lounge 1, Corridor camera on the 7th floor



To create a new layout, follow these steps:

1 Open the channel layout setup menu.

2 Click <**New**>.

3 Enter a name for the selected channels (e.g., ELEVATOR).

4 Select the channels that you want to add to the layout (e.g., 2, 7, 10, 15).

5 Choose a split mode to apply (e.g., 4-way split).

6 Click <**OK**>.

7 Choose a layout to view it on the screen (e.g., change to ELEVATOR).

1. Select the < >.
The layout setting screen will appear.

- New : You can set the new layout.
- Rename : You can make changes to the selected layout.
  When the layout is changed, the channel order is initialized.
- Delete : You can delete the selected layout.
- Channel Table : You can select channels in the table to be registered in, or removed from the layout.
- Channel List : You can select channels in the list to be registered in, or removed from the layout.

2. Press the <**New**> button and enter the name of layout to add.

3. In the <**Ch. Table**> or <**Channel List**>, click and select the channel to be displayed on the layout screen.

4. Click on <**OK**> to save the selected layout.

- The layout for each user is saved separately.

AUDIO ON/OFF

You can turn the sound on/off corresponding to the channel in Live mode.

AUDIO ON/OFF in Single mode

Click on the audio icon (🔊) on the screen to turn it ON/OFF.

- If you have configured the audio output settings properly but the audio or voice is not output, check if the connected network camera supports the sound signal and if you have configured the sound settings as appropriate.
  The sound icon can be displayed if the sound signal fails to output from noise.
- Only the channel where <**AUDIO**> is set to <**ON**> in "**Setting the Device** > **Camera**" displays the audio icon (🔊) in Live mode that you can use to turn the sound on/off.

FREEZE

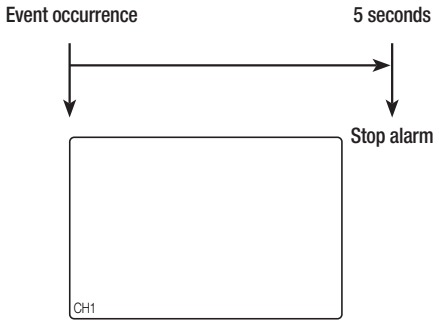
This is available only in Live mode, this pauses playing the Live image temporarily.

1. Click < ❄ > of the launcher mode.
   Video playing is paused.
2. Click on < ❄ >.
   Pause is canceled. Playing is resumed.

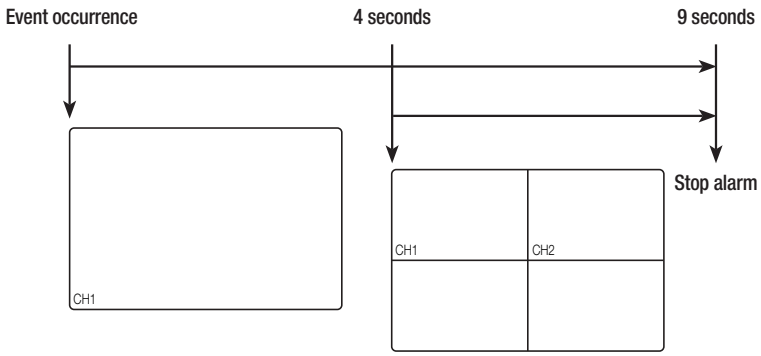
EVENT MONITORING

This will display the channel in sync with a specific event (Sensor/Motion/Video Loss) if it occurs.
In "**Monitor** > **Event Display**", set the event monitoring to ON/OFF and specify the event display time. (Page 75)

- If multiple events occur simultaneously, the screen will switch to a split mode.
  - 2~4 events : 4-split mode
  - 5~9 events : 9-split mode
  - 10~16 events : 16-split mode
- If the second event occurs within the set time of <**Event Display**>, the first event will last until the second one is terminated.
  - Ex : If you set <**Event Display**> to 5 seconds, and only one event occurs in CH 1.



  - Ex : If you set <**Event Display**> to 5 seconds, and the second event occurs in CH 2 within the set time after the first event occurred in CH 1.



- Select <**Stop Alarm**> to initialize the status of alarm output and release the event function.
- If an alarm is output with the pre-event and post-event times specified together with the event recording settings, the event recording will perform according to the specified recording type (pre event or post event).

- In case of continuous events such as motion detection, switching to another split mode display may not immediate if concatenating events follow, even when you stopped alarm of the event.
- The video may be delayed depending on the network condition.
- The event output can be delayed as the transfer of the alarm event from the network camera takes time.

PTZ CONTROL

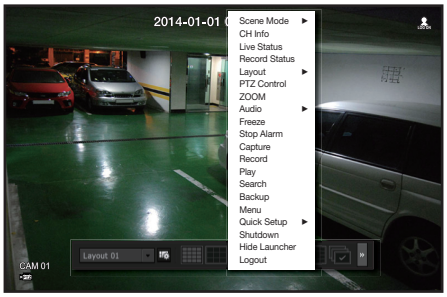
With this NVR, you can configure the settings of a PTZ camera as well as commercial cameras in the market to your preference.

PTZ device

This is active only if a channel that a PTZ camera is connected to is selected.

Getting started with PTZ operations

The PTZ camera will be activated only if the channel of the PTZ camera is selected, which can be performed in the following way:

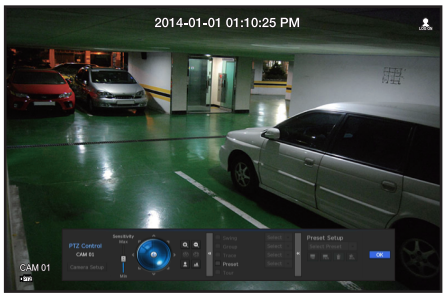


- Using the launcher menu : Click < PTZ > from the launcher menu of the Live screen.
- Using the Live screen menu : Select <**PTZ Control**> in the context menu of the Live screen.
- Using the icons on the Live screen : Simply click the <PTZ> icon on the Live screen.

- This is available only if a PTZ camera is connected and the <PTZ> icon is displayed on the screen.
- Even if the connected network camera does not support the PTZ operations, you can configure the PTZ control settings (if possible) by installing the PTZ driver (physical device).
- It only supports a network camera with Samsung Techwin's PTZ function and a camera registered in the ONVIF.

Using the PTZ camera

You can use a single PTZ camera to perform the Pan, Tilt and Zoom operations to monitor multiple places, and configure the custom settings of the presets in a desired mode.



1. Open the <**PTZ Control**> menu.
   The <PTZ> icon in the left bottom of the screen will turn yellow, indicating that the system accesses "**PTZ Control**" mode. You will see the "**PTZ Control**" launcher menu.

- The PTZ working (active) mark can be active even if the PTZ operation is not available in normal mode. So ensure that you have completed the PTZ settings before proceeding.

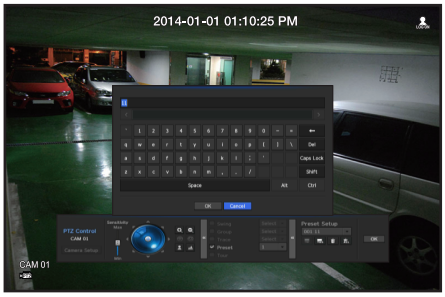
2. Use the PTZ Wheel in the launch menu to adjust the location of recording by a camera.

- Sensitivity : Adjust sensitivity for Pan, Tilt controls.
- PTZ Wheel : Click a near area from the center to move the camera lens slowly; clicking a far area will move it fast.
  - If clicking and holding the mouse in the left will turn the camera counterclockwise; if clicking and holding the mouse in the right will move the camera lens clockwise.
- Zoom : Activate the Zoom operation of the PTZ camera.
- Iris : Adjust the amount of light incoming to the camera.
- Focus : You can adjust the focus manually.
- Swing : Swing is a monitoring function that moves between two preset points and enables you to trace the motion.
- Group : The group function enables you to group various presets before calling them in sequence.
- Trace : Tracking remembers the trace of movements that you instructed and reproduces it for your reference.
- Tour : Monitor all the groups created by a user in turn.
  - Some cameras may differ in the menu title and operation with regard to Swing, Group, Tour and Trace.

- Even if the network camera supports the PTZ operations by default, the PTZ control can be enabled only if the applicable menu is active in the launcher menu.

Preset

Preset is a specific position remembered by the PTZ camera. You can use the Preset function to define up to 255 presets for a single PTZ camera.



To add a preset

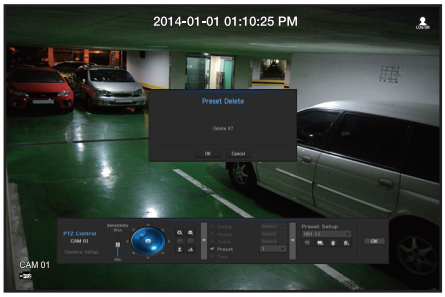
1. Check the preset checkbox.
2. Select < >.
   The virtual keyboard will appear on the screen. Use it to provide the preset name.
   - Refer to "**Using Virtual Keyboard**". (Page 46)

- : You can change the preset settings to your preference.
- : Delete a selected preset.
- : Delete all the existing preset settings.

- You can add up to 255 presets, which is the max count supported by the NVR.
- If you replace a camera that saves your preset settings with a different one, you must configure the preset settings again.

3. Select <**OK**>.
   The preset setting will be saved in the provided name.

To change or delete a registered preset



1. Check the preset checkbox and select a preset to change or delete.
2. Press < > or < > as needed.

- : Delete all the existing preset settings.

- If you delete the entire presets, the default presets specified in the network camera can be deleted accordingly.

3. Provide a new name and press <**OK**>.

menu setup

You can setup the system, devices, and options for recording, event and network.

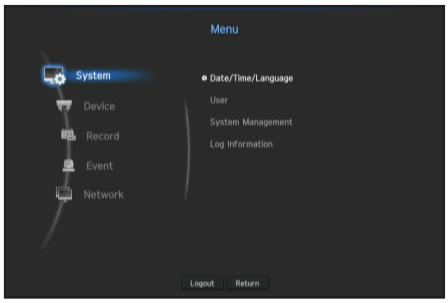
SYSTEM SETUP

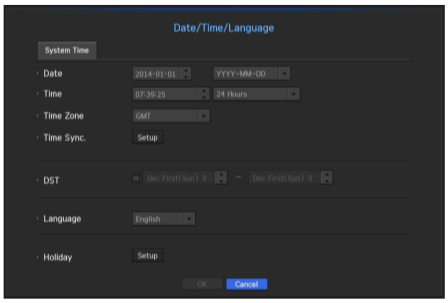
You can setup Date/Time/Language, User, System Properties and Log.

Date/Time/Language

Setting the Date/Time/Language

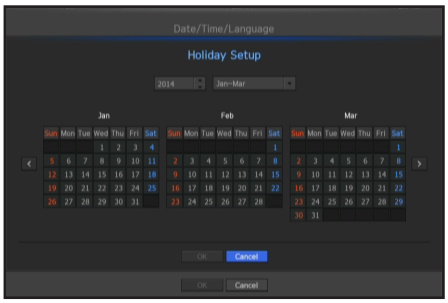
You can check and setup the current Date/Time and time related properties, as well as the language used for the interface on the screen.

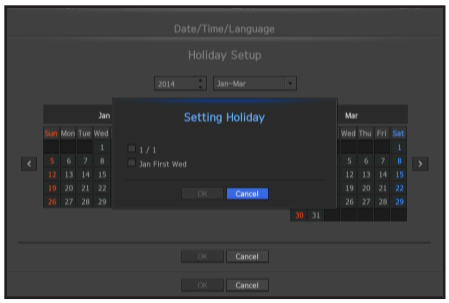




- Date : Sets the date and its format that will appear on the screen.
- Time : Sets the time and its format that will appear on the screen.
- Time Zone : Sets the time zone of your area based on the Greenwich Mean Time (GMT).
  - GMT (Greenwich Mean Time) is standard World Time and the basis of world time zone.
- Time Sync. : Specify the use of synchronization with the time server.
  Click the <**Setup**> button to display time synchronization setup screen.
  If you select to use the <**Time Server**>, the current time will be synchronized on a regular basis by the server defined as <**Time Server**>.
  If this is the case, you cannot change the time setting manually.
  - Synchronization : Specify the use of synchronization with the time server.
  - Time Server : Enter an IP or URL address of the time server.
  - Last Sync Time : Displays the most recent synchronization time from the selected time server.
  - Activate as Server : Set to <**Use**> to allow the NVR to act as a Time Server for other NVRs.
- DST : Set up Daylight Saving Time with its period to make the time earlier than the GMT of its time zone by 1 hour during the set period.
- Language : Select your language. Sets the language for the interface.
  English, French, German, Spanish, Italian, Chinese, Russian, Korean, Polish, Japanese, Dutch, Portuguese, Turkish, Czech, Danish, Swedish, Thai, Romanian, Serbian, Croatian, Hungarian, Greek, Finnish, and Norwegian are supported.

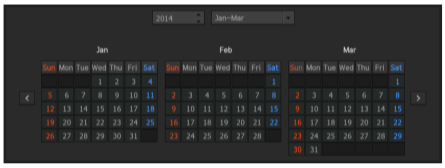
- Holiday : A user can select specific dates as holidays according to their own preferences. Holidays are applied in the <**Recording Schedule**> or <**Alarm Schedule**> setting too.





  - e.g. every first day of a year is set to be a holiday if you select January 1 and check <**1/1**>, and every first day of a year and every first Wednesday of January are set to be holidays if you check <**1/1**> and <**Jan First Wed**>.

To use the calendar



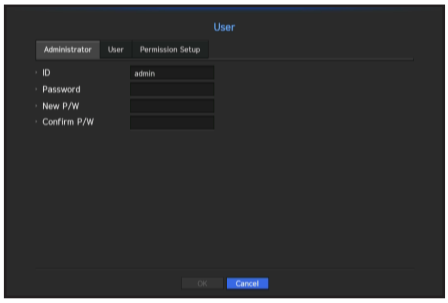
1. Select year and month.
   Select the < < > > key on both ends of year and month to move back/forward to the previous/next year or previous/next three month.
2. Select a date and click on the <**OK**> button.
   - A date is marked in gray if there exist data for search for system log, event log, time search and event search.

User

You can set permissions of each user over the NVR's specific function and settings.

Setting the Administrator

You can set and change Administrator's ID and password.
The administrator can use and set all menu items and functions.



- ID : Change the admin ID.
- New P/W : Enter new password.

- The initial administrator ID is "**admin**" and the password should be set when logging in for the first time.
- Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.
  Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

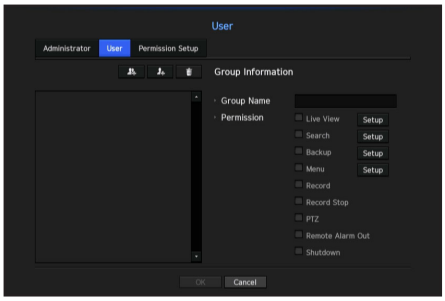
Using Virtual Keyboard

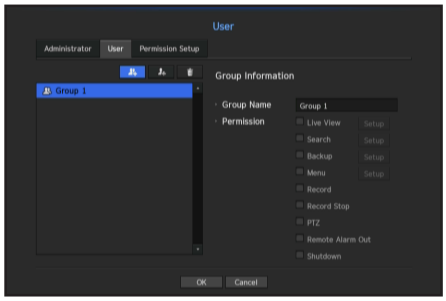
1. For alphanumeric inputs, the virtual keyboard window appears.
2. Using a mouse, click on the desired character tab.
3. In the upper text input box of the virtual keyboard, there displays a list of candidate words containing the selected character.
4. Select a word from the list, or use the keyboard to enter the whole word.
   - If there are many of candidate words, use < > buttons to move between them forward and backward.

5. Select <**OK**>.
   Entered word is applied.
   - For upper case letters, use <**Caps Lock**> button.
   - For special characters, use <**Shift**> button.
   - Using the virtual keyboard is the same to a normal keyboard use in your region.
   - ID allows alphanumeric characters only.
   - A password should be a combination of numbers and letters with eight or more characters.
     It must not have special characters such as '&', '#', '<', '>', '{', '}', '"', '~'.

User setting

You can create a group or set permissions for each group.
You can add a user and edit the registered user information.



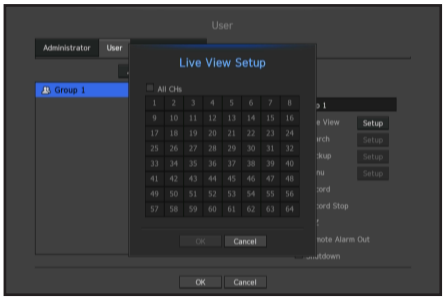


If you want to add a group

1. Click on the [ ] button to launch the Group Addition popup window.
   If you want to add a group, click on <**OK**>.
2. Press the group name item to launch the virtual keyboard used to enter group names.
   Enter the group name to register.
   - You can add a maximum of 10 groups.

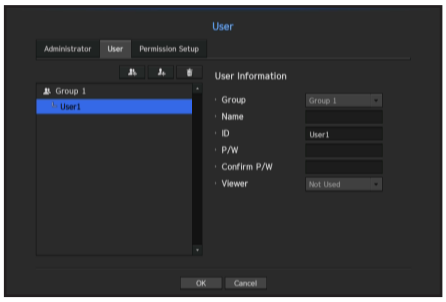
If you want to set group permission

Set permission to access each group.
Each group's users can only access items with a check mark beside them.



1. Select the menu to set group permissions.
   The menu with access permissions will appear when a user of the group logs in.
   - Live View : You can set permissions to access the live screen for each channel.
   - Search : You can set permissions to access the search menu for each channel.
   - Backup : You can set permissions to access the backup menu for each channel.
   - Menu : You can select and set the setting menu that can be accessed. A group user can only access the menu selected. If you select the menu, the menu permission setting screen will be displayed.
   - Record Stop, PTZ, Remote Alarm Out, Shutdown : You can select these functions to add to a group's permissions.
2. Click <**OK**>.
   Check a group user to give them the permission to access the selected item.

If you want to register a user



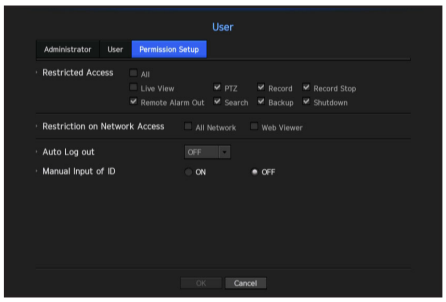
1. Click on the [ ] button to launch the user addition popup window.
   To add a user, click on <**OK**>.
2. Select a group.
   When registering a user, the selected group will be automatically registered.
   - A group can be changed after inputting all required information.
3. Enter name, ID, password and select whether to use the viewer.
   If you activate use of <**Viewer**>, you will have the right to use the web viewer and the network viewer.
4. Click <**OK**>.
   Registered user information will be saved.

When you want to delete the group and user information

1. To delete, click on the [ ] button.
2. The deletion confirmation window will appear and you can select an item to delete and click on <**Delete**>.

Setting Permissions

You can set restricted access for all general users.
Items with restrictions will require logging in for use.



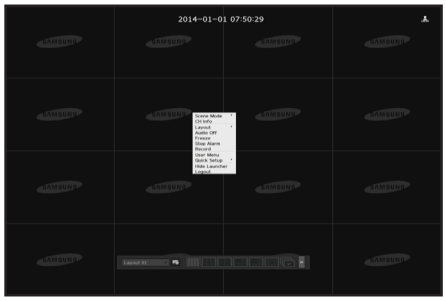
- Restricted Access : All menu items allowed for a user can be set with restricted access.
  - Checked (☑) : Restricted
  - Not checked (☐) : Accessible
  - If it is not checked (☐) in <**Restricted Access**>, any user can access the item no matter what the <**Permission**> setting.
  - If it is checked (☑) in <**Restricted Access**>, a user can access the item only if the user has permission in <**Permission**> setting.

- Restriction on Network Access : Restricts remote access from a <**Restricted Access**> network.
  - All Network : Restricts all access instances via Network Viewer and Web Viewer.
  - Web Viewer : Restricts access via the Web Viewer.
- Auto Log out : A user will be automatically logged out if there is no operation on NVR for over set period of time.
- Manual Input of ID : In the login window, select whether to enter ID.

If the user has restricted access

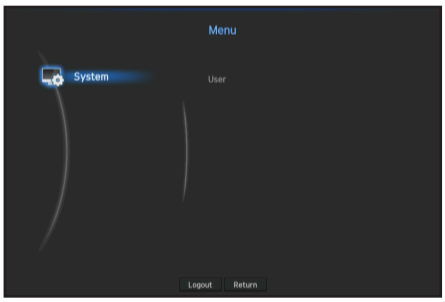
If a new group is restricted to access the entire menus, the users belonging to the group can access only the basic menus and can change only their respective password.

If all permissions are restricted, you will see only some menu items accessible in the Live screen menu.



To change the user password

If you log in with the user account of a group with restricted access, you just can change your own password.



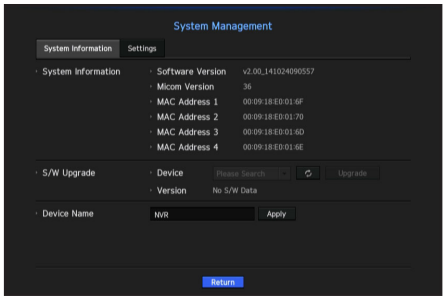
1. Provide the login information.
2. Select <**User Menu**>.
   The Permission Management screen appears.
3. Select <**User**>.
   The Password dialog shall appear.
4. Provide a new password.
5. Select <**OK**>.
   The old password will be changed to a new one.

System Management

You can check the system version, update to a newer version, as well as data backup and initialization.

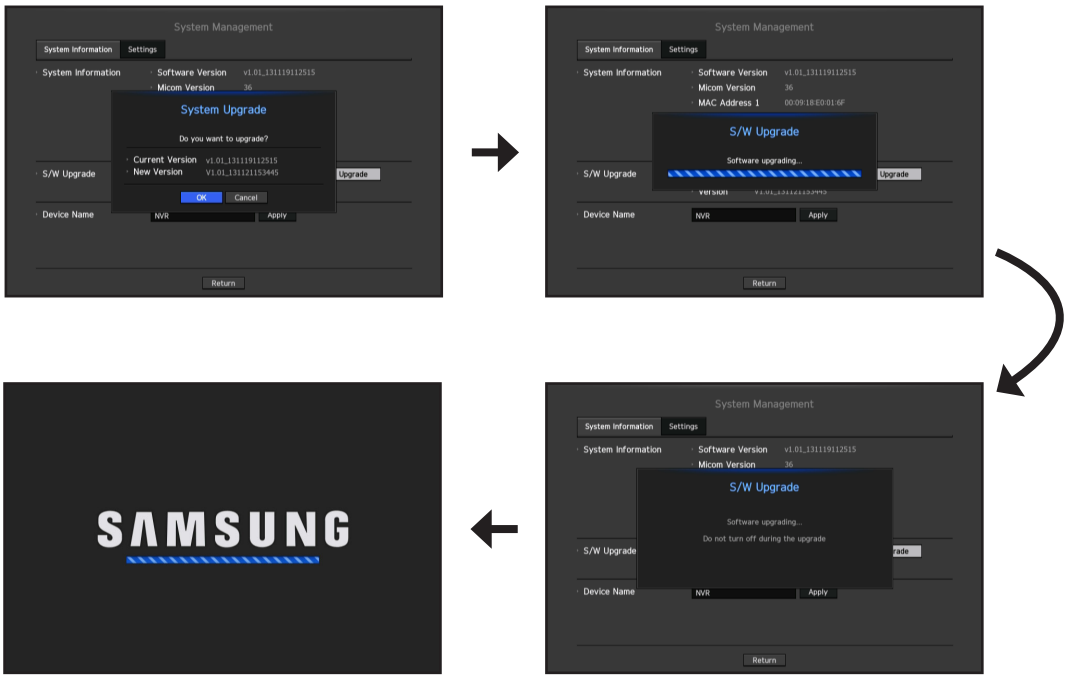
Checking the System Information

You can check the current software version and MAC address before proceeding with the upgrade.



- System Information : Shows the current system's information.
  The values can not be changed by a user.
  - Micom version : This is the micom version.
- S/W Upgrade : Updates the NVR's software up to date.
  - Press the < > button to search for and display the equipment to upgrade.
- Device Name : Displayed if the network viewer is connected to NVR.

To upgrade the current software version

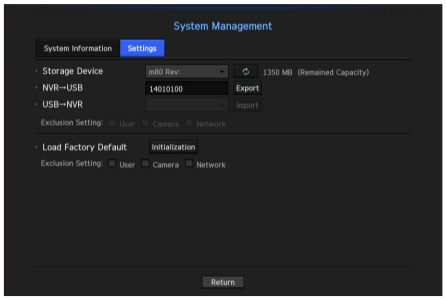


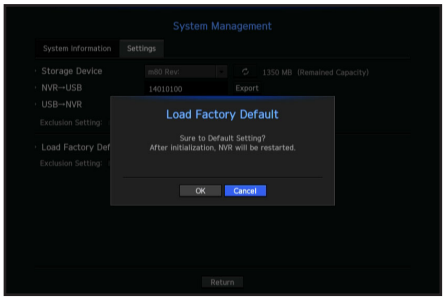
1. Connect a device storing the software to be updated.
   - It may take about 10 seconds to recognize the device.
   - Upgradeable devices include USB memory, and network device.
   - To update the network, the current NVR should have been connected to the network.
     Upgrade via the proxy server may not be enabled due to the restricted access.
2. Select <**System Management**> from <**System**> window.
3. Select <**System Information**>.
4. When the recognized device appears, select <**Upgrade**>.
   - If you connect a device in the upgrade menu window, you can press the < > button to search for available software.
   - If there is an upgrade image on the network, the popup window will appear.
   - The <**Upgrade**> button will be activated only if the current <**Software Version**> of the <**System Information**> is same to or older than that of <**S/W Upgrade**>.
5. Press <**OK**> in the "**S/W Upgrade**" window.
   - While updating, it shows the progress.
6. When the updating is done, it automatically restarts.
   Do not turn the power off until it finishes restarting.

- If "**Upgrade Failed**" appears, retry from the step 4.
  When you experience continued failure, consult the service center for assistance.

Settings

You can copy and import the NVR settings by using a storage media.





- Storage Device : Shows the connected storage device.
- Export : Exports NVR settings to the connected storage device.
- Import : Imports NVR settings from the storage device and applies to the NVR.
  - Uncheck the checkbox of an item(s) that you want to import.
    Only the other items than the selected one will be applied to the NVR.
- Load Factory Default : Restore the factory default settings of NVR.
  Uncheck the checkbox of an item(s) that you want to reset. Then, only the other items than the selected one will return to the factory default.
  If <**Initialization**> is selected, a confirmation dialog for "**Load Factory Default**" prompts. Press <**OK**> to initialize the system to the factory default.

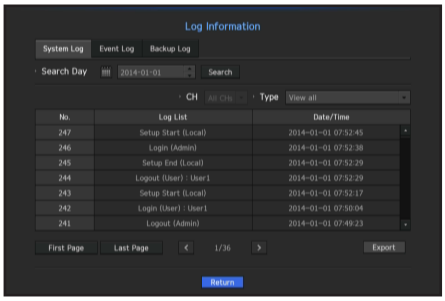
- When you initialize the system without changing the <**Authority Setting**>, you must enter the ID and password to log into the system after it reboots. The ID and password are "**admin**" and "**4321**", respectively.
  Please change the password after you log in.

Log Information

You can browse logs on the system and events.

Checking the system log

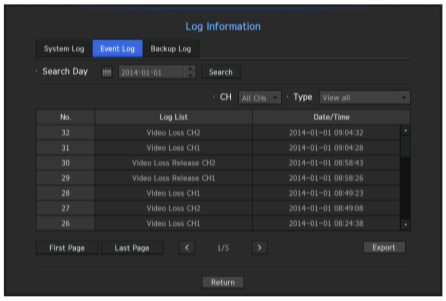
System Log shows log and timestamp on every system start up, system shutdown, and changes on system settings.



- Search Day : Click the Calendar icon to display the calendar window, or use the direction buttons to specify the search period of the system log.
  - For using the calendar, refer to "**To use the calendar**". (Page 45)
- Search : Specify the date and press this button to display the search result in the log list.
- Type : When there are too many logs, you can display logs of the desired format by selecting the type.
- Export : Save all the logged information recorded in the NVR into the storage media.

Checking the event log

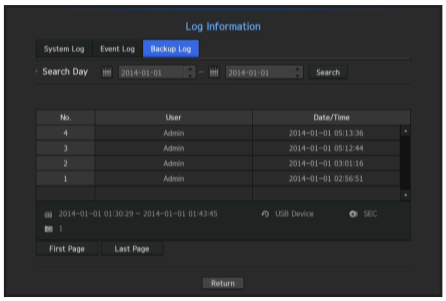
You can search recorded events including alarms, camera events and video loss.
It also shows the log and its timestamp.



- Search Day : Click the Calendar icon to display the calendar window, or use the direction buttons to specify the search period of the system log.
  - For using the calendar, refer to "**To use the calendar**". (Page 45)
- Search : Specify the date and press this button to display the search result in the log list.
- Type : When there are too many logs, you can display logs of the desired format by selecting the type.
- Export : Save all the logged information recorded in the NVR into the storage media.

Checking the backup log

You can find out who backed up and the details (backup time, channel, device to use, file format, etc.).



- Search Day : Click the Calendar icon to display the calendar window, or use the direction buttons to specify the search period of the system log.
  - For using the calendar, refer to "**To use the calendar**". (Page 45)
- Search : Specify the date and press this button to display the search result in the log list.

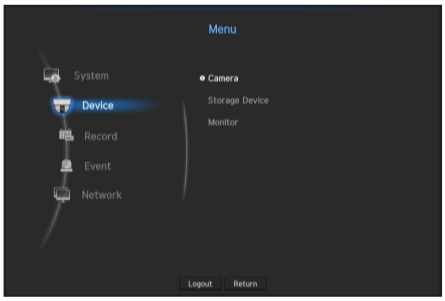
SETTING THE DEVICE

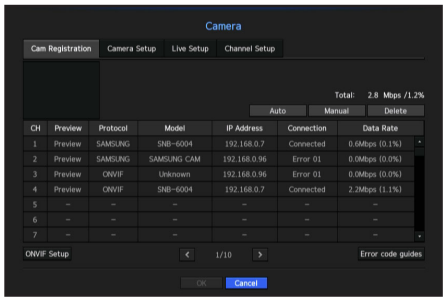
You can setup Camera, Storage Device and Monitor.

Camera

To register a camera

You can register a network camera for each channel and make connection between.





- Preview : View the video of the channel as a current image.
- Protocol : Show the protocol information of a registered network camera.
- Model : Show the camera model name.
- IP Address : Display the IP address of a network camera.
- Connection : Display the connection status.
- Data Rate : Displays the total amount of data received by the channel.

■ If the NVR has been initialized, it may not connect to cameras. Configure the network settings first and add cameras. For more information on network settings, refer to "**Network Configuration**". (Page 85)

To auto-search for and register a network camera

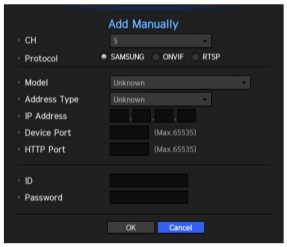
1. In the <**Cam Registration**> field, click on the <**Auto**> button.

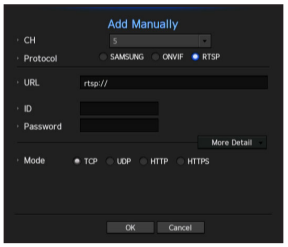
2. Search for a network camera connected.
   - An already registered camera will be marked in blue in the list.
   - If you search for the camera again or if the IP is an old IP that was not assigned by the DHCP server (such as -192.168.1.100), then press the < > button to check if a new IP has been assigned. If the IP is still the same, then select Assign IP to assign the IP manually.
3. Select a camera from the camera list to see a preview of its current video feed.
   - Camera searched with ONVIF does not provide previews.
4. Check the checkbox next to a network camera that you want to connect to.
   - You can select all of the network cameras in the list and provide <**ID**> and <**Password**> all at once.
   - Click a header at the top of the list to sort the list according to that header.

- Registering camera with user account other than admin may restrict camera function.
- When you change the camera ID/password in the camera web viewer, if the camera is already registered in NVR, you also have to change the camera ID/passowrd information registered in NVR.

5. Click on the <**ID/PW**> button to enter the selected network camera's <**ID**> and <**Password**>.
6. Press the <**Connection Test**> button to make a connection to a camera.
7. Press <**Register**> to register the selected camera.

To manually search for and register a network camera





1. In the <**Cam Registration**> menu, click on the <**Manual**> button.
2. The manual search window will appear.
3. Select a channel and protocol used to connect to a camera.
   The input items may differ depending on the selected protocol.

- SAMSUNG : Comply with the internal network protocols adopted by Samsung Techwin.
- ONVIF : Means the camera supports ONVIF protocols. When connecting a camera that its name cannot be found from the list, select <**ONVIF**>.

- Time difference between the ONVIF camera and NVR exceeds more than 2 minutes, the camera cannot be connected. In this case, synchronize the ONVIF camera's time to the NVR or set times of both camera and NVR to a same NTP server (if in the same time zone), or make the NVR an NTP server.

- RTSP : Comply with RFC 2326, one of "Real Time Streaming Protocol (RTSP)" for real-time streaming.

4. If you select the <**SAMSUNG**> protocol, check options as necessary.

- Model : Select a camera model.
  - Samsung Network Camera/Encoder : Means the camera/encoder supports Samsung Techwin's SUNAPI, SVNP protocol. When connecting a camera that does not appear in the camera list, select Samsung Netowrk Camera/Encoder.
    - However, you must select the correct model name of the camera, if it's in the list. Some of obsolete camera models may not be supported.
    - The below models are discontinued. If you register them with ONVIF, some camera functions will be restricted or cause errors. It is recommended you register the Samsung protocol.
      - SNB-2000, SNB-3000, SNC-B2315, SNC-B2331, SNC-B2335, SNC-B5368, SNC-B5395, SNC-B5399, SNC-570, SNC-1300, SND-460V, SND-560, SND-3080, SND-3080C, SND-3080CF, SND-3080F, SND-3081, SNP-3301, SNP-3301H, SNP-3350, SNP-3370, SNP-3370TH, SNP-3750, SNV-3080, SNP-3430
- Address type : Select an address type of the camera.
  - Address type can be different dependingon connected product model.
  - Static(IPv4)/Static(IPv6) : Used to provide the IP address of the camera manually.
  - iPOLiS DDNS : This is available only if the camera is registered with the iPOLiS DDNS(www.samsungipolis.com) server. Provide the registered domain for DDNS ID.
    - Ex) http://www.samsungipolis.com/snb5000 ➞ provide "snb5000" for iPOLiS DDNS
  - URL : Used for URL address input.

- Refer to the user manual of the connected camera and check the DDNS specification that is supported by the camera.

- IP Address : Provide the IP address of the camera.
- Device Port : Provide the device port of the camera.
- HTTP Port : Provide the HTTP port of the camera.
- ID : Provide the ID of the camera that you want to register.
- Password : Enter the password of the camera to be registered.

5. Select <**ONVIF**> or <**RTSP**> for the protocol and enter your input for each field appears.

- ONVIF Address / RTSP URL : Enter the camera's RTSP access address that supports ONVIF or RTSP. For more information about the RTSP address, refer to the manual of each applicable network camera.
- ID : Enter the ID for accessing via ONVIF/RTSP protocol.
- Password : Enter the password for accessing via ONVIF/RTSP protocol.
- Mode : If <**More Detail**> button clicked, setup window will appear. Select a mode that is supported by the network camera in RTSP connection mode.
  - TCP : The connection type with the network camera will switch to "RTP over TCP".
  - UDP : The connection type with the network camera will switch to "RTP over UDP".
  - HTTP : The connection type with the network camera will switch to "RTP over TCP (HTTP)".
  - HTTPS : The connection type with the network camera will switch to "RTP over TCP (HTTPS)".

If you want to check the error details of camera registration

If you failed to register a camera, the reason for the failure will be displayed.

- **Connection failed due to unknown error.** : This message appears if the camera has failed to be registered due to unknown connection status.
- **Due to the camera account locking, access has failed.** : When you enter a wrong ID/password 5 times to login to the camera account, this message is displayed.
  Try to log in again after 30 seconds. If the same message appears, you may need to check whether someone has tried to access your camera account from the outside.
- **Connected successfully.** : This message appears if the camera is connected successfully.
- **Incorrect model information. Provide the correct model information.** : This message appears if the model information provided for registering the camera is incorrect.
- **Authentication has failed** : This message appears if the ID or password provided for registering the camera is incorrect.
- **Connection has failed due to excessive concurrent users.** : This message appears if the concurrent user count exceeds the upper limit.
- **Connection has failed due to incorrect HTTP port information.** : This message appears if the HTTP port number of the camera is invalid.
- **Connection has failed. Unknown connection status.** : This message appears if the camera has failed to be connected due to a unknown error.
- **User Model Modification** : When registering a new camera, it is named according to the device's default if user set the model to <**Samsung Network Camera/Encoder**>. In case if automatic registration fails, user can change the model name of camera to be registered.

To edit camera profile

When a camera is added for the first time, it is added as the default profile of H.264, MPEG4 and MJPEG in order temporarily.
To change its profile, refer to "**Setting the network camera's recording profile**" (Page 79) or "**Live Setting**" (Page 65).

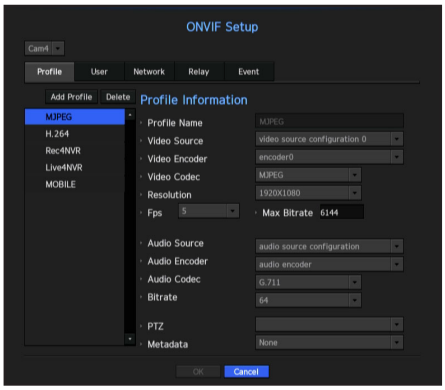
- In case of NVR, if you set 3 different profiles for live, recording and network profile, one camera will produce video streams accordingly, having different stream formats. Especially, note that the live profile may vary depending on the used screen split mode.
- For cameras, if applied with one profile only, the produced frame rate is fixed as the profile specifies; if applied with multiple profiles, produced video stream's frame rate is not guaranteed. For example, if applied with 2 profiles of 30fps, the camera may transmit streams at 20fps.

ONVIF Setup

In the bottom of the camera addition screen, click on the <**ONVIF Setup**> button to set additional settings for cameras with the ONVIF protocol.

- You can change the information only if the user account (camera account used for camera registration) is used to read the user information and a connection is made with the admin privilege.

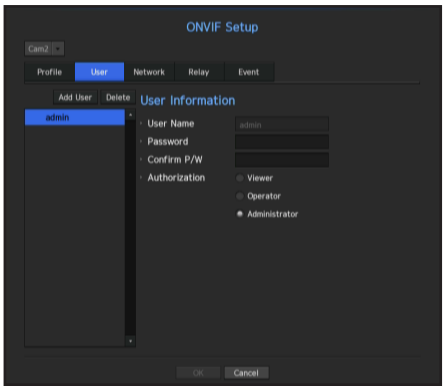
Profile



- CH : It shows the list of registered camera with the ONVIF setting.
- Add Profile : You can add camera profile.
  After adding a profile, click on the <**OK**> button to add it to the list.
- Delete : After selecting the profile to delete, click on the <**Delete**> button to delete the selected profile.
- Profile information : You can set the details of the selected profile.

After finishing setting each item, click on the <**OK**> button to save changes.

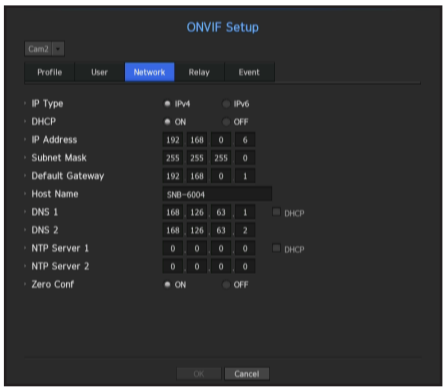
User



- Add User : You can add a camera user.
  After adding a user, click on the <**OK**> button to add them to the list.
- Delete : After selecting the user to delete, click on the <**Delete**> button to delete the selected user.
- User Information : You can set the details of the selected user.

Network

You can set the details of the network.



- IP Type : Select from either the IPv4/IPv6 IP types.
- DHCP : Select whether to use the DHCP.
- DNS / NTP Server : Only if the DHCP setting is <**ON**>, the DHCP checkbox will be activated.
  - If the DHCP is checked, you can manually enter the IP address.

Relay

You can set details of the relay.

- Digital Output : You can select a digital output channel.
- Relay Mode : Select either bi or mono stable modes.
- Relay Idle State : Select either open or closed relay standby modes.
- Delay Time : Select the relay operation waiting time.

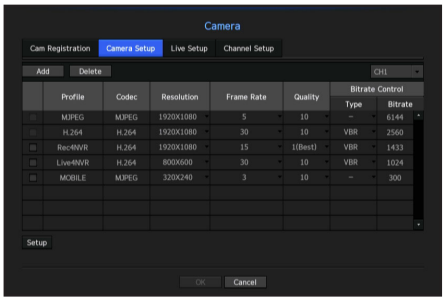
Event

You can set details of the event.

- Available events (camera) : It shows the list of all the events supported by a camera by using the ONVIF protocol.
- NVR supported events : You can map the list of events supported by a camera to events that the NVR can detect. There is no default value. It only shows the value sent by a camera.

Camera Setting

You can change the video settings of a registered network camera for each channel.



- Add : You can add camera profile. Click on the Add button to launch the addition window. Enter the information and click on the <**OK**> button to add it to the list.
- Delete : You can delete the selected profile from the list.
- Select Camera : Select the camera channel to change the video transmission settings.
- Profile : Show a video profile for the connected camera.
- Codec : Show the codec information for the selected profile.
- Resolution : You can change the resolution of the selected profile.
- Frame Rate : You can change the baud rate of the selected profile.
- Quality : You can change the video quality of the selected profile.
- Bitrate Control : You can change the bit rate for video transmission of the selected profile.

- If you change the settings of a specific profile for each model, the effective range of the baud rate may be changed accordingly. Ex) if you set the baud rate of the first profile to 30fps, the send rate of the second profile will be changed to 15fps.
- Menu items except Codec, Resolution, Transfer Rate, and Transfer Quality can be configured in the network camera's settings menu.
- If you change the current profile settings, you may encounter an interrupted playback on the recording or live screen for a certain time.
- Changes made in Camera Setup page are applied immediately, while changes made through the camera's web page may require up to 3 minutes.

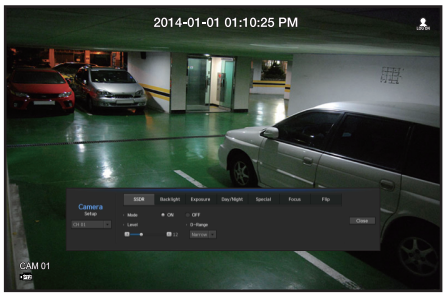
Setup

In the bottom of the camera setting screen, press the <**Setup**> button to set your camera while watching the live video of the selected camera.

- SUNAPI (Samsung Unified Network API) : Camera that supports the communication protocols provided by Samsung
  1. Camera supporting SUNAPI.
  2. A camera connected with admin privileges.
  3. A camera connected to Samsung protocols.
  In the above cases, you can use the function.
- For more details on camera settings, refer to the camera user manual.
  Settings and operational spec vary depending on each camera.
- This function is not supported in some models.

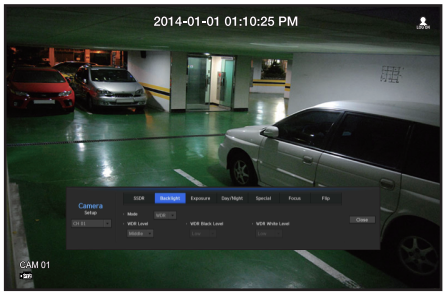
SSDR

If there is a significant difference between the dark and the bright areas, increase the brightness of the dark areas to maintain the level of brightness of the entire area.
Mode, level, D-Range can be set.



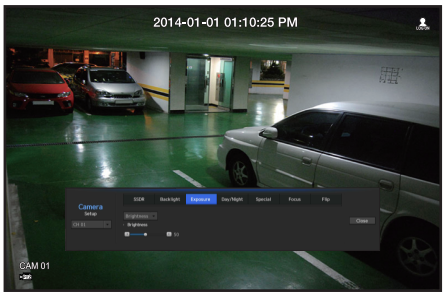
Backlight

You can view both bright and dark areas.
Mode, WDR level, WDR black/white levels can be set.



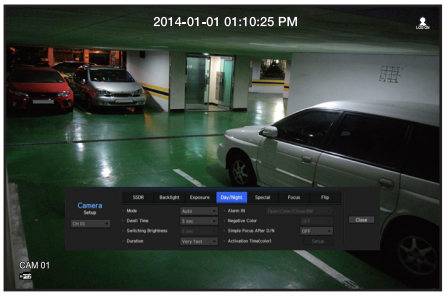
Exposure

You can adjust the exposure of your camera.
Brightness control, shutter, SSNR, Sens-up, shutter/lens, and gains can be set.



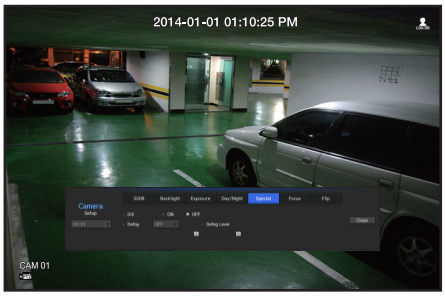
Day/Night

You can change the mode to adjust the color and contrast.
Mode, switching time, brightness change, alarm time, alarm input/output, negative color, daytime/nighttime switching and simple focus, and activation time can be set.



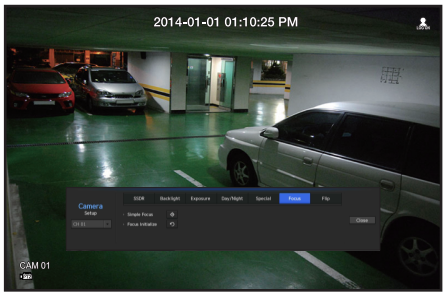
Special

DIS (shaking compensation), use of Defog levels can be set.



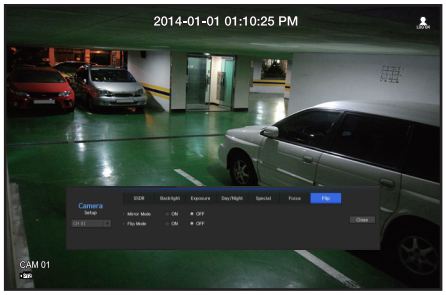
Focus

You can adjust the focus of you camera's video.
Items of Simple Focus and Focus-Initialize Setting can be set.



Flip

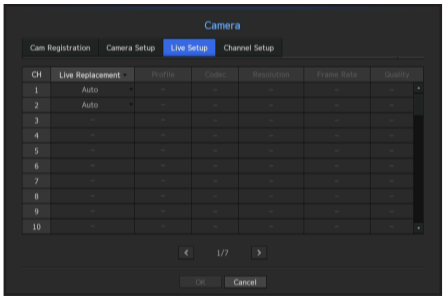
Mirror and flip modes can be set.

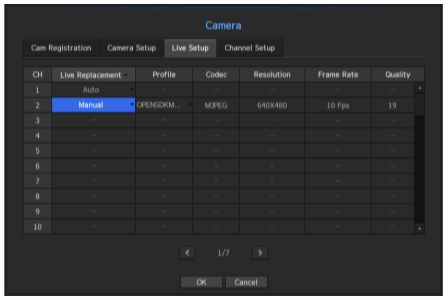


After finishing with setting camera, click on the <**Close**> button to move back to the previous screen.

Live Setting

You can change the live transfer settings of the network camera.

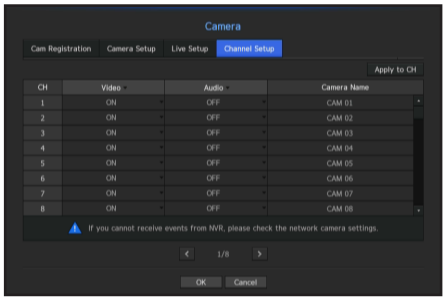




- Live Replacement : You can select the live profile setup mode.
  If you select <**Manual**>, the profile setup items are enabled, and you can change settings manually.
  - Auto : In case of split mode, the profile for live monitoring shows the Live4NVR profile(basic: H.264 800*600 30fps) created at the time of registration and it automatically selects the second profile in case of single mode.
  - Manual : Live monitoring is performed with the profile selected by the user from the registered camera profiles.
  - Record : Live monitoring is performed with the profile set for recording.
- Profile : You can select the video profile of the connected camera setting.
- Codec : Show the codec of the selected recording profile.
- Resolution : Show the resolution of the selected profile.
- Frame Rate : Show the frame rate of the selected profile.
- Quality : Show the quality of transfer video of the selected profile.

Channel Setting

You can configure the video settings for each channel.



- Apply to CH : If you select <**Apply to CH**>, the "**Apply to CH**" confirmation window will appear.
  After selecting channels that the settings will be applied to, click on <**OK**> to apply them to the selected channels.
- Video
  - <**ON/OFF**> : You can turn ON/OFF the selected channel's camera.
  - <**Covert1**> : Shows information other than the video of the selected channel.
    For privacy protection, it does not display the video while the recording continues.
  - <**Covert2**> : Shows nothing but an empty screen while the recording continues.

- If the channel is set to <**Covert1**> or <**Covert2**> mode, the channel's sound is not hearable.
  However, the channel's sound is recorded if its Audio setting is set to <**ON**>, even the sound is not heard in Live mode.

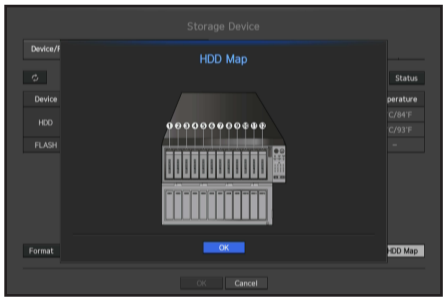
- Audio
  - If set to <**ON**>, you can turn the audio of the channel ON/OFF on the Live screen.
  - If set to <**OFF**>, the channel's audio is off on the Live screen and not recorded.
- Camera Name : Provide a camera Name.
  - You can enter up to 15 characters including space.

Storage Device

You can check information on storage devices.

Device/Format

You can check storage devices and their capacity, usage as well as status.
Devices available are HDD, and USB devices (Memory, HDD).



- Storage Status : Displays the working status of a storage device.
  - Red : Displays the situation of video loss.
  - Green : Displays the normal situation without video recording losses.
  - Status
    - Full BPS : Displays the current rate of recording.
    - Current Loss Rate : Displays the current recording loss rate.
    - Max Loss Amount : Displays the maximum amount of losses up until now.
- No. : You can check the designated number for the built-in HDD.
  - If you want the find out about the location corresponding to the HDD number, refer to the <**HDD Map**>.
- Capacity : Displays the amount of storage device use and the full capacity.
- Usage : Designate the purpose of use for a storage device.
- Status : Displays the current working condition of a storage device.
  For inspection or replacement of HDD alarms, please refer to "**HDD Alarm Setting.**" (Page 74)
  - Normal : It is displayed during normal operation.
  - Inspection : Operating with partial problems.
    In the case of the RAID Array, it is displayed when status is displayed as Degraded or Rebuilding.
  - Replacement : It is displayed when you can no longer use it.
    In case of the RAID Array, it is displayed when there is a system failure.
  - RAID(?) : Unknown RAID. It is an HDD that used the RAID in the past. Currently, the RAID is not used. If you organize the RAID again, it will be included in the full format. To use the general HDD, you need to format it first.
  - Unknown : The RAID array is installed in the currently used slot, but the HDD does not constitute the RAID.
- Temperature : You can check the temperature of the HDD mounted in the NVR.

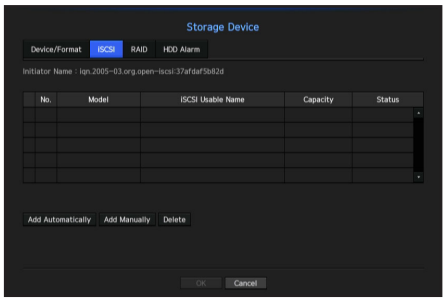
- Format : Select a device and click on format after which a format confirmation window appears. Click on the <**OK**> button to format the selected storage device.

- Formatting will delete all the recording data that has been saved. Be careful.
- While formatting is ongoing, you cannot record video.
- Do not remove a formatting device until it is finished.

- HDD Map : You can check the location according to the assigned number for the HDDs installed inside.
  - Refer to this when servicing or installing an additional HDD.

Connecting the iSCSI

If you connect the NVR with an iSCSI device, you can search, connect and disconnect the iSCSI device.



- iSCSI Usable Name : It displays the name of iSCSI in compliance with the iSCSI protocol format.
- Capacity : It displays the currently used amount/total capacity of iSCSI devices.
- Status : Displays the status of an installed iSCSI device.

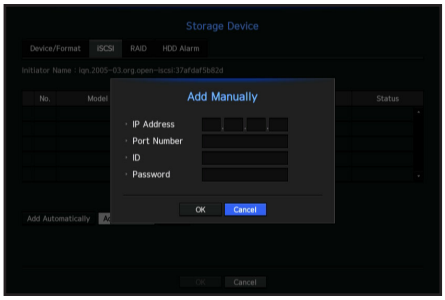
List of products supported

Promise Technology vessRAID 1740i / 1840i 1ea JBOD 3ea

Adding an iSCSI device automatically

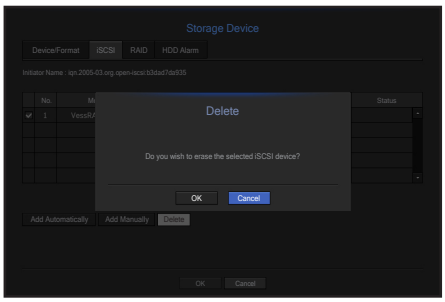
1. In the iSCSI window, click on the <**Add Automatically**> button.
2. On the Auto Add screen, enter the IP address and the connecting port, and click <**Search**>.
3. In the <**iSCSI Usable Name**> list, click on a device to add.
4. After entering ID/password, click on the <**OK**> button.

Adding an iSCSI device manually



1. On the iSCSI screen, click <**Add Manually**>.
2. On the Manual Add screen, enter the IP address, the connecting port, the ID and the password, and click <**OK**>.

Canceling registration of iSCSI devices

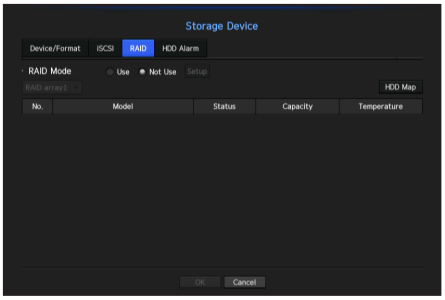


1. In the <**iSCSI Usable Name**> list, select an iSCSI device to delete.
2. Click on the <**Delete**> button to launch the Delete window.
3. If you click <**OK**>, the iSCSI device is removed from the list.

- iSCSI devices use an iSCSI port only.
- When using a hub to connect an iSCSI device with NVR, make sure to use the GIGA hub and to use an independent network to save data normally.
- When you perform single directional CHAP authentication in vers. RAID, an iSCSI device in compliance with the NVR, you need to use the iSCSI Manual Add function to make a connection to iSCSI.
- If multiple NVRs try to access a single iSCSI device, it can cause a problem.
- When the NVR is connected to an iSCSI device, if you change the iSCSI equipment setting, a problem can occur.
- A HDD to be mounted in vess RAID should be listed in the RAID compatibility list.
- iSCSI equipment only supports a volume of RAID 5/6.
- It is recommended that you configure each volume for an iSCSi device with a maximum of 16 HDD.
- When you register an iSCSI device in the NVR for the first time, you need to format it first.
- The iSCSI lun mapping function is supported.
- If you activate the lun mapping function in the iSCSI device, the lun can only be connected to an NVR which is mapped.

RAID mode setting

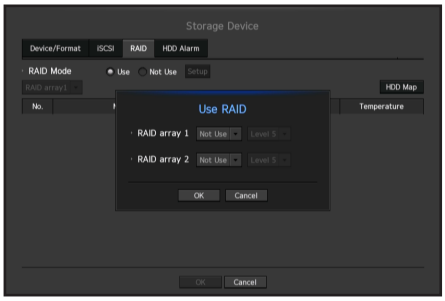
If you enable the RAID (Redundant Array of Independent Disks) mode, when a system HDD is damaged you can restore data safely. The NVR supports RAID level 5 and 6. RAID Level 5 supported by the NVR can work to restore data for a single HDD only in case of failure of that HDD. RAID level 6 can restore data and operation of up to two malfunctioning HDDs.



- In this NVR, you can organize two RAID. The first RAID uses only the HDDs installed in HDD slot 1 to 6, and the second RAID uses only the HDDs installed in HDD slot 7 to 12.
- If the RAID has 5~6 HDDs installed, you can operate and organize it.
- You can use RAID level 6 only if a single RAID has 6 HDDs mounted in it.

- Status : Displays the operational status of the RAID.
  - Active : Signals the fact that the RAID is operating normally.
  - Build : User is in process of organizing a RAID and normal operation is ongoing.
  - Degraded : It is displayed when the one or more HDDs that make up the RAID are malfunctioning. When the maximum number of HDDs allowed in the RAID level are malfunctioning, if an additional HDD malfunctions, you cannot use or restore the RAID.
    Immediately, replace the HDD and proceed with restoration.
    - For more on how to replace the HDD and to restore the RAID, refer to "**Recovering RAID Array**". (Page 72)
  - Rebuilding : It means that a RAID is being restored. When the maximum allowable number of HDDs in the RAID are being rebuilt (due to malfunctioning), if an additional HDD malfunctions, you cannot use or restore the RAID.
  - Fail : This means that the RAID cannot be used or restored.
- Status : Displays the current operating condition of the HDDs installed in a RAID.
  - Active : Displays that the HDD is operating normally.
  - Faulty : It displays that the HDD is malfunctioning. You need to immediately replace the HDD for smooth recovery of the RAID.
  - Removed : It displays that a HDD does not work and cannot be detected. You need to immediately replace the HDD for smooth recovery of the RAID.
  - Restore : Displays that a HDD is being recovered.
- Capacity : It shows the total capacity of the HDDs that composes a RAID.
- Temperature : You can check the temperature of HDD(s) that compose a RAID.

RAID mode setting



1. Click on the <**Use**> or <**Setup**> button.
2. In the use RAID window, select settings of RAID and click on the <**OK**> button.

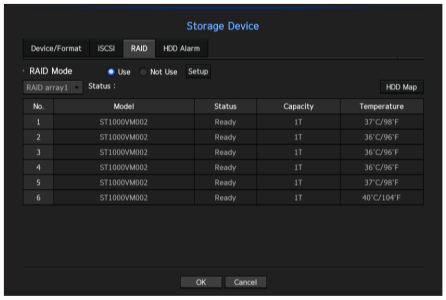
- Use/Not Used : You can select whether or not to use the RAID mode.
- Level5/Level6 : It shows the type of RAID supported by the NVR.

3. It will show the list of HDDs that compose a RAID. In the RAID screen, click on <**OK**>.
4. The data deletion and system rebooting message window will appear. You can click on the <**OK**> button to reboot the system for RAID mode setting.
5. When RAID building is complete, select <**Setup**> - <**Device**> - <**Storage Device**> - <**RAID**> to check the build.

- When you build the RAID in level 5, the available capacity of a RAID is (the least HDD capacity) x (total number of HDDs -1). When you build the RAID in level 6, the available capacity of a RAID is (the least HDD capacity) x (total number of HDDs -2).
- If you use HDDs with different capacity, the HDD with the smallest capacity will be used to build a RAID.
- If you deactivate the RAID mode, all the RAID will be deselected. If you want to select a single RAID to be canceled, a particular RAID to be deactivated may be selected in the setup window.
- If the status of HDD is displayed as inspected/replaced in the device/format page, you cannot use it to build a RAID.
- When a RAID is being built, recording will be stopped.
- The greater the HDD capacity is, the longer it takes to finish building a RAID.

- If you enable or disable the RAID mode, existing data will be deleted.
  You make sure to backup your data.

Recovering RAID Array

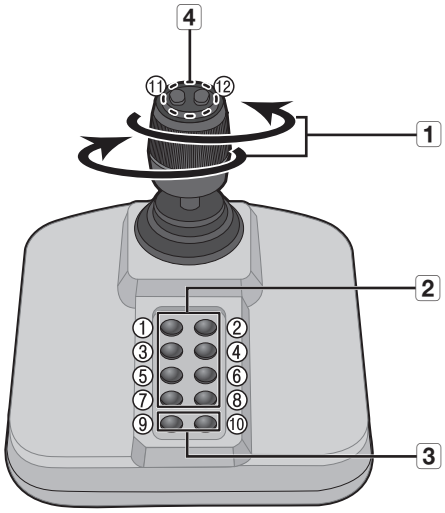


1. If you see a number for an HDD which <**Status**> states Faulty/Removed, then check the location of the HDD to be replaced in the HDD map. In addition, check the location of the HDD for which the HDD LED is highlighted in red.
2. Replace the malfunctioning HDD from the NVR with a new HDD.
3. After replacing the HDD, if the recovery popup appears, click on the <**OK**> button.
4. When recovery starts, the LED for the replaced HDD will blink in orange.
   The <**Device**> - <**Storage Device**> - <**RAID**> menu will show the progress of recovery.

- Replace it with the same model of HDD or an HDD of the same capacity from the same manufacturer.
- A HDD used to build the RAID should be one of the recommended models.
  If it's not possible to use the same model of HDD, then use the HDD with the same capacity from the same manufacturer should be used.
- If you remove the power cord while using the RAID, it can damage it, so be careful.
  For reliable power, it is recommended you use the UPS.

Use Joystick

The SPC-2000 joystick is operated as follows:

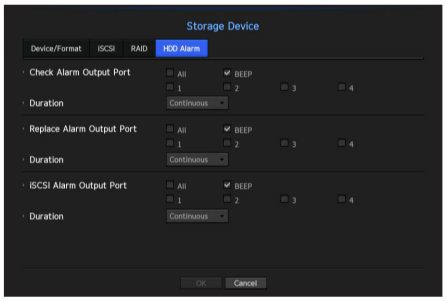


Name		Function
1	Up/Down/Left/Right	In PTZ mode, the camera can be panned, tilted, and controlled in 8 directions The webviewer only supports the PTZ mode. In Screen mode, the top/bottom/left/right tile can be selected.
	Rotation	In PTZ mode, the screen is zoomed in when it is rotated clockwise and zoomed out when it is rotated counterclockwise.
2	1~8	In PTZ mode, presets number 1~8 are run. Screen mode works as follows. 1: Changing live layout / 2: Search 3: Backup / 4: Zoom mode 5: Freeze mode / 6: Audio 7: Alarm / 8: Rec
3	9	It allows to exit PTZ mode in PTZ mode. The webviewer won't be able to stop the PTZ on its own. This is used to change to PTZ mode from screen mode.
	10	It allows to exit PTZ mode in PTZ mode. The webviewer won't be able to stop the PTZ on its own.
4	11, 12	In PTZ mode, Focus Near/Far operation is run. When using the screen mode, the same operations can be done by moving the mouse.

- More than one mapped lun should be available to connect to the initiator when using lun mapping.

HDD Alarm Setting

For HDD malfunctions, you can set the inspection alarm output terminal, the replacement alarm output terminal, the iSCSI alarm output terminal and the alarm time.



- Alarm
  - If <**All**> was selected, both beep sound and alarm signal through rear side ports will output.
  - If <**BEEP**> was selected, a beep will sound.
  - Alarm signal will output through the alarm out port on the rear side when selected <**1**>, <**2**>, <**3**>, and <**4**>.
- Check Alarm Output Port : If HDD generates check alarm, the alarm signal will output to the specified alarm output port.
- Replace Alarm Output Port : If HDD generates replace alarm, the alarm signal will output to the specified alarm output port.
- iSCSI Alarm Output Port : If a connection to your iSCSI device is lost, a signal is sent to the designated alarm terminal.
- Duration : Sets the alarm duration for the alarm signal and beep sound.

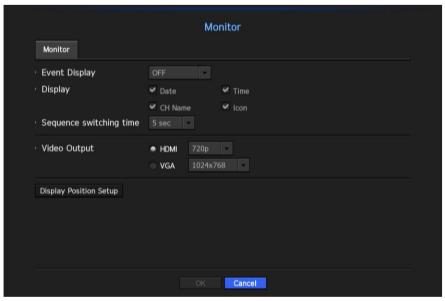
- <**Check**> status means that the HDD is operating but it has problems that require technical examination.
  ( ) appears on the Live screen.
  If a RAID is degraded or rebuilding, < / > will appear on the live screen.
- <**Replace**> status means that the HDD has defect and requires immediate replacement.
  ( ) appears on the Live screen.
  If a RAID has failed, < > will appear on the live screen.

Monitor

You can set the information displayed on the monitor as well as the output system.

Monitor settings

You can configure the monitor output-related settings including the displayed information, dwell time and output system.

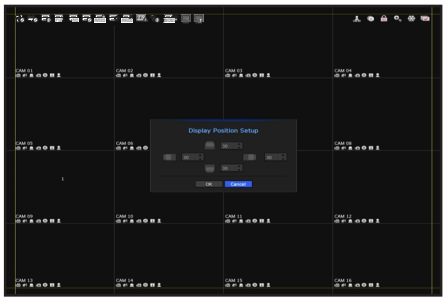


- Event Display : Sets the dwell time of the event channel display on the monitor when an event occurs.
  If you set <**Continuous**>, it will keep displaying until you cancel it.
- Display : Displays only checked items on the monitor screen.
- Sequence switching time : Set the automatic switching time for the segmented screen in live mode.
- Video Output : Select a video output type from <**HDMI**> and <**VGA**>.
  If your selection of <**HDMI**> or <**VGA**> does not match with the monitor setting, the video may not be output.
  - If the changed resolution is not supported by the monitor, the video may not be displayed properly. If this is the case, the screen will restore the default resolution after a certain time. Then, you can change it to a different resolution.

- Specify the event display time and dwell time in consideration of the video delay depending on the network environment.

To adjust the display position

Some monitors many not display information (camera name, icon, time information, etc.) about the NVR, depending on the condition. Then, you can change the display position of the data.



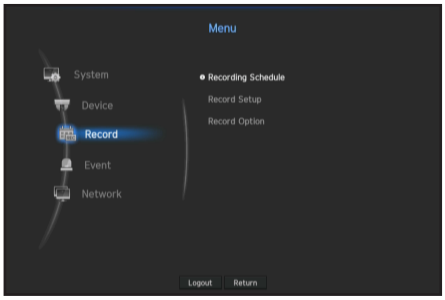
1. From the monitor setup menu, select <**Display Position Setup**>.
2. Using the number button to adjust the screen that is cut off.
3. Press <**OK**>.

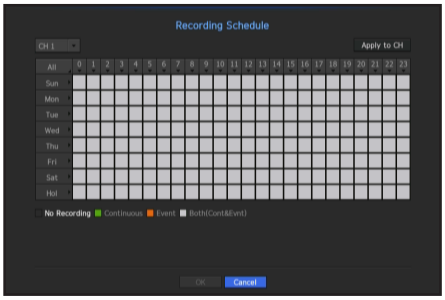
SETTING THE RECORDING

You can setup scheduled recording, event recording and other recording related settings.

Recording Schedule

Make your reservation on a date and time to schedule the recording on specified time.





- All : The entire time range (Monday through Sunday including holidays, AM 0~ PM 23) will be reserved with the same recording schedule
- Apply to CH : If you select <**Apply to CH**>, the "**Apply to CH**" confirmation pop-up window will appear. After selecting channels that the settings will be applied to, click on <**OK**> to apply them to the selected channels.

- Event recording and scheduled recording starts about 3 seconds prior to the event/schedule for guaranteed recording.

Record setting by the color

Color	Function	Description
No Color	No Recording	No schedule / event recording
Green	Continuous	Scheduled recording only
Orange	Event	Event recording only
White	Both(Cont&Evnt)	Both scheduled / event recordings

Each press of a selected cell will cycle through <**No Recording**>-<**Continuous**>-<**Event**>-<**Both(Cont&Evnt)**>.

Recording performance spec for the HDD condition

No	HDD condition	Receiving (Mbps)	Recording (Mbps)	
			Internal	iSCSI
1	HDD for CE / Non RAID	400	300	-
2	HDD for CE / RAID 5	400	300	-
3	HDD for CE / RAID 6	400	200	-
4	HDD for Server / Non RAID	400	300	-
5	HDD for Server / RAID 5	400	400	300
6	HDD for Server / RAID 6	400	300	200

Record Setting

You can set resolution, IPS, and quality of recordings by channel, and by recording type of standard / event.

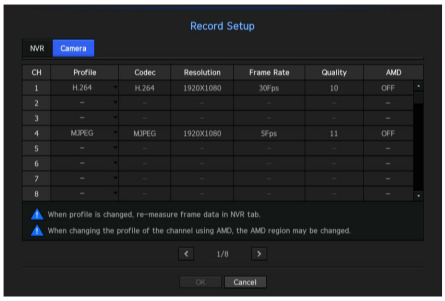
You can check frame rates and data transfer amount of Full Frame and Key Frame recordings for each channel, and set the transfer limit for recordings.

- Apply to CH : If you select <**Apply to CH**>, the "**Apply to CH**" confirmation window will appear.
  After selecting channels that the settings will be applied to, click on <**OK**> to apply them to the selected channels.
- Standard, Event : Configures Standard recording and Event recording.
  - FULL : Records all frames fed by the camera.
  - KEY : Records only key frames fed by the camera.
    Actual recording rate may differ from camera settings. In general, 1 to 2 frames per second are recorded.
  - OFF : No recording is made.
- Frame
  - FULL : Shows the amount of data for all the scene recordings.
  - KEY : Shows the amount of data for the main scene recordings.
- Limit : Set the amount of data allowed for input for each channel.
- Event : When an event occurs, you can set which point you will start or stop recording.
  - Pre : When an event occurs, recording will be started regardless of the time set.
    If you set it to five seconds, recording will start at five seconds before an event occurs.
  - Post : When an event occurs, recording will continue after the time set.
    If you set it to five seconds, recording will continue for a further five seconds after an event is finished.
- Audio : Specify whether to record the sound received from the camera or not.

- If a channel's data transfer exceeds defined allowed limit, then it may affect to other channels, and may force switching to <**KEY**> recording even when the channel is configured to <**FULL**> recording mode. For Key Frame recording channels, the icon for limited recording appears on the live screen's top side.
  But if the sum of the limits is below the max limit, you can still receive the entire frames despite exceeding the permitted bitrates for each channel.
- A channel displayed in yellow indicates that the recorded data is not being transferred from the camera and that the recording is being performed temporarily using another profile on the camera.
  Check the channel information to see the applied profile to the channel listed in yellow.
  A channel displayed in orange indicates that the amount of inputted data is greater than the permitted data amount.
  In this case, it is impossible to record all of the incoming frames.
  Instead, only part of the frames (1 or 2 frames per second) can be recorded. To resolve this issue, you must set the permitted data amount to be greater than the amount of inputted data.
  Refer to notes on "**Record status**". (Page 36)

Setting the network camera's recording profile

You can configure the video profile settings for instructing the network camera (connected to each channel) to make recording.



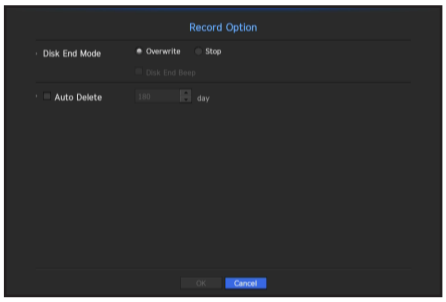
CH	Profile	Codec	Resolution	Frame Rate	Quality	AMD
1	H.264	H.264	1920X1080	30Fps	10	OFF
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	MJPEG	MJPEG	1920X1080	5Fps	11	OFF
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-

- You can configure the settings only for the profiles that are supported by the camera.
- If the profiles used for recording and network are different, camera's video feed may not comply with the frame rate as specified in the camera.

- Profile : Select a record profile for the connected camera.
- Codec : Show the codec information for the selected record profile.
- Resolution : Display the resolution for the selected record profile.
- Frame Rate : Display the baud rate for the selected record profile.
- Quality : Display the video quality for the selected record profile.
- AMD : Display whether to set the Advanced Motion Detection (AMD) event for the channel.

Record Option

When the HDD capacity is full, you can set whether to stop recording or start overwriting.



- Disk End Mode : Select a HDD repetitive recording type.
  - Overwrite : If the HDD is full, this will overwrite the existing data and keep recording.
  - Stop : If the HDD is full, this will stop recording automatically.
- Disk End Beep : If you select <**Stop**> for the disk end mode, this button will be active. Specify the use of beep when the HDD recording ends.
  If you check it, the beep will sound on the disk full and the recording stops.
- Auto Delete : If you check this option, the period list box is active. Specify the deletion period to delete any earlier data than the specified date. However, you can search for data from the current time to the selected date.

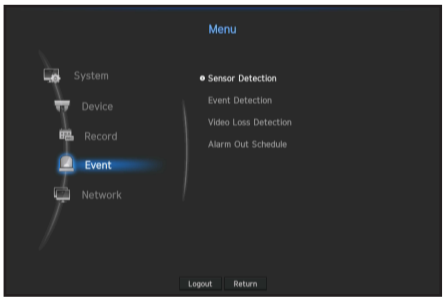
- If you press <**OK**> when you have completed your settings, all the existing data earlier than the specified period will be deleted automatically. So it is recommend to backup the previous data if necessary for later use.

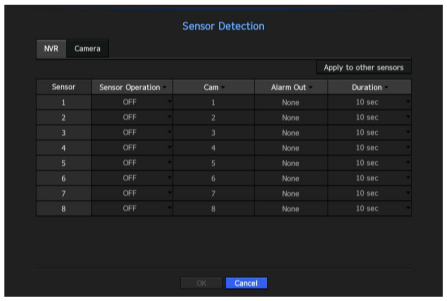
SETTING THE EVENT

You can make the setup for record in case of sensor detection, camera event or video loss detection.

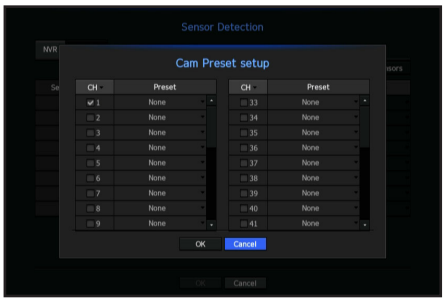
Sensor Detection

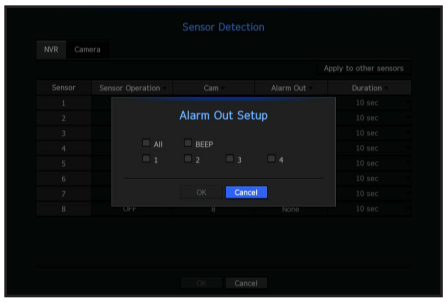
You can set the sensor's operating condition and connected camera, as well as alarm output and its duration.





- Apply to other sensors : If you select <**Apply to other sensors**>, the "**Apply to other sensors**" confirmation window will appear.
  After selecting channels that the settings will be applied to, click on <**OK**> to apply them to the selected channels.
- Sensor Operation : Sets the operation mode of sensors.
  - In the <**Camera**> tab, you can set whether or not to use a sensor.
  - <**N.O (Normal Open)**> : Sensor is opened. If the sensor is closed, it generates alarm.
  - <**N.C (Normal Close)**> : Sensor is closed. If the sensor is open, it generates alarm.





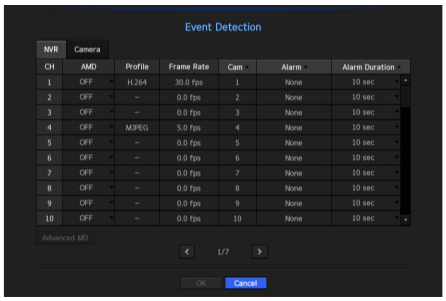
- Cam : Select a channel to be connected to the sensor.
  If selected camera, "**Cam Preset setup**" window appears.
  Select a channel and setup the preset.
  - Preset setup can be done in PTZ mode.
- Alarm out : Sets the alarm output method.
  - For further information on alarm output, refer to "**HDD Alarm** > **Alarm**". (Page 74)
- Duration : Sets the duration of alarm signal and alarm sound.

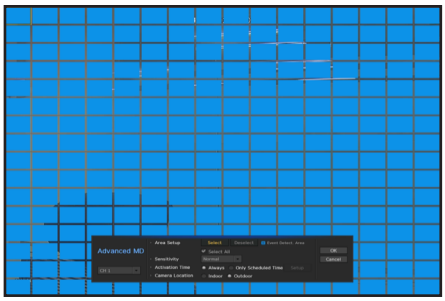
- If you select <**Camera**> tab, you can configure the sensor operation settings of the network camera connected to each channel.
- If the connected network camera that has configured the alarm in/out settings triggers an alarm, NVR will perform the alarm out.

Event detection

You can set whether to run an event sent from the NVR or camera (motion detection, video analysis event, audio event) and the method for alarm output as well as the alarm time.

NVR

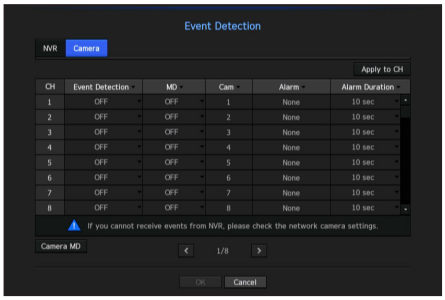




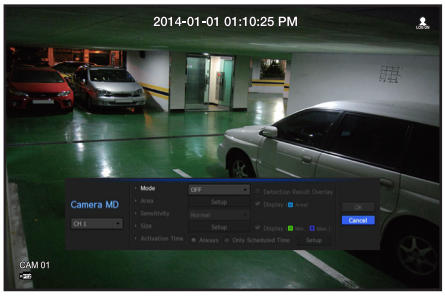
- AMD : Select whether or not to use motion detection.
- Profile : Shows the video profile set for each channel.
- Frame Rate : Shows the frame count for each channel.
- Camera : Select an event detection channel.
  If you select a camera item, the "**Camera preset**" screen will appear. Select a channel to connect and set the preset.
  - You can set the preset in PTZ mode.
- Alarm : Select the method for alarm output.
  - Continuous : Alarm keeps going off until you cancel it.
  - For more details, refer to "**HDD alarm** > **Alarm**". (Page 74)
- Alarm Duration : Set the duration of alarm.
- Advanced MD : You can set the detailed setting of motion detection.
  If there is at least one AMD ON channel, it will be activated.
  - Area Setup : You can set the area of motion detection.
  - Sensitivity : Set the sensitivity of motion detection. (high/medium/low).
  - Activation Time : Select the operation time of motion detection.
  - Camera Location : Select the location of a camera (indoor/outdoor) subject to motion detection.

- The NVR can output alarms only when event detection is set for a network camera connected.
- You can set AMD motion detection for a maximum of four channels. It requires recording a profile setting of a minimum 10fps. It is recommended you use 30fps with a resolution of less than 2M. (If the recording profile's fps is out of range, the AMD motion detection function will not operate normally.)
- It is recommended you install or set a camera so that the size of a recorded object is within the range below.
  - Minimum Detection Size : More than 1/4 of a single lattice area
  - Maximum Detection Size : Less than 1/4 of the full screen
- If you set the camera location to <**Outdoor**> then the car/human classification function will operate. If you set it to <**Indoor**>, the heat map cannot display the detection result for cars. Heat map data will be saved in 30 seconds after you set AMD motion detection.
  For more on heat maps, refer to "**Heat Map Search**". (Page 99)
- If the video has low intensity or is fuzzy, it is recommended to set the sensitivity to <**High**> and if the video has a dynamic background (shaking tree, wave) then it is recommended to set it to <**Low**>.

Camera



- Apply to CH : If you select <**Apply to CH**>, the "**Apply to CH**" confirmation window will appear. After selecting channels that the settings will be applied to, click on <**OK**> to apply them to the selected channels.
- Event Detection : Select whether to use an event detection.
- MD : Select whether or not to use motion detection from camera.
- Cam : Select an event detection channel.
- If you select a camera item, the "**Camera preset**" screen will appear. Select a channel to connect and set the preset.
  - You can set the preset in PTZ mode.
- Alarm : Select the method for alarm output.
  - For more details, refer to "**HDD alarm** > **Alarm**". (Page 74)
- Alarm Duration : Set the duration of alarm.
- Camera MD : You can set the detailed setting of motion detection for a network camera connected.

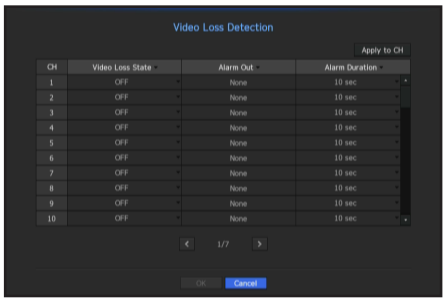


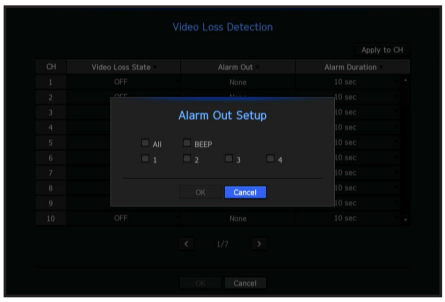
- Mode : Set the motion detection mode.
- Area : Click on <**Setup**> and when the detailed setup menu appears, set the motion detection area.
- Sensitivity : Set the sensitivity for motion detection. (very low/low//medium/high/very high).
- Size : Click on <**Setup**>. When the detailed setup menu appears, set the max/min size of the object to be detected.
- Activation Time : Select the operation time of motion detection.

After finishing with setup, click on the <**OK**> button to move back to the previous screen after saving the setup.

Video Loss Detection

You can set the camera so that the camera can trigger the alarm if it is disconnected or the video is lost due to unstable network connection.

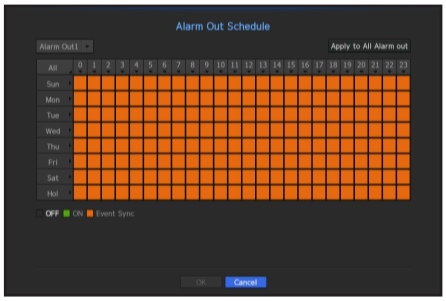


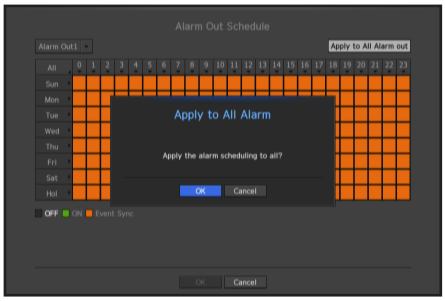


- Apply to CH : If you select <**Apply to CH**>, the "**Apply to CH**" confirmation window will appear. After selecting channels that the settings will be applied to, click on <**OK**> to apply them to the selected channels.
- Video Loss State : Specify the use of video loss detection.
- Alarm Out : Select an alarm output method.
  - For further information on alarm output, refer to "**HDD Alarm** > **Alarm**". (Page 74)
- Alarm Duration : Specify the duration of the alarm output with the beep.

Alarm Out Schedule

You can set the conditions and operating hours for scheduled alarms.





- Alarm Out : Sets the alarm output method.
  - For further information on alarm output, refer to "**HDD Alarm** > **Alarm**". (Page 74)
  - <**ON**> : Marked in green, and always generates alarm on scheduled time.
  - <**OFF**> : Marked in black, no alarm is generated even if an event occurs.
  - <**Event Sync**> : Marked in orange, generates alarm only when an event occurs.
- Apply to All Alarm out : Applies the configured schedule to all alarms.

- When the alarm is generated on the scheduled time, you can stop the alarm by canceling the schedule.

NETWORK CONFIGURATION

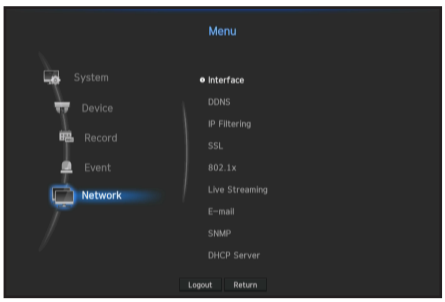
It provides networked monitoring of Live screen from a remote place, and supports mail forwarding function with events. You can configure the network environment which enables such functions.

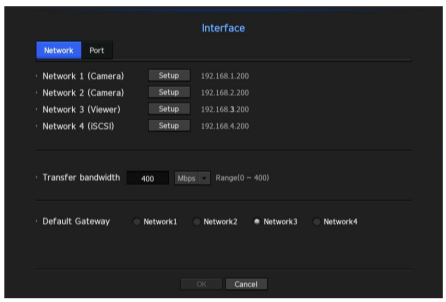
Interface

You can set the network connection route and protocol.

Setting a network connection

Sets the protocol and environment of the network.





- Network 1 (Camera) : Port for camera connections; it receives video from a camera.
- Network 2 (Camera) : Port for camera connections; it receives video from a camera.
- Network 3 (Viewer) : Port used to send video to the web viewer.
- Network 4 (iSCSI) : Port to make a connection to the external iSCSI.
- Network 1 (Camera) / Network 2 (Camera) / Network 3 (Viewer) / Network 4 (iSCSI) setup
  - IP Type : Select a network connection type.
  - IP Address, Subnet Mask, Gateway, DNS
    <**Static**> : You can manually enter IP address, subnet mask, gateway and DNS.
    <**DHCP**> : IP address, subnet mask and gateway values will be automatically set.
    <**PPPoE**> : IP address, subnet mask and gateway values will be automatically set.
  - User ID, Password : If you set the connection mode to PPPoE, you need to enter "**User ID**" and "**Password**" to register in PPPoE.
- Transfer bandwidth : Enter the maximum amount of upload data bandwidth.
  Check the assigned setting in Connection Mode before entering your value.
  - If the sum of the network TX/RX is less than 700Mbps, there is a max transmission rate of 400Mbps.
- Default Gateway : Set the basic gateway by using Network1 / Network2 / Network3 / Network4 setup.

- You can manually input DNS of <**DHCP**> and <**PPPoE**> when it selected to <**Manual**>.

Connecting and Setting the Network

Networking may differ from the connection method, check your environment before setting the connection mode.

When no router is used

- **Static mode**
  - Internet connection : Static IP, leased line, and LAN environments allows connection between the NVR and remote user.
  - NVR Network Settings : Set the <**Network**> in <**Interface**> menu of the connected NVR to <**Static**>.
  - ■ Consult your network manager for IP, Gateway and Subnet Mask.

- **DHCP mode**
  - Internet connection : Connect the NVR directly to a cable modem, DHCP ADSL modem or FTTH network.
  - NVR Network Settings : Set the <**Network**> in <**Interface**> menu of the connected NVR to <**DHCP**>.

- **PPPoE**
  - Internet connection : An PPPoE modem is directly connected to the NVR, where the PPPoE connection requires user ID and password.
  - NVR Network Settings : Set the <**Network**> in <**Interface**> menu of the connected NVR to <**PPPoE**>.
  - ■ PPPoE <**User ID**> and <**Password**> should be the same to the PPPoE user information.
    If you don't know the ID and password, consult your PPPoE service provider.

When a router is used

- To avoid IP address conflict with the NVR's static IP, check followings :

• Setting the NVR with a static IP

- Internet connection : You can connect the NVR to a router which is connected to an PPPoE/Cable modem or a router in a Local Area Network (LAN) environment.

• Setting the NVR Network

1. Set the <**Network**> in <**Interface**> menu of the connected NVR to <**Static**>.
2. Check whether the set IP address is in the static IP range provided by the Broadband Router.
   IP Address, Gateway, and Subnet Mask : Consult your network manager.
   - Check whether the set IP address is in the static IP range provided by the Broadband Router.

- If a DHCP server is configured with starting address (192.168.0.100) and end address (192.168.0.200), you should set the IP address out of the configured DHCP range (192.168.0.2 ~ 192.168.0.99 and 192.168.0.201 ~ 192.168.0.254).

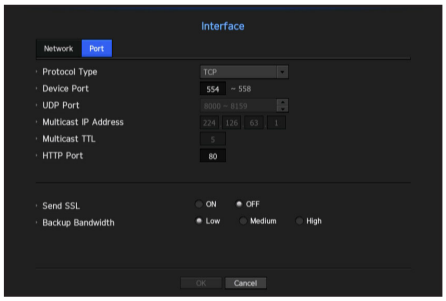
3. Check the Gateway address and subnet mask are equal to those set in the Broadband Router.

• Setting the DHCP IP Address of the Broadband Router

1. To access the Broadband Router's configurations, open a web browser on the local PC that is connected to the Broadband Router and enter the router's address (ex : http://192.168.1.1).
2. At this stage, make the local PC's windows network configurations to the below example :
   Ex) IP : 192.168.1.2
   Subnet Mask : 255.255.255.0
   Gateway : 192.168.1.1
   - Once connected to the Broadband Router, it prompts with password. While entering nothing to the User Name field, enter "**admin**" into the password field and press <**OK**> to access the router configurations.
   - Access the router's DHCP configuration menu and set its DHCP server activation, and provide the start and end address.
     Set the start address (192.168.0.100) and end address (192.168.0.200).

- Above steps may differ from the router devices depending on the manufacturer.

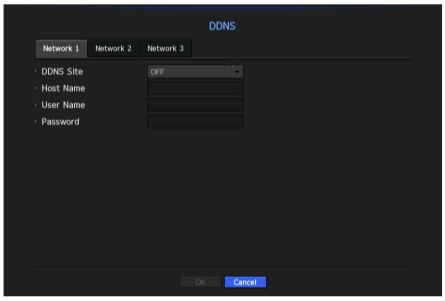
Port Setting

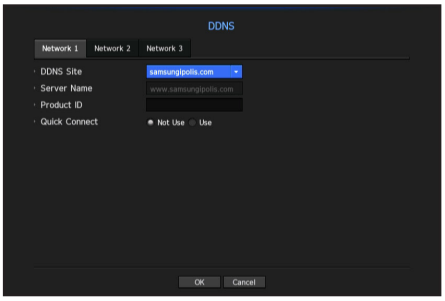


- Protocol Type : Select the protocol type among TCP, UDP - Unicast and UDP - Multicast.
- Device Port : Enter the connectable port number. Initially, <**554**> is set.
  - TCP : It has better stability and lower speed when compared to UDP, and recommended for internet environments.
- UDP Port : Initially, <**8000~8159**> is set. It increases / decreases by 160.
  - UDP : It has less stability and faster speed when compared to TCP, and recommended for local area network (LAN) environments.
- Multicast IP Address : User can directly input.
- Multicast TTL : Select from 0 ~ 255. Initial value for the TTL is set to <**5**>.
- HTTP Port : Enter the port number for the Web Viewer. Initially, it is set to <**80**>.
- Send SSL : Select this option to send SSL.
- Backup Bandwidth : Select the degree of backup bandwidth.

DDNS

If a remote user accesses the network, you can set whether or not to use DDNS and the site to be connected.





- DDNS Site : Specify the use of DDNS and select a site that you registered.
- Host Name : Provide the host name that you registered with the DDNS site.
- User Name : Provide the user ID that you registered with the DDNS Site.
- Password : Provide the password that you registered with the DDNS site.

- Refer to "**Using Virtual Keyboard**". (Page 46)
- If you select <**OFF**>, the input box will be inactive.
- If you select <**iPOLiS**>, the host name input box will be inactive. The user name input box will be active.

- Quick Connect : Appears if the <**samsungipolis.com**> is selected for a <**DDNS Site**>.
  To use the function, set to <**Use**> after connecting the NVR to a UPnP router.

- If canceled during Quick Connect configuration, it automatically switches to <**Not Use**> and saved.

To check Quick Connect status

A progress bar and its message appears for a Quick Connect.

- **Quick Connect Success** : Message for a successful connection.
- **Invalid Network Configuration** : Message appears if the network configuration is not valid. Check the configuration.
- **Please enable UPnP function of the router** : Message appears if the router requires UPnP function enabled.
- **Failed to find the router** : Message appears if the router is not found. Check the router's configurations.
- **Please restart the router** : Message appears if the router should be restarted.

DDNS Setting

DDNS is a short form of Dynamic Domain Naming System.
DNS (Domain Name System) is a service that routes a domain name consisting of user friendly characters (ex : www.google.com) to an IP address consisting of numbers (64.233.189.104).
DDNS (Dynamic DNS) is a service that registers a domain name and the floating IP address with the DDNS server so that the domain name can be routed to the IP address even if the IP is changed in a dynamic IP system.

- **Setting DDNS in the NVR**

  Set <**Protocol Type**> in the <**Protocol**> menu of the connected NVR to the following :

  Ex) Protocol Type : TCP
  Port (TCP) : 554, 555, 556, 557, 558
  DDNS Site : iPOLiS

- **DDNS Settings of the Router**

  Select the corresponding menu for the network transfer protocol of the router.

- **Setting up UPnP of Router**

  Refer to the router's documentation to enable the UPnP function of the router.

IP Filtering

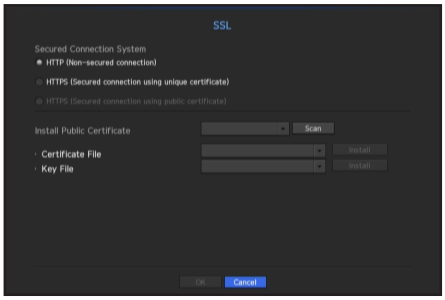
You can prepare the list of IP addresses to allow or block access to a specific IP address.

- Filtering Type :
  - Deny : If you select reject, access to the registered IP address will be limited.
  - Allow : If you choose permit, then they can only access the registered IP addresses.
- Use : Select the checkbox for the IP address that will use IP filtering.
- IP Address : Enter the IP address for filtering.
- Filtering Range : If you enter an IP address or prefix, then the range of IP addresses blocked or permitted will be displayed.

- If a camera's IP address is not included in the Permit list or is in the Reject list access to it will be rejected.

SSL

You can select a security connection system or install public certificates.



- Secured Connection System : You can select a type of security connection system.
  - HTTP (Non-secured connection)
  - HTTPS (Secured connection using unique certificate)
  - HTTPS (Secured connection using public certificate)

- If the NVR device is connected to the external internet or installed in an environment with high priority for security, making a secure connection is recommended.

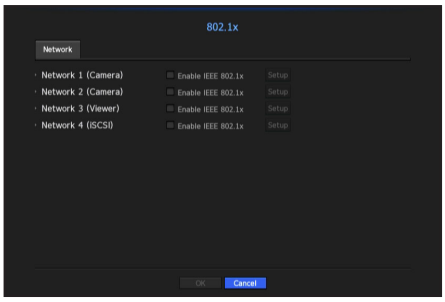
- Install Public Certificate : You can scan and register public certificates to be installed.
  If you want to use a certificate, you need to install a certificate file along with and an encryption file.
  - The <**HTTPS (Secured connection using public certificate)**> menu can be selected only if there is a registered public certificate.

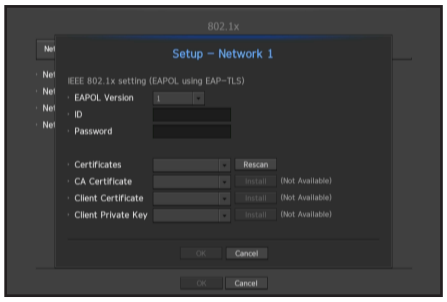
802.1x

When connecting to a network, you can select whether to use the 802.1x protocol and install a corresponding certificate.

802.1x is a certificate system for the server and the client. It can guarantee robust performance against hacking into the Tx/Rx network data, virus or information leaks.

By using this system, you can block access from a client who is not certified and only allow communication to certified users and thus increase the level of security.





- EAPOL Version : Select the EAPOL version to be used as protocol.
  - Some switch hubs will not operate if you set them to version <**2**>. Select version <**1**>.

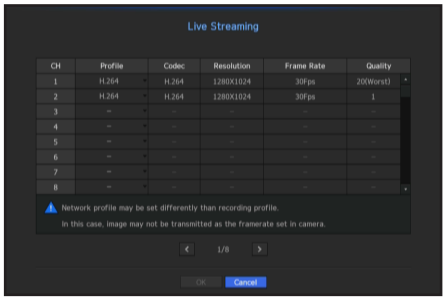
- ID : Enter the ID provided by the RADIUS server administrator.
  - If the entered ID does not match the ID of the client's certificate, it won't be processed properly.

- Password : Enter the password provided by the RADIUS server administrator.
  - If the password you entered does not match that of the client's private key, it won't be processed properly.
- Certificates : Search for a device. Click on <**Rescan**> to search for a device again.
- CA Certificate : Select this only if your public certificate includes the public key.
- Client Certificate : Select if the public certificate includes a client's authentication key.
- Client Private Key : Select it if the public certificate contains the client private key.

- For successful implementation of the 802.1x operating environment, the administrator must use the RADIUS server. In addition, the switch hub connected to the server must be a device that supports 802.1x.
- If the time setting of the RADIUS server, the switch hub and an NVR device do not match, communication between them can fail.
- If a password is assigned to the client's private key, the server administrator should confirm the ID and password. The ID and password allow up to 30 characters each. (But it only supports letters, numbers and special characters ("-", "_", "." 3 types) only.
  Accessing non password-protected files is allowed without entering a password.
- The 802.1x protocol adopted by the NVR is EAP-TLS.
- You need to install all three certificates to use 802.1x.

Live Streaming Setting

You can configure the profile to transfer the live video of each channel via the network.



- Profile : Select a network profile for the connected camera.
- Codec : Show the codec information for the selected network profile.
- Resolution : Display the resolution for the selected network profile.
- Frame Rate : Display the baud rate for the selected network profile.
- Quality : Display the video quality for the selected network profile.

- If the profiles used for network and recording are different, camera's video feed may not comply with the frame rate as specified in the camera.

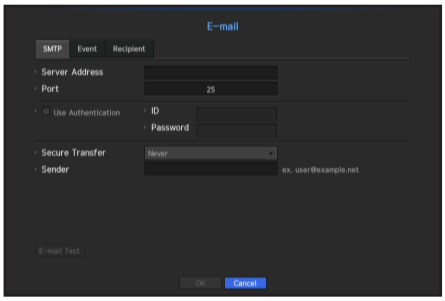
E-mail

You can send an e-mail to a NVR-registered user at a specific time interval, or if an event occurs.

- If the camera is set to <**OFF**> or the channel's event is Video Loss, a notification is sent to the designated email address only in text.

SMTP Setting

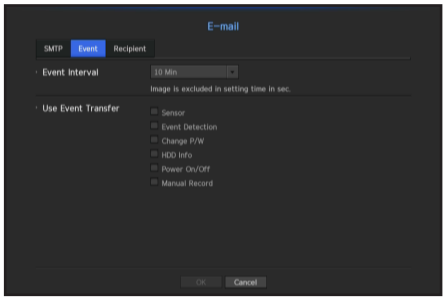
Sets the SMTP mail server.



- Server Address : Enter the SMTP server address to connect to.
- Port : Sets the communication port.
- Use Authentication : Check this if the SMTP server uses user authentication. The account input box will be activated.
- ID : Enter a ID to use authentication when connecting to the SMTP server.
- Password : Enter the password of the SMTP server user.
- Secure Transfer : Select one from <**Never**> and <**TLS (if available)**>.
- Sender : Use the virtual keyboard to enter the sender's e-mail address.
  - Refer to "**Using Virtual Keyboard**". (Page 46)
- E-mail Test : Conducts the test on the server settings.

Event Setting

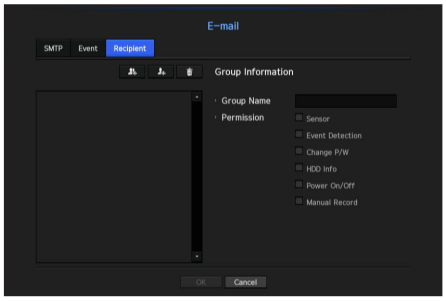
You can set the interval and type of the event that will be sent to the user.

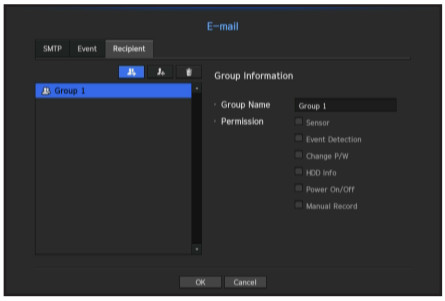


- Event Interval : Set the event interval.
  - If a series of events occurs, the e-mail will be sent at the specified interval, not on each event.
- Use Event Transfer : Select an event type to send if an event occurs.
  If the selected event occurs, the e-mail will be sent to the group that has the recipient authority.

Recipient Setting

You can create a group and add users to it or; you can delete users and change a group.

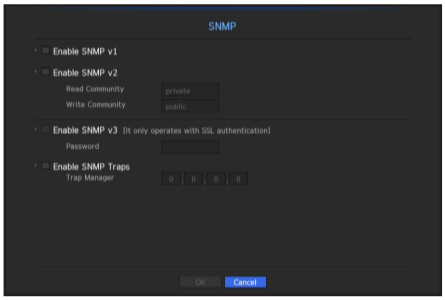




- Click on < > to add a group.
  Select a group name and the privilege.
- Select a recipient group to receive emails.
  If a group is added, it will appear in the group list.
- Click on < > to add a recipient.
  Select a group and enter names and email addresses.
  If a group is created, you can add a recipient.
  - For inputting the recipient name and email address, refer to "**Using Virtual Keyboard**". (Page 46)

SNMP

Using the SNMP protocol, the system or network administrator can monitor the network devices remotely as well as the operating environment.



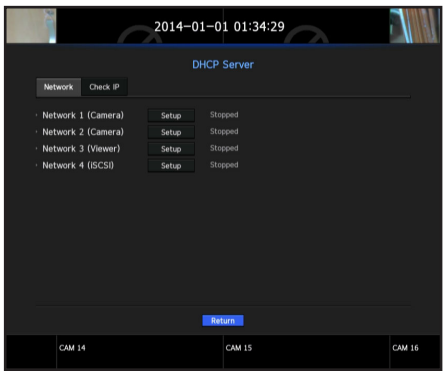
- Enable SNMP v1 : SNMP version 1 is used.
- Enable SNMP v2 : SNMP version 2 is used.
  - Read Community : Enter the name of read-only community to access the SNMP information. By default it is set to <**private**>.
  - Write Community : Enter the name of write-only community to access the SNMP information. By default, it is set to <**public**>.
- Enable SNMP v3 : SNMP version 3 is used.
  - Password : Set the initial user password for SNMP version 3.
- Enable SNMP Traps : SNMP trap is used to send important events and conditions to the Admin System.
  - Trap Manager : Enter the IP address to which messages will be sent.

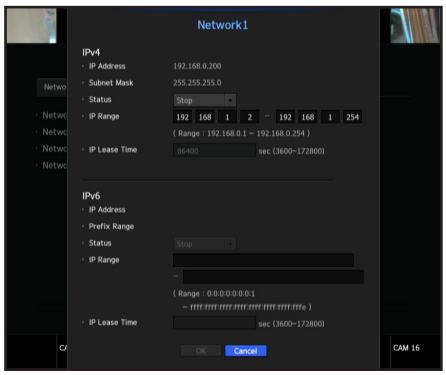
- SNMP v3 can be set only if the security connection method is set to HTTPS mode.
  Refer to "**SSL**" for more details. (Page 91)

DHCP Server

You can set the internal DHCP server and assign an IP address to the network camera.

Network Setting





- Network 1/2/3/4 : Select <**Setup**>, and you can set the IP range operated by the server and time.

To set the DHCP server

1. On the DHCP Server Setup window, click <**Setup**>.
2. Select <**Run**> in the <**Status**> field.
3. Enter the starting IP and end IP in the <**IP Range**> field.
4. Fill in the <**IP Lease Time**> field.
5. Click <**OK**>.
   The IP range entered is set as the DHCP server address of the network.

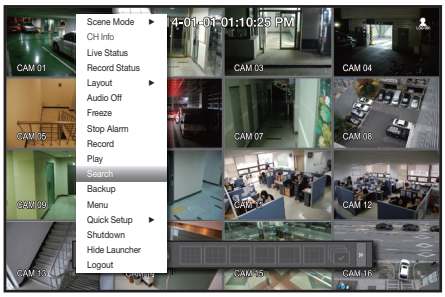
Check IP

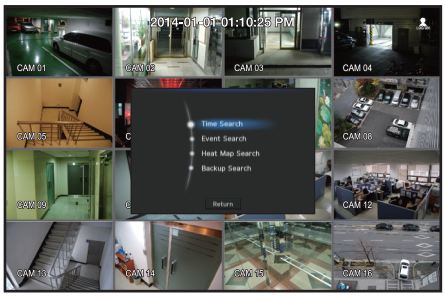
You can check the IP Address and Mac currently used through the DHCP server, and the connected network port.

- Network : Select the network port to check the information on IP and others.

SEARCH

You can perform the search for recorded data by the time or by the search criteria such as an event.
You can access the <**Search**> menu directly in Live mode.



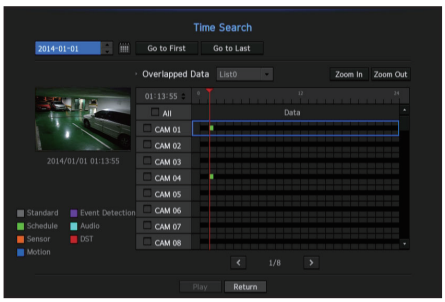


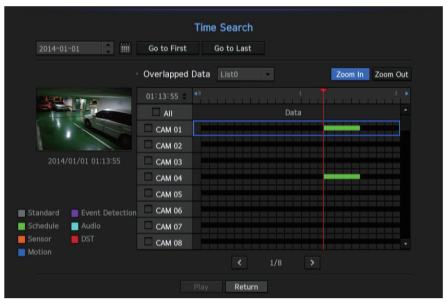
1. In live mode, right click with your mouse button.
   The Live menu appears.
2. Select <**Search**>.
3. The Search menu should appear.
4. The search can be restricted by the Auto Delete function.
   Refer to "**Setting the Recording** > **Record Option**". (Page 80)

- Overlapped data : It only appears if there exists overlapped data on a certain time, produced due to the change of NVR's time setup. The latest data comes first, from <**List0**>.
  It does not appear in <**Backup Search**>.
- The search time is based on the time specified by NVR.

Time Search

You can search for recorded data of a desired time.
The displayed time is based on the local time zone and the daylight saving time (DST). Therefore, data recorded at the same time from different areas may differ based on the time zone and the DST.





1. Select <**Time Search**> in the <**Search**> menu.
2. In the date selection window, click on the < ⬍ > button to select a search date.
   - For using the calendar, refer to "**To use the calendar**". (Page 45)

3. The record data on the specific date will be listed.
   The display bar is different according to the data type. So check the data type for the color in the left pane.

- If DST (Daylight Saving Time) is configured, overlapping multiple recordings may be produced for a certain moment of time. Such a time section is distinguished with red color to mark DST section.

- Go to First : Move to the earliest recording date.
- Go to Last : Move to the latest recording date.
- Time : Enter a time to perform the search or use the up/down button <⬍> to select one.
- Zoom In : The map enlarges in detail.
  It will switch in the sequence of 24hours - 12 hours - 6 hours - 2hours - 1hour.
- Zoom Out : The map will switch in the reverse order of the detailed mode above.
  It will switch in the sequence of 1hour - 2 hours - 6 hours - 12 hours - 24 hours.
- Preview : Click <**Channel**> and select (click, drag) a time in <**Duration**> to display a still image for the portion.
  - If the selected channel does not contain any recorded data, it will be marked black.

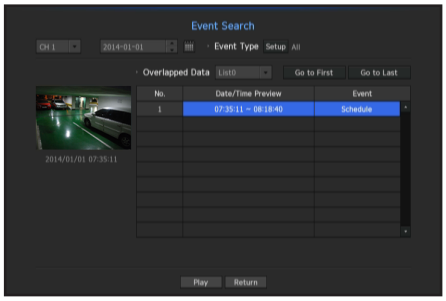
4. Select a data item and click <**Play**>.
   The screen switches to the data playback mode.

Color indications depending on current recording status

The recorded data types are represented through the use of different colors. Each color corresponds to a certain recording type.

Event Search

You can search for events by the channel and play them.



1. Select <**Event Search**> in the <**Search**> menu.
2. Set the channel, search date, and search condition items.
   - Depending on the menu selected, it will search for all/motion detection/video analysis/audio detection/sensors/reservation/general recording events.

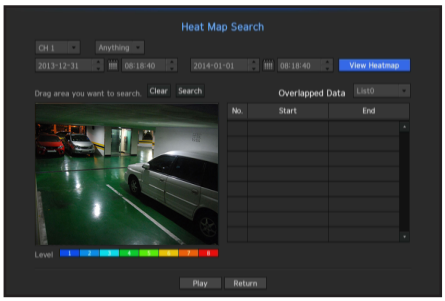
- Date/Time Preview : If you select a data item in the list, the still image of the selected data will be displayed in the left preview pane.
- Event : Displays the type of the event that occurred.

3. Select a data item and click <**Play**>.
   The screen switches to the event data playback mode.

Heat map search

Using the heat map search function, you can check the frequency of all events such as humans, cars, and humans/cars through the use of eight different colors.

After checking the heat map search results, in the preview screen you can set the area to check information of the events that occurred in it.



1. In the <**Search**> menu, select the <**Heat Map Search**> item.
2. You can select a channel and target for searches (Ex.-cars, person, or Anything).
3. In the date selection window, click on the < ⬍ > button to select a search date.
   - For more details refer to "**To use the calendar**". (Page 45)
4. Select the time interval data for your search.
5. Press the <**View Heatmap**> button to check the frequency of all events such as humans, cars, or Anything in the eight different colors.
   - Level 1 : Event frequency low ~ Level 8 : Event frequency high
6. In the heat map search results, drag your mouse to the area that you want to search events for.
   - Multiple areas can be selected.
7. Press the <**Search**> button to display the event search results for the area.
8. After selecting an event searched, press the Play button to start playing video before the search time.
   - Press the <**Clear**> button to initialize the user setting area selected for event searches.

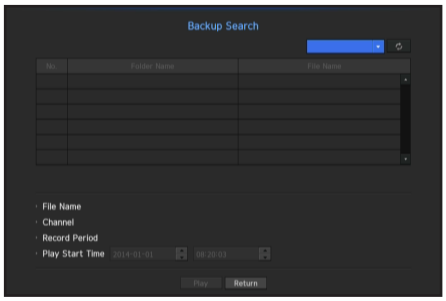
To make sure the heat map function operates properly

- The human/car classification function performs at an optimal level when the camera installation angle is set between 30 and 60 degrees.
- It is recommended to install a camera at the height where the full aspects of recorded objects can be seen.

- If you set the camera location to <**Outdoor**> then the car/person classification function will operate. If you set it to <**Indoor**>, the heat map cannot display detection results for cars.
  For more on camera location settings, refer to "**Event Detection**". (Page 82)
- When the AMD event is set, you can perform heat map searches for the channels being recorded at the same time.
  For more on AMD event settings, refer to "**Event Detection**". (Page 82)

Backup Search

Searches for backup data in the connected backup device.
Only data in the format of NVR is included in the search.



1. Select <**Backup Search**> in the <**Search**> menu.
2. Set the channel, search date, and search conditions.

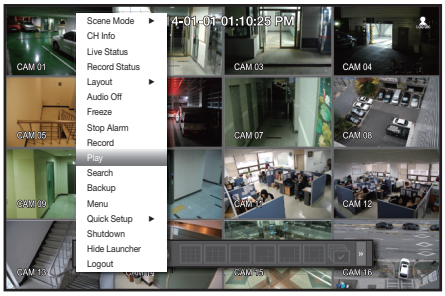
- Channel : Displays the recorded channel.
- Record Period : Displays the record period.
- Play Start Time : Select a time that you start playing.

3. Select a data item and click <**Play**>.
   The screen switches to the backup data playback mode.

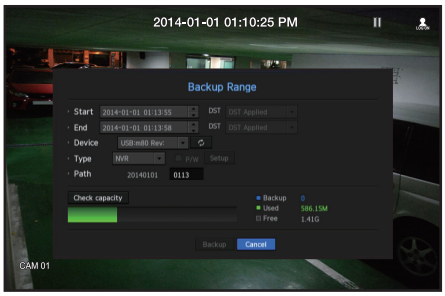
PLAYBACK

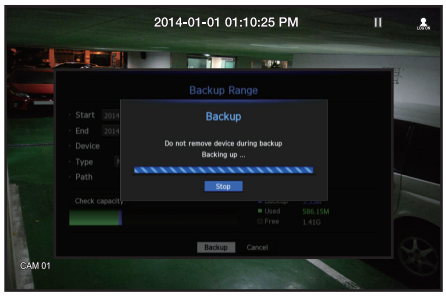
Play

You can play data stored in the HDD and backup a desired portion of the data.



1. In the live screen menu, select the <**Play**> menu or click on < ▶ > in the launcher menu.
2. Select a menu for searches.
   - If this is the first time you try to play, you will start with the data search window.
     For data search, refer to "**Search**". (Page 97)
3. Select a data item and click <**Play**> in the Search menu.
   The selected data is played and the play launcher appears on the screen.
   - If there is an existing data, <**Play**> will start immediately without performing the search.

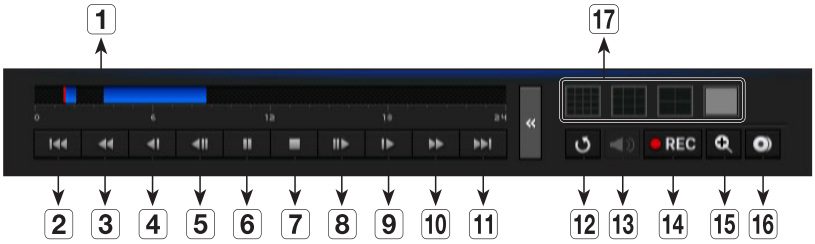




- Playback Information : Displays the date and time of the current data in the top corner.
- Backup : Click < ◉ > to set the current time to the start time of backup; you can specify a backup area using the mouse (yellow triangle).
  Click < ◉ > again to set the current time to the end time of the backup and the "**Backup Range**" window appears.
  - Type : Supports formats of NVR and SEC.
  - Device : Select a backup device.
  - Check Capacity : Enables you to check the capacity of the selected storage device.

4. If you want to go back to the live screen during plays, then click on < ■ > of the launcher menu.

Using the Playback Button

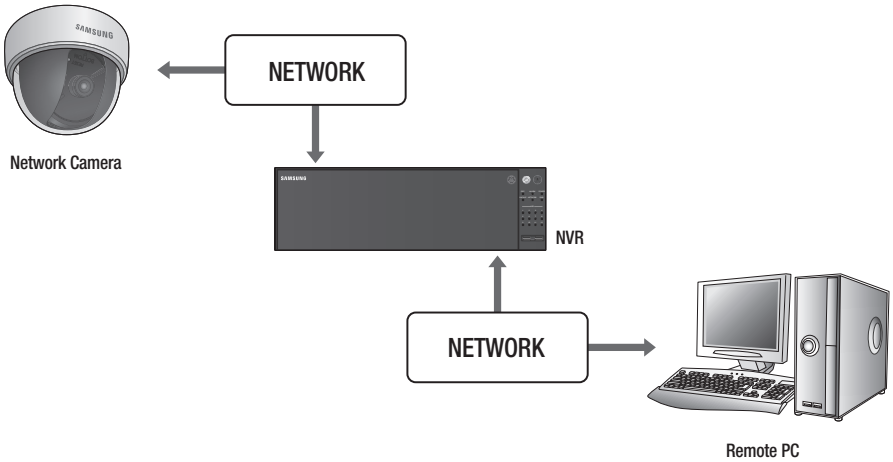


Name		Description
1	Play Timeline	Indicates the current playback point, and can be used to move.
2	Skip Backward	Moves backward by unit time.
3	Backward Fast Play	Used for quick backward search while in Play.
4	Backward Slow Play	Used for backward frame-by-frame search while in PAUSE.
5	Step Backward	Moves backward by one frame at a time.
6	Pause	Stops playing the current video temporarily.
7	Stop	Stops playback and moves to the live screen.
8	Step Forward	Moves forward by one frame at a time.
9	Forward Slow Play	In a split mode, the real time playback may not be supported, depending on the record quality, resolution and number of channels. And some frame rates may be supported.
10	Forward Fast Play	Used for quick forward playback.
11	Skip Forward	Moves forward by unit time.
12	Return	Return to the search setup screen.
13	Audio	Sets Audio ON/OFF.
14	REC	Records all channels in Live mode.
15	ZOOM	This is available in Single mode, which will enlarge the video from a selected channel. To cancel the zooming, simply double-click the enlarged image or select <**Close Zoom**> in the Live screen menu.
16	Partial Backup	Begins backup of the selected section of the video being played, with the specified starting/ending point.
17	Mode Switch	Click on a desirable play mode to change the screen segmentation mode.

starting web viewer

WHAT IS WEB VIEWER?

WebViewer is a software program with which the operator can access a remote NVR (Network Video Recorder) for real-time monitoring, PTZ control (if configured) or search.



Product Features

- Remote connection using the browser
- PTZ camera control enabled
- Supports 1, 4, 9, 16, 25, 36, 64 camera viewing formats (maximum of 64 cameras in the list).
- Saving function in JPEG/BMP/PNG image format for printing and storage.
- Record video in AVI format-compatible with popular media players. (The integrated codec is needed)
- To play the video in Windows Media Player, you must download and install the relevant codec from www.windows7codecs.com. (version 4.0.3 or higher)

System Requirements

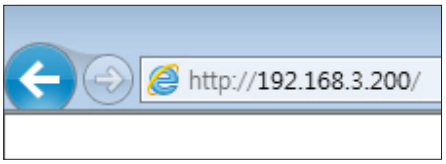
The following lists the minimum suggested hardware and operating system requirements needed to run the Web Viewer.

Item	Minimum	Recommended
CPU	Intel Core 2 Quad 2.5GHz or higher	Intel i7 (3.5GHz) or more
RAM	3GB or more	4GB or more
HDD	200GB or more	500GB or more
VGA Memory	512MB or more	1GB or more
Display Resolution	1280 x 1024 or higher	
OS	Window XP(service pack 2 or above), Vista, 7, 8, Mac OS X(10.6 or above) OpenGL (GPU Accelerator supported) Web browser Windows environment : Latest security patch, IE 8 or higher with bug patches (IE 9 recommended), IE 10, Chrome 26.x or higher, FireFox 19.x version or higher Mac OS X environment : Latest security patch, Safari 6.0.3 or higher with bug patches	
Network	10/100/1000 Ethernet NIC	

starting web viewer

CONNECTING WEB VIEWER

1. Open your web browser and type the IP address or URL of NVR into the URL address box.



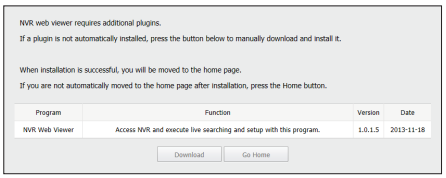
- You need to connect network 3 before you can access the web viewer.
- "**192.168.3.200**" is set to IP by default.
- You must have specified the IP address in "**Network** > **Interface**".
- The URL connection will be enabled only when the DDNS connection settings have been completed. For more information, refer to "**Network Configuration** > **DDNS**". (Page 89)

2. A user with the admin permissions should provide the admin ID and password. A registered user should provide the user ID and password.

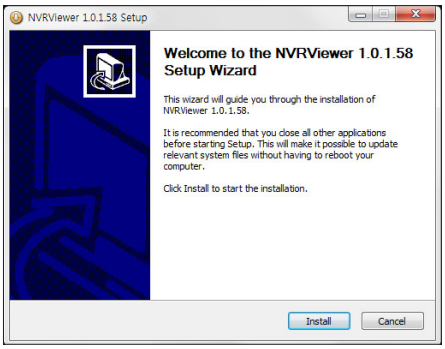
- The initial ID and password for webviewer is "**admin**" and "**4321**". When an initial password is entered, while partially resetting to access a web viewer, a pop up window will appear that will guide the user to change the password and when doing a whole reset to access a web viewer, a pop up window will appear that will guide the user to complete the settings for the Install Wizard. Set a new password when a pop up window appears.
- Set password for your wireless network if you use the product with a wireless router. Being not protected with password or using the default wireless router password may expose your video data to potential threat.
- Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.
  Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

- It allow s up to 10 simultaneous access including the Admin and general users.
- Password of the Admin and general users can be changed in <**User**> menu of the NVR.
- Normal users should have set <**Webviewer**> under <**Restriction on Network Access**> to Use before connecting to the Web Viewer. (Page 48)
- All settings are applied by the NVR's settings.

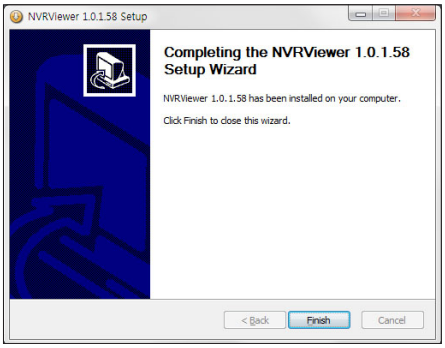
3. The plugin installation confirmation pop-up window will appear.



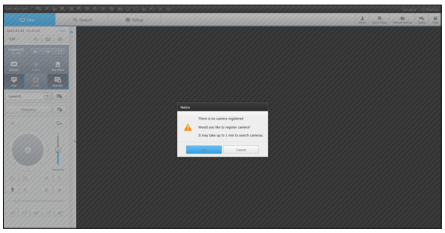
4. When a program installation wizard window appears, press the [**Install**] button to install the program.
   - The version of the program installed may vary depending on the update version.



5. When program installation is complete, click on the [**Finish**] button.



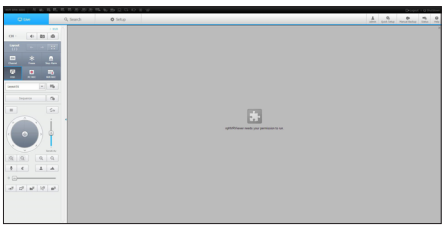
6. When installation is complete, and you log in successfully, before the live viewer main screen appears, the camera registration <**Notice**> pop-up window will appear.
   To register a camera, press the <**Yes**> button.
   - For more on how to register a camera, refer to "**To register a camera**". (Page 55)

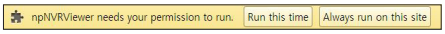


If you want to access the web viewer with multiple browsers

Set auto execution of plugin (npNVRViewer) in the browser menu that you first access and refresh the screen after activating the plugin or selecting plugin reliability.

- Each time the browser is upgraded in the future, the plugin activation method can be changed. Plug in setting menu can be referred to in the browser manual.



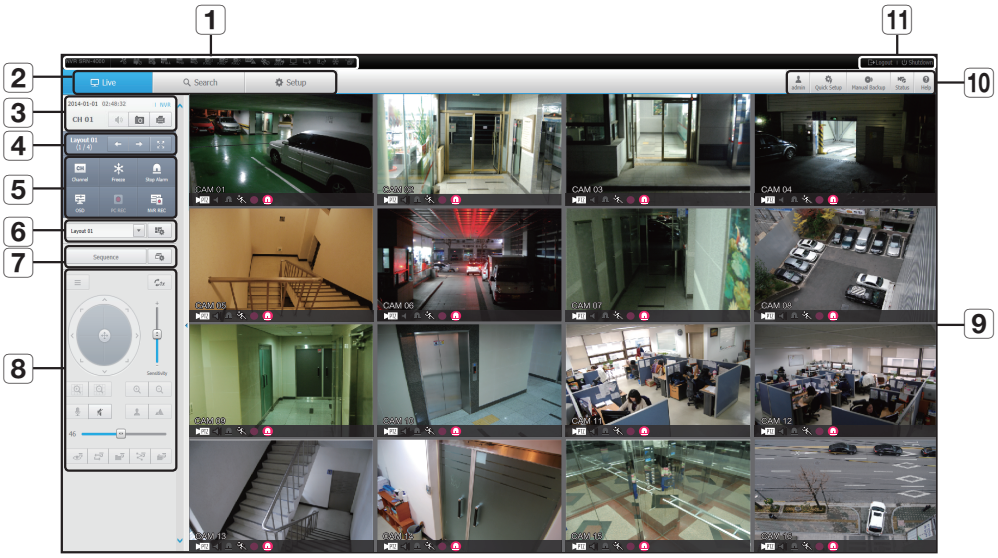


- For chrome browsers, "**Plug in is not activated. Please select 'Always run on this site' and refresh**", then select the '**always execute on this site**' button in the top of the browser.

LIVE VIEWER

You can check the video from camera registered in the NVR connected from a remote PC. Also, you can adjust the camera and check the network transfer status.

Live Viewer Screen



Menu		Description
1	System Stauts Indicator	Displays icons to display the screen or system status.
2	Menu Selection	Switches into corresponding menu screen by clicking each menu.
3	Date/channel	Shows the access date/time and the selected channel.
	Sound	Sets the sound connected to each channel to either ON/OFF.
	Capture	Saves current video for the selected channel in the path designated by the user.
	Print	Prints current video image for the selected channel through designated printer.
4	Channel change/full screen	Switches to the previous/next channel group. Switch from the full screen to the split screen.

Menu		Description
5	Channel information	Shows the channel information selected.
	Pause	Temporarily stops the videos in all the channels or deactivates the Pause function in suspending status.
	Stop Alarm	Deactivates an alarm when it occurs.
	OSD	Check the OSD item to display the OSD screen information in the web viewer window.
	PC recording	Saves the real-time video, in AVI format, from the selected channel in a designated folder on the PC.
	NVR recording	Start and stop NVR recording.
6	Layout setting	Set the layout.
7	Switching	Set the sequence.
8	PTZ	Controls connect PTZ camera(s).
9	Display Pane	Displays the video of camera connected to NVR.
10	ID	Display the ID of user connected.
	Quick setup	Simple camera registration and recording settings.
	Manual backup	Manually backup the video of the camera connected.
	Status	Shows the camera live and recording status.
	Help	Move to the help window.
11	Logout	Performs logout process.
	Close	Turn off the NVR system.

LIVE SCREEN CONFIGURATION

System Status

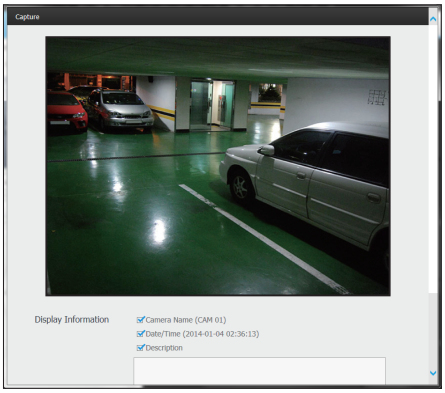
You can check the status or operation of the NVR with the icons on the live screen.

Item		Description
System Operation		It is displayed when there is a problem with the fan.
		It is displayed when there is a problem with the power supply.
		It is displayed when there is an issue with the recording conditions.
		Displayed if the HDD is full and the NVR has an insufficient space to record.
		Displayed if no HDD is installed or the existing HDD should be replaced.
		Displayed if the HDD needs a technical examination.
		It is displayed when there is a malfunctioning HDD in the RAID. ■ There are one or two HDD malfunctions but you can still read or write to it.
		It is displayed when recovering an RAID Error.
		It is displayed when you cannot write RAID due to a malfunction of HDD.
		It is displayed when the max permitted amount of data for each channel is exceeded.
		It is displayed when due to a network performance degradation (10fps or less), the AMD function fails.

Item		Description
System Operation		It is displayed when an iSCSI device is disconnected.
		It is displayed when the network is overloaded. It is displayed when the network is overloaded. ■ It occurs when the max receiving performance is exceeded, causing an overload to the CPU. It will disappear if you modify the camera setting or delete a camera to reduce the level of performance overload.
		It is displayed when there is firmware to update the server. It is displayed when there is firmware to update the server.
		It is displayed if the battery level for an NVR device is empty.
		If you press the screen stop button, it is displayed.
		It is displayed when all the channels are switched at the set time interval.

To capture a screen

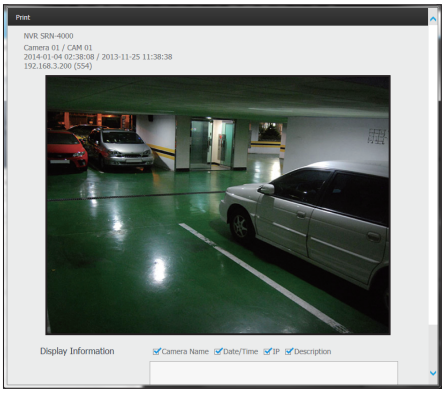
1. Click < > button.
   When a pop-up window appears, select the saving path for captured image.
2. Select the path and name the file. And then click the [**OK**] button.
3. Save current camera's video image as .bmp, .jpg or .png file.



■ If the viewer is running without the administrator's permission in Windows Vista/7, you may not save the captured image as .bmp, .jpg or .png file.

To print a screen

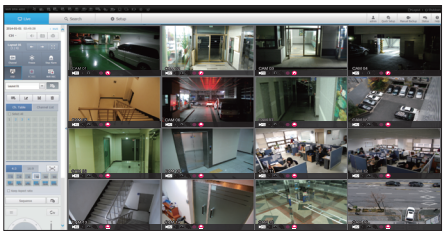
1. Click < > button.
2. Print current camera's video image with the printer connected to the PC operating the Web Viewer.



Setting the layout

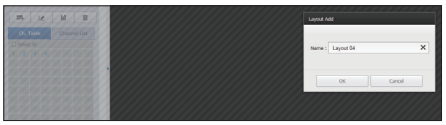
If you don't add or save it in the layout after registering a camera, the live screen will not be displayed.

Click on the < > button to launch the layout setting screen.



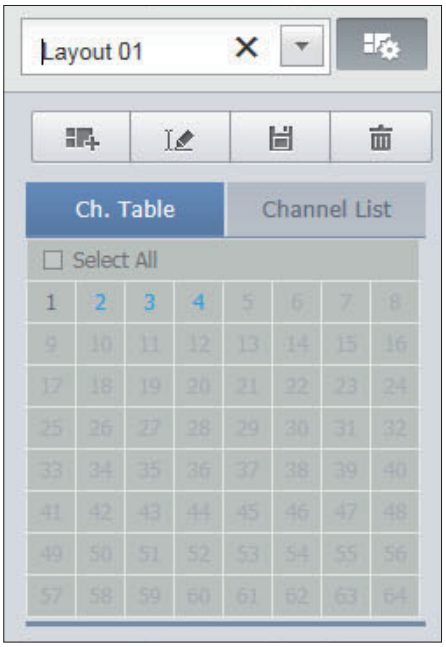
If you want to add a layout

Click on < >.
Set the layout name to add and click on the <**OK**> button to add it.



If you want to change the layout name

Select the layout name to change and click on < >.
After changing the name, click on the outside of the layout window to change the name.



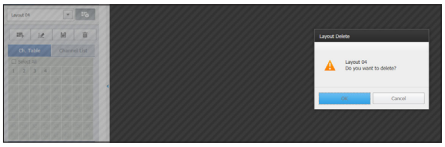
If you want to save the layout

Click on < >.
The changed layout will be saved.

- The layout for each user is saved separately.

If you want to delete the layout

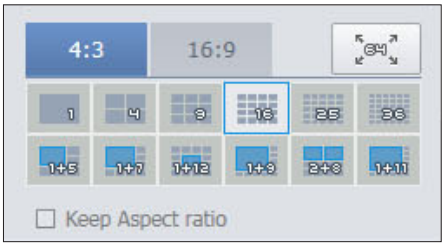
After selecting the layout to delete, click on < 🗑 >.
The selected layout will be deleted.

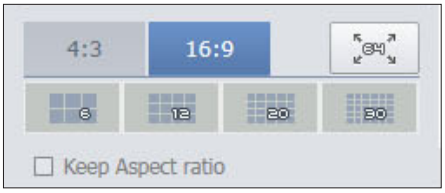


- Unless you press the Save or Delete button, changes will not be saved.

Changing Split Mode

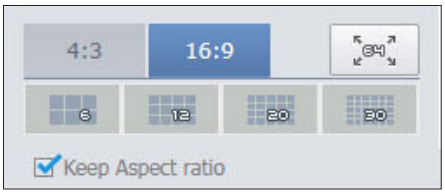
When clicking the Split Mode selection button, the screen is changed into the selected split mode.





If you want to maintain the current screen ratio

When you change from a split screen, check <**Keep Aspect ratio**> to maintain the ratio and change to a different size.



To go to your desired channel screen

Press the < ← → > button to move to the previous/next channel group.

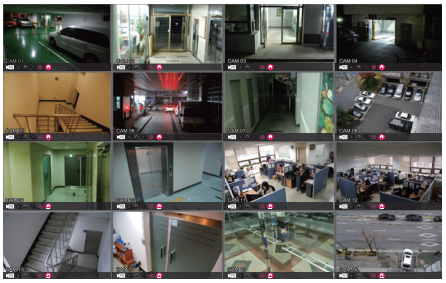
To switch to full screen mode

Click < >.

Current split screen appears in full screen.

Press the [**ESC**] key to exit the full screen mode.

- MAC Safari does not support full screen.



Click on < >.

To switch from the 64 channel split screen to the full screen.

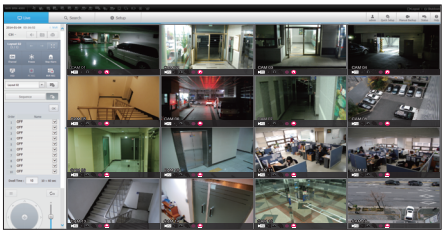
To exit full screen, press the [**ESC**] key.

Setting screen switching

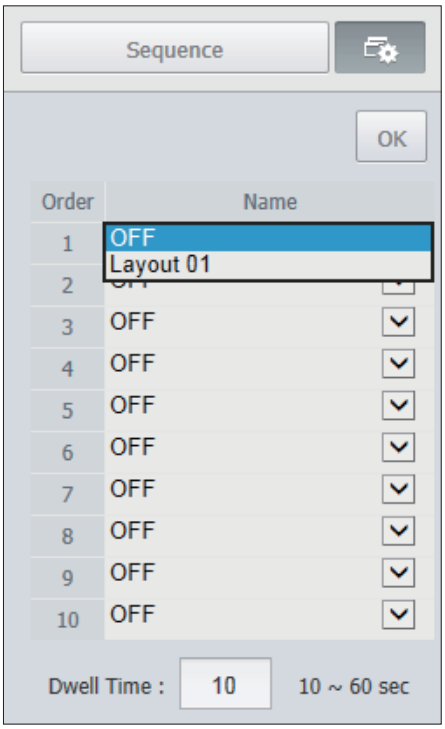
If you don't register the layout, the screen switching function will not operate.

You can view the layouts one by one.

Click on the < > button to launch the switching setting window.



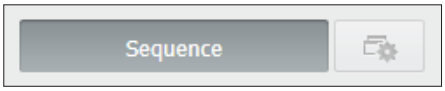
1. Select the layouts to be shown in turn by pressing < >.
2. Enter the screen switching time.



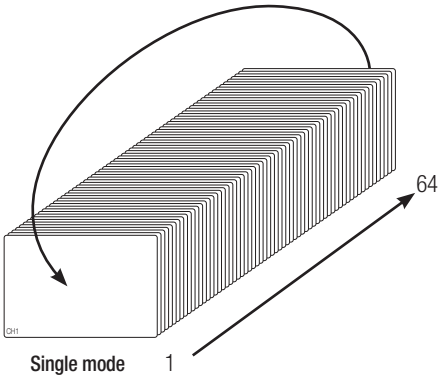
3. Click on the <**OK**> button to save the designated sequence.

To perform switching

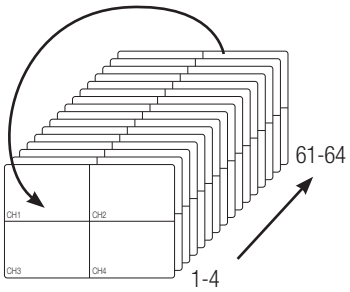
Click on the <**Sequence**> button to activate the switching mode and run a sequence.



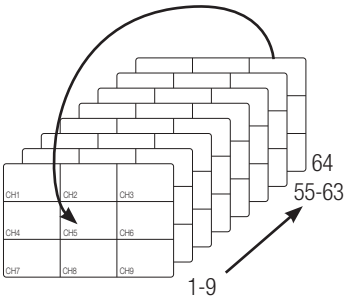
Auto Sequence



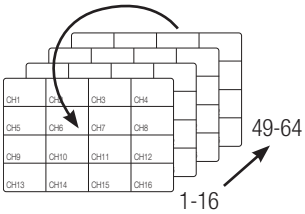
Single mode



4-split mode



9-split mode



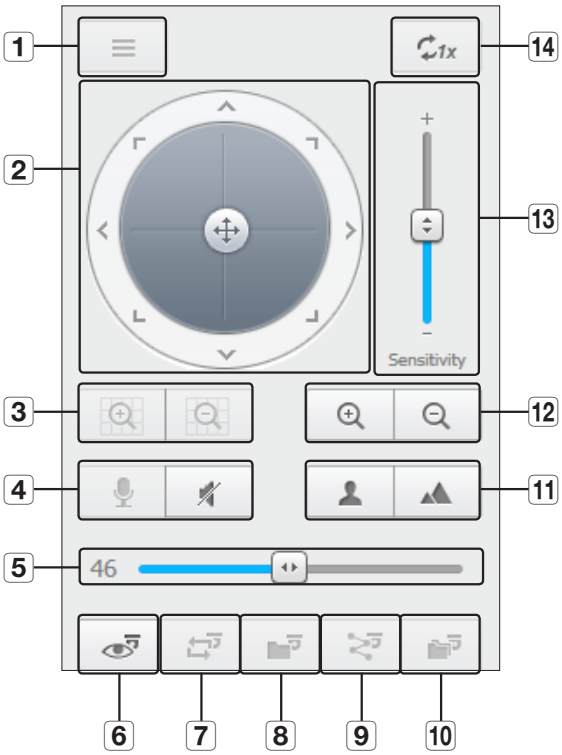
16-split mode

- In a split mode, If you have set <**Sequence switching time**> in "**Device** > **Monitor**", Auto Sequence will be conducted at the set interval. (Page 75)
- When switching to another channel, the video may be slightly delayed depending on network status.
- If you perform automatic switching of a single screen, the layout setting menu will be deactivated during operation.

CONTROLLING A CONNECTED NETWORK CAMERA

Controlling PTZ

If PTZ camera is connected, the < PTZ > icon appears on screen. When selecting corresponding camera channel, the PTZ tab is provided to allow you to control the PTZ.

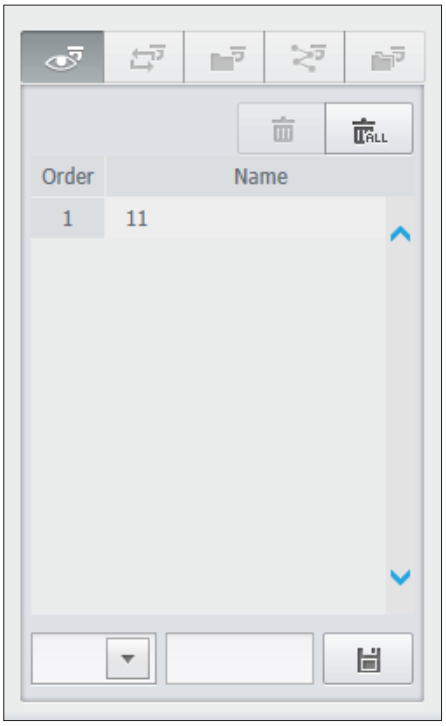


Item		Description
1	Camera menu	Displays the camera settings menu.
2	Direction Adjustment	Use this to adjust the direction of the camera or click the crosshair in the center to use it as an OK button.
3	Digital zoom	Adjust digital zooming to make an image larger or smaller.
4	Sound	You can set the camera audio torque and mute.
5	Volume control	Change the PC volume between 0 and 100.
6	Preset	Sets the preset position for camera framing and moves to designated preset position when selecting a desired preset.
7	Swing	Moves between the preset start point and end point.

Item		Description
8	Group	Moves in the path specified by combining the preset.
9	Trace	Moves camera's framing in the predefined path.
10	Tour	Moves in the path specified by combining multiple groups.
11	Focus	Adjusts the focus of the camera.
12	Zoom	Zooms in/out the image by controling camera's zoom.
13	Sensitivity	Adjust the sensitivity of your camera operation.
14	Digital Zoom Off	Returns to the original size from the zoomed state.

To set a preset

1. Click < > button to display "**Preset**" window.
2. Click on < > to select the preset order.
3. Enter the name of preset.
4. Use direction keys to adjust the direction which camera aims at.
5. Click the < > button.



To activate the preset

1. Click < > button to display "**Preset**" window.
2. Select a desired preset to activate from the list.
   The camera's framing moves to the preset position.

To activate Swing(Auto-pan), Group(Scan), Trace(Pattern) and Tour

You can activate listed functions in the same manner as using a preset. For more information, refer to corresponding user manul of applicable camera.

- Only selective functions of the camera can be supported, depending on camera.

SEARCH VIEWER

You can search and play the video record saved in NVR by accessing NVR remotely.

Search Viewer Screen

Item		Description
1	**Menu Selection**	Switches to the corresponding menu screen by clicking each menu.
2	**Calendar**	Displays the video-recorded date in blue and today in red. Click the date in blue color to display the recorded video information in timeline.
3	**Channel selection**	Displays the search channels.
4	**Search**	Search for the user designated channel for the selected date.
5	**Channel displays**	Display the selected channel number.

Item		Description
6	Sound	Sets the sound connected to each channel to either ON/OFF.
	Capture	Saves current video for selected channel in the designated path.
	Print	Prints current video image for selected channel through the assigned printer.
	Section backup	Backup the video for the selected section.
	Magnify/Shrink	Magnify or shrink the current video for the selected channel.
	OSD	Displays the channel information.
	Full screen	Show the four way split screen in the full screen.
7	Sound control	Adjust the audio for the video searched.
8	Recording Color	Displays the corresponding color depending on recorded data type if you place your mouse cursor on that area.
9	Display Pane	Plays corresponding data on the screen if you select a search result.

To search by date

You can select the search date by using calendar.

1. Click on < <, > > to select the year/month for your search.
   If a date has data associated with it, it is displayed in blue. The current date is displayed as a blue box.
2. Click the date to search in calendar.
   The first image of searched video data on the date is displayed on screen and the data is displayed in the timeline.
3. To search video data on today, click <**Today**>.
   Today's date is selected.

Color indications depending on current recording status

Displays the corresponding color according to the recorded data type.

- If 2 or more kinds of recording type are mixed for the same timeline, only the recording type with higher priority is displayed. (Priority: Standard > Motion > Schedule > Sensor > Camera Event > Audio Detection > DST)

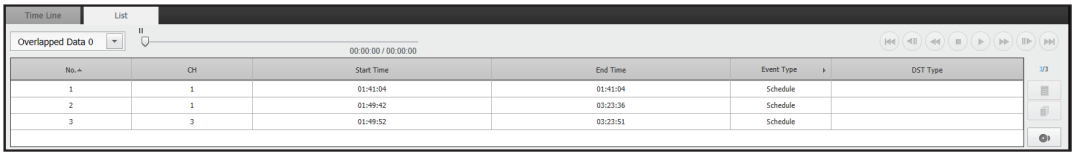
To adjust timeline

If searched data are overlapping, you can select a desired data, move its playback time point, and zoom in/out the timeline.

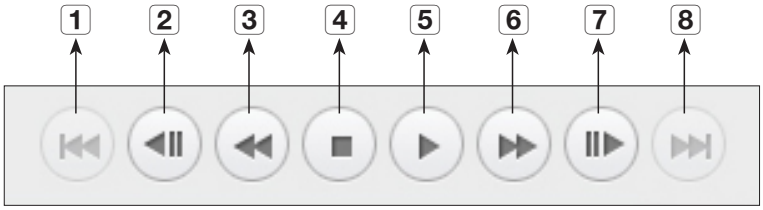
1. Select the number of data to search if data is overlapping.
   It appears only when data are overlapped and assigns <**0**> to the most recent data.
2. Click your desired time point to play on the timeline.
   The playback start point is moved.
3. Click <**+**> / <**-**> to zoom in/out the zoom factor to display time.
4. When magnified, if you want to view the pre/post timeline, click on the timeline and drag it in the direction you want to move it.

If you want to check the recording list

The results for each recording section will be displayed.



Names and Functions of Play Buttons

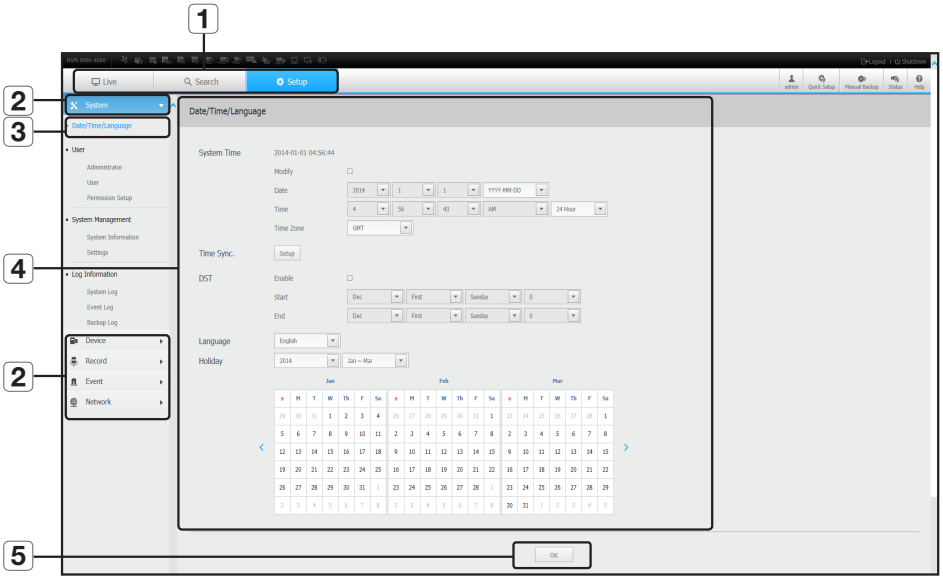


Item		Description
1	Back	Returns to the previous event.
2	Previous frame	Move backward one sec.
3	Backward X times speed playing	Used to rewind at X times the speed.
4	Stop	Stops the video replay.
5	Play/Pause	Video is played and paused.
6	Forward X times speed playing	Play the video forward at X times the speed.
7	Next frame	Move forward one sec.
8	Move forward	Proceeds to the next event.

SETUP VIEWER

You can configure the NVR settings remotely on the network.
To configure the NVR settings, click <**Setup**>.

Settings Screen



Item		Description
1	**Menu Selection**	Click each menu to switch into corresponding menu screen.
2	**Parent Menu**	Configure the settings or select a parent item to change the existing settings.
3	**Sub-Menu**	Among the sub-menus of selected parent menu, select a desired item to set.
4	**Detailed Menu**	Click desired item's input field to change and enter a desired value.
5	**OK**	Apply the modified settings.

System

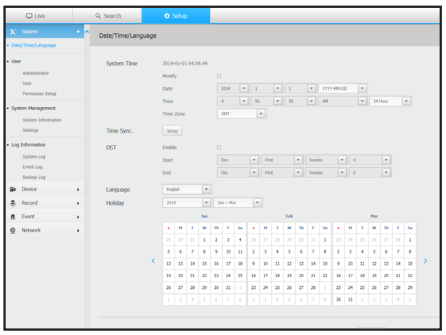
You can configure the various settings of the NVR system.

Date/Time/Language

For more information, refer to "**Date/Time/Language**" in the "**System**" menu. (Page 44)

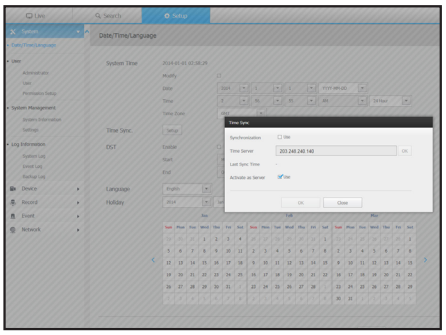
Date/Time

Set the date and time.



Time Synchronization Setup

Set the time synchronization.



DST (Daylight Saving Time)

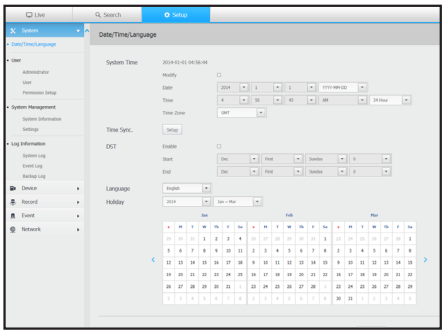
During the summer, Daylight Saving Time (DST) advances clocks one hour forwards from the standard local time zone.

Language

Select a preferred language for the NVR.

Holiday

A user can select specific dates as holidays according to their own preferences.



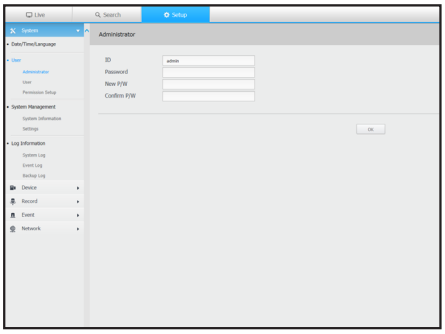
Permission Management

For more information, refer to "**User**" in the "**System Setup**" menu. (Page 46)

Administrator

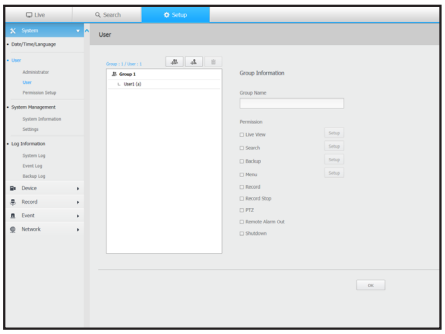
You can change the admin ID or the password.

- ID allows alphanumeric characters only.
- If the admin ID is not used for access, you cannot change the ID.
- If the ID being used is changed, you will be automatically logged out.



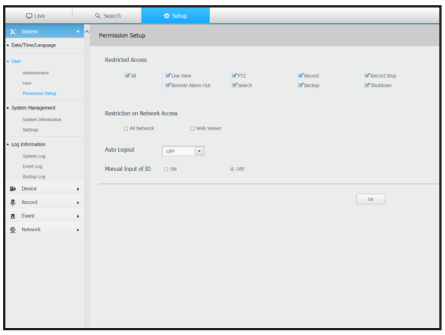
User

You can add, change or remove a user or users.



Permission Setup

You can set the user permission.

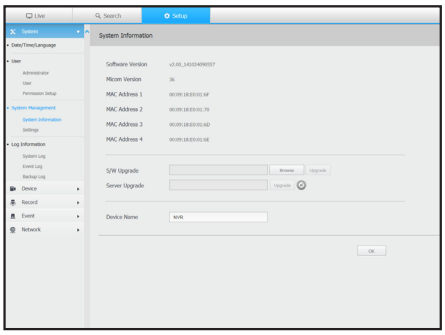


System Management

For more information, refer to "**System Management**" in the "**System**" menu. (Page 50)

System Information

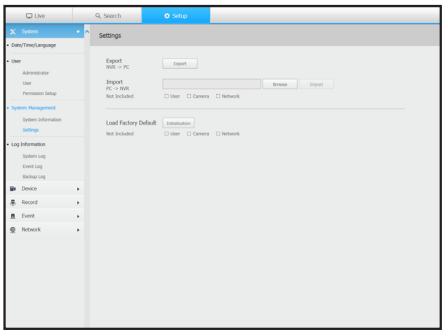
You can see information of the current system.
Check the software version and MAC address.



Settings

Using a storage device, you can apply the current configuration of NVR to another NVR.

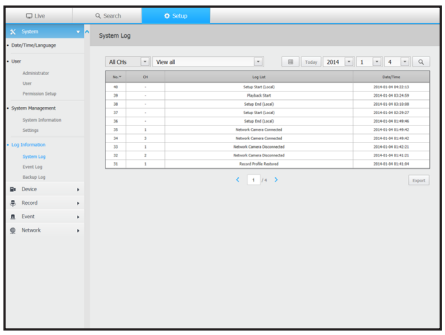
Press the Initialize button to return the network settings to their factory default state. Items in the <**Not Included**> category are excluded from the initialization.



Log information

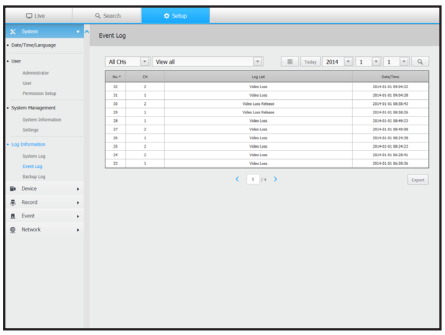
System log

Data recorded in the system log displays various system-related logs/date/time such as system starts, system ending and menu setting changes.



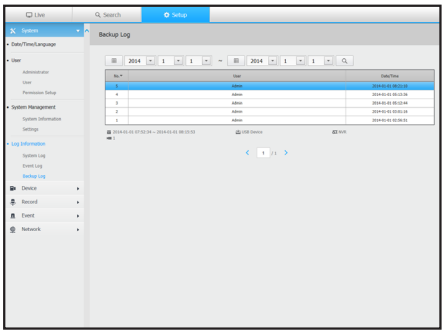
Event log

The event log lists recorded events, such as sensor events, camera events, or image losses.



Backup log

You can inquire about a user who performed a backup, execution time, details (backup time, channel, backup device, backup file type).



setup viewer

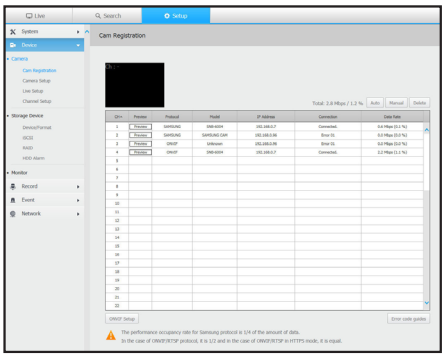
Device

You can check a list of devices that are connected to the NVR and configure the necessary settings.
Click <**Device**> in the menu screen.
For more information, refer to "**Setting the Device**". (Page 55)

Camera

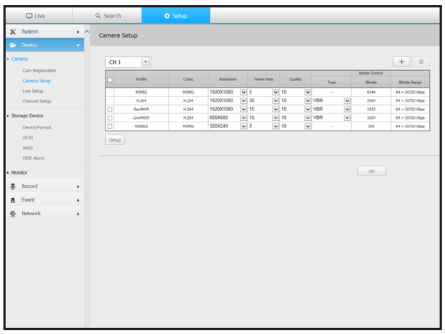
Cam Registration

You can add a network camera(s).



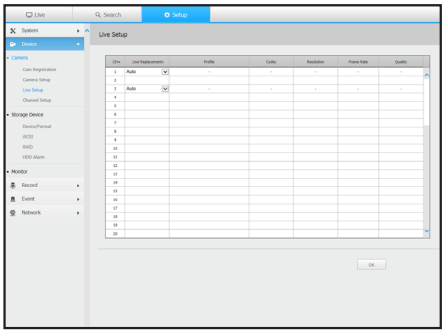
Camera Setup

You can change the settings of a connected network camera.



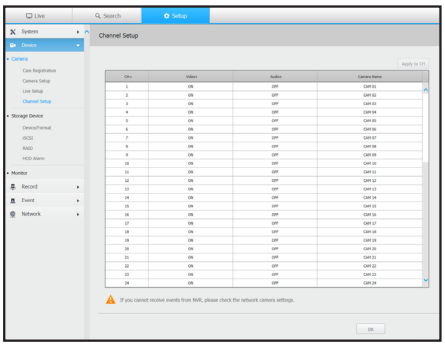
Live Setup

You can change the life transfer settings of the network camera.



Channel Setup

You can configure the video settings for each channel.

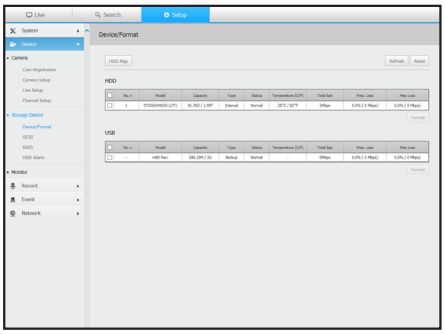


Storage Device

You can check and change the settings related to the data storage device.

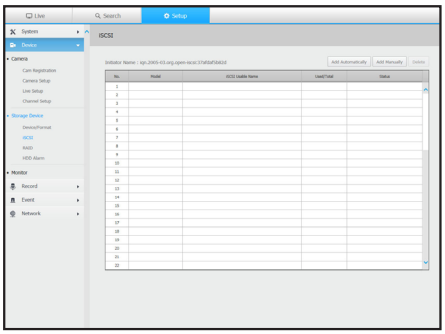
Device/format

You can check a storage device, amount of use, type of use and status of storage device.



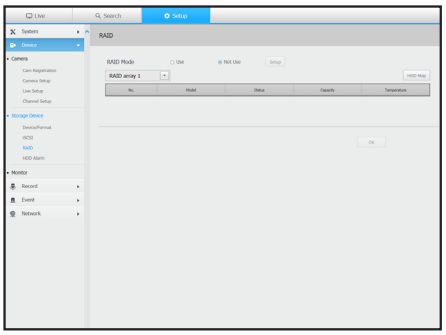
iSCSI

If you connect NVR with an iSCSI device, you can search, connect or disconnect the iSCSI device.



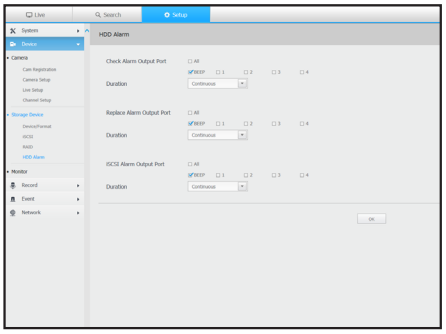
RAID

If you set the RAID mode, then even if the system HDD is damaged, you can safely recover data.



HDD Alarm

You can set the alarm output port and the duration in case an error occurs.

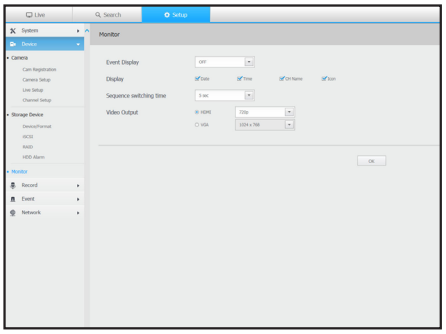


Monitor

Monitor

You can configure the monitoring screen settings and set the output system.

- If the video is not played properly, refer to the troubleshooting section later in this manual. (Page 150)
- The Monitor Setup settings control the monitor connected to the NVR.

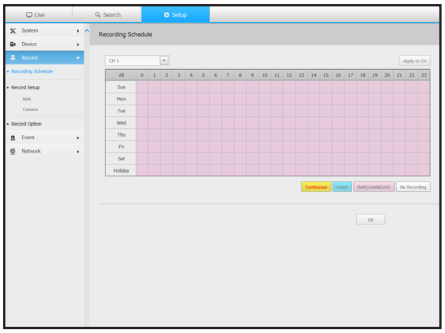


Record

For more information, refer to "**Setting the Recording**". (Page 77)

Recording Schedule

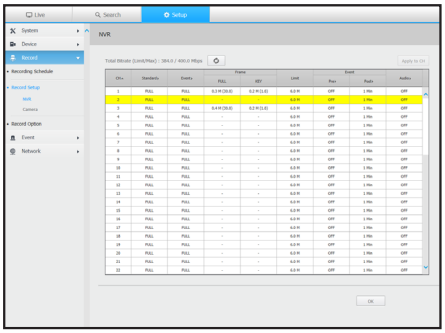
If you set a recording schedule for a specific date and time, the recording will start at that specific time.



Record Setup

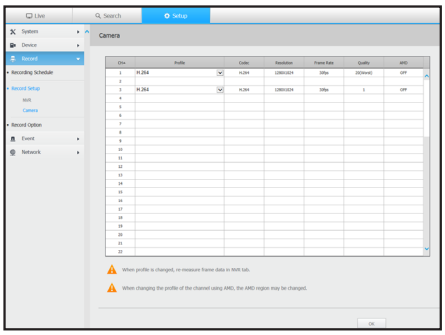
NVR

Select a type of the normal/event recording frame rate for each channel.



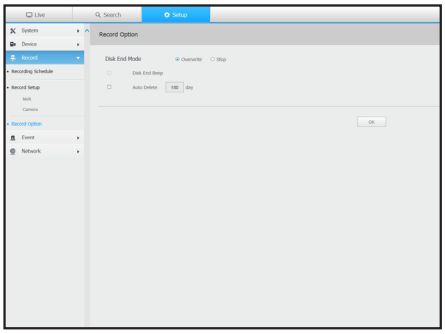
Camera

You can set the recording profile for a network camera.



Record Option

You can set the Disk End Mode.



Event

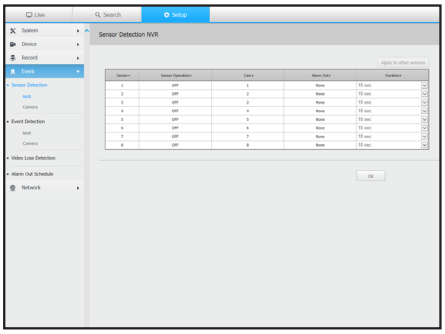
For more information, refer to "**Setting the Event**". (Page 81)

Sensor Detection

NVR / Camera

You can set the sensor operation mode and the synchronized camera as well as the alarm output type and the duration.

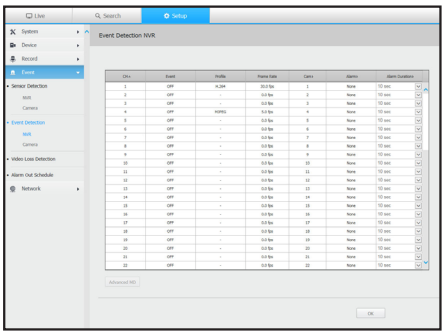
- If the connected network camera that has configured the alarm in/out settings triggers an alarm, NVR will perform the alarm out.



Event Detection

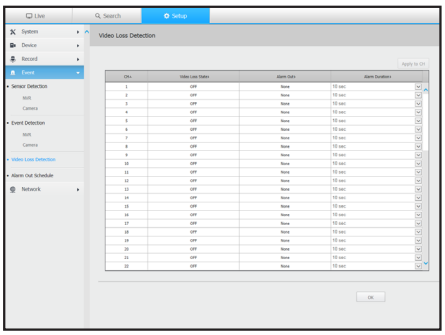
NVR / Camera

You can set NVR and camera event mode, alarm output type and alarm time.



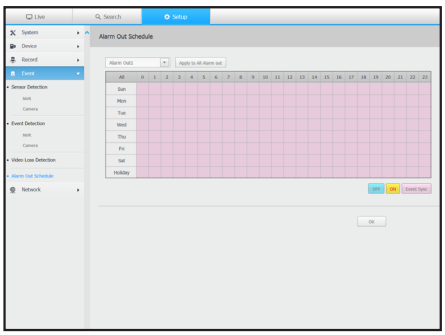
Video Loss Detection

You can set to trigger the alarm if a video loss occurs.



Alarm Out Schedule

You can schedule the alarm output according to the day of the week and the time.
The default setting is Event Sync, which activates the alarm only if an event occurs.



Network

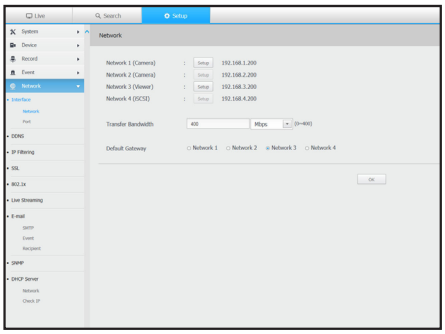
For more information, refer to "**Network Configuration**". (Page 85)

Interface

A remote user can access the NVR via the network to check the current mode and the IP address.

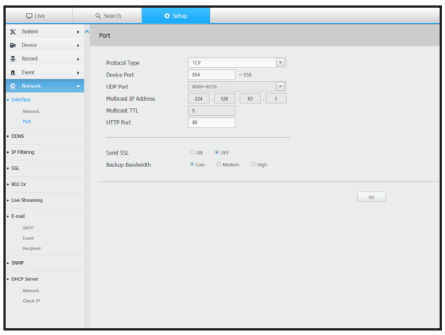
Network

Specify the network connection path.



Port

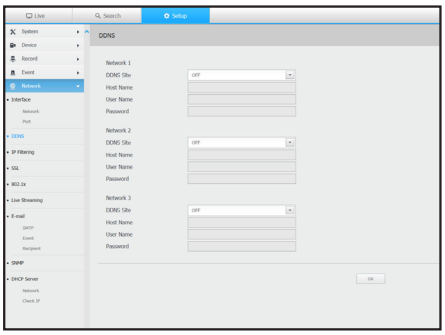
You can configure the protocol related settings.



DDNS

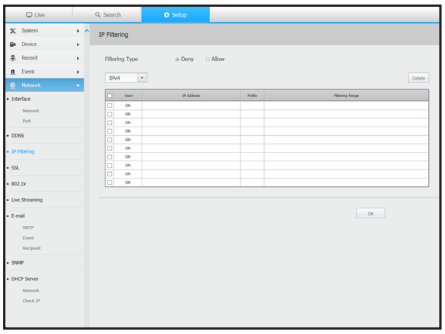
Network 1/2/3

You can check the DDNS settings.



IP Filtering

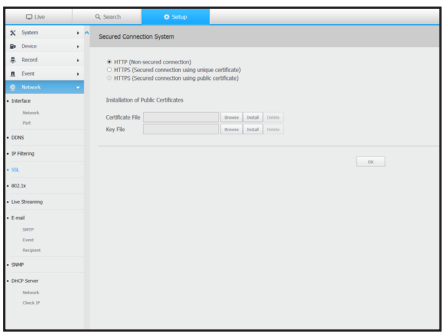
You can prepare the list of IP address to allow or block accesses to a specific IP address.



SSL

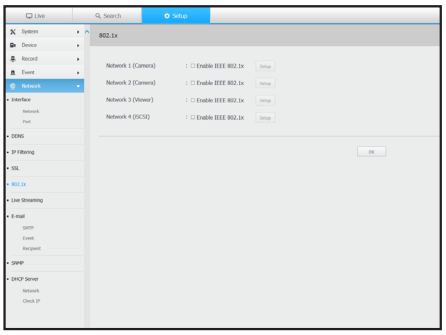
You can select a security connection system or install public certificates.

- While using HTTPS, if you want to switch to HTTP, then abnormal operation can take place as the browser contains the setting values. You need to change the URL to HTTP and reconnect or initialize the cookie setting of the browser.



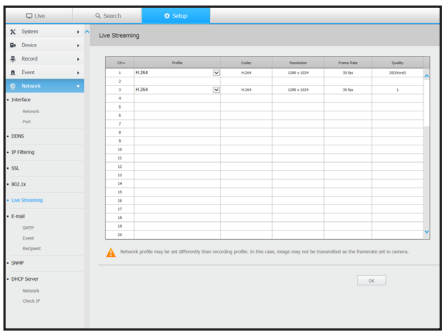
802.1x

When connecting to a network, you can select whether to use the 802.1x protocol and install corresponding certificate.



Live Streaming

You can configure the network transfer settings of the network camera.

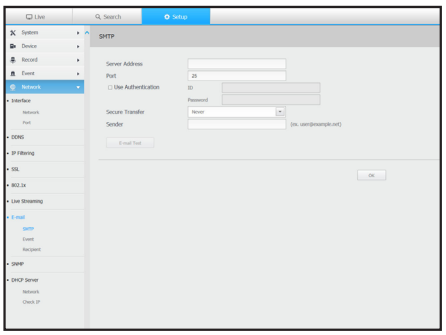


E-mail

You can specify the SMTP server that sends a mail if an event occurs and set the recipient group and users.

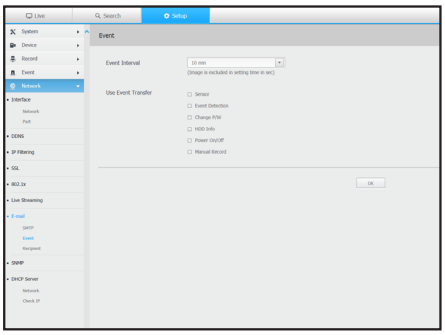
SMTP

You can set the server that sends mails and specify if you use the authentication process.



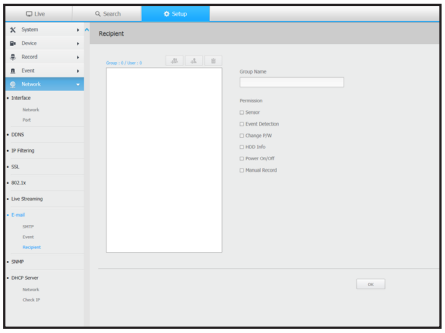
Event

You can set the event interval and specify which events the server sends mails for.



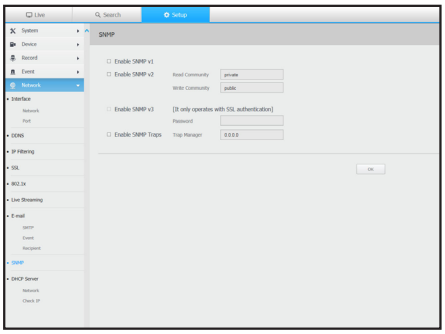
Recipient

You can set groups and recipients to receive emails.



SNMP

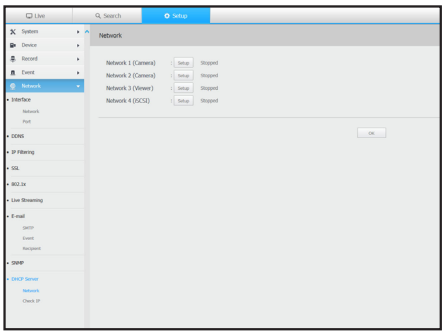
Using the SNMP protocol, the system or network administrator can remotely monitoring the network devices and sets the environment.



DHCP Server

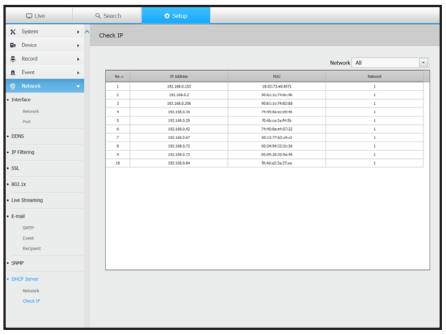
Network

You can set the internal DHCP server and assign an IP address to the network camera.

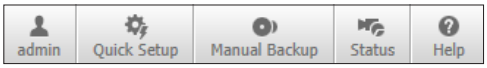


Check IP

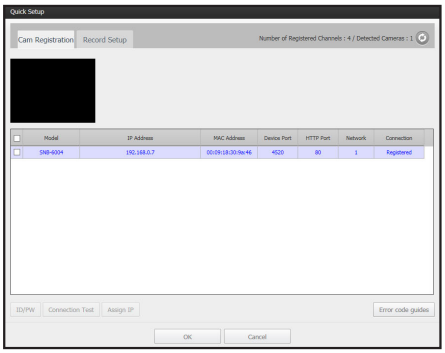
You can check the IP and MAC currently used through the DHCP server, and the connected network port.

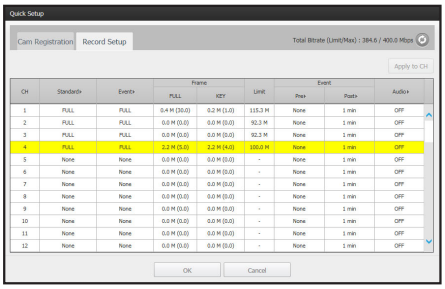


Using the setting icons

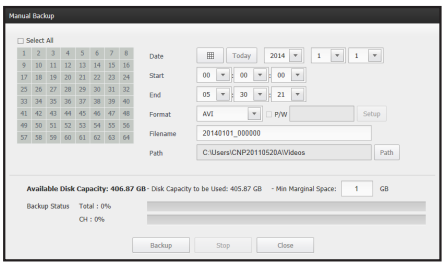


- admin : Display the ID of user connected.
- Quick Setup : You can register a network camera for each channel and easily set the resolution and the number of shots in case of event occurrence or manaual recording.
  - For more on how to register a camera, refer to "**To register a camera**". (Page 55)

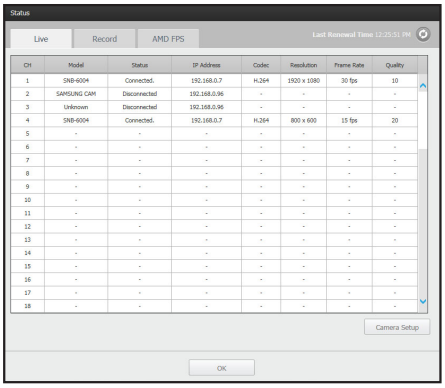




- Manual Backup : You can manually enter the desired backup channel and time/date to backup the recorded video.

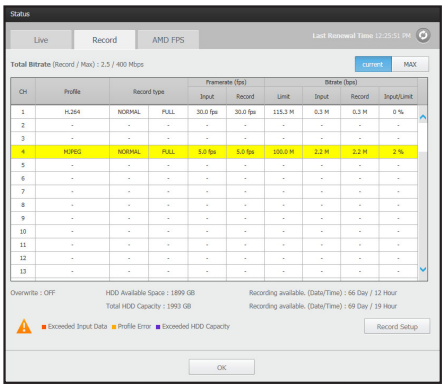


- Status : You can check the recording status and the status of camera connected.
  - Live : Select <**Live**> to check the status of camera connected to each channel and the transmission information.

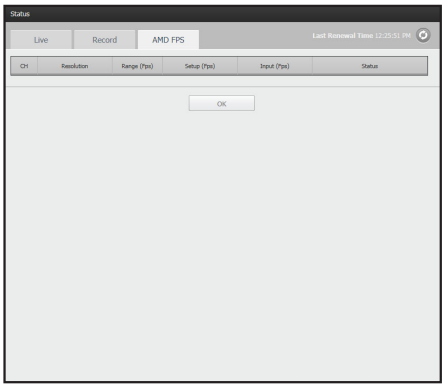


setup viewer

- Recording : Select <**Record**> to check the following for each channel : profile, recording type, inputs / recording transmission rate, settings / inputs / amount of recorded data.



- AMD FPS : Can check the status of advanced motion detection (AMD) FPS for the channel.

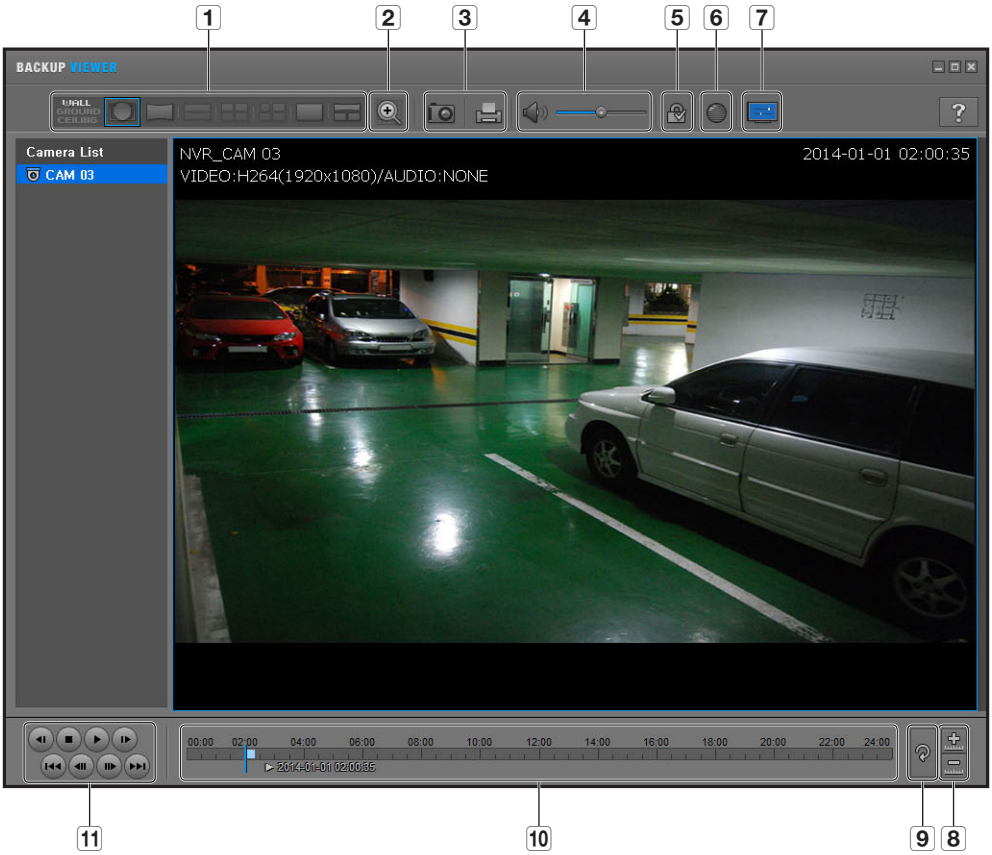


- < Help > : You will be immediately directed to the homepage of Samsung Techwin. (http ://www.samsungcctv.com/).

backup viewer

SEC BACKUP VIEWER

You can play a file that is backed up in the format of SEC.
Backup in SEC format produces backup data file, library file and self-executable viewer file.
If you run the backup file viewer, the backup data file will be played.



Recommended System Requirements

PCs with a lower specification than the recommended below may not fully support forward/backward and high-speed playback.

- OS : Windows XP professional, Windows Vista, Windows 7
- CPU : Intel Core 2 Quad 2.5GHz or higher
- RAM : 3GB or more
- VGA : Geforce 6200 or higher

backup viewer

Item			Description
1	Fish eye view mode		The fish eye installation can be changed. WALL/GROUND/CEILING view mode can be selected instead depending on the installation location.
			The fish eye view mode on the current screen can be changed independently on each split.
2	Digital Zoom		Enlarge the image by up to 100 times as big as the current one. Press the Zoom In ( ) button the enlarge the image; press the Zoom Out ( ) button to shrink the image. You can also use the slide bar ( ) in the pop-up window to zoom in/out. Press ( ) on a size-changed video to restore the default zoom factor (100%). If you enlarge the image by more than 200%, the enlarged area will be marked on the digital zooming screen. Click on the marked area and move it to a desired position. The digital zooming is applied to all backup viewer. When the digital zooming is canceled, the video size will restore the default rate of 100%.
3	Screen Printout		Saves the current video's image as in an image file. Supports JPEG file format.
			Prints out the current screen. You should have installed the appropriate printer driver before you can print out the screen.
4	Audio	/	A toggle button. Each time you press this button, the audio output will toggle between activated and deactivated.
			You can adjust the volume level from 0 to 100.
5	Watermark	/	Press the button to enable file tampering detection, to detect data file forging.
6	Deinterlace		You can enable the De-interlace function.
7	Show OSD		Check the OSD checkbox to display the OSD information on the backup playback screen. Information such as backup date, day of the week, time, model name, and channel number will be displayed on the screen.
8	Enlarge / Reduce Timeline		Collapses the time range that is displayed on the range bar of the storage time. You can collapse the range bar until the overall range is shortened to 24 hours.
			Enlarges the time range that is displayed on the range bar of the storage time. You can enlarge the range bar until the overall range is extended to 1 minute.
9	Restore Timeline		Restores the timeline to the default.
10	Display of storage time range		Displays the time range of a stored video file. You can move the gridline of the range bar to select a time point to play.
11	Playback Control		You can adjust the video playback of the timeline.

PRODUCT SPECIFICATION

Item		Details
Display		
Network Camera	Inputs	Max. 64CH
	Resolution	CIF ~ 5MP
	Protocols	Samsung, ONVIF
Live	Local Display	HDMI/VGA
	Multi-Channel Display	[Local Monitor] 1 / 4 / 6 / 8 / 9 / 13 / 16 / Sequence [Web] 1 / 4 / 9 / 16 / 32 / 64 / Sequence
Performance		
Operating System	Embedded	Linux
Record	Compression	H.264, MPEG-4, MJPEG
	Recording Bandwidth	Max. 400Mbps(2MP 64camera real-time recording)
	Resolution	CIF ~ 5MP
	Type	Manual, Schedule(Continuous/Event), Event (Pre/Post)
	Event Trigger	Alarm Input, Video Loss, Camera Event(MD, Video Analytics), Internal VA(Upto 4ch selectable, Advanced MD, Object Classfication (People, Car))
	Event Action	e-Mail, PTZ Preset, Alarm Out, Buzzer, Monitor Out
Search & Play	Playback Bandwidth	20Mbps(16ch simultaneously)
	Mode	Date & Time(Calendar)/Event Log list
	Simultaneous playback	16 channels(Local Monitor) 4 ch(Web), 16 ch(CMS)
	Resolution	CIF ~ 5MP
	Playback Control	Fast Forward/Fast Backward, Move one step up/Move one step down

Item		Details
Storage	Internal HDD	Up to 12 SATA HDDs, Max. 36TB
	External	NAS(iSCSI) : vessRaid 1840i, Max. 192TB(JBOD)
	RAID	RAID-5/6
Backup	File backup (Via Web)	BU/EXE(GUI), JPG, AVI(Network)
	Function	Single channel Play, Date-Time/Title display
Sensor	I/O	8/4 (NO/NC Selectable)
Audio	Input	64 channels (network)
	Compression	G.711, G.726
	Audio Communication	2-Way
Network		
Interface		RJ-45, Gigabit Ethernet x4
Protocol		TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTSP, NTP, HTTP, DHCP, PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, ONVIF, HTTPS, SNMP
DDNS		Samsung iPOLiS DDNS
Network	Total throughput Bandwidth	Up to 700Mbps
	Transmission Bandwidth	Up to 400Mbps
Max Remote Users		Search(1) / Live unicast(10) / Live multicast(20)
IP Version		IPv4/v6
Security		User access Log, IP Filtering, 802.1x, Encryption

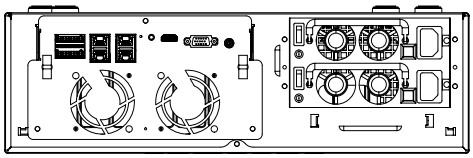
Item		Details
Language(24)		English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Swedish, Czech, Portuguese, Danish, Rumanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese, Thai
OS		Supported OS : Window XP(service pack 2 or above), Vista, 7, 8, Mac OS X(10.6 or above)
Web Browser		IE 8 or higher with bug patches (IE 9 recommended), IE 10, Chrome 26.x or higher, FireFox 19.x version or higher
Viewer Software	Type	Webviewer, Smart Viewer
	CMS Support	Support SDK, SUNAPI
Smart phone	Platform	Android, iOS
	Protocol Support	RTP, RTSP, HTTP, SUNAPI
	Max. Remote Users	Live (10), Playback(1)
Functions		
Camera Setup	Register	Auto, Manual
	Setup Items	1) IP Address, Add Profile Edit, Bitrate, Compression, GOP, Quality 2) Video Setup(MD, ABF, Brightness/Contrast, Flip/Mirror, IRIS, WDR, D&N, SSNR, Shutter)
PTZ	Control	Via GUI, Webviewer
	Preset	255 Presets
Smart phone	Support Model	I-Phone, Android
	Control	Live(4ch) / Playback(1ch)
System Control		Mouse

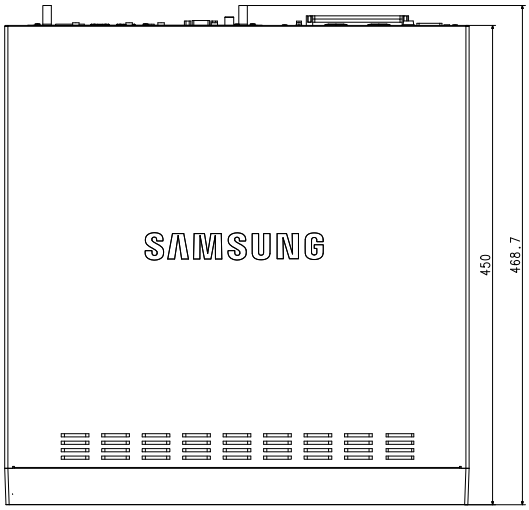
Item		Details
Indicator/Interface		
Front	Indicator	LED Status indicator : HDD Action(12), RAID Status(1), Alarm(1), Power(1), Record(1), Backup(1), Network(1)
	Switch	PWR Switch 1EA Key-Lock 1EA
Connectors	VGA	1 EA
	HDMI	1 EA
	Audio	Out(1EA, RCA, Line)
	DVD	N/A
	Serial	N/A
	Ethernet	RJ-45(4EA, GbE) w/ LINK/ACT LED
	Alarm	In(8EA, Terminal Block) Out(4EA, Terminal Block)
	USB	2EA(Front)
	Reset	Switch(1EA)
	Power Cord	2x AC Inlet
System		
Log	Log List	Max. 20000 (System Log, Event Log, Backup Log each)
Environmental		
Operating Temperature / Humidity		+0°C to +40°C
Humidity		20% ~ 85%

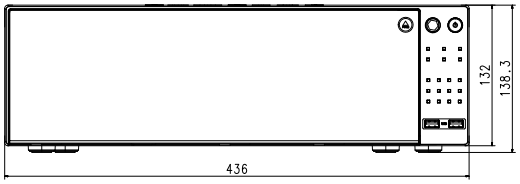
Item		Details
Electrical		
Power		100 to 240 VAC ±10%; 50/60 Hz, 3~1.5A(Dual SMPS)
Power Consumption		Max 187W(546 BTU with 1TB 12 HDDs)
Mechanical		
Color / Material		Black / Metal
Dimension (WxDxH)		W436.0 x D468.7 x H132.0 mm (3U)
Weight		11.8Kg(without HDD)
Standards		
Approvals	Safety	UL,KC
	EMC	CE, FCC, KCC, CCC, Gost-R

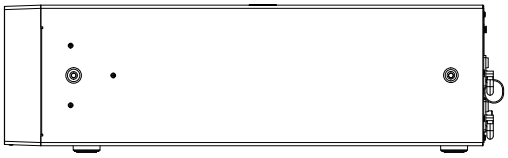
PRODUCT OVERVIEW

unit : mm (inches)









DEFAULT SETTING

To reset the system, move to "**System Management** > **Settings** > **Load Factory Default**" and press the <**Initialization**> button.

This returns the factory default settings.

- When you initialize the system without changing the <**Authority Setting**>, you must enter the ID and password to log into the system after it reboots. The ID and password are "**admin**" and "**4321**", respectively.
  Please change the password after you log in.

- The initial administrator ID is "**admin**" and the password should be set when logging in for the first time.
- Please change your password every three months to safely protect personal information and to prevent the damage of the information theft. Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

Category	Details			Factory Default
System	Date/Time/Language	Date/Time/Language	Date	YYYY-MM-DD
			Time	24 hours
			Time Zone	GMT
			Time Sync.	OFF
			DST	OFF
			Language	English
	User	Admin	ID	admin
		Permission Setup	Restricted Access	Backup/Record/Record Stop/Search/PTZ/Remote Alarm Out/Shutdown
			Restriction on Network Access	None
			Auto Log out	3 Min
			Manual Input of ID	OFF
	System Management	System Information	Device Name	NVR
Device	Camera	Channel Setup	Video	ON
			Audio	OFF
			Camera Name	CAM 01 ~ CAM 64
	Storage Device	HDD Alarm	Check Alarm Output Port	BEEP
			Duration	Continuous
			Replace Alarm Output Port	BEEP
			Duration	Continuous
			iSCSI Alarm Output Port	BEEP
			Duration	Continuous
	Monitor	Monitor	Event Display	OFF
			Display	All
			Sequence switching time	5 sec
			Video Output	VGA(1280x1024)
			Display Position Setup	30

Category	Details			Factory Default
Record	Recording Schedule	CH1~CH64		Both(Cont&Evnt)
	Record Setup	Standard		Full
		Event		Full
		Pre Event		OFF
		POST Event		1 min
	Record Option	Disk End Mode		Overwrite
			Disk End Beep	OFF
		Auto Delete		180
Event	Sensor Detection	NVR	Sensor Operation	OFF
			Cam	Camera No.
			Alarm Out	None
			Duration	10 sec
		Camera	Sensor Operation	OFF
			Cam	Camera No.
			Alarm Out	None
			Duration	10 sec
	Event Detection		AMD	OFF
			Event Detection	OFF
			MD	OFF
			Cam	Camera No.
			Alarm	None
			Alarm Duration	10 sec
	Video loss detection		Video loss status	OFF
			Alarm Out	None
			Alarm Duration	10 sec
	Alarm Out Schedule			Alarm Out1

Category	Details			Factory Default
Network	Interface	Network	IP Type	Static IP
			Network 1(Camera)	192.168.1.200
			Network 2(Camera)	192.168.2.200
			Network 3(Viewer)	192.168.3.200
			Network 4(iSCSI)	192.168.4.200
			Subnet Mask	255.255.255.0
			Gateway	192.168.1.1
			DNS	168.126.63.1
		Port	Protocol Type	TCP
			Device Type	554
			UDP Port	8000~8159
			Multicast IP Address	224.126.63.1
			Multicast TTL	5
			Web Streaming Port	80
	DDNS	Network1/2/3	DDNS Site	OFF
	IP Filtering		Filtering Type	Deny
	SSL		Secured Connection System	HTTP (Non-secured connection)
	802.1x	Network	Enable IEEE 802.1x	OFF
	E-Mail	SMTP	Port	25
			Use Authentication	OFF
			Secure Transfer	Never
		Event	Event Interval	10 min
			Use Event Transfer	OFF
	SNMP		Enable SNMP v1	OFF
			Enable SNMP v2	OFF
			Enable SNMP v3	OFF
			Enable SNMP Traps	OFF
	DHCP Server	Network 1(camera)	IP Range	192.168.1.1 ~ 192.168.1.254
			IP Lease time	86400
		Network 2(camera)	IP Range	192.168.2.1 ~ 192.168.2.254
			IP Lease time	86400
		Network 3(Viewer)	IP Range	192.168.3.1 ~ 192.168.3.254
			IP Lease time	86400
		Network 4(iSCSI)	IP Range	192.168.4.1 ~ 192.168.4.254
			IP Lease time	86400

TROUBLESHOOTING

Problem	Action
Live video will be slow or cut off.	• The frame number set for multiple data transmission set in camera or network environment could differ from the actual rate of transmission. Right click with the mouse button and select <**Channel Information**> to check the number of incoming frames for each channel and the actual number of framed played. Basically, when you register a camera, the Live4NVR profile is created and the rate is set to H.264.800*600fps. If necessary, go to <**Menu**> ➞ <**Device**> ➞ <**Camera**> ➞ <**Camera Setting**> and change the number of frames. • If you keep seeing video slow down or cut off, then check the network environment or camera condition.
The system does not turn on and the indicator on the front panel does not work at all.	• Check if the power supply system is properly connected. • Check the system for the input voltage from the power source. • If the problem persists even after you have taken the above actions, check the power supplier and replace it with a new one if neccessary. • Check inside if the cables are properly connected. (SMPS, FRONT)
Some channels display just a black screen even if they receive video sources.	• Check if the camera is properly supplied with power. • Check the video output connecting the camera's webviewer. • Check if the network port is properly connected and the network setting is set correctly. • Change the hub supporting Gigabit, it may solves.
The screen displays the logo image repeatedly.	• This may occur from a problem with the main board, or the related software is corrupt. Contact the nearest service center for more information.
The Channel button does not work on the Live screen.	• The Channel button does not work if the current screen is in the event monitoring mode.
The cursor will not move to the Start button when I start the calendar search.	• Check if the channel and the date that you want to play are marked with the V symbol. Both channel and date should be checked before you can start playing with the Start button.
No video is played on the connected monitor.	• Check if the necessary cables are connected to the monitor properly. • Some monitors do not support the NVR output (HDMI or VGA). (NVR output resolution : VGA : 1024*768, 1280*1024, HDMI : 720P, 1080P) Check the monitor resolution

Problem	Action
No response controlling PTZ in the live viewer.	• Check the registered Camera if it support PTZ function.
The camera is not connected or the PC fails to connect to the product.	• Check if the network cable is connected properly. • Ensure that you have set Network – Connection Mode. • Check the IP setting of the PC or camera. • Try the Ping Test. • Check if there is a different device near the product uses the same IP.
I registered a camera, but the web viewer does not show live video.	• After registering a camera, a user need to edit/save the desired layout, before the screen split mode and live screen fit for the setting appears.
In the web viewer, the screen does not switch automatically.	• You need to select the desired layout for sequence operation, in the automatic switching menu.
The Live screen is too bright or too dark.	• Check the video settings of the registered camera.
A message of "Need to reset date/time." Is displayed on the screen.	• This message is displayed if there occurs a problem with the time setting of the internal clock or an error in the clock itself. Contact the retailer or the service center for more information.
The time bar is not displayed in Search mode.	• The timeline can switch between normal and extension mode. In extension mode, the time bar may not be displayed in the current timeline. Switch to normal mode or use the left or right button to navigate through the time bar.
The "NO HDD" icon and an error message are displayed.	• Check the HDD for connection. If the problem persists in a normal condition, contact the nearest service center to have the HDD checked by the service personnel.
I have installed an additional HDD on the NVR but it does not recognize the HDD.	• See the compatibilty list to check if the additional HDD is supported by the NVR. For the compatibility list, contact the retailer where you purchased the NVR.
I have connected an external storage device (USB Memory, USB HDD) to the NVR but the NVR seems not to recognize it.	• See the compatibility list of external storage devices to check if the connected device is supported by the NVR. For the compatibility list, contact the retailer where you purchased the NVR.
If I press the ESC key in full screen mode of the WebViewer, the system does not switch to a normal split mode.	• Press the ALT+TAB keys to select 'ACTIVE MOVIE' and press the ESC key again. The system will switch to a normal split mode.
I found it difficult to configure the network settings if using the default search, backup and router settings.	• For more information, refer to the user manual. • If you want to check the basics of the product for a quick start, refer to the quick start guide (backup, search). • If you use the router for network connection, refer to the "**Connecting and Setting the Network**" section in this manual.

Problem	Action
I forgot the password.	• Contact the NVR administrator for help.
Backup data is just not played by the PC or NVR.	• When you are backing up data, you have choices about the player either: PC or NVR. Make your selection before proceeding. • If you are using the PC to play the data, the format of the backup file should be either SEC. • If you are using the NVR for this purpose, formatting backup files should be done by the NVR.
Recording does not work.	• If your player does not display a Live image at all, that indicates recording does not work so first check if you see an image on the screen. • Recording does not work if the recording settings are not properly configured Scheduled Record: Specify a desired time in Menu – Record – Recording Schedule. Recording will start at the specified time. - <**Continuous**> Record: Recording will proceed in any conditions at the specified time. - <**Event**> Record: When an event occurs, recording will perform only if the event is of alarm, motion detection and video loss. If there is no event found, recording will not perform. - <**Continuous / Event**> Record: If there is no event found, Continuous recording will perform. Whereas, if an event occurs, Event recording will perform.
The image quality of the recording data is not good.	• Increase the resolution and quality level in Menu – Record – Quality / Resolution. 1) Resolution: Select a bigger size when specifying the recording size. The recording image in the CIF format shows a deteriorated quality as it is enlarged from a small-sized image. 2) Record Quality: Specify a bigger level for the recording quality. • If you increase the resolution and the recording quality, the data size increases accordingly. So the HDD will be filled faster. Overwriting will overwrite the existing data so recording will proceed at a shorter interval.
Frame rate of the actual recording does not match that of configured to the camera.	• If multiple profiles were applied to one camera for video transmission, the actual video stream can be serviced by the camera at a lower frame rate than specified. Configure your camera to use one profile for data streaming as possible. For example, if you set the same profile for recording and network profiles, the actual recording is made at the specified frame rate. Still, live video display using split screen mode may apply yet another profile to camera in accordance with the used screen mode. Note that allowed limit bitrate for recording / recording settings should be set to be bigger values than that of camera's feed.

<table>
<tr><th>Problem</th><th>Action</th></tr>
<tr><td>In the recording setting screen, the permitted level for a specific channel is displayed in orange.</td><td>• If the input data is greater than the permitted level for each channel, it is displayed in orange. Set the permitted data limit to higher than the amount of input data.
• If the sum of input data for each channel exceeds the limit, the alarm icon will be displayed. In this case, the channel exceeding the input limit does not record the entire frame, but it records the main frame only(one or two per sec).</td></tr>
<tr><td>In the live screen, the [REC] icon is displayed and the message window saying " recording data load exceeds the limit. Check it in the record setting." pops up.</td><td>• If the sum of input data for each channel exceeds the limit, the alarm icon and the pop up window will be displayed. In this case, the channel exceeding the input limit does not record the entire frame, but it records the main frame only(one or two per sec).
• Set the permitted data limit to higher than the amount of input data entered in the record setting menu (page 78).</td></tr>
<tr><td>Recording is not performed in accordance with the settings.</td><td>• If the recording status shows that the input data is exceeded.
Then go to Menu – Recording – Recording Setting, and set the max data capacity to greater than the input data.
• Exceeding of HDD performance is displayed in recording status.
Set the total recording amount referring to the table below.
<table>
<tr><th rowspan="2">No</th><th rowspan="2">HDD condition</th><th rowspan="2">Receiving (Mbps)</th><th colspan="2">Recording (Mbps)</th></tr>
<tr><th>Internal</th><th>iSCSI</th></tr>
<tr><td>1</td><td>HDD for CE
Non RAID</td><td>400</td><td>300</td><td>-</td></tr>
<tr><td>2</td><td>HDD for CE
RAID 5</td><td>400</td><td>300</td><td>-</td></tr>
<tr><td>3</td><td>HDD for CE
RAID 6</td><td>400</td><td>200</td><td>-</td></tr>
<tr><td>4</td><td>HDD for Server
Non RAID</td><td>400</td><td>300</td><td>-</td></tr>
<tr><td>5</td><td>HDD for Server
RAID 5</td><td>400</td><td>400</td><td>300</td></tr>
<tr><td>6</td><td>HDD for Server
RAID 6</td><td>400</td><td>300</td><td>200</td></tr>
</table></td></tr>
<tr><td>The iSCSI disconnect icon and the error message pop up window will appear.</td><td>• Check if the iSCSI port is connected to the network cable.
• Check the IP address setting of the iSCSI equipment.
• Try a ping test.</td></tr>
<tr><td>The recording screen will slow down.</td><td>• Check if the recording spec for each HDD condition (refer to the recording setting in menu) is appropriate for the actual recording setting.
• Only main video frames will play if the data data processing rate exceeds the play performance (refer to the product specifications in menu).</td></tr>
</table>

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Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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Version 3, 29 June 2007

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TinyXML

TinyXML is a simple, small, C++ XML parser that can be easily integrated into other programs.

What it does.

In brief, TinyXML parses an XML document, and builds from that a Document Object Model (DOM) that can be read, modified, and saved. XML stands for "eXtensible Markup Language." It allows you to create your own document markups. Where HTML does a very good job of marking documents for browsers, XML allows you to define any kind of document markup, for example a document that describes a "to do" list for an organizer application. XML is a very structured and convenient format. All those random file formats created to store application data can all be replaced with XML. One parser for everything. The best place for the complete, correct, and quite frankly hard to read spec is at http://www.w3.org/TR/2004/REC-xml-20040204/. An intro to XML (that I really like) can be found at http://skew.org/xml/tutorial. There are different ways to access and interact with XML data. TinyXML uses a Document Object Model (DOM), meaning the XML data is parsed into a C++ objects that can be browsed and manipulated, and then written to disk or another output stream. You can also construct an XML document from scratch with C++ objects and write this to disk or another output stream. TinyXML is designed to be easy and fast to learn. It is two headers and four cpp files. Simply add these to your project and off you go. There is an example file - xmltest.cpp - to get you started. TinyXML is released under the ZLib license, so you can use it in open source or commercial code. The details of the license are at the top of every source file. TinyXML attempts to be a flexible parser, but with truly correct and compliant XML output. TinyXML should compile on any reasonably C++ compliant system. It does not rely on exceptions or RTTI. It can be compiled with or without STL support. TinyXML fully supports the UTF-8 encoding, and the first 64k character entities.

What it doesn't do.

TinyXML doesn't parse or use DTDs (Document Type Definitions) or XSLs (eXtensible Stylesheet Language.) There are other parsers out there (check out www.sourceforge.org, search for XML) that are much more fully featured. But they are also much bigger, take longer to set up in your project, have a higher learning curve, and often have a more restrictive license. If you are working with browsers or have more complete XML needs, TinyXML is not the parser for you. The following DTD syntax will not parse at this time in TinyXML: @verbatim]> @endverbatim because TinyXML sees this as a !DOCTYPE node with an illegally embedded !ELEMENT node. This may be addressed in the future.

Tutorials.

For the impatient, here is a tutorial to get you going. A great way to get started, but it is worth your time to read this (very short) manual completely. - @subpage tutorial0

Code Status.

TinyXML is mature, tested code. It is very stable. If you find bugs, please file a bug report on the sourceforge web site (www.sourceforge.net/projects/tinyxml). We'll get them straightened out as soon as possible. There are some areas of improvement; please check sourceforge if you are interested in working on TinyXML.

Related Projects

TinyXML projects you may find useful! (Descriptions provided by the projects.)

• TinyXPath (http://tinyxpath.sourceforge.net). TinyXPath is a small footprint XPath syntax decoder, written in C++.

• TinyXML++ (http://code.google.com/p/ticpp/). TinyXML++ is a completely new interface to TinyXML that uses MANY of the C++ strengths. Templates, exceptions, and much better error handling.

Features

Using STL

TinyXML can be compiled to use or not use STL. When using STL, TinyXML uses the std::string class, and fully supports std::istream, std::ostream, operator<<, and operator>>. Many API methods have both 'const char*' and 'const std::string&' forms. When STL support is compiled out, no STL files are included whatsoever. All the string classes are implemented by TinyXML itself. API methods all use the 'const char*' form for input. Use the compile time #define: TIXML_USE_STL to compile one version or the other. This can be passed by the compiler, or set as the first line of "tinyxml.h". Note: If compiling the test code in Linux, setting the environment variable TINYXML_USE_STL=YES/NO will control STL compilation. In the Windows project file, STL and non STL targets are provided. In your project, It's probably easiest to add the line "#define TIXML_USE_STL" as the first line of tinyxml.h.

UTF-8

TinyXML supports UTF-8 allowing to manipulate XML files in any language. TinyXML also supports "legacy mode" - the encoding used before UTF-8 support and probably best described as "extended ascii". Normally, TinyXML will try to detect the correct encoding and use it. However, by setting the value of TIXML_DEFAULT_ENCODING in the header file, TinyXML can be forced to always use one encoding. TinyXML will assume Legacy Mode until one of the following occurs:

1. If the non-standard but common "UTF-8 lead bytes" (0xef 0xbb 0xbf) begin the file or data stream, TinyXML will read it as UTF-8.

2. If the declaration tag is read, and it has an encoding="UTF-8", then TinyXML will read it as UTF-8.

3. If the declaration tag is read, and it has no encoding specified, then TinyXML will read it as UTF-8.

4. If the declaration tag is read, and it has an encoding="something else", then TinyXML will read it as Legacy Mode. In legacy mode, TinyXML will work as it did before. It's not clear what that mode does exactly, but old content should keep working.

5. Until one of the above criteria is met, TinyXML runs in Legacy Mode.

What happens if the encoding is incorrectly set or detected? TinyXML will try to read and pass through text seen as improperly encoded. You may get some strange results or mangled characters. You may want to force TinyXML to the correct mode. You may force TinyXML to Legacy Mode by using LoadFile(TIXML_ENCODING_LEGACY) or LoadFile(filename, TIXML_ENCODING_LEGACY). You may force it to use legacy mode all the time by setting TIXML_DEFAULT_ENCODING = TIXML_ENCODING_LEGACY. Likewise, you may force it to TIXML_ENCODING_UTF8 with the same technique. For English users, using English XML, UTF-8 is the same as low-ASCII. You don't need to be aware of UTF-8 or change your code in any way. You can think of UTF-8 as a "superset" of ASCII. UTF-8 is not a double byte format - but it is a standard encoding of Unicode! TinyXML does not use or directly support wchar, TCHAR, or Microsoft's _UNICODE at this time. It is common to see the term "Unicode" improperly refer to UTF-16, a wide byte encoding of unicode. This is a source of confusion. For "high-ascii" languages - everything not English, pretty much - TinyXML can handle all languages, at the same time, as long as the XML is encoded in UTF-8. That can be a little tricky, older programs and operating systems tend to use the "default" or "traditional" code page. Many apps (and almost all modern ones) can output UTF-8, but older or stubborn (or just broken) ones still output text in the default code page. For example, Japanese systems traditionally use SHIFT-JIS encoding. Text encoded as SHIFT-JIS can not be read by TinyXML. A good text editor can import SHIFT-JIS and then save as UTF-8. The Skew.org link does a great job covering the encoding issue. The test file "utf8test.xml" is an XML containing English, Spanish, Russian, and Simplified Chinese. (Hopefully they are translated correctly). The file "utf8test.gif" is a screen capture of the XML file, rendered in IE. Note that if you don't have the correct fonts (Simplified Chinese or Russian) on your system, you won't see output that matches the GIF file even if you can parse it correctly. Also note that (at least on my Windows machine) console output is in a Western code page, so that Print() or printf() cannot correctly display the file. This is not a bug in TinyXML - just an OS issue. No data is lost or destroyed by TinyXML. The console just doesn't render UTF-8.

Entities

TinyXML recognizes the pre-defined "character entities", meaning special characters. Namely: @verbatim & & < < > > " " ' ' @endverbatim These are recognized when the XML document is read, and translated to there UTF-8 equivalents. For instance, text with the XML of: @verbatim Far & Away @endverbatim will have the Value() of "Far & Away" when queried from the TiXmlText object, and will be written back to the XML stream/file as an ampersand. Older versions of TinyXML "preserved" character entities, but the newer versions will translate them into characters. Additionally, any character can be specified by its Unicode code point: The syntax " " or " " are both to the non-breaking space characher.

Printing

TinyXML can print output in several different ways that all have strengths and limitations. - Print(FILE*). Output to a std-C stream, which includes all C files as well as stdout. - "Pretty prints", but you don't have control over printing options. - The output is streamed directly to the FILE object, so there is no memory overhead in the TinyXML code. - used by Print() and SaveFile() - operator<<. Output to a c++ stream. - Integrates with standart C++ iostreams. - Outputs in "network printing" mode without line breaks. Good for network transmission and moving XML between C++ objects, but hard for a human to read. - TiXmlPrinter. Output to a std::string or memory buffer. - API is less concise - Future printing options will be put here. - Printing may change slightly in future versions as it is refined and expanded.

Streams

With TIXML_USE_STL on TinyXML supports C++ streams (operator <<,>>) streams as well as C (FILE*) streams. There are some differences that you may need to be aware of. C style output: - based on FILE* - the Print() and SaveFile() methods Generates formatted output, with plenty of white space, intended to be as human-readable as possible. They are very fast, and tolerant of ill formed XML documents. For example, an XML document that contains 2 root elements and 2 declarations, will still print. C style input: - based on FILE* - the Parse() and LoadFile() methods A fast, tolerant read. Use whenever you don't need the C++ streams. C++ style output: - based on std::ostream - operator<< Generates condensed output, intended for network transmission rather than readability. Depending on your system's implementation of the ostream class, these may be somewhat slower. (Or may not.) Not tolerant of ill formed XML: a document should contain the correct one root element. Additional root level elements will not be streamed out. C++ style input: - based on std::istream - operator>> Reads XML from a stream, making it useful for network transmission. The tricky part is knowing when the XML document is complete, since there will almost certainly be other data in the stream. TinyXML will assume the XML data is complete after it reads the root element. Put another way, documents that are ill-constructed with more than one root element will not read correctly. Also note that operator>> is somewhat slower than Parse, due to both implementation of the STL and limitations of TinyXML.

White space

The world simply does not agree on whether white space should be kept, or condensed. For example, pretend the '_' is a space, and look at "Hello____world". HTML, and at least some XML parsers, will interpret this as "Hello_world". They condense white space. Some XML parsers do not, and will leave it as "Hello____world". (Remember to keep pretending the _ is a space.) Others suggest that __Hello___world__ should become Hello___world. It's an issue that hasn't been resolved to my satisfaction. TinyXML supports the first 2 approaches. Call TiXmlBase ::SetCondenseWhiteSpace(bool) to set the desired behavior. The default is to condense white space. If you change the default, you should call TiXmlBase::SetCondenseWhiteSpace(bool) before making any calls to Parse XML data, and I don't recommend changing it after it has been set.

Handles

Where browsing an XML document in a robust way, it is important to check for null returns from method calls. An error safe implementation can generate a lot of code like: @verbatim TiXmlElement* root = document.FirstChildElement("Document"); if (root) { TiXmlElement* element = root->FirstChildElement("Element"); if (element) { TiXmlElement* child = element->FirstChildElement("Child"); if (child) { TiXmlElement* child2 = child->NextSiblingElement("Child"); if (child2) { // Finally do something useful. @endverbatim Handles have been introduced to clean this up. Using the TiXmlHandle class, the previous code reduces to: @verbatim TiXmlHandle docHandle(&document); TiXmlElement* child2 = docHandle.FirstChild("Document").FirstChild("Element").Child("Child", 1).ToElement(); if (child2) { // do something useful @endverbatim Which is much easier to deal with. See TiXmlHandle for more information.

Row and Column tracking

Being able to track nodes and attributes back to their origin location in source files can be very important for some applications. Additionally, knowing where parsing errors occured in the original source can be very time saving. TinyXML can tracks the row and column origin of all nodes and attributes in a text file. The TiXmlBase::Row() and TiXmlBase::Column() methods return the origin of the node in the source text. The correct tabs can be configured in TiXmlDocument::SetTabSize().

Using and Installing

To Compile and Run xmltest: A Linux Makefile and a Windows Visual C++ .dsw file is provided. Simply compile and run. It will write the file demotest.xml to your disk and generate output on the screen. It also tests walking the DOM by printing out the number of nodes found using different techniques. The Linux makefile is very generic and runs on many systems - it is currently tested on mingw and MacOSX. You do not need to run 'make depend'. The dependecies have been hard coded.

Windows project file for VC6

- tinyxml: tinyxml library, non-STL
- tinyxmlSTL: tinyxml library, STL
- tinyXmlTest: test app, non-STL
- tinyXmlTestSTL: test app, STL

Makefile

At the top of the makefile you can set: PROFILE, DEBUG, and TINYXML_USE_STL. Details (such that they are) are in the makefile. In the tinyxml directory, type "make clean" then "make". The executable file 'xmltest' will be created.

To Use in an Application:

Add tinyxml.cpp, tinyxml.h, tinyxmlerror.cpp, tinyxmlparser.cpp, tinystr.cpp, and tinystr.h to your project or make file. That's it! It should compile on any reasonably compliant C++ system. You do not need to enable exceptions or RTTI for TinyXML.

How TinyXML works.

An example is probably the best way to go. Take: @verbatim Go to the Toy store! Do bills @endverbatim Its not much of a To Do list, but it will do. To read this file (say "demo.xml") you would create a document, and parse it in: @verbatim TiXmlDocument doc("demo.xml"); doc.LoadFile(); @endverbatim And its ready to go. Now lets look at some lines and how they relate to the DOM. @verbatim @endverbatim The first line is a declaration, and gets turned into the TiXmlDeclaration class. It will be the first child of the document node. This is the only directive/special tag parsed by TinyXML. Generally directive tags are stored in TiXmlUnknown so the commands wont be lost when it is saved back to disk. @verbatim @endverbatim A comment. Will become a TiXmlComment object. @verbatim @endverbatim The "ToDo" tag defines a TiXmlElement object. This one does not have any attributes, but does contain 2 other elements. @verbatim @endverbatim Creates another TiXmlElement which is a child of the "ToDo" element. This element has 1 attribute, with the name "priority" and the value "1". @verbatim Go to the @endverbatim A TiXmlText. This is a leaf node and cannot contain other nodes. It is a child of the "Item" TiXmlElement. @verbatim @endverbatim Another TiXmlElement, this one a child of the "Item" element. Etc. Looking at the entire object tree, you end up with: @verbatim TiXmlDocument "demo.xml" TiXmlDeclaration "version='1.0'" "standalone=no" TiXmlComment " Our to do list data" TiXmlElement "ToDo" TiXmlElement "Item" Attribtutes: priority = 1 TiXmlText "Go to the " TiXmlElement "bold" TiXmlText "Toy store!" TiXmlElement "Item" Attributes: priority=2 TiXmlText "Do bills" @endverbatim

Documentation

The documentation is build with Doxygen, using the 'dox' configuration file.

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References

The World Wide Web Consortium is the definitive standard body for XML, and their web pages contain huge amounts of information. The definitive spec: http://www.w3.org/TR/2004/REC-xml-20040204/ I also recommend "XML Pocket Reference" by Robert Eckstein and published by OReilly...the book that got the whole thing started.

Contributors, Contacts, and a Brief History

Thanks very much to everyone who sends suggestions, bugs, ideas, and encouragement. It all helps, and makes this project fun. A special thanks to the contributors on the web pages that keep it lively. So many people have sent in bugs and ideas, that rather than list here we try to give credit due in the "changes.txt" file. TinyXML was originally written by Lee Thomason. (Often the "I" still in the documentation.) Lee reviews changes and releases new versions, with the help of Yves Berquin, Andrew Ellerton, and the tinyXml community. We appreciate your suggestions, and would love to know if you use TinyXML. Hopefully you will enjoy it and find it useful. Please post questions, comments, file bugs, or contact us at: www.sourceforge.net/projects/tinyxml Lee Thomason, Yves Berquin, Andrew Ellerton.

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