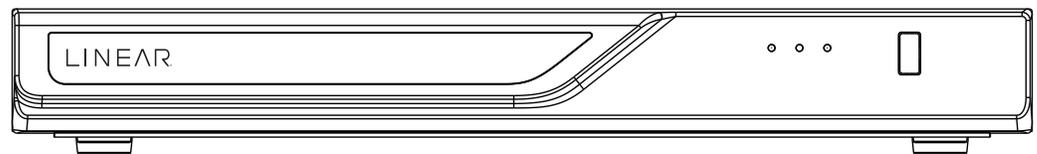


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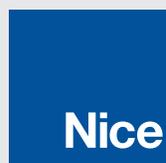
LNVR1-08P

LNVR1-16P



Network Video Recorders | 8 + 16 Channel

EN - User Manual



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Revision History

- » Rev. 1.0: Initial release.

NOTE:

The following are the limitations for web access using the non-IE browsers:

1. Playback: fast forward, rewind, next frame buttons are not available.
2. Snapshot and Auto screen ratio not available on Safari.
3. Web browsers supported:
 - » Chrome v68.0.3440 and later official version
 - » Firefox v61.02 and later official version
4. Supported Operating Systems
 - » Windows
 - » Windows 7, 64 bit
 - » Windows 10
5. Minimum PC hardware requirements
 - » **CPU:** Intel i5 4th generation and higher
 - » **RAM:** 4GB and higher

Limitations on text entry length:

- » **User account:** 64 alpha-numeric characters
- » **Account password:** 64 alpha-numeric characters
- » **Path name:** 256 alpha-numeric characters
- » Supports all printable ASCII (0x21-0x7E) characters and space (0x20) for password:
!"#\$%&\'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefg
hijklmnopqrstuvwxyz{|}~
- » **IP domain name:** host.xxx.yyy.zzz - 63 bytes; total: 253 bytes
- » **Email account:** local@domain_name_part - local -63bytes
domain_name_part - 253 bytes.

Read Before Use

THE USE OF SURVEILLANCE DEVICES MAY BE PROHIBITED BY LAW IN YOUR COUNTRY. THE NETWORK CAMERA IS NOT ONLY A HIGH-PERFORMANCE WEB-READY CAMERA BUT CAN ALSO BE PART OF A FLEXIBLE SURVEILLANCE SYSTEM. IT IS THE USER'S RESPONSIBILITY TO ENSURE THAT THE OPERATION OF SUCH DEVICES IS LEGAL BEFORE INSTALLING THIS UNIT FOR ITS INTENDED USE.

IT IS IMPORTANT TO FIRST VERIFY THAT ALL CONTENTS RECEIVED ARE COMPLETE ACCORDING TO THE PACKAGE CONTENTS LISTED BELOW. TAKE NOTE OF THE WARNINGS IN THE QUICK INSTALLATION GUIDE BEFORE THE NETWORK CAMERA IS INSTALLED; THEN CAREFULLY READ AND FOLLOW THE INSTRUCTIONS IN THE INSTALLATION CHAPTER TO AVOID DAMAGE DUE TO FAULTY ASSEMBLY AND INSTALLATION. THIS ALSO ENSURES THE PRODUCT IS USED PROPERLY AS INTENDED.

THE NETWORK CAMERA IS A NETWORK DEVICE AND ITS USE SHOULD BE STRAIGHTFORWARD FOR THOSE WHO HAVE BASIC NETWORKING KNOWLEDGE. IT IS DESIGNED FOR VARIOUS APPLICATIONS INCLUDING VIDEO SHARING, GENERAL SECURITY/SURVEILLANCE, ETC. THE CONFIGURATION CHAPTER SUGGESTS WAYS TO BEST UTILIZE THE NETWORK CAMERA AND ENSURE PROPER OPERATIONS. FOR CREATIVE AND PROFESSIONAL DEVELOPERS, THE URL COMMANDS OF THE NETWORK CAMERA SECTION SERVES AS A HELPFUL REFERENCE TO CUSTOMIZING EXISTING HOME PAGES OR INTEGRATING WITH THE CURRENT WEB SERVER.

 **NOTE:**

The operating system and management software are installed on a flash memory mounted on the main board. Except for running the plug-ins for the on-screen control on a web console, there is no need to install software.

Package Contents

<ul style="list-style-type: none">• LNVR1-08P or LNVR1-16P• Power cord• Quick Installation Guide• Rack Mount Brackets	<ul style="list-style-type: none">• Mouse• HDD Screws• SATA HDD Cable
--	---

Symbols and Statements in this Document

 **INFORMATION:** provides important messages or advices that might help prevent inconvenient or problem situations.

 **NOTE:** Notices provide guidance or advices that are related to the functional integrity of the machine.

 **Tips:** Tips are useful information that helps enhance or facilitate an installation, function or process.

 **WARNING! or IMPORTANT:** These statements indicate situations that can be dangerous or hazardous to the machine or you.

 **Electrical Hazard:** This statement appears when high voltage electrical hazards might occur to an operator.

Chapter 1: Hardware Installation and Initial Configuration

Introducing the Network Video Recorder

The Linear® LNVR-1 and LNVR1-16P are H.265 Linux-based standalone NVRs with embedded PoE. Equipped for up to 8-CH/16-CH network cameras, the NVRs support 8x or 16x 802.3 at/af PoE ports. Both also display the PoE power information, providing for a more convenient and smarter installation.

With H.265 compression technology, embedded Linux and support for 2 HDD's providing up to 16TB of storage space, the NVR provides 30% more recording capacity than H.264 systems. This advancement provides users with more storage space for longer durations of video recording. In addition, the RAID 0/1 configurations provide further data security in the rare event of a hard drive failure.

For high-quality and detailed images, the NVR supports a maximum network camera resolution of 4K,12-Megapixels. To intelligently manage bandwidth while maintaining this high-quality, the "Auto Adaptive Stream" function will adjust the display resolution automatically for each different layout type. To quickly and intuitively find any target event, the NVR is equipped with the "Story-Board Search" function that provides a glimpse of past recordings over an intuitive time line.

The NVR supports HDMI and VGA local video output, so users can control the GUI OSD interface via mouse & keyboard, eliminating the need for a separate PC to search video or playback from the NVR.

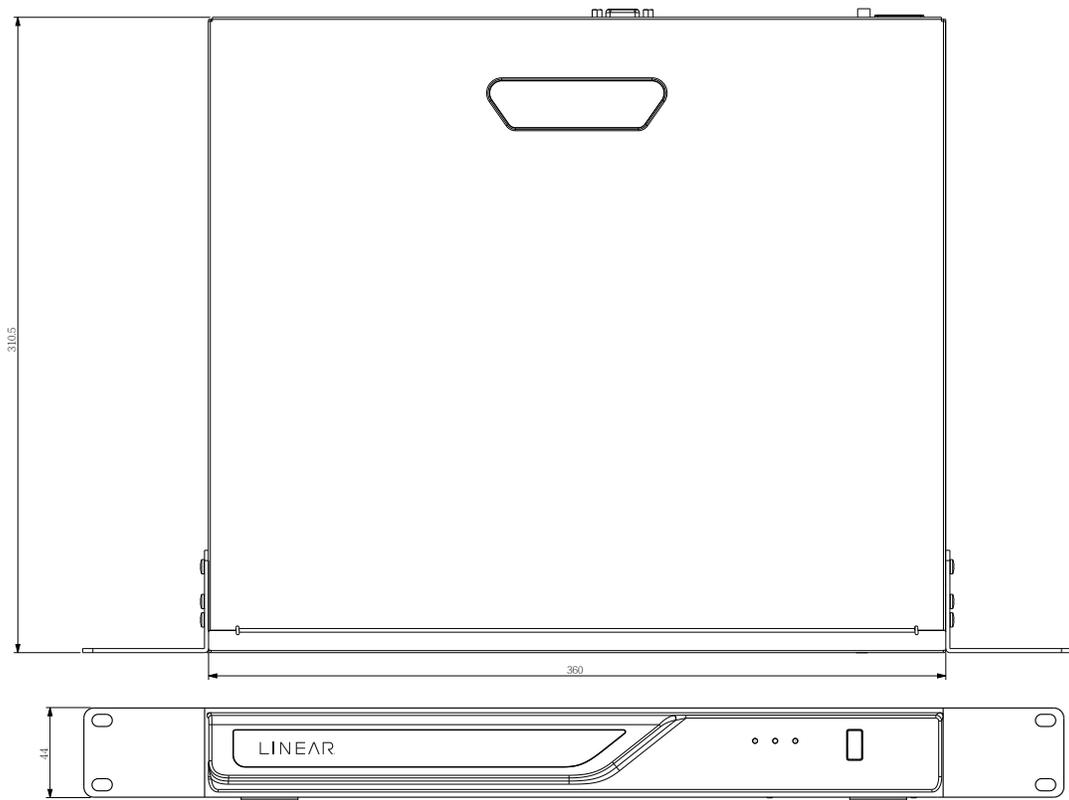
Special Features

- Runs on embedded Linux
- 1 x HDMI and 1 x VGA for local display
- 2 x HDD bay
- 1 x Gigabit RJ45 Ethernet port for uplink;
- 2 x USB Ports (1 USB 2.0 in front and 1 USB 3.0 in Back)
- Size: 360 mm (W) x 311 mm (D) x 44 mm (H). Weight: 3.16kg (w/o HDD).
- 8- or 16-CH Live View & 4-CH Synchronous Playback (web console)
- H.265 / H.264 / MJPEG
- Supports RAID0 and RAID1 volume configuration.
- PTZ Support
- Snapshot / Export Media
- Digital zoom Video Control
- Terminal block pins for DI/DO connection.
- Configuration Backup / Restore
- Integrates with Linear Access Control, Linear Cameras and ONVIF cameras

Safety

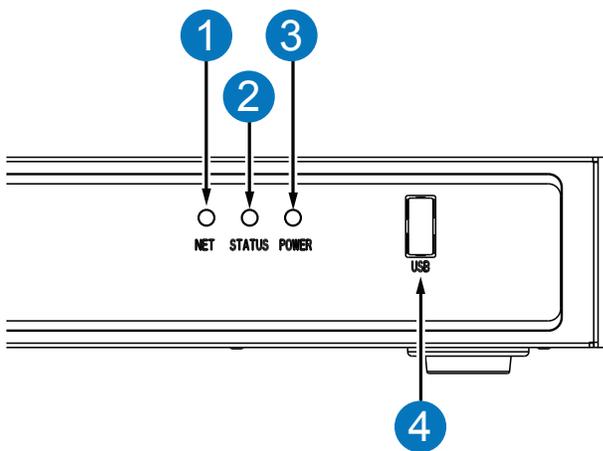
- Connect the system to an earthed main power outlet.
- Never open the housing of the power supply unit.
- Install and operate the system only in a dry, weather-proof location.
- Observe the following safety factors:
 - » Is there visible damage to the system or power cord?
 - » Is the system operating correctly?
 - » Has the system been exposed to rain or moisture?
 - » Has the system been in a long storage under harsh conditions or exposed to unconforming stress?
- The relevant electrical engineering regulations must be complied with at all times during installation.
- Ensure that all maintenance and repair work is handled by qualified personnel such as electrical engineers or network specialists.
- Read this manual before installing or operating the system. The documentation contains important safety instructions about permitted uses.
- The rated AC input is: **100-240V~ 3.5A, 60-50Hz**; the maximum consumption: **170W (LNVR1-08P), 250W (LNVR1-16P)**.
- If a fault occurs, disconnect the power cord from the power supply.
- Do not install the system close to heaters or other heat sources.
- Avoid locations with direct sunlight.
- All ventilation openings must not be blocked.
- Use only the cables shipped with system or use appropriate cables that can withstand electromagnetic interference.

Chassis Dimensions



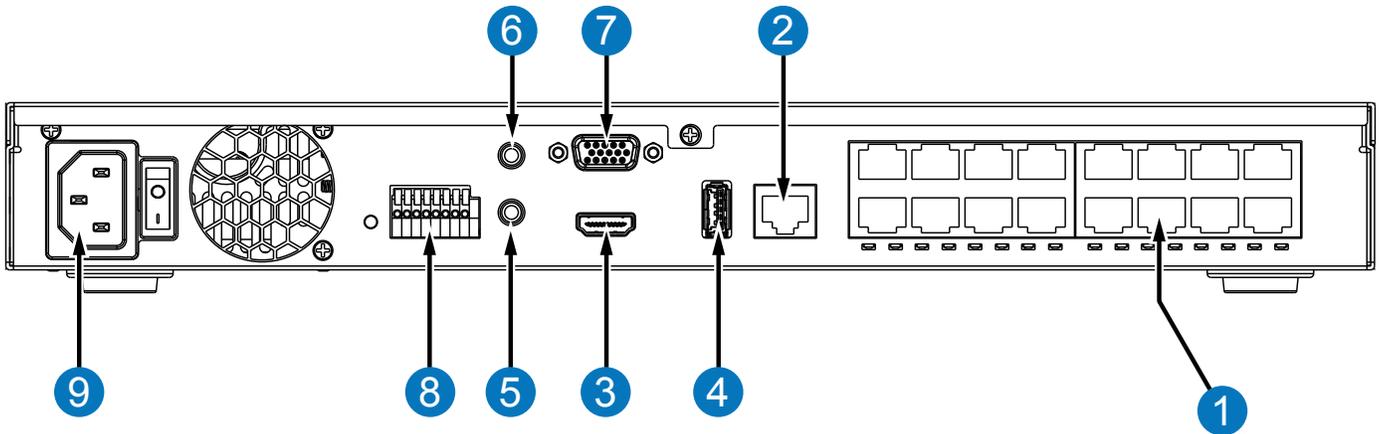
Physical Description

Front View



- | | |
|---|------------------------------------|
| 1 | Network uplink status/activity LED |
| 2 | System status LED |
| 3 | System power status |
| 4 | USB 3.0 port |

Rear View



1	PoE ports # 1 to 16 (LNVR1-16P)	6	Audio OUT
2	RJ45 port - GbE uplink	7	VGA
3	HDMI	8	DI/DO terminal block
4	USB 3.0 port	9	Power socket (110/240V AC), w/ a power
5	Audio IN		

⚠ IMPORTANT:

The total PoE power budget for the LNVR1-08P's 8 PoE ports is 120W.

The total PoE budget for the LNVR1-16P's 16 PoE ports is 200W. Every 8 ports (#1 ~ #8 or #9 ~ #16) provides 100W.

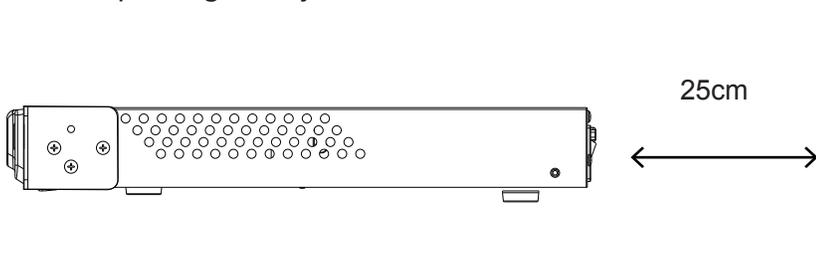
The total PoE power per port is 30w not to exceed total PoE power budget.

Please ensure the camera PD specification meet the NVR PSE power supply specification before installation.

⚠ IMPORTANT:

It is important to leave a clearance of 25cm behind the chassis. The clearance is required to ensure an adequate airflow through the chassis to ventilate heat.

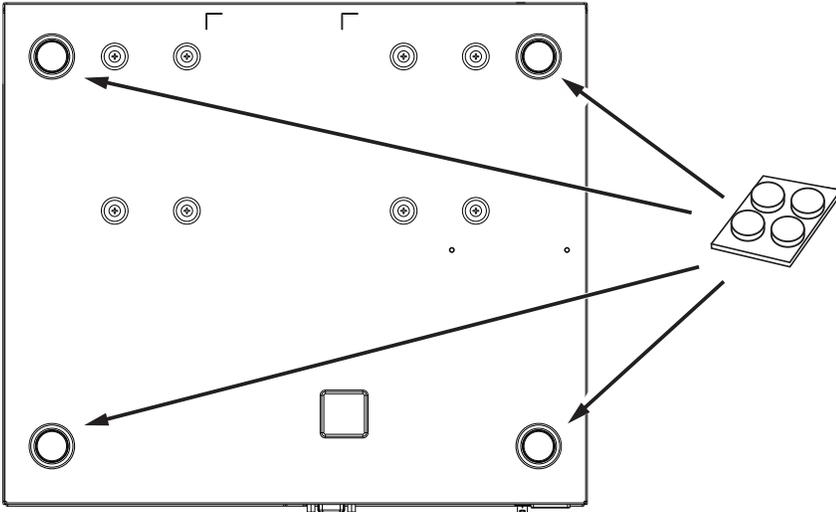
To ensure normal operation, maintain ambient airflow. Do not block the airflow around chassis such as placing the system in a closed cabinet.



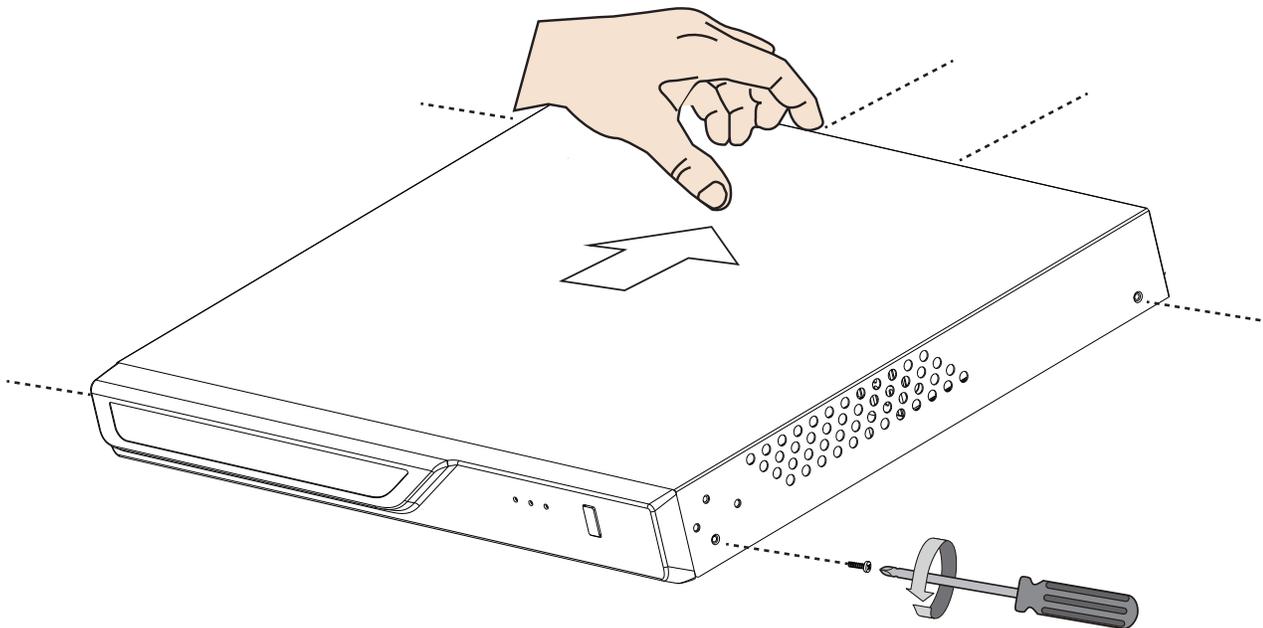
Hardware Installation

The NVR can support two Hard Disk Drives. It comes equipped with one HDD. To add another HDD, follow the instructions below.

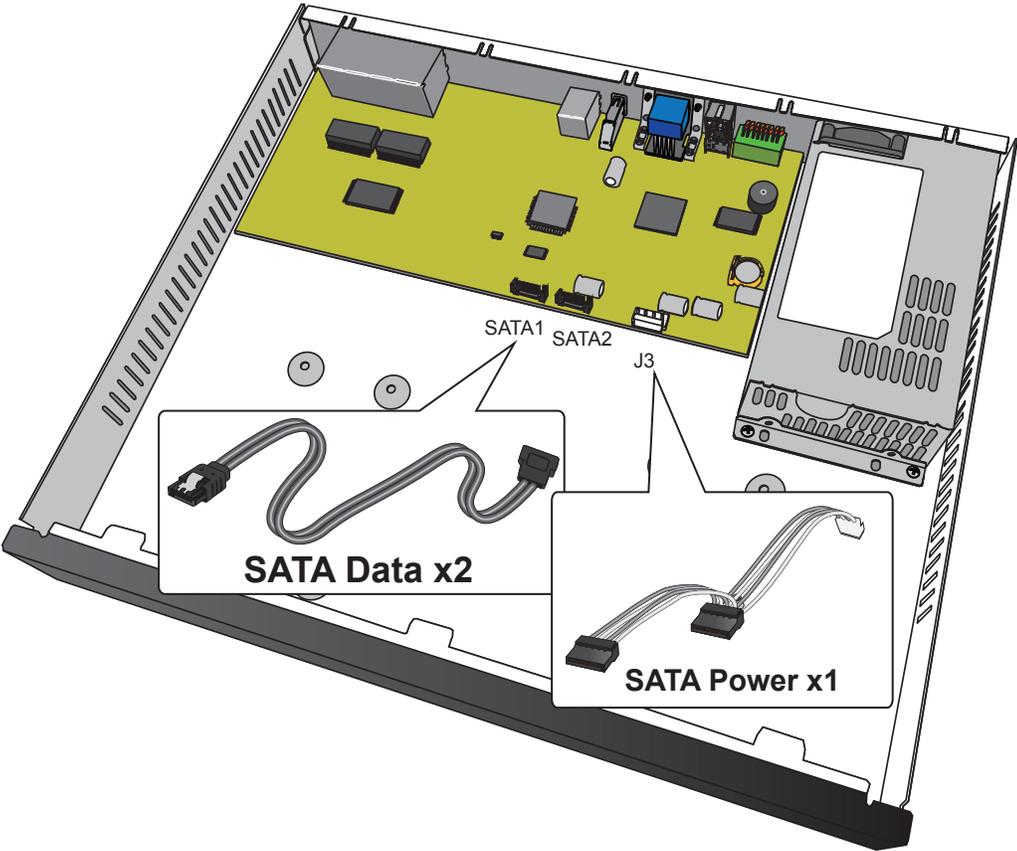
1. Attach four (4) foot pads to the bottom of the enclosure if the NVR is to be placed on a desk or shelf.



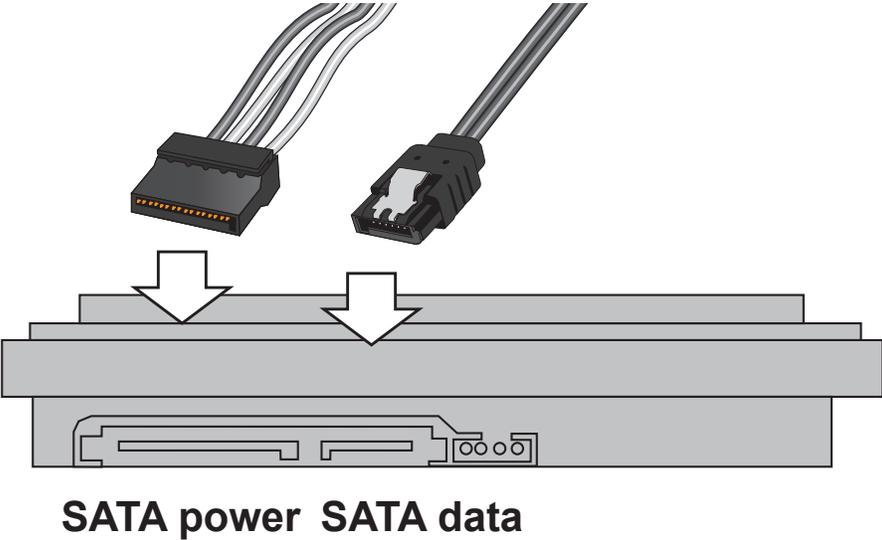
2. Use a screwdriver to loosen the retention screws on the sides and the back of the chassis. Slide the top cover back, and then remove the top cover.



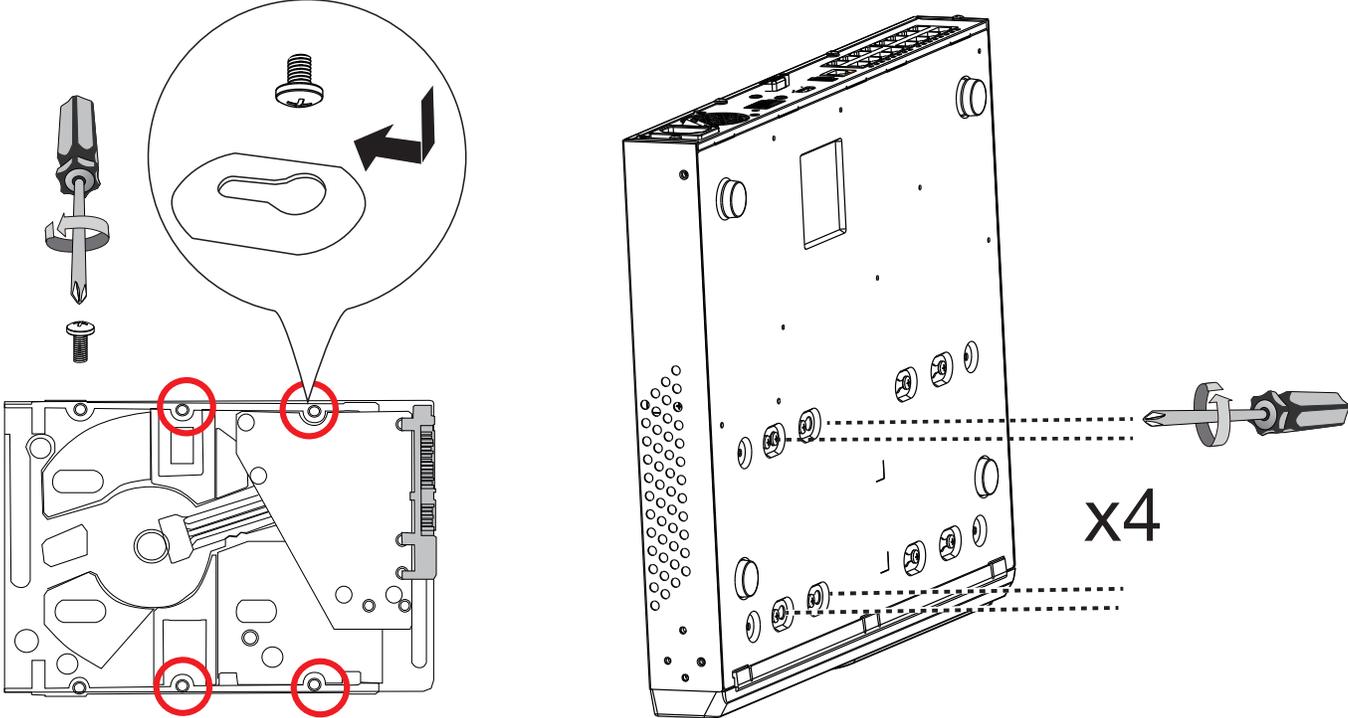
3. Attach the SATA Data cable to the SATA2 connector on the NVR mother board.



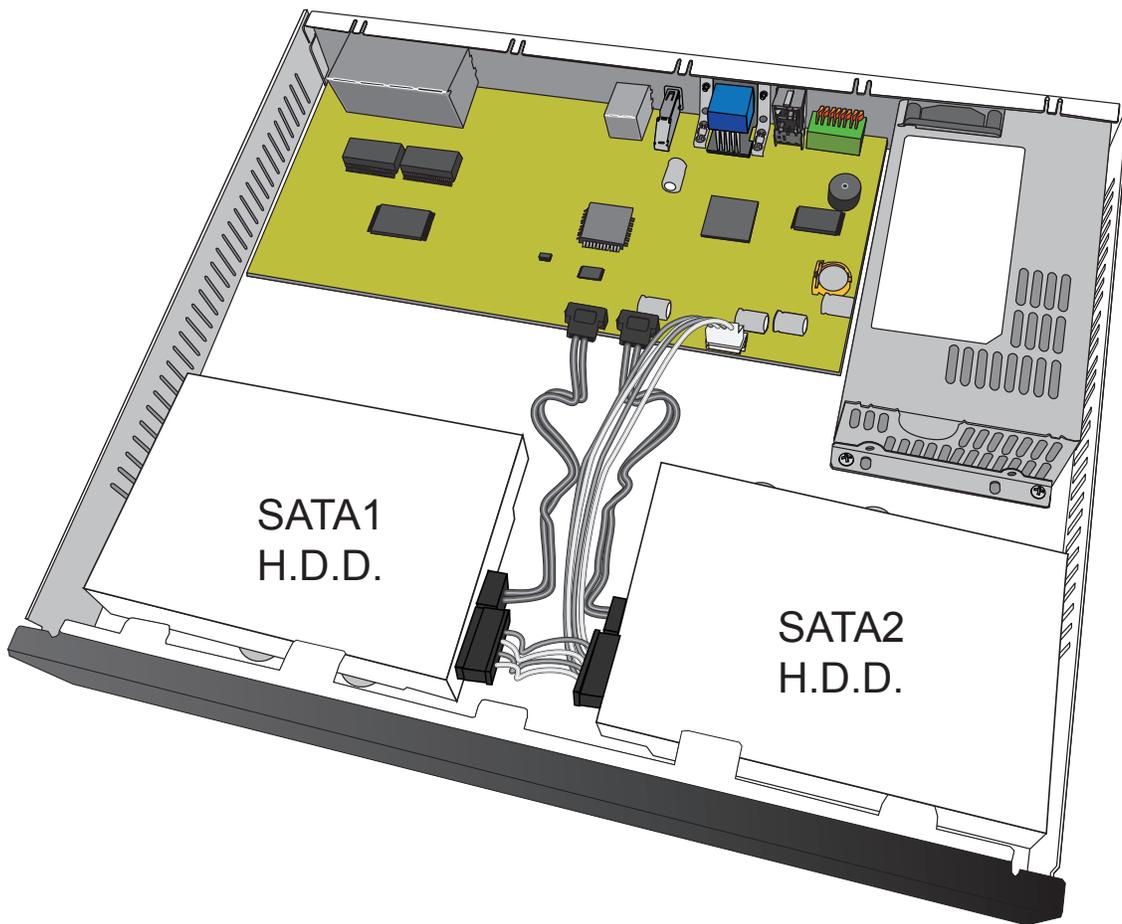
4. Connect the SATA power and SATA data cables to the hard drive.



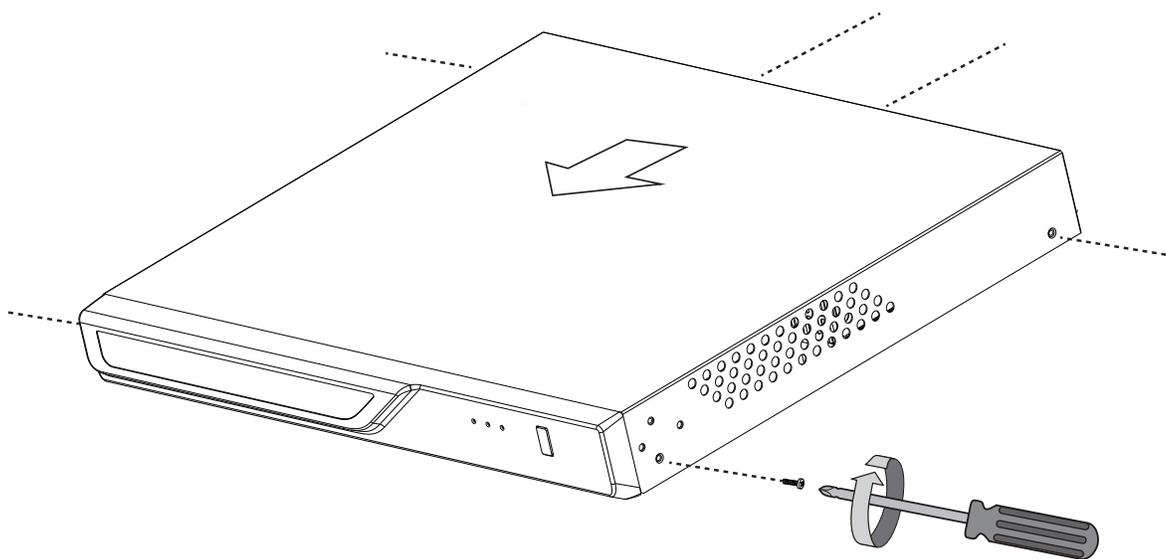
5. Insert four supplied screws into the HDD (leaving them loose). Position the HDD screws through the large end of the slotted mounting holes on the bottom of the NVR chassis, slide it over and then tighten the mounting screws.



6. Secure the hard disks to the mounting positions in the chassis with its label side facing up and the connectors facing the inside of the chassis. The sample drawing below shows the positions.



7. Reinstall the cover and the 6 (six) cover screws.

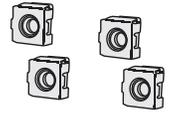


Rack-mounting

IMPORTANT:

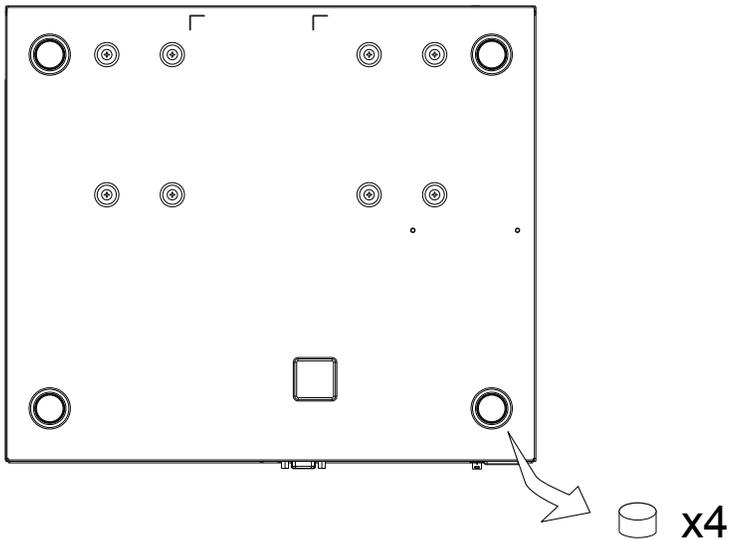
If you have either a round-holed or square-holed rack, install cage nuts or clip nuts to the desired positions on the rack posts.

The instructions below are based on the installation to a 4-post equipment rack. The slide rails apply to rack cabinet of a depth of 700 to 900mm. With two (2) hard drives, the chassis can weigh up to 4kg.

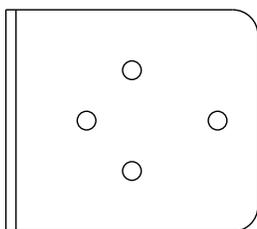
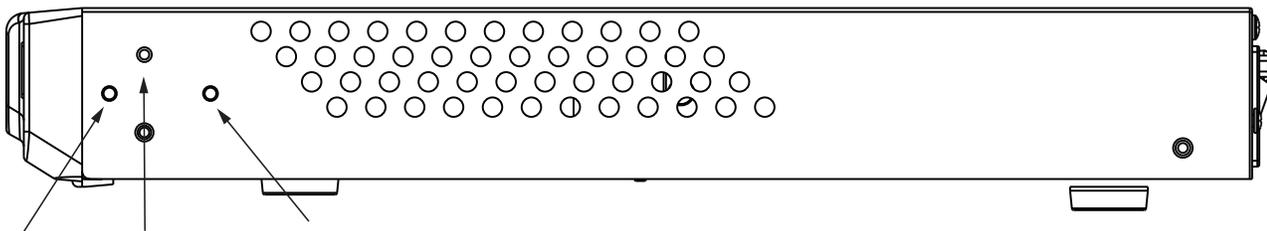


If you need to install the NVR system into a rack cabinet:

1. Remove the foot pads from underneath the chassis.

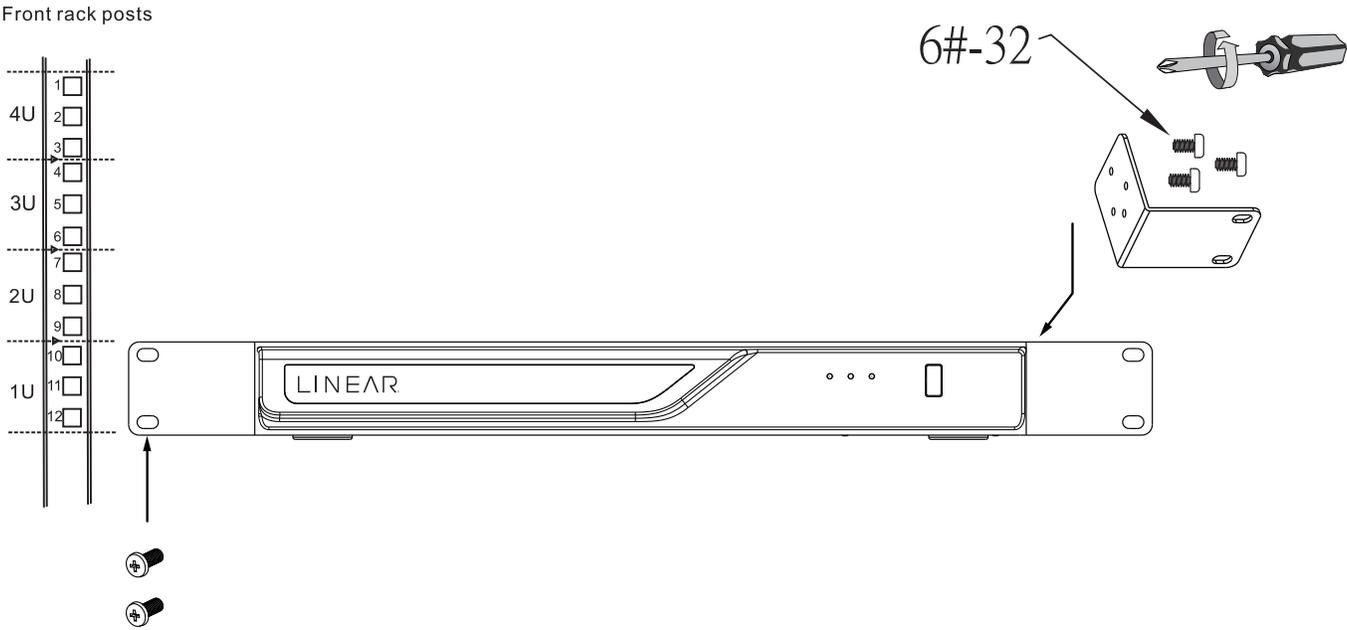


2. Secure the brackets to the sides of the chassis by driving three (3) included screws.



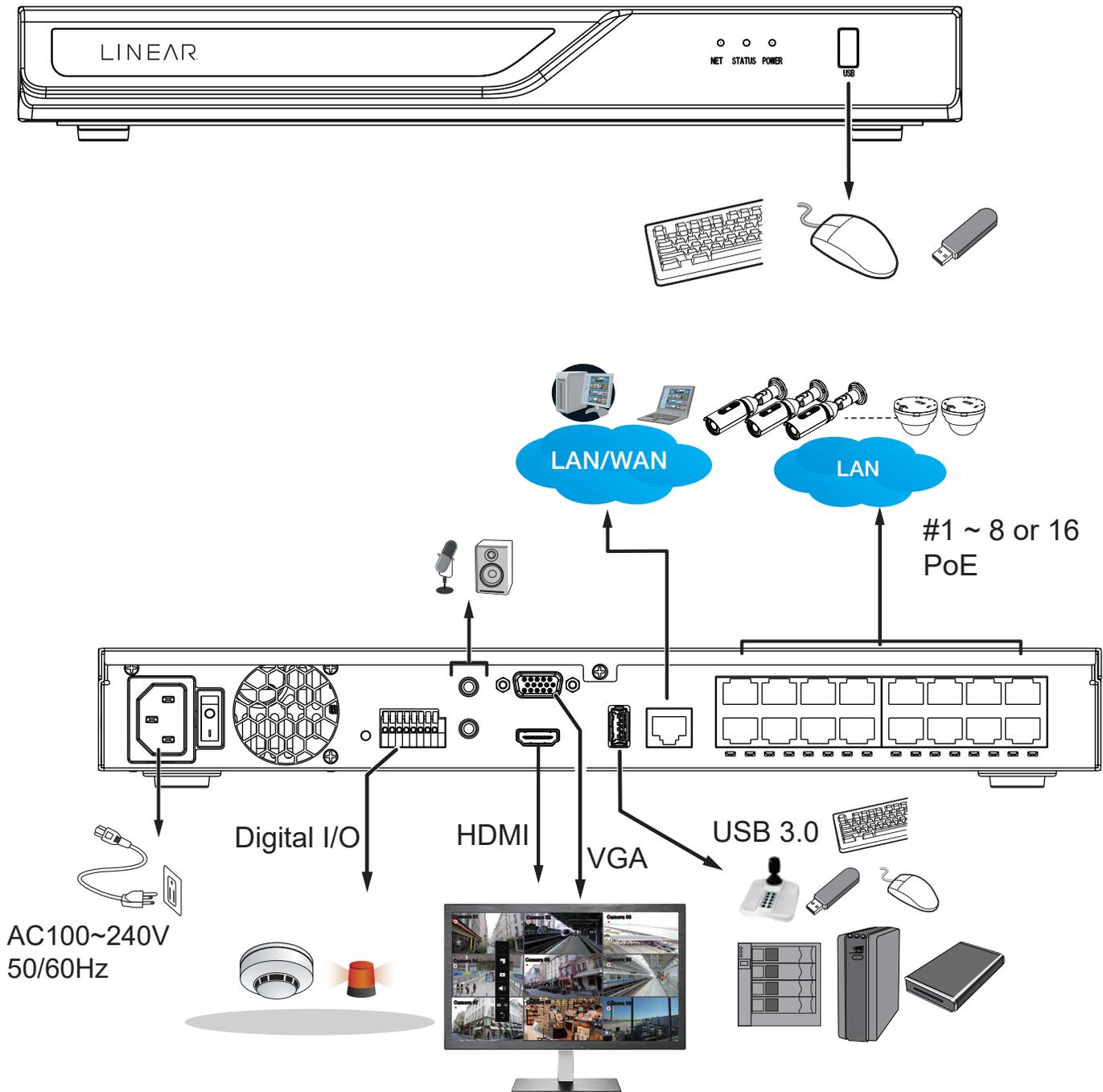
6#-32 

3. Secure the chassis to rack posts using two (2) M6 screws on each side.



Interface Connections

1. Connect to a monitor using an HDMI cable. VGA is also supported.
2. Connect CAT5e or better-quality Ethernet cable to the GbE Ethernet ports.
3. Connect USB devices such as, mouse, keyboard, USB optical drive, USB thumb drive (formatted in FAT format), joystick or UPS.
4. Connect external devices, such as sensors, relays or alarms to the terminal block.
5. Connect the system to the power mains.



 **NOTE:**

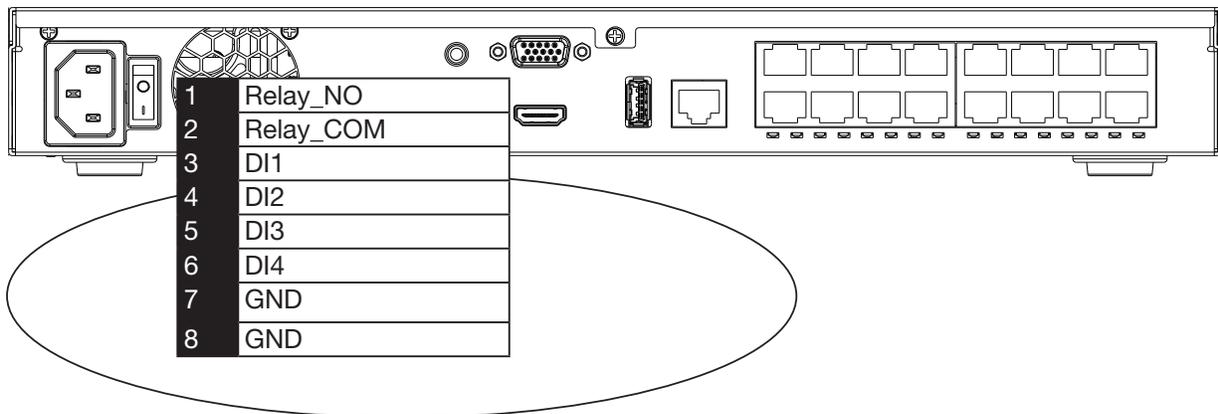
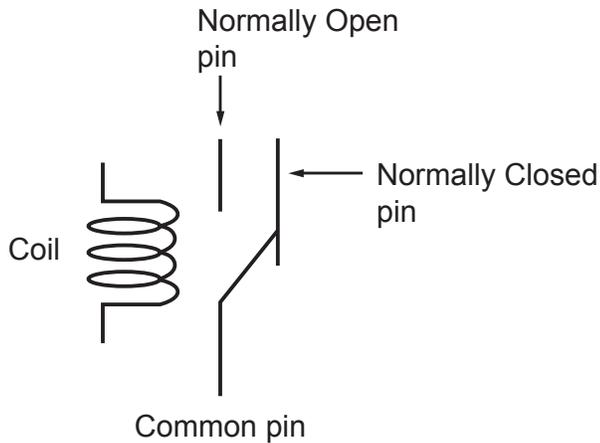
1. The NVR ships with a default IP Address of 192.168.0.240. Additionally, the system supports MAC Binding for Linear Cameras and can detect Linear cameras within the network regardless of the IP setting of the camera. Ideally, cameras and the NVR should reside in the same subnet. If a camera's IP is changed for some reasons, the system should be able to detect its new IP.
2. Note on external storage enclosure via the USB 3.0 interface:
 - 2-1. If external USB 3.0 storage is attached, a maximum volume size of 16TB is supported. The NVR supports the connection to a USB3.0 storage with a maximum of five (5) disk drives. The minimum storage size in the external storage is 64GB.
 - 2-2. The external storage must be powered on first before the NVR.
 - 2-3. Hot-swapping is not supported. If the external storage is disconnected, recording will be continued using the NVR's internal disk drives.
 - 2-4. The storage configuration on the external storage is separately configured. For example, a RAID configuration. The RAID volume on the external storage appears to the NVR as a single large disk drive, and you should create a volume from it from the Storage configuration page.
 - 2-5. If the disk drives in the external storage are not configured into the NVR's storage volumes, you can use them as the external backup devices. To do so, you should format disk drives in the external storage in the FAT32 or NTFS format, and export the recorded video on NVR to these disk drives.
 - 2-6. **Limitations:**
 - When you are exporting video to the disk drives in an external storage, you cannot select the other disk drives to create a new volume.
 - If the disk drives or volumes in the external storage is smaller than 1TB, you cannot configure them as volumes for the NVR.
 - The connection interface to external storage must comply with the USB 3.0 specifications.
 - 2-7. The RAID or volume configuration in the NVR does not extend to include devices in the external storage.

Terminal Block Connections

The terminal block pinouts is shown as follows:

The relay pins default status is set to **Normally Open**. Connect your relay or external devices' signal wires to the system. The system will automatically detect the current signal status. You can then trigger the external devices using the DI/DO panel on the live view.

You can also configure the system alarm setting for the system to automatically trigger a relay pin on the occurrence of system events. See **Settings - Alarm - Events**, [page 107](#).

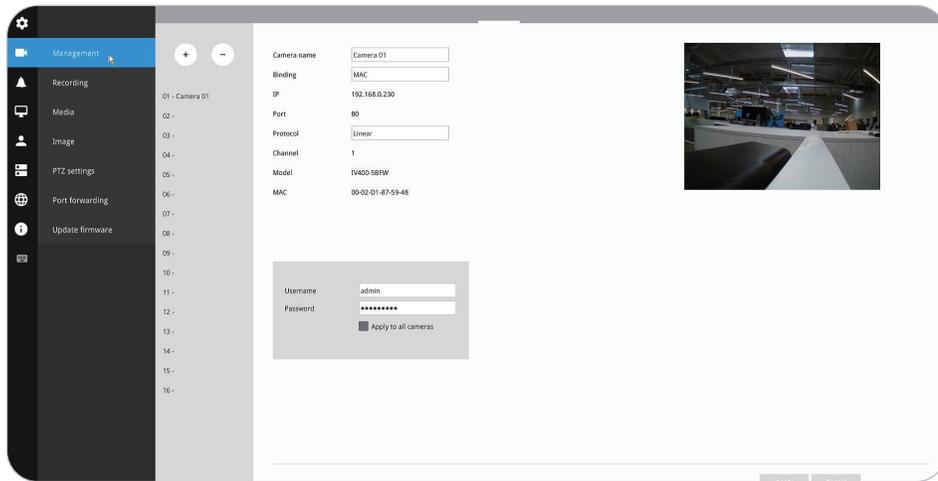


The GND are common ground for the DIs.

Initial Configuration - via a Local Console

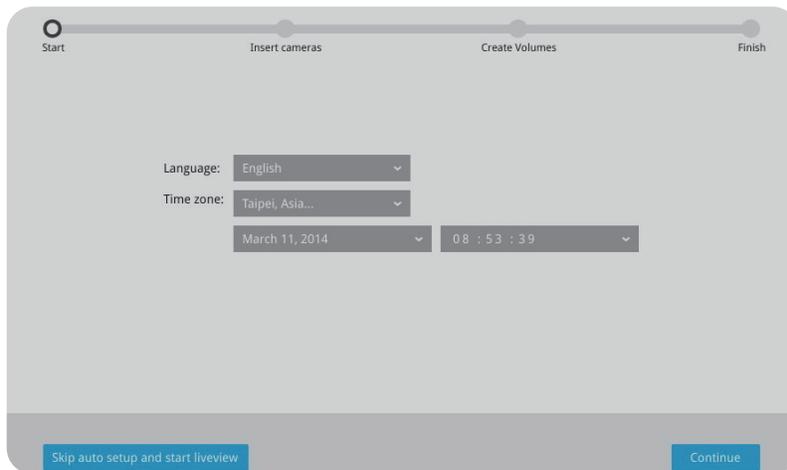
A local console requires the following:

1. A monitor is connected via an HDMI or VGA cable.
2. A mouse and/or a keyboard are connected to the system.
3. It is presumed that the system has not been configured yet.
4. The system will prompt you to create a password.



Follow the on-screen messages to complete the initial configuration:

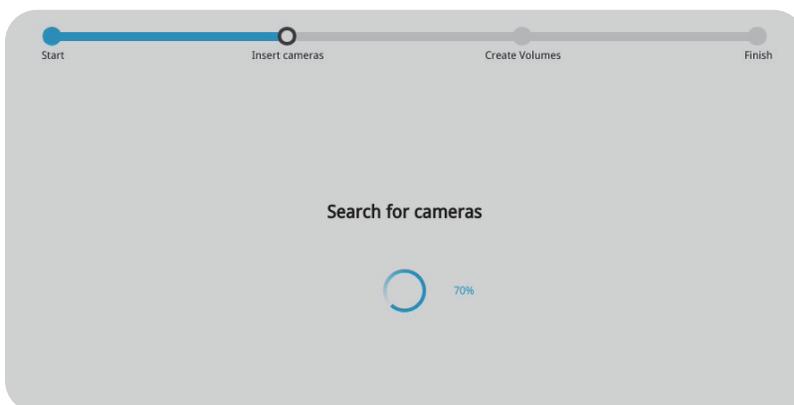
1. Select the UI language, Time zone and current date and time. Click on the **Continue** button to proceed. Make sure you enter the correct date and time.



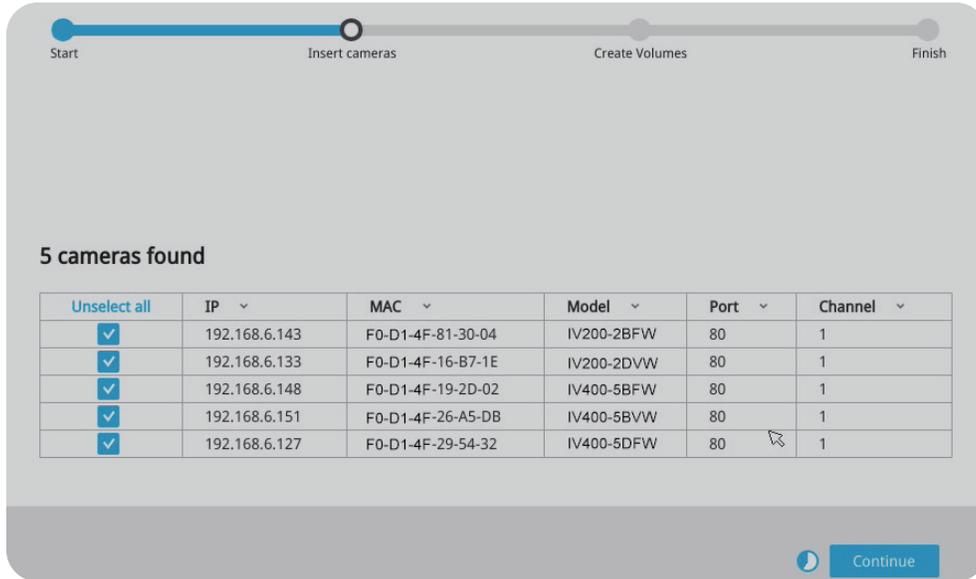
IMPORTANT:

Except in the initial setup, changing system time can produce disruptions to the existing recordings. Turning the current system time back to a time when video recording was taking place can generate duplicate files. And those files may not be playable.

2. The system will then start to scan the local subnet for connected cameras.



3. All cameras detected on the network will be automatically selected. If necessary, deselect the cameras you want to exclude from the configuration. Click **Continue** to proceed.



The screenshot shows a configuration window with a progress bar at the top. The progress bar has four stages: 'Start', 'Insert cameras', 'Create Volumes', and 'Finish'. The 'Insert cameras' stage is currently active. Below the progress bar, the text '5 cameras found' is displayed. A table lists the detected cameras with columns for 'Unselect all', 'IP', 'MAC', 'Model', 'Port', and 'Channel'. Each row has a checked checkbox in the 'Unselect all' column. A 'Continue' button is located at the bottom right of the window.

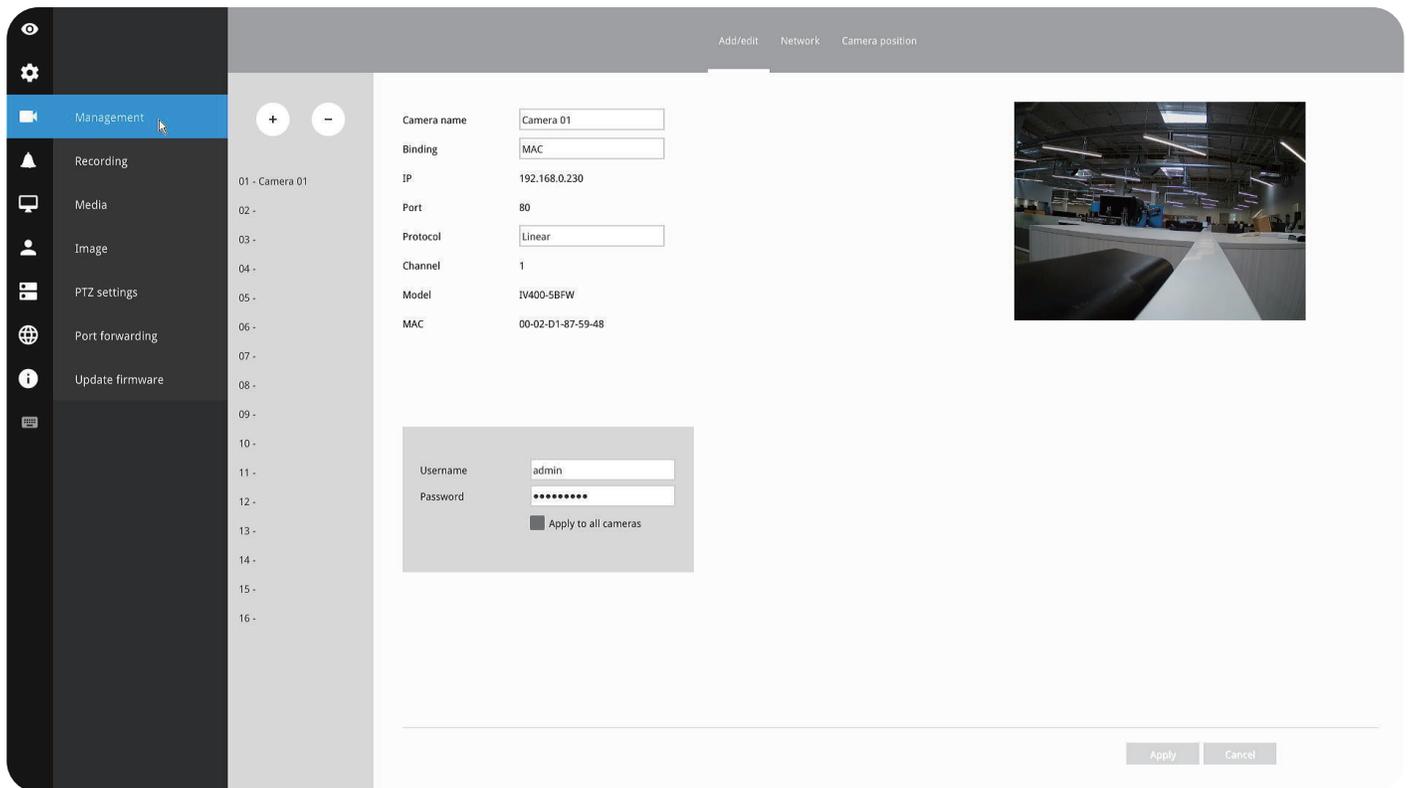
Unselect all	IP	MAC	Model	Port	Channel
<input checked="" type="checkbox"/>	192.168.6.143	F0-D1-4F-81-30-04	IV200-2BFW	80	1
<input checked="" type="checkbox"/>	192.168.6.133	F0-D1-4F-16-B7-1E	IV200-2DVW	80	1
<input checked="" type="checkbox"/>	192.168.6.148	F0-D1-4F-19-2D-02	IV400-5BFW	80	1
<input checked="" type="checkbox"/>	192.168.6.151	F0-D1-4F-26-A5-DB	IV400-5BVW	80	1
<input checked="" type="checkbox"/>	192.168.6.127	F0-D1-4F-29-54-32	IV400-5DFW	80	1

 **NOTE:**

- The maximum decoding bandwidth is
 - » H.265
 - » 3840x2160@30fps 1 CH
 - » 1920x1080@120fps 4 CH
 - » H.264
 - » 3840x2160@30fps 1 CH
 - » 1920x1080@120fps 4 CH
 - » Recording throughput:
 - » 64Mbps (LNVR1-08P); 96Mbps (LNVR1-16P)
 - » Note that when accessed over the network, the total streaming throughput is 24Mbps.
 - » Pre-recording: 5 seconds (maximum 10)
 - » Post-recording: 20 seconds (maximum 300)
 - » When cameras are recruited into the configuration, their stream 1 is used as the recording stream.
 - » The resolution and fps (frame rate per second) of stream 1 may vary depending on the specifications of different cameras.
- If there are less than 8 or 16 cameras, the Auto Setup will automatically move to the next configuration step.

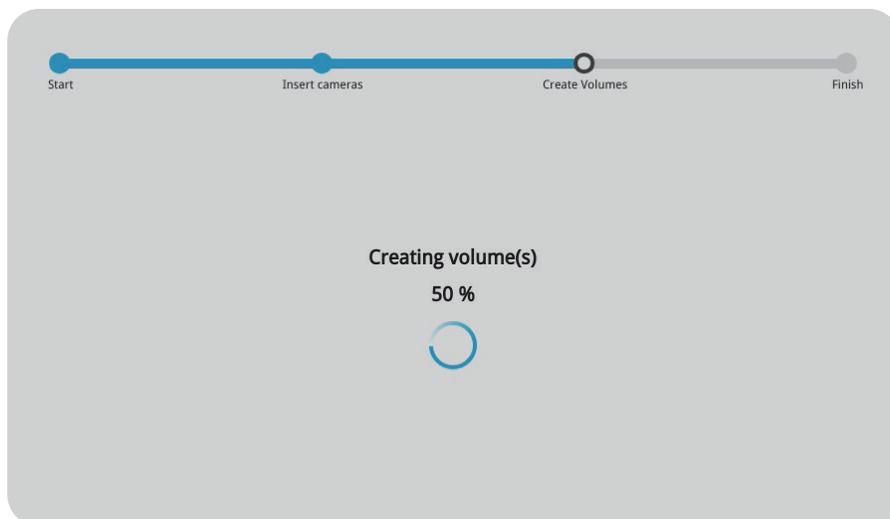
NOTE:

If the need should arise, you can manually enter an IPv6 address to recruit a camera. Note that currently you can not search a camera with an IPv6 address in the device search panel.

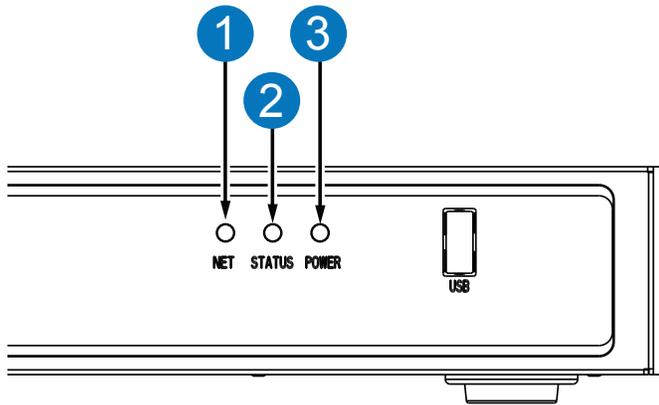


Note the following when using IPv6 addresses:

- Abbreviation is supported. For example, :: for 0000:0000.
 - If illegal characters are entered, conflict warning messages will display.
4. The system will automatically create volumes from the installed disk drives. The process will take several minutes. Hard disks will be configured into single-disk volumes. You can delete these volumes and then create RAID volumes in the **Settings > Storage** page.



LED Indicators



Name	Behavior	Definitions
1. NET LED	1 Blinking Orange	Data is being transmitted or received.
	2 OFF	The Ethernet uplink is disconnected.
2. Status LED	1 Constant Green	System ready.
	2 Blinking Green every 1 second	Updating firmware or device pack.
	3 Constant Red	<ol style="list-style-type: none"> 1. S.M.A.R.T.-related disk errors, 2. A configured H.D.D. is missing, 3. H.D.D. is full. Buzzer will also be sounded. When buzzer is turned off, LED will return normal.
3. Power LED	1 Solid Green	The NVR is powered on.
	2 OFF	The NVR is powered off.

Power Up and Power Down

To power up and power down:

On the initial configuration:

1. Connect the power cord between the system and power outlet.
2. Turn on the system using the power switch on the back of chassis.

After the initial connection:

3. Use the **Power Down** button on the lower right corner of the Settings page. The system should start flushing the cached contents in system memory and shut down. You should then flip the **Power Switch** button on the back of chassis to completely shut down the system.
4. Press the **Reset** button for longer than five (5) seconds can restore system defaults. The **Reset** button is located on the NVR system board (see [page 11](#)).

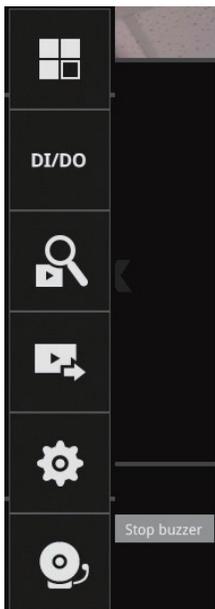
WARNING:

1. No storage system is completely fail-safe. Damage to data might occur due to file system corruption, operating system malfunction, virus infection, HDD component failures and so on. Therefore, it is highly recommended to regularly back up your data. Data loss or recovery is not the responsibility of Nice North America.
2. Always power off the system using the **Power** button on the back of chassis. The system is powered off when you observe that all LEDs go off. Do not disconnect the power cord while the system is still operating. Doing so will result in data inconsistencies. The normal power-off procedure allows cached data to be written to disks.

NOTE:

If system buzzer is sounded, move your mouse cursor to reveal the main screen portal and then click on the **Stop buzzer** button.

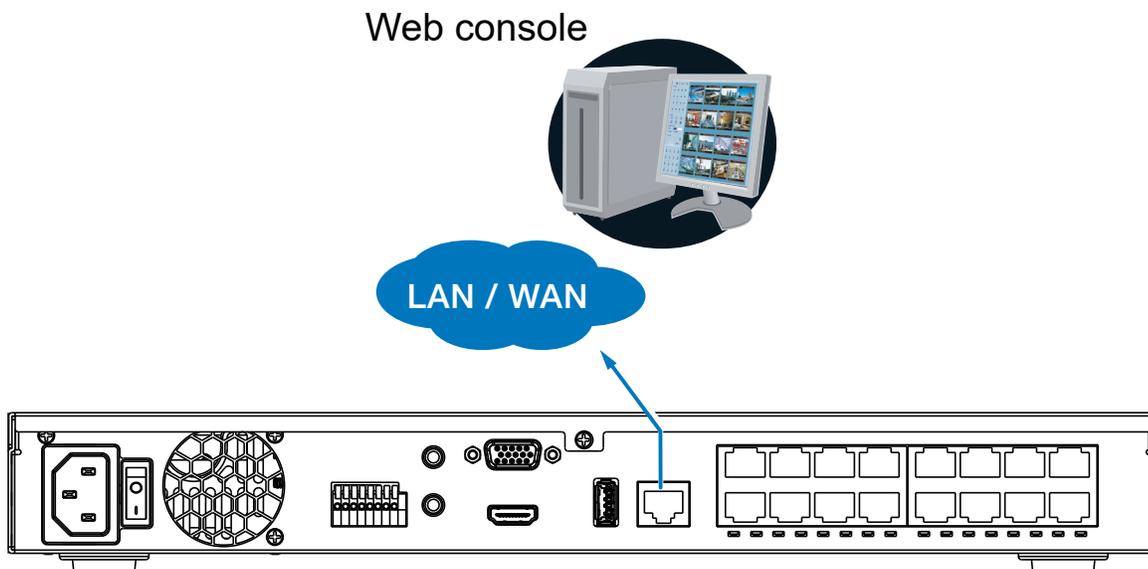
Serious system faults, such as a missing volume, can trigger the system buzzer. Verify the cause of system fault and turn off the buzzer.



Section 1: Management Over a Web Console

There are two different interfaces on the system:

1. One is connecting mouse and keyboard, and an HDMI cable to a TV screen or monitor. The local management thus made is described in **Section One** of this manual.
2. The other is accessed through the Ethernet connection. Management via a web console will be described in **Section Two** of this manual.

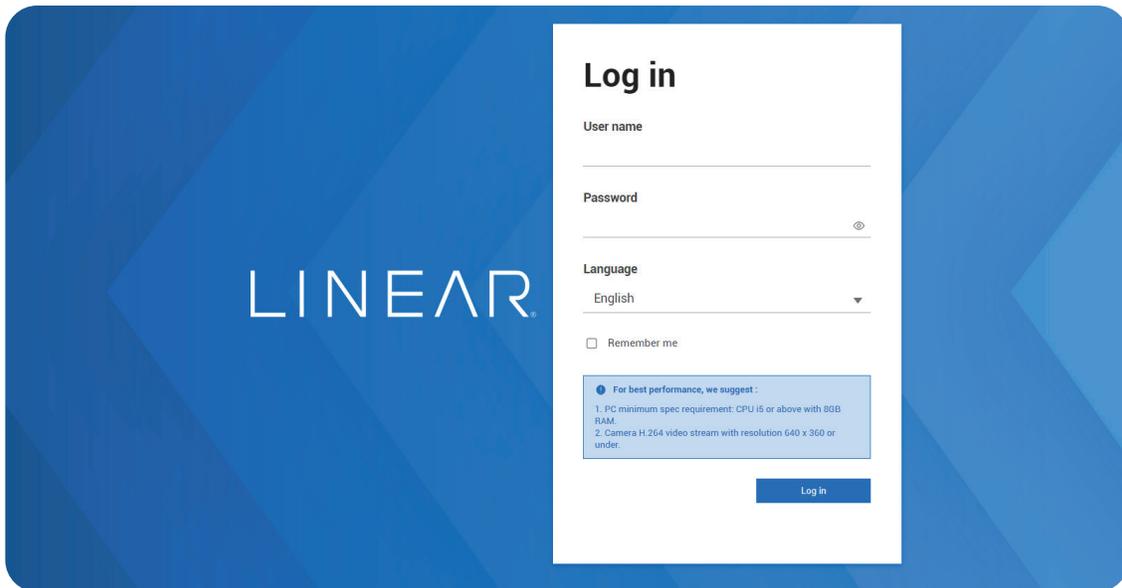


Note that when accessed over the network, the total streaming throughput is 24Mbps.

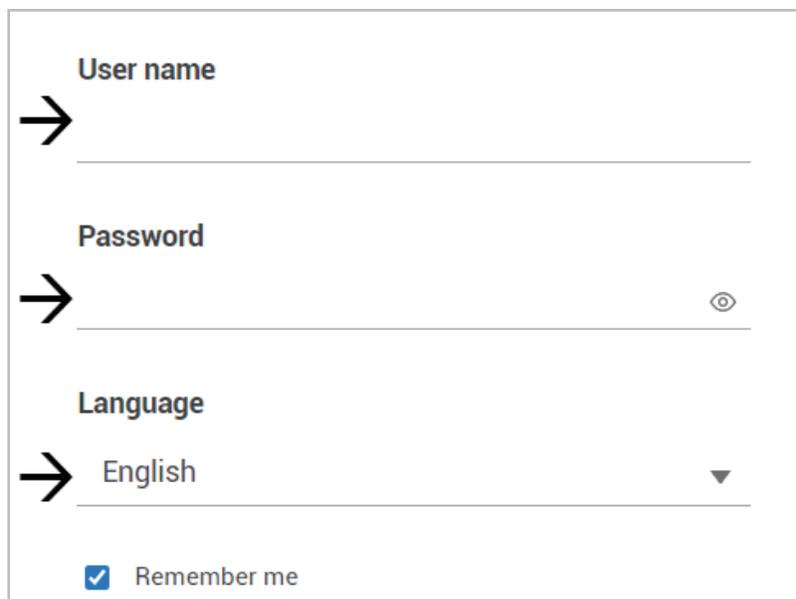
Chapter 1: Login and Getting Started

1-1. Login

This is the login page on the browser. The minimum for resolution is 1280x960. Please use Google Chrome to access the NVR. By default, the web console opens with the new user interface.

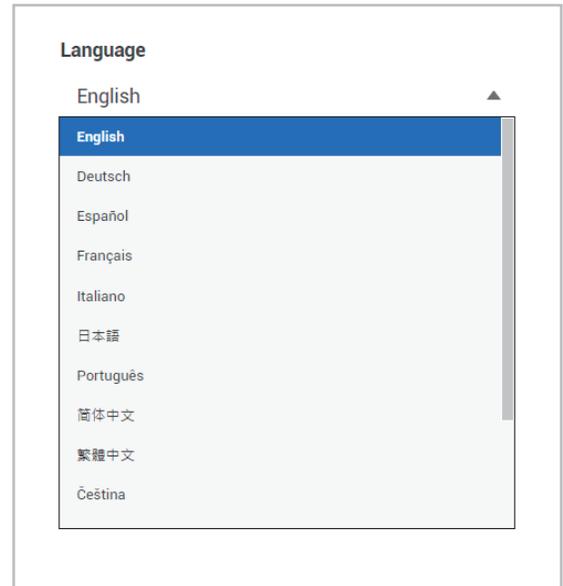


Please refer to [Settings - User](#) page to see how to prevent unauthorized access. The system will prompt you if you entered an incorrect user name or password.



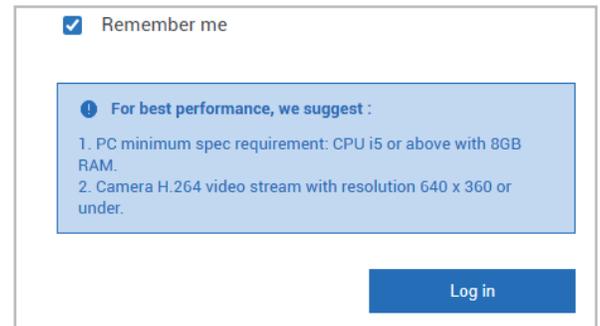
You can also select a different language using the **Multilingual** selector menu on the **lower left** corner of the Login screen. The functional items, menus and dialogues will then be displayed using the selected language.

English is the default language setting.



Remember me

Select the **Remember Me** checkbox to save your user name for use on the next login. The user name will be preserved in browser cookies for two days. If you do not login within the next two days, the user name will be erased.

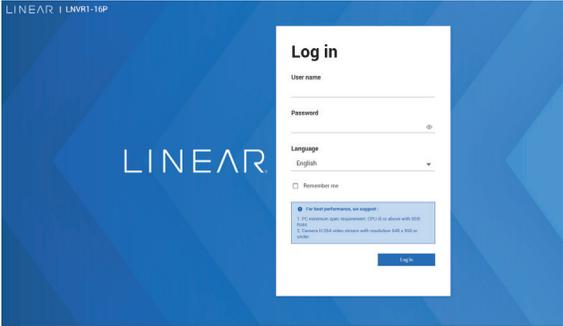


Login Error

A Login failure can result from entering the incorrect user name and/or password.

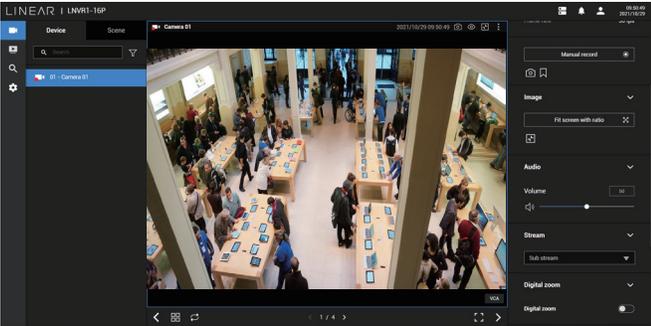


The NVR system features a simple UI structure which consists of a Liveview window and Playback utility.



Liveview

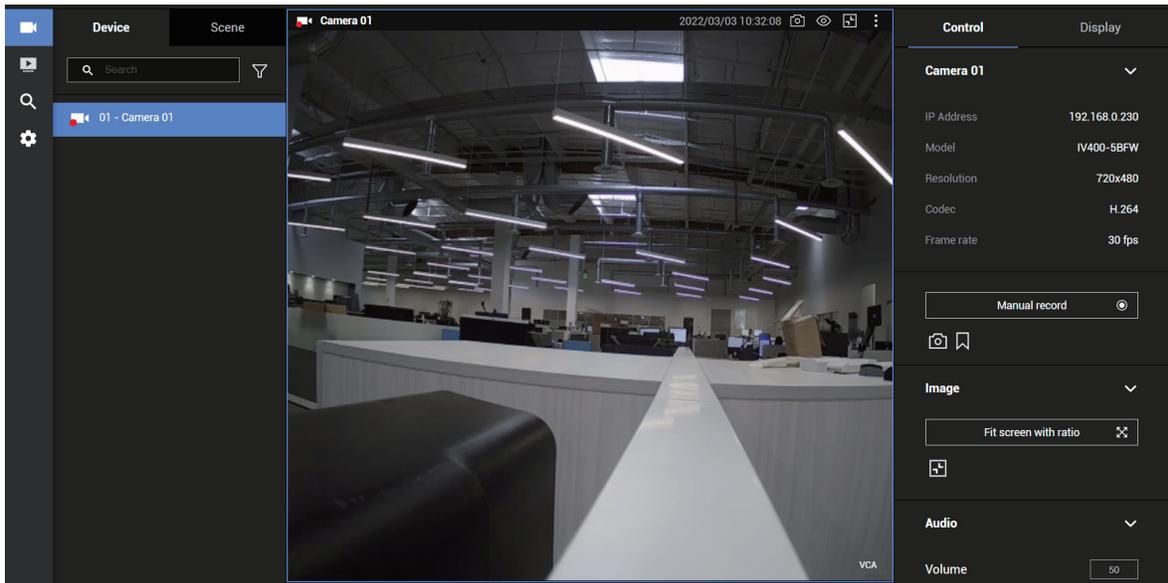
Playback



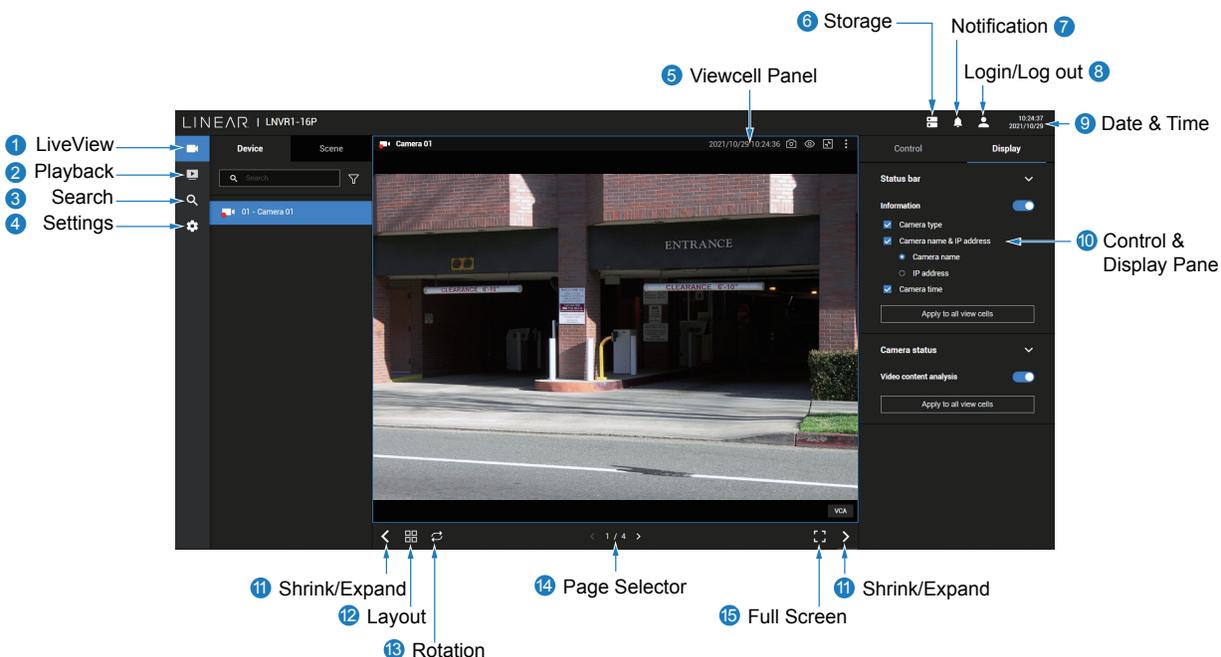
 **NOTE:**

The NVR supports plug-in-free web sessions using any browser.

When more than one camera is connected, multiple cameras can be view at one time and custom camera scenes can be displayed.



1-2. Graphical Layout and Screen Elements - Liveview



Once you log in, the system defaults to the Liveview page, which provides access to other configuration utilities, live view screen and other functional panels. The screen elements are described as follows:

Item	Name	Description
1	Live view	Provides a glimpse of all cameras inserted into your configuration.
2	Playback	Provides access to camera recordings.
3	Search	Provides access to the Alarm search panel.
4	Device List	All devices (cameras / video servers) that have been recruited into the configuration will be listed.
5	View cell panel	The video feeds from cameras will be placed into view cells.
6	Storage	Provides a glimpse of current storage usage.
7	Notification	System notifications including system events and alarm notifications.
8	Login/Logout	You can log out and log in again using another user role. You can switch to the original interface from here, too.
9	Date & Time	Displays date and time. You can click to enter the date and time setting page.
10	Control & Display Pane	When a view cell is selected, the camera-specific control (such as PTZ) and display options will be available here.
11	Shrink/Expand	You can display or hide the side panes.
12	Layout	Provides functions to extend, rotate and redo the layout.
13	Rotation Mode	Click to enter the Rotation mode.
14	Page Selector	Click to move to the other layout page when your live views are distributed over many pages.
15	Full Screen	Enters the full screen with only the live views.

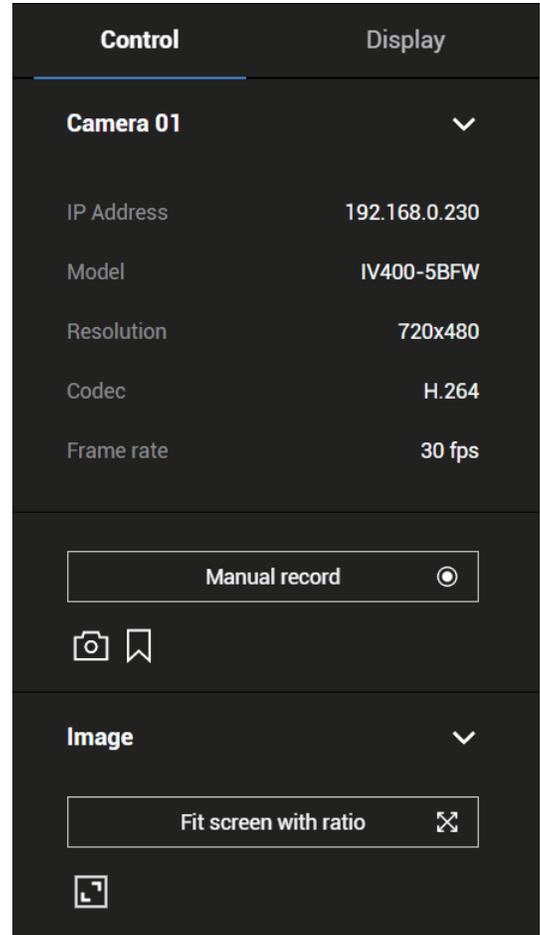
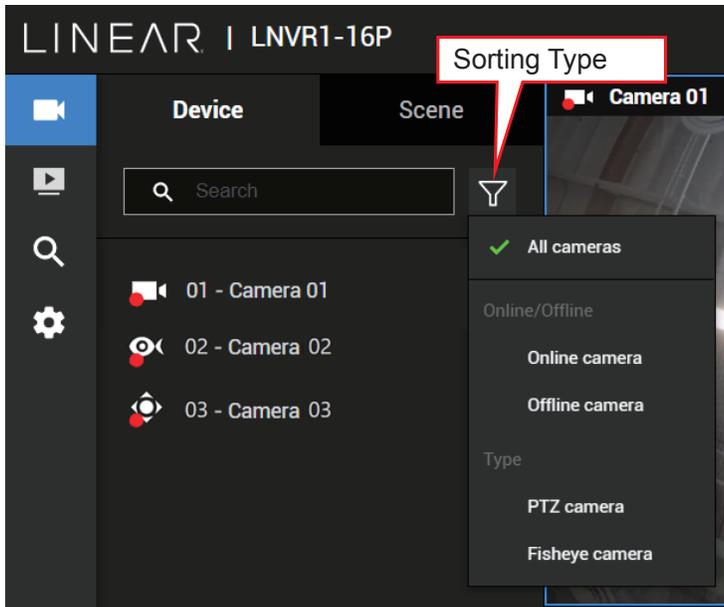
1-2-1. Camera List Panel

The Device list displays the recruited cameras by the sequential numbering order you configured in the System Settings utility.

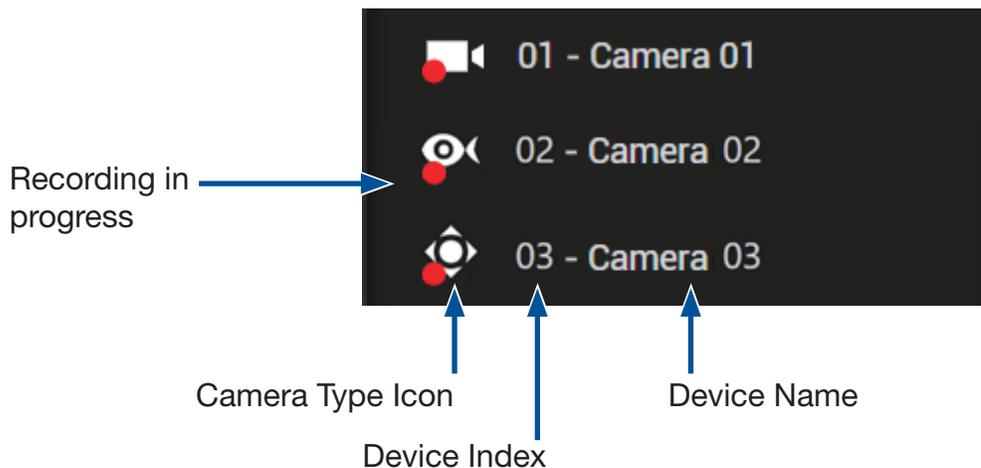
If a user has logged in using a credential of a limited access, he may only see cameras accessible instead of all of the cameras.

Camera Icon:

A mouse click on the camera name on the Device list brings forth the summary of IP address, model name, recording setup, DI/DO information and other control elements on the right pane.



Once devices are added to the NVR, they will be listed. The device type will be automatically detected. Different types of devices will be given different types of device icons.



Different types of devices will be given different types of device icons.



Box or Bullet cameras.

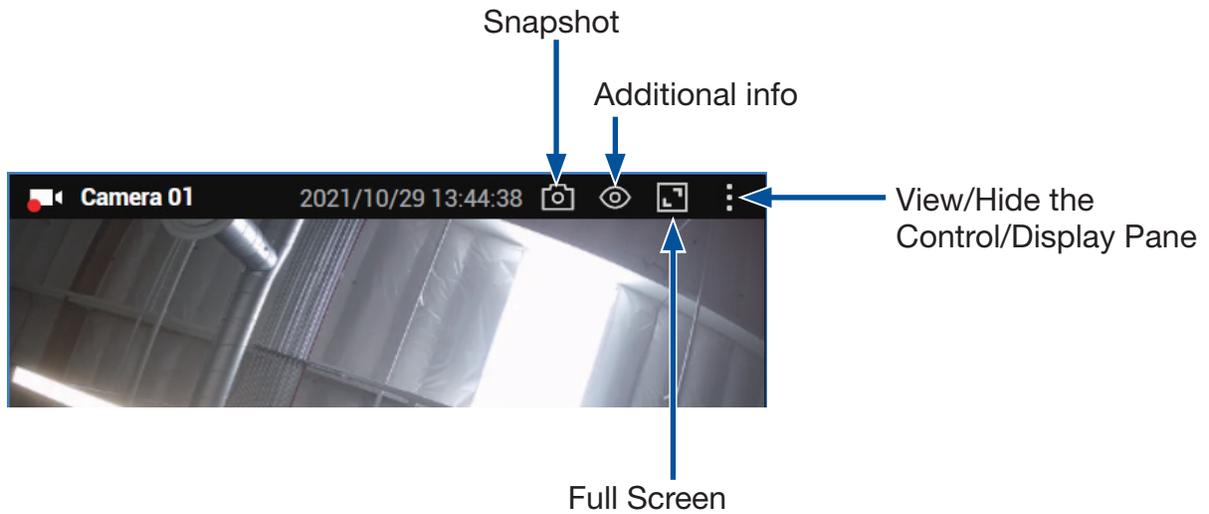


Fisheye cameras.

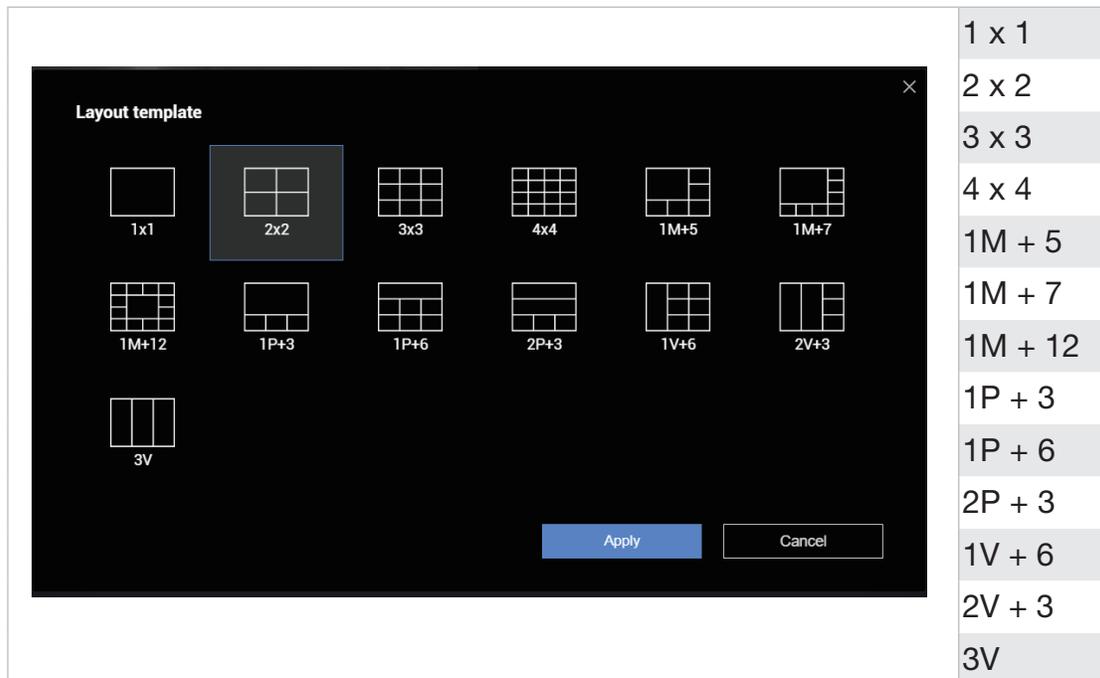


PTZ cameras.

View Cell elements:



1-2-4. Layout



Only an administrator can change and preserve a custom layout, and every user can designate a specific layout to be displayed when he/she logs in. The default layout for each user is stored in a browser's cookies.

The available layouts are categorized into four (4) types: Equal, *Panorama*, *Focus* and *Vertical*.

Equal: 1x1, 2x2, 3x3, 4x4

Panorama: 1P(Panoramic)+6, 2P+3 (applies to fisheye cameras)

Focus: 1M+5, 1M+7, 1M+12

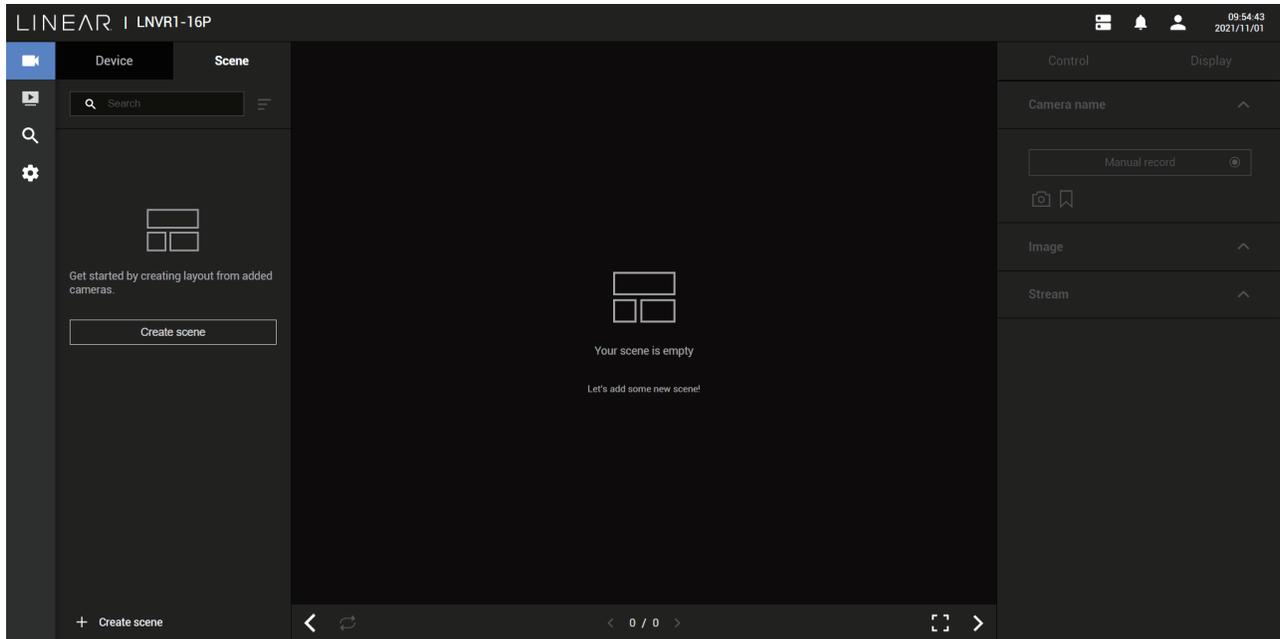
Vertical: 1V+6, 2V+3, 3V (applies to corridor view)

Note that a user who did not log in as an administrator can change a layout, but his configuration changes (with cameras placed on view cells) will not be saved.

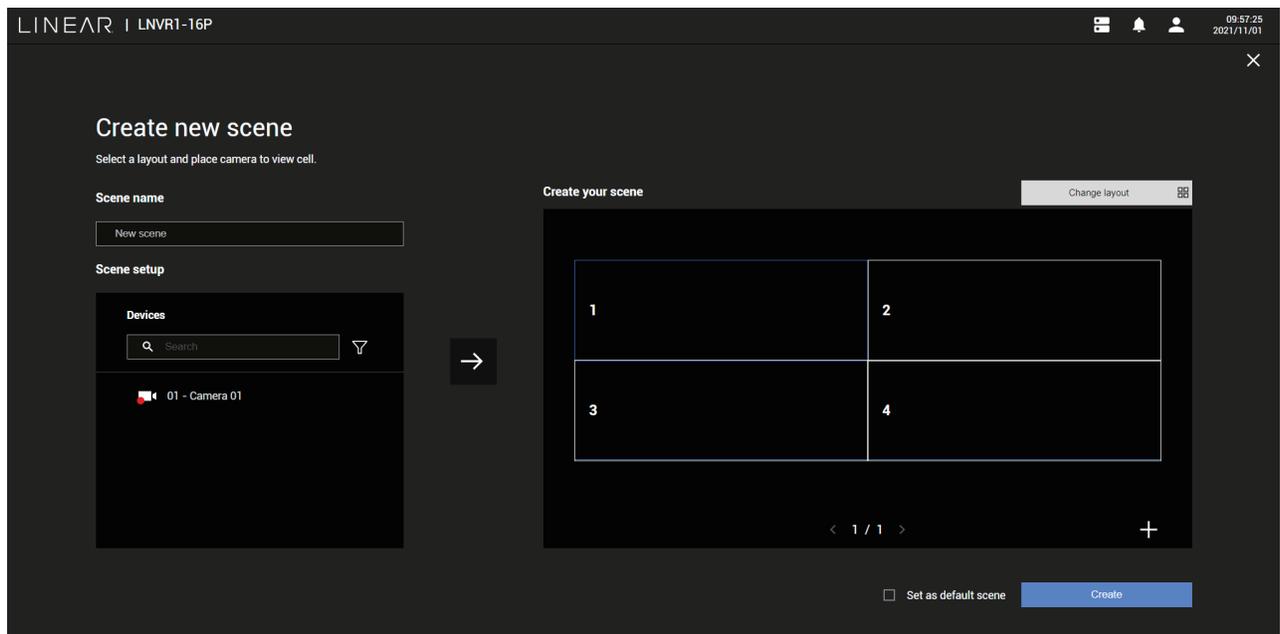
1-2-5. Scene

A scene allows users to gather the live views from multiple cameras together into a comprehensive view. For example, several cameras may have been installed to cover a specific area.

To create a new scene, click on the **Create Scene** button.



You can change layout, enter a name for the new scene, and click and drag cameras into the layout. When done, click the **Create Scene** button.

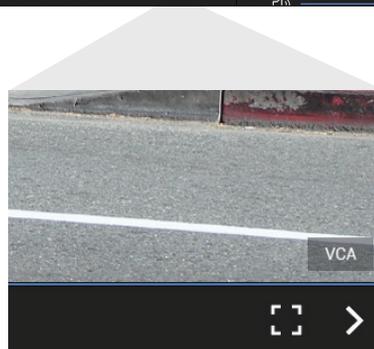
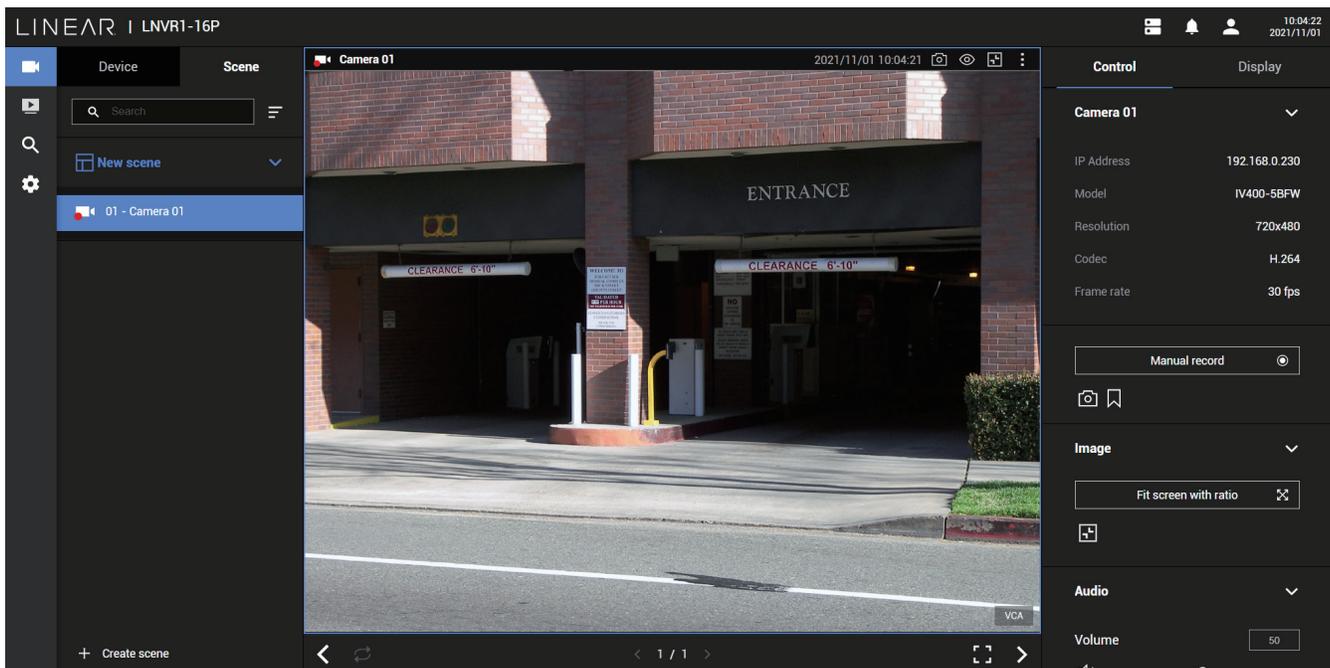


In the Scene view, you can place one camera into multiple view cells. This applies when using cameras with a wide coverage area, such as fisheye or multi-lens cameras.

1-2-5. View Cell panel

A single view cell is shown below. Each view cell contains a video stream display area, information and functional buttons. A view cell is displayed in *Normal*, *Focused* or *Maximized* mode.

1. **A single click** selects a view cell from the View Cell panel, enables its function buttons and turns it into the Focused mode.
2. **The 2nd click** maximizes the size of the view cell to the full of the panel.
3. **The 3rd click** shrinks the maximized view back into the focused mode.



Adding Cameras to View Cells

Although the system automatically selects the video stream to display on the view cell, you can still manually select a different video stream from the Stream tab below.

Click  to open to **Full-Screen** view. To return to the normal view, click on the **Restore**  button at the lower right of the window.

1. Click and drag a camera from the camera list to an unoccupied view cell.
2. Double-click a camera on the camera list. The camera will be added to the first available view cell.

To deselect a view cell and return to the normal view, double-click on the view cell. You can also click on another view cell to continue adding other cameras.

The system automatically adds cameras into view cells by their index numbers. If you prefer a different order and placement, use the *Scene* mode to create different placements.

Sometimes network problems can cause a view cell to be attempting to connect to a network camera. If the connection attempt takes a long time, it may result from network problems or incorrect configuration with video streaming. For example, you may have configured the camera to be streaming a 5MP stream. The NVR uses video stream #1 for recording, and uses stream #2 from cameras for live viewing. You should then open an individual web console to the network camera to change its video streaming configuration.

If the current layout already contain the maximum number of cameras. For example, 16 for the LNVR1-16P, the following message will be displayed.

 **Not able to add camera**
Current layout already has 16 cameras.

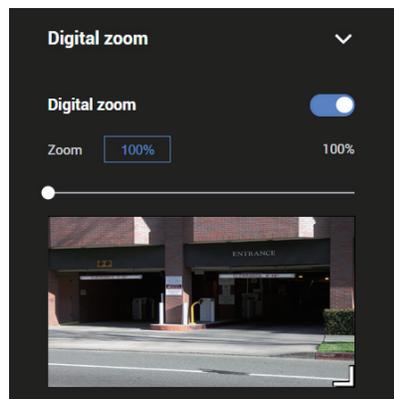
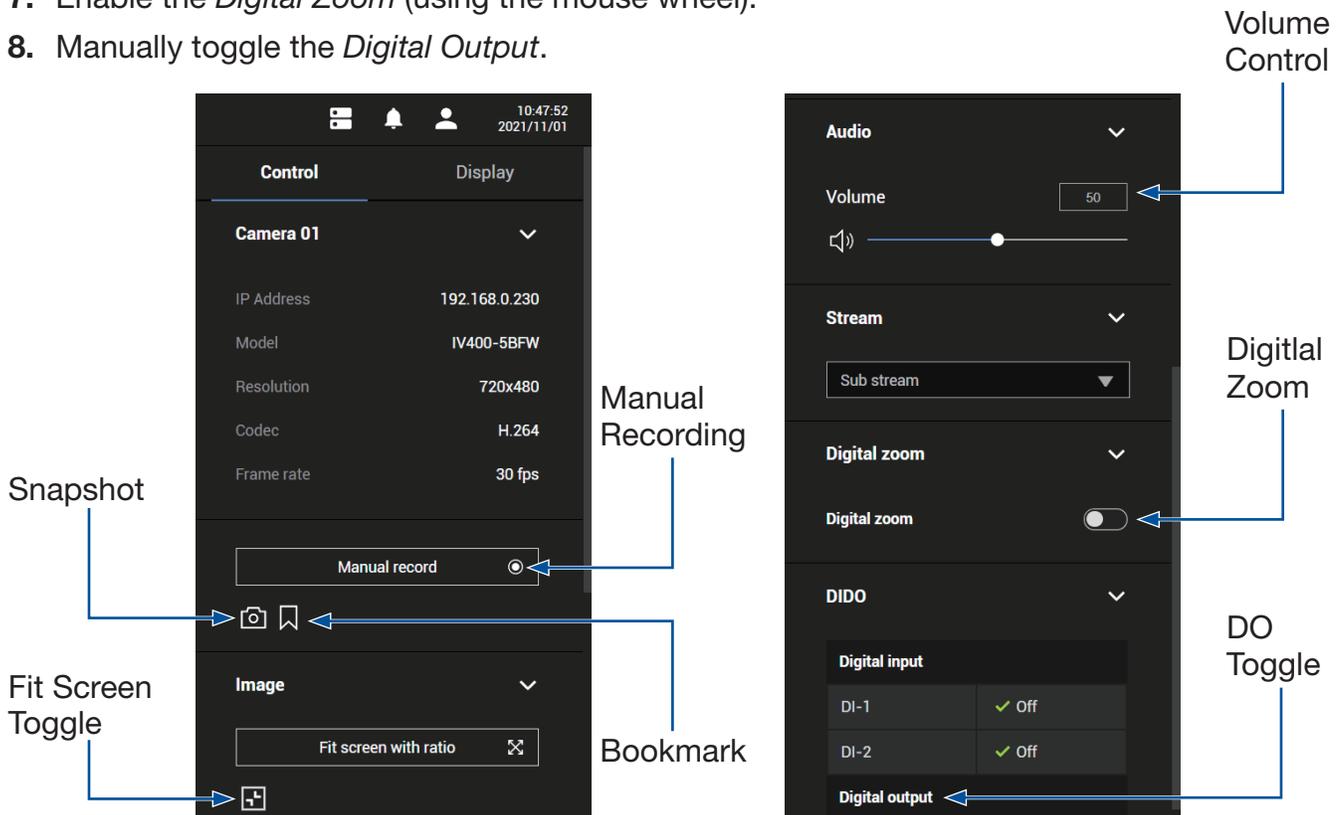
If you are using the 16-CH LNVR1-16P, there can be more than 16 view cells across multiple layout pages. For example, on the second page of the 1M+12 layout, placing a camera in the 17th to 18th view cells will display the following message.

 **Not able to add camera**
Could not place camera here. Try other view cells.

Control Pane

Click to select any of the view cells to activate its Control and Display panes. You can exert the following:

1. View basic information such as the *IP address*, *Model Name*, etc.
2. Start a manual recording.
3. Take a snapshot.
4. Place a bookmark if you find something of your interest. The bookmark is preserved as a one-minute footage along with a short description of a particular incident. The precondition of using this function is that the video stream, while you are watching it on the view cell, must be recorded to the NVR at the same time.
5. Tune the audio volume.
6. Select a different stream.
7. Enable the *Digital Zoom* (using the mouse wheel).
8. Manually toggle the *Digital Output*.

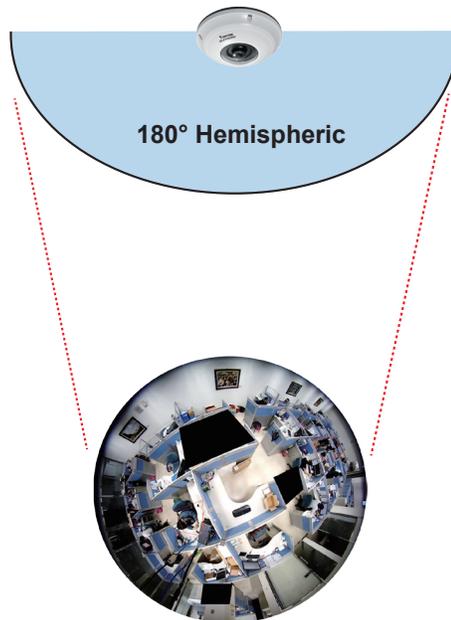


* For a fisheye camera, you can select a dewarp mode as a *Regional* view or a *Panoramic* view.

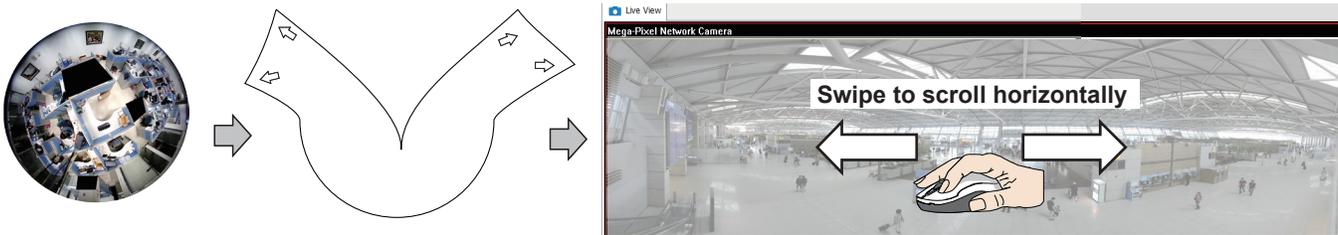


1O (Original view)

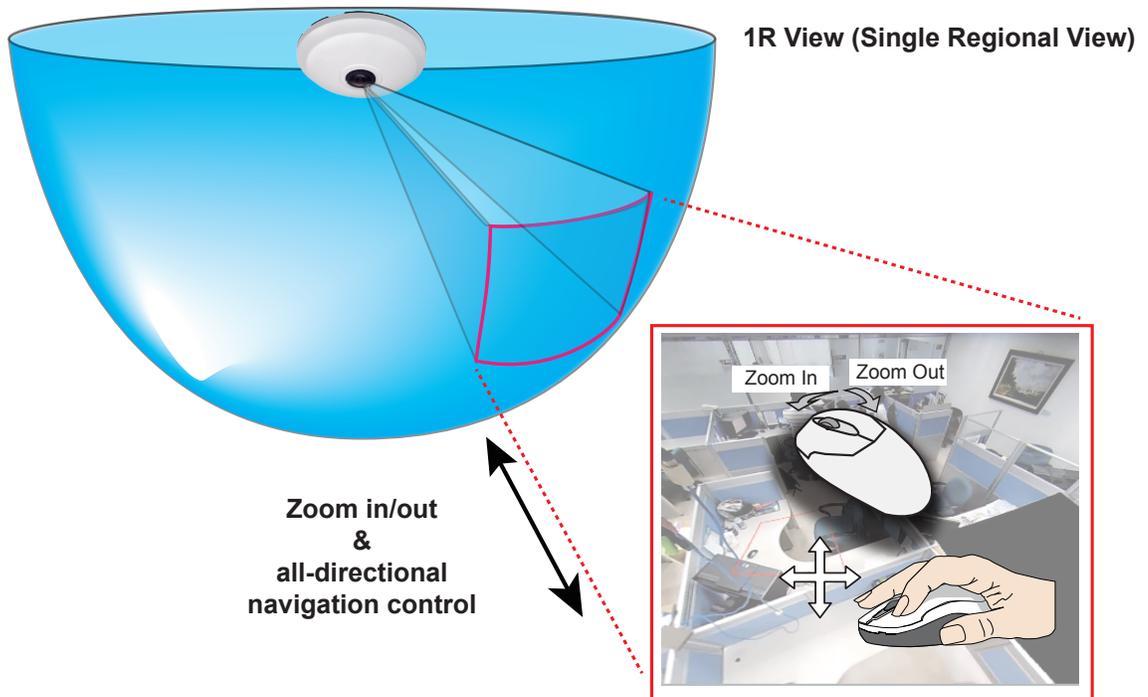
1O View (Original View)



1P (Panoramic view)



1R (Regional view)



The 1R mode (or rectilinear) provides access to one image section within the hemisphere. You can zoom in or out (using the mouse wheel or PTZ panel) or travel through to other areas within the hemisphere using simple mouse clicks and drags.

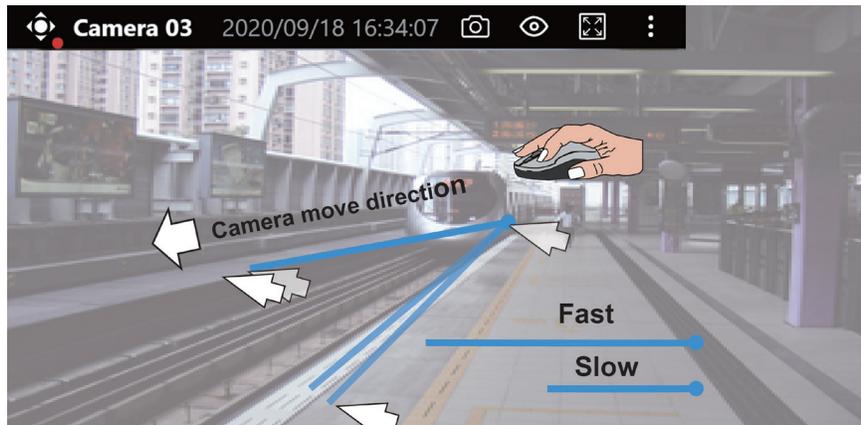
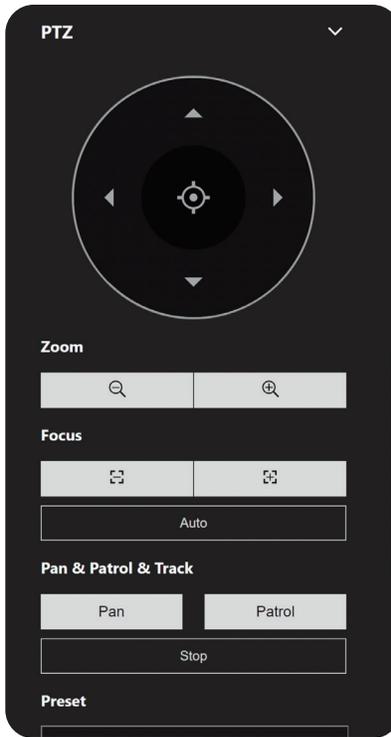
A single click on a particular object can bring the object to the center of your view window. Click and hold down the **Left Mouse** button to swipe the view both horizontally and vertically.

Note that if your fisheye mounting type is set to the **Wall Mount** type, your screen control in the view cell will be limited to 90° pan and tilt. Make sure your mounting type and camera settings have been properly configured.

Because fisheye lens can cover a wide surveillance area, you can insert a fisheye camera into multiple view cells, and let different regional views display in these view cells. In this way, you can have a glimpse of multiple areas of interest, and the configuration of these different view windows will be preserved when you save your layout settings.

* For a PTZ camera, scroll down to display the PTZ control panel where you can zoom, focus, pan, patrol or move the camera lens.

On a live view of a PTZ camera, you can hold down the **Mouse** button and move the cursor towards the direction you want to move. The mouse control is automatically enabled for PTZ cameras. As depicted below, the farther you move along the screen, the faster the lens module moves.



NOTE:

Bookmarks will be erased if the user/system erases the video clips they were appended to. For example, system will recycle storage space by deleting old videos along with their bookmarks.

Auto pan/patrol controller: These buttons provide pan and patrol functions provided that preset locations have been configured on the camera. For a speed dome camera, the pan command tells the camera to continuously pan 360 degrees until it is stopped by a user command.

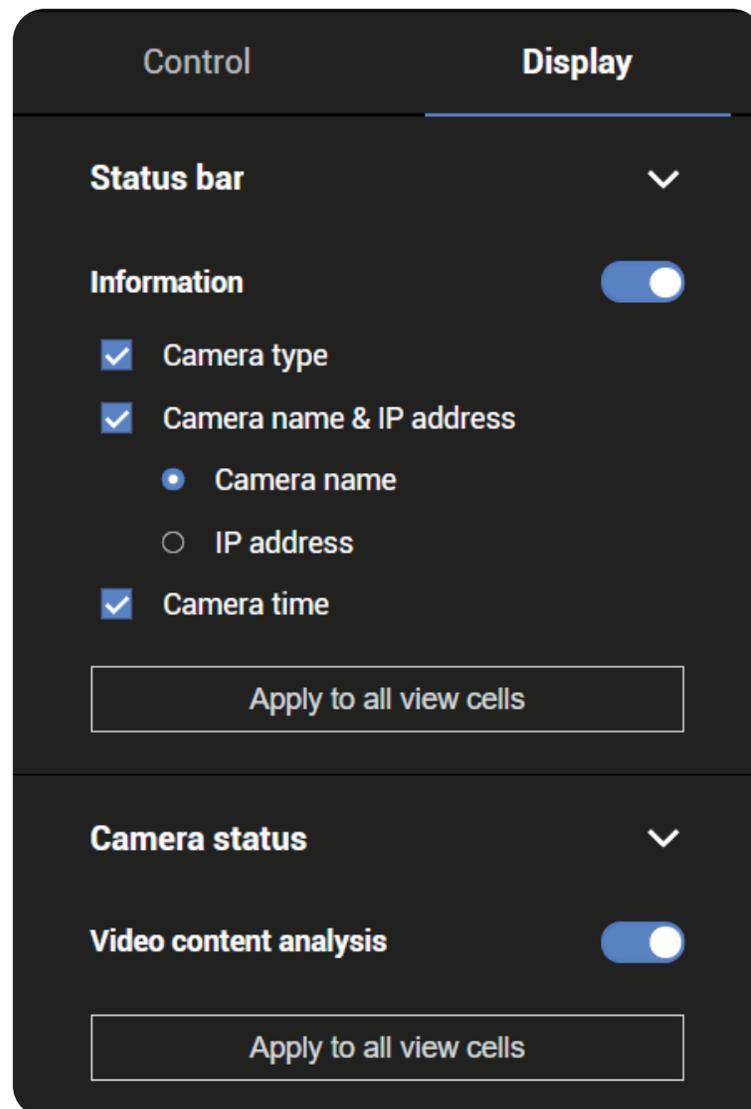
The **Stop** button ends a pan or patrol tour.

Display Pane

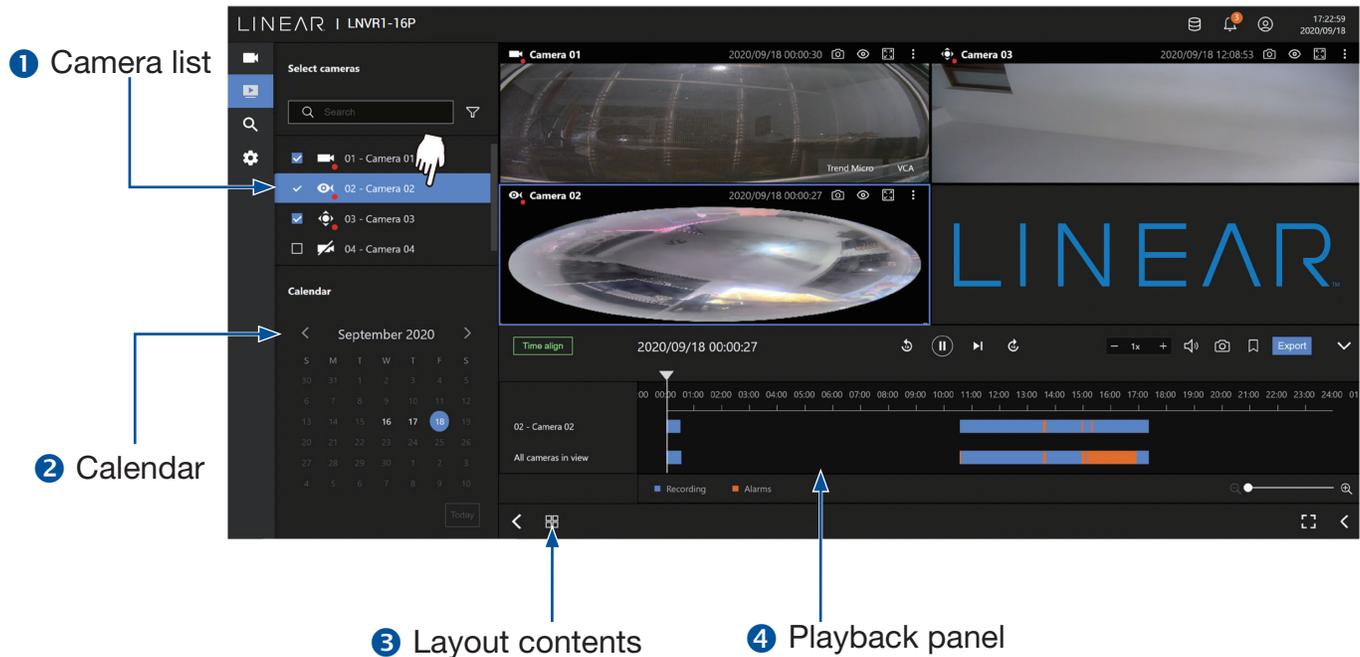
On the Display pane, you can configure the following:

1. Enable or disable the display of the **Camera type** (the small icon on the upper left of view cell).
2. Camera name and IP address. Select one or both.
3. Displays camera time.
4. **Displays Camera status:** Trend Micro IoT Security and Video content analysis. If your camera supports these features, you can choose to display them on the live view.

You can enable the display features on all view cells using the **Apply to all view cells** button.



Graphical Layout and Screen Elements - Playback

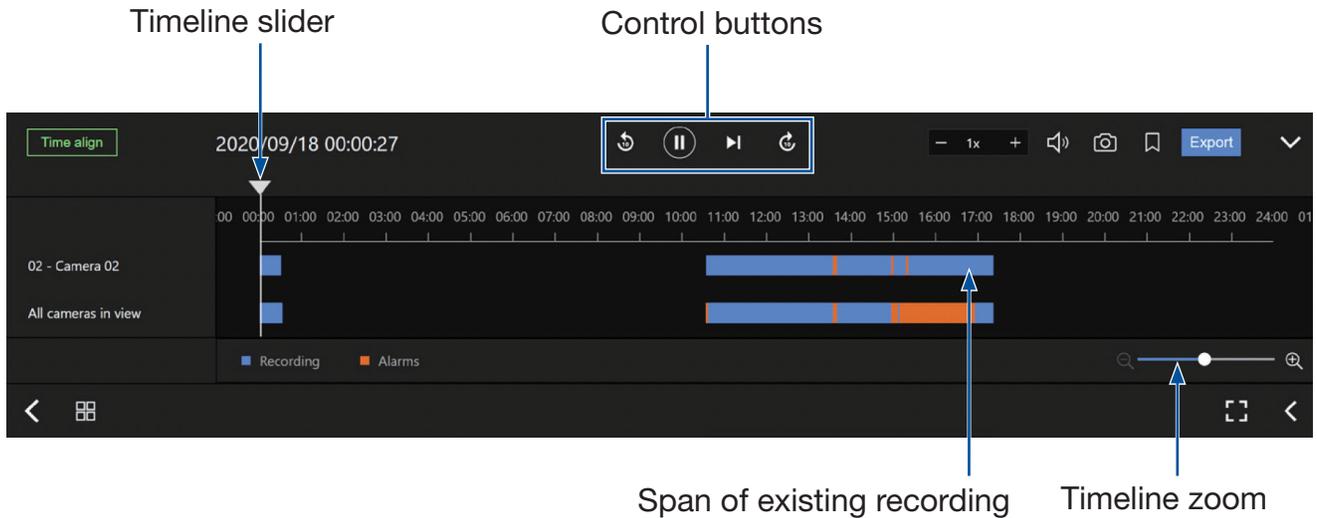


The screen elements of the Playback window are described as follows:

Item	Name	Description
1	Camera List	Provides a glimpse of all cameras that have recorded data. Basic information is also provided along with a screenshot.
2	Calendar	Shows when the recording took place, and thus enables users to quickly locate a specific part of recording in history.
3	Layout Contents	Provides functions to extend, rotate, redo the layout and the synchronous playback.
4	Playback Panel	Displays the playback functions. Snapshot, bookmark, and export functions are also available on individual view cells.

To begin playback and search for past recordings:

1. Single click to select a camera. You can select multiple cameras.
2. The Calendar panel will display the days video recording actually took place. And those days will be highlighted by a lighter text. Click to select the days with recordings.



Buttons	Description
	Pause
	Play. This button is available after you manually pause a playback.
	Next frame. After you paused a playback, use this button to browse video frame by frame.
	Plays back previous 10 seconds before.
	Plays back 10 seconds later.
	Speeds up or speeds down. Speeds down by 1/2. The slowest speed is 1/8. Speeds up. Increases the playback speed, to 2x, 4x, 8x, 16x and then to a maximum of 32x.
	Playback volume tuner.
	Takes a snapshot of the current playback screen.
	Places a bookmark on the current recording.
	Timeline zoomer. Use the zoomer to zoom in for more precise skimming.
	Lets the cameras in the scene play the recording of the same time.
	When you find something of your interest, use the Export function to export a video clip. Select the length of the video clip using the Start and Stop time menus below. Depending on the length of clips, an export can take a while to finish. The default export length is 30 minutes.

Playback export

Camera 01 2020/09/21 09:46:15

Trend Micro VCA

Start 2020 / 09 / 21 09 : 45 : 30 ~ End 2020 / 09 / 21 10 : 10 : 30

00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 24:00

Recording Alarms

Settings

Attach data

- POS
- GPS

It will take a while for large video recordings exporting. Please make sure your network connection is good.

Export

Note that for specific cameras, such as fisheye cameras, you can click its view cell to display its control options such as the dewarp type.

2020/09/21 09:46:03

11:30:14
2020/09/22

Control Display

Camera 02

IP Address 192.168.11.8

Model FE9182-H

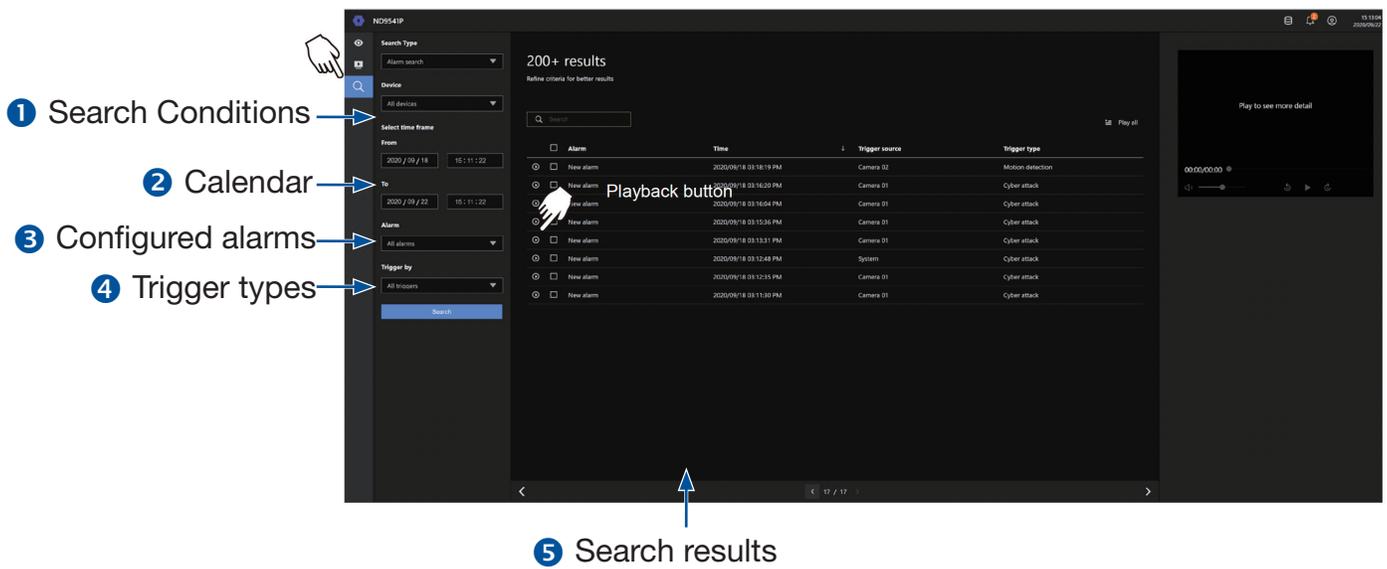
Image

Fit screen with ratio

Fisheye

1R

Graphical Layout and Screen Elements - Search



The screen elements of the Playback window are described as follows:

Item	Name	Description
1	Search conditions	The whole panel provides access to search conditions. You can select Devices, time span, pre-configured alarms or trigger types.
2	Calendar	Shows when the possible time of occurrence of alarms.
3	Configured Alarms	Select the alarms you previously configured on the system.
4	Trigger types	There are many trigger types including system event triggers, cyber attacks, DI/DO or the numerous VCA detection triggers.
5	Search results	The results are displayed by <i>Alarm name</i> , <i>Time of occurrence</i> , <i>Trigger source</i> and the <i>Trigger type</i> .

To begin playback and search for past recordings:

1. Single click to select a camera. You can select multiple cameras.
2. The Calendar panel will display the days video recording actually took place. And those days will be highlighted by a lighter text. Click to select the days with recordings.

The image shows two panels from a video management interface. The 'From' panel on the left includes a date and time selector set to '2021 / 11 / 02' and '11 : 00 : 20'. Below this is a calendar for November 2021, with the 2nd of the month highlighted in a light blue circle. A 'Today' button is located at the bottom right of the calendar. The 'Device' panel on the right features a dropdown menu for 'All devices' and a list of selected items: 'LNV1_16P' under the 'System' category, and 'Camera 01', 'Camera 02', and 'Camera 03' under the 'Cameras' category. Each item has a checked checkbox.

The image shows the 'Trigger by' panel, which is divided into four sections. The top section, 'All triggers', has a dropdown menu set to 'All triggers'. The 'System trigger' section contains five items with checked checkboxes: 'DI', 'DO', 'Disk failure', 'Disk full', and 'PoE error'. The 'Camera trigger' section contains six items with checked checkboxes: 'Camera DI', 'Camera DO', 'Motion Detector', 'PIR', 'Camera Tamper Detector', and 'Camera disconnected'. The rightmost section contains ten items with checked checkboxes: 'Line Cross Detector', 'Intrusion Detector', 'Loiter Detector', 'Face Recognition', 'Object Removed Detector', 'Object Left Detector', 'Crowd Detector', 'Object Removed Detector', 'Object Left Detector', 'Crowd Detector', 'Human Detector', 'Vehicle Detector', 'Pet Detector', and 'License Plate Recognition'.

This search panel enables the search for the detection results from Smart VCA analytics functions. They include:

- Line crossing detection
- Intrusion detection
- Loitering detection
- Face detection
- Missing objection detection
- Unattended object detection
- Crowd detection

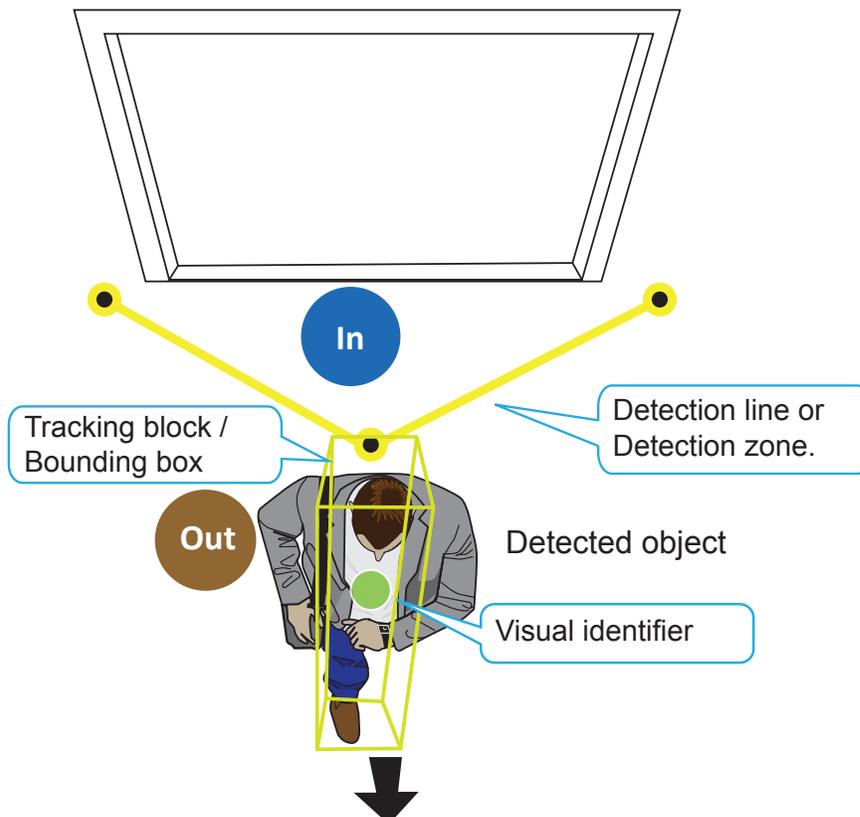
The event search takes effect when the related cameras are currently recording videos to the NVR. The search function helps sorting through hours of videos, enabling you to quickly find a person or an event of your interest. This facilitates an effective search for a deployment across large surveillance areas. VCA events are recorded along with video recordings.

The NVR automatically detects cameras that come with the video analytics functionality. Note that the video analytics configuration should be separately configured on individual cameras; such as drawing the detection zone and detection line for Line-crossing detection.

You may also refer to the following documentation for more information about video analytics:

1. Smart Motion Detection User Guide.
2. Smart VCA User Guide.
3. Smart 360 User Guide.

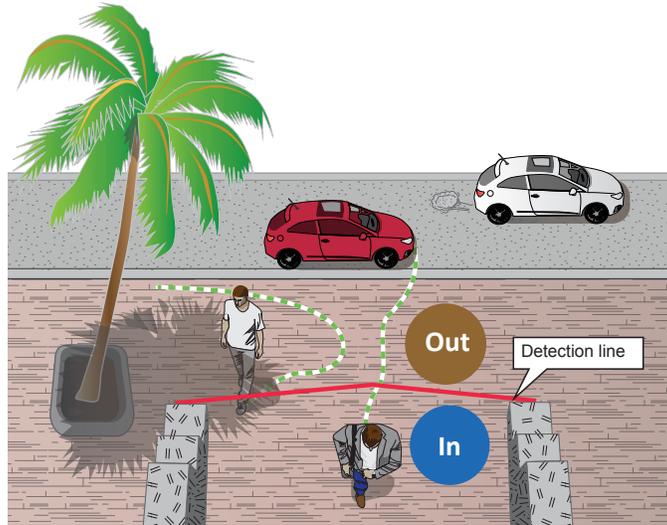
On the live view, you can also see the analytics rules and the bounding boxes indicating the detected objects while the analytics is taking place.



Below are the short introductions to these analytics functions:

Line Crossing Detection

The Line Crossing detection detects one or multiple persons crossing a virtual trip-wire. The traffic direction can be assigned on screen for persons passing the line in one specific direction or in both directions.

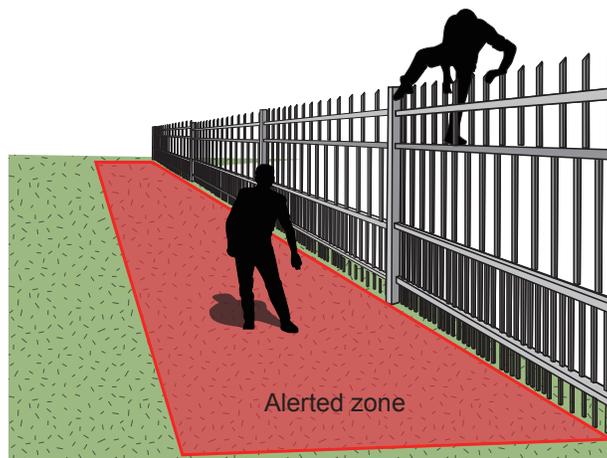


The applicable scenarios of this feature can be:

- Detects someone who enters a drive way, entrance or exit through the virtual line.
- Detects and triggers an alarm in a predetermined direction.
- The detection line can be used as a fence boundary to know if someone has crossed the articulated line around a perimeter.

Intrusion Detection

Intrusion Detection can be used to detect people entering or leaving a virtual area in the camera field of view.

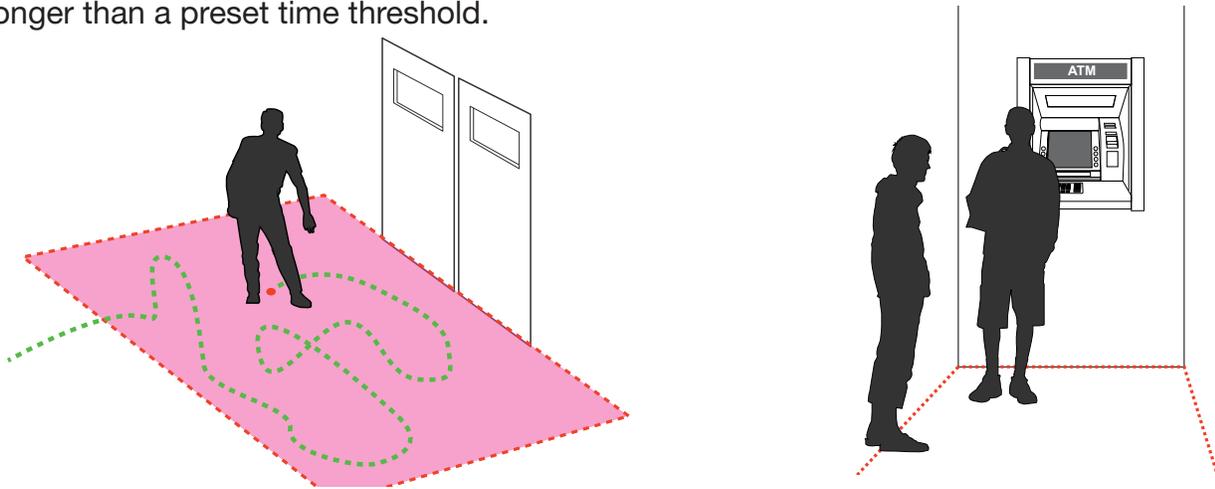


The applicable scenarios of this feature can be:

- Detects when a person enters a bank vault or school after the office hours.
- Detects when a person leaves an emergency exit, fire escape or any place that is normally forbidden from access.

Loitering Detection

The Loitering detection can be used to detect a person or a group of people lingering in an area for longer than a preset time threshold.

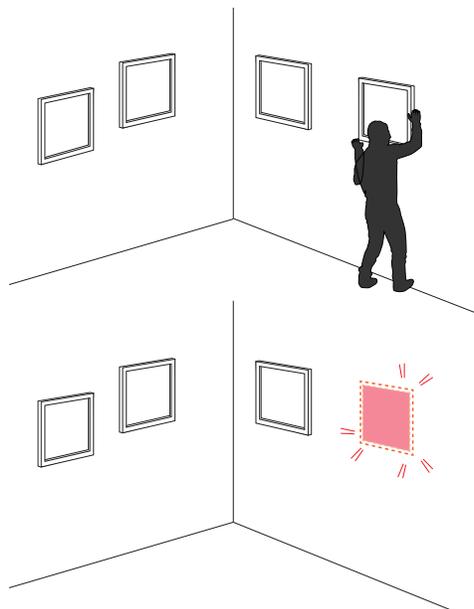


The applicable scenarios of this feature can be:

- Detects when a person is loitering at a walk-up of ATM lane.
- Detects when a person is loitering in a high-theft area of a store or to prevent vandalism and break-ins.
- Detects when a person is loitering in an area that is normally not an access for visitors.

Missing Object Detection

The Missing Object detection can be used to detect the removal of a predefined asset from a surveillance scene.

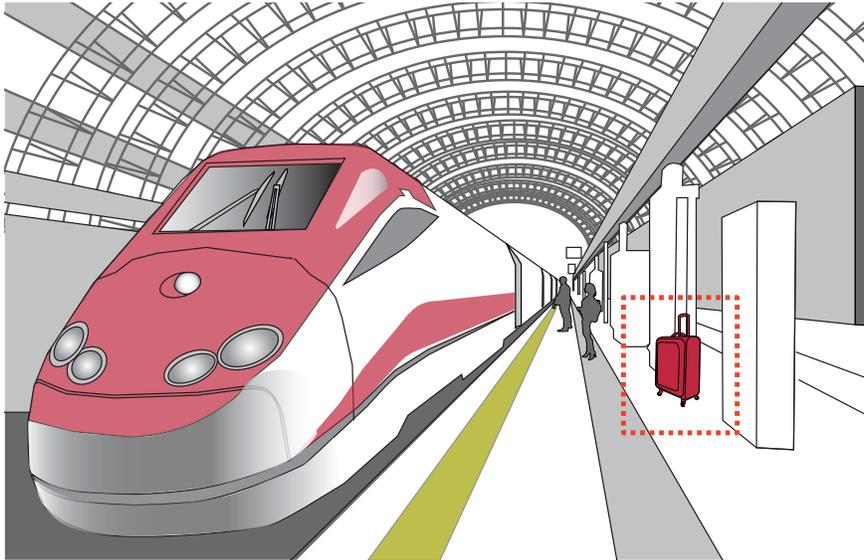


The applicable scenarios of this feature can be:

- In a campus setting, the *Missing Object* feature can be used to monitor high-risk areas for theft, such as the administrative offices, computer labs or science laboratories.
- Detects when theft occurs in storage areas or warehouses. It is helpful when there are security personnels monitoring the scene, yet their attention went down through time.

Unattended Object Detection

The Unattended Object detection can be used to detect objects intentionally or unintentionally left in scene.



The applicable scenarios of this feature can be:

- Detects objects placed in front of an emergency exit.
- Detects objects left on subway tracks, platform, on a bridge or in a bank lobby.

Face Detection

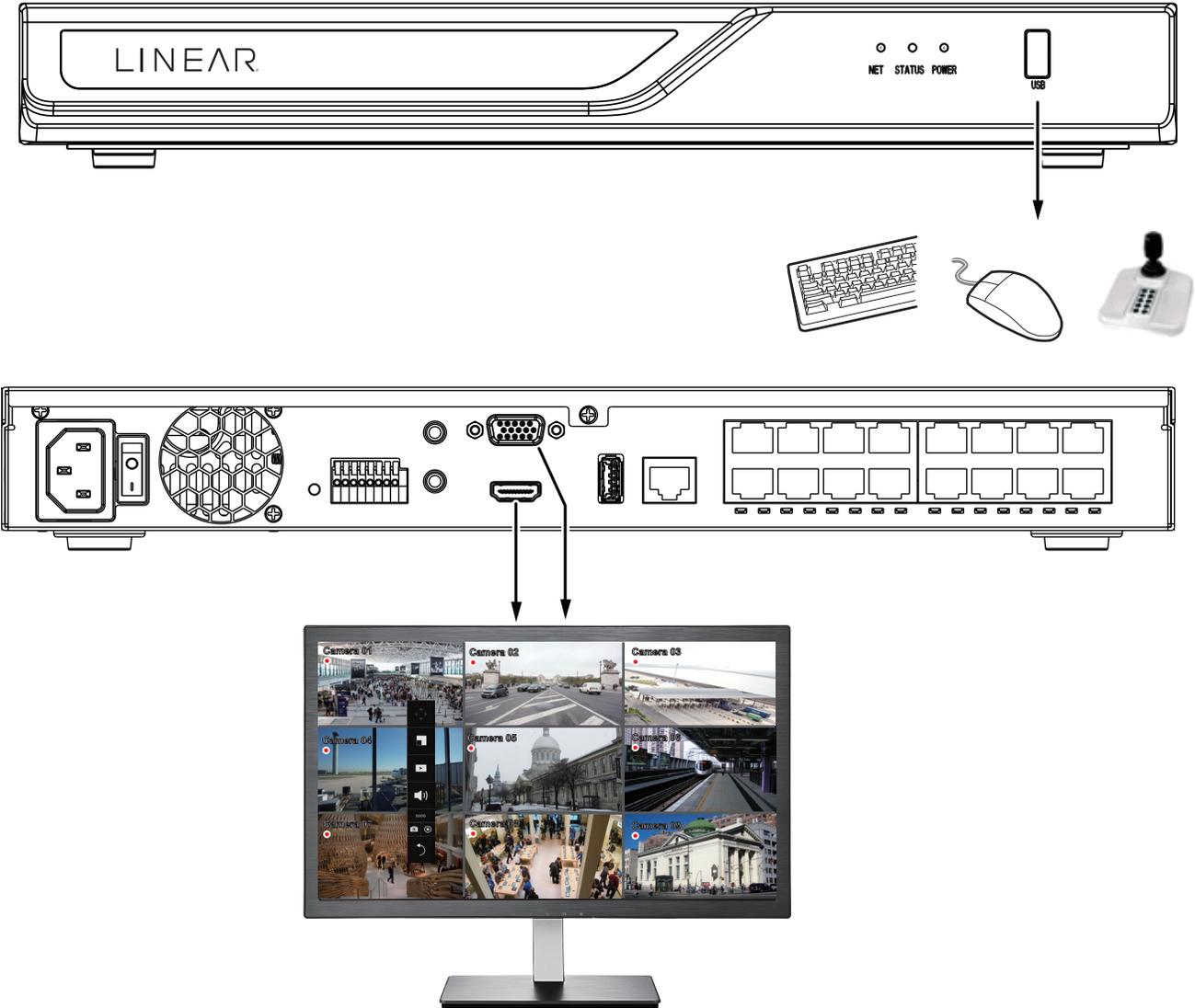
Face detection detects the presence of human faces in the field of view.

The applicable scenarios of this feature can be:

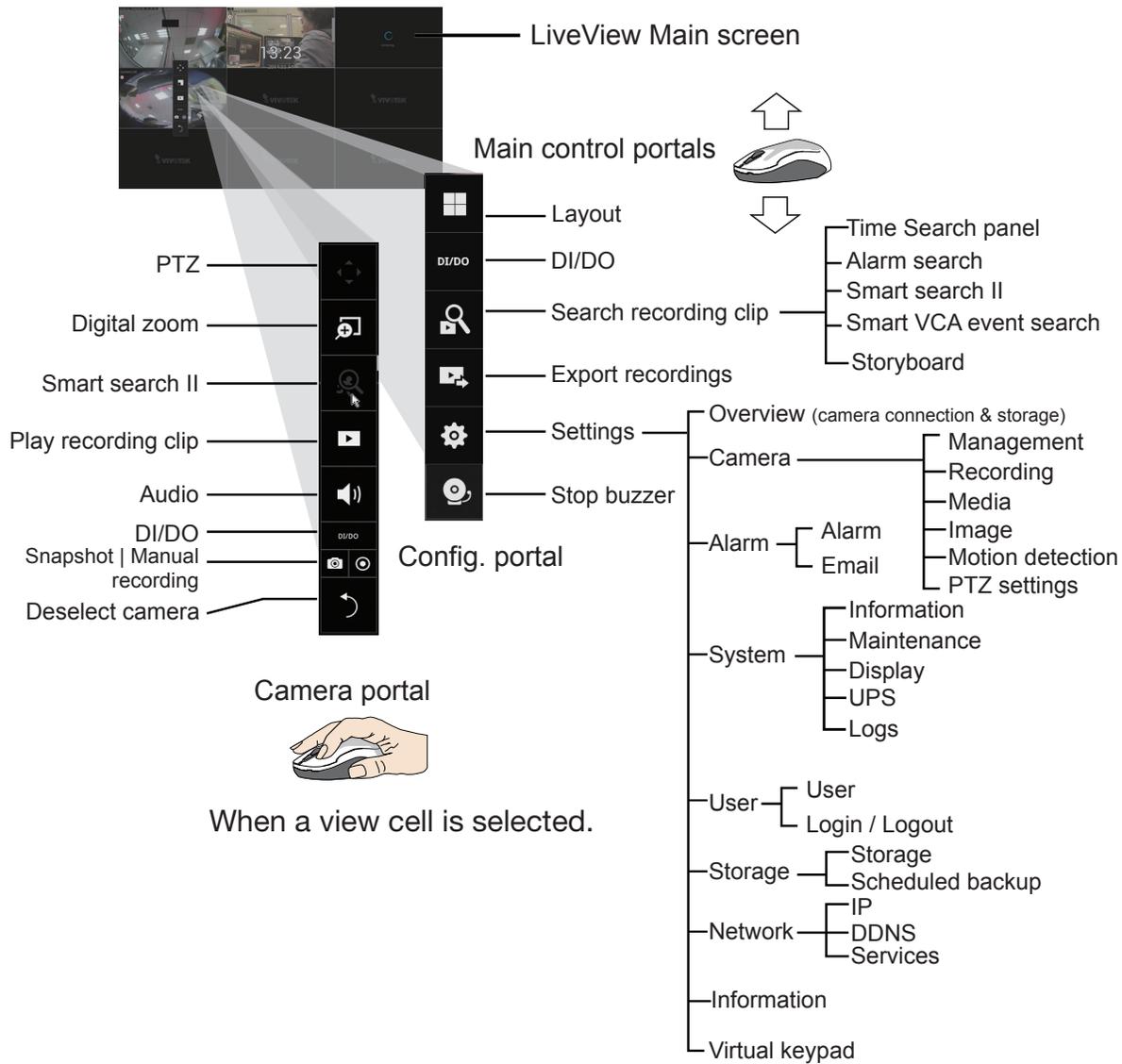
- By tagging the video frames which contain facial features, the administrator can later search for the video clips with presence of these faces in a more efficient manner. Instead of searching through hours of recordings, face detection can facilitate the process of forensic search in recorded videos. Objects irrelevant to facial features will be filtered out.

Section 2: Management over a Local Console

Chapter 2: Introduction to the Local Console Interface



By default, a live view appears on an HDMI monitor. The interface architecture of the local console is illustrated as follows:



When a view cell is selected.

After you finish configuring using a Camera portal, click again on the camera view cell to reveal the main control portals.

! IMPORTANT:

Due to the limitation of system resources, the fisheye dewarp (1R, 1P, 1O3R, 1O8R modes) can only take place on one view cell, for one fisheye camera.

For the *Export recordings* function, refer to [page 42](#).

2-1. How to Begin

1. How to access the Configuration Portal?

Make sure a mouse is attached to your NVR. Move your mouse cursor, and the Configuration Portal will appear on screen. For all the configurable options available through this portal, please refer to **Chapter 3** on [page 66](#).



2. How to access the Camera Portal?

Single click to select a camera view cell, the Camera Portal will appear. The system automatically detects the characteristics of an individual camera when you select a view cell.



This portal appears with a camera that supports mechanical PTZ.



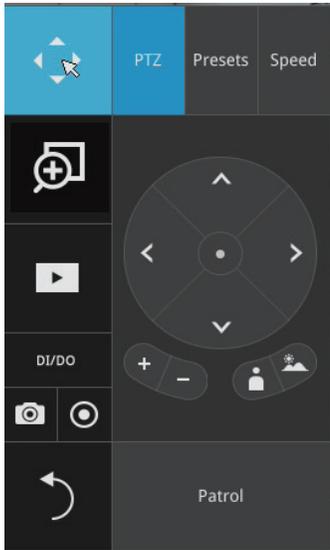
This portal appears with a camera that does not support mechanical PTZ.

Tips:

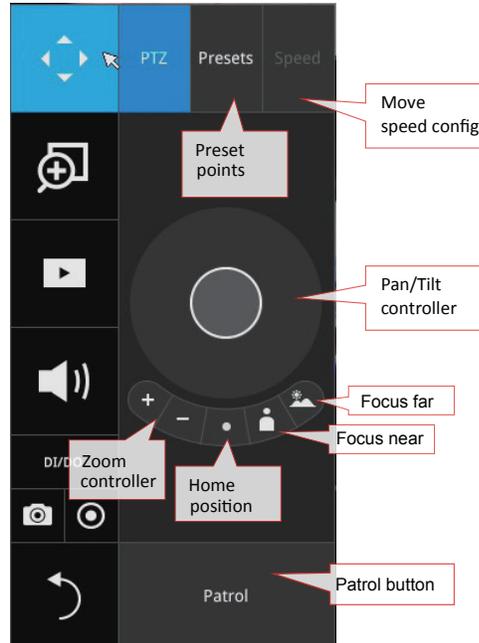
Here are some operation steps using the tool bar:

1. Single-click to select a view cell and bring out the tool bar.
2. Double-click to expand a view cell to the full view.
3. Double-click again to shrink the view cell to the original size.

PTZ control panel for ordinary PTZ type



PTZ control panel for joystick type PTZ



PTZ presets: If your PTZ cameras have preset locations, click on the **PTZ** button to unfold the preset menu. Click on any of the preset locations to move to the area of your interest.

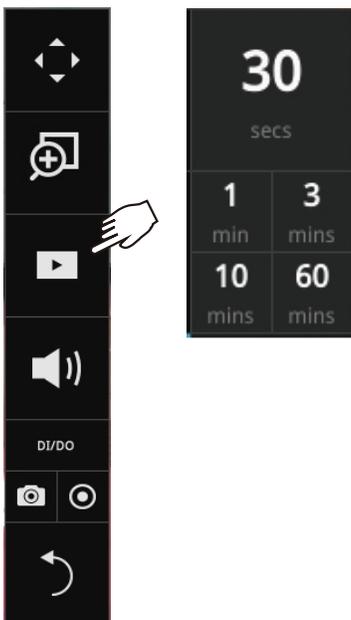
Pan/Tilt controller: Pull the inner circle to the direction you prefer. Release the **Mouse** button to stop moving.

Zoom controller: The zoom controller buttons only apply to cameras that come with an optical zoom module, such as a speed dome camera.

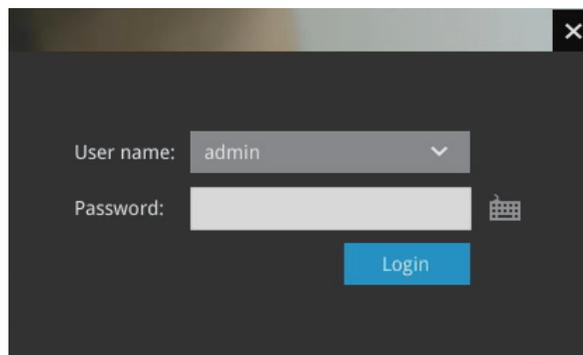
Focus controller: The focus controller buttons apply to cameras that come with focus control over its lens module, such as a speed dome camera.

3. How to retrieve and access recorded videos?

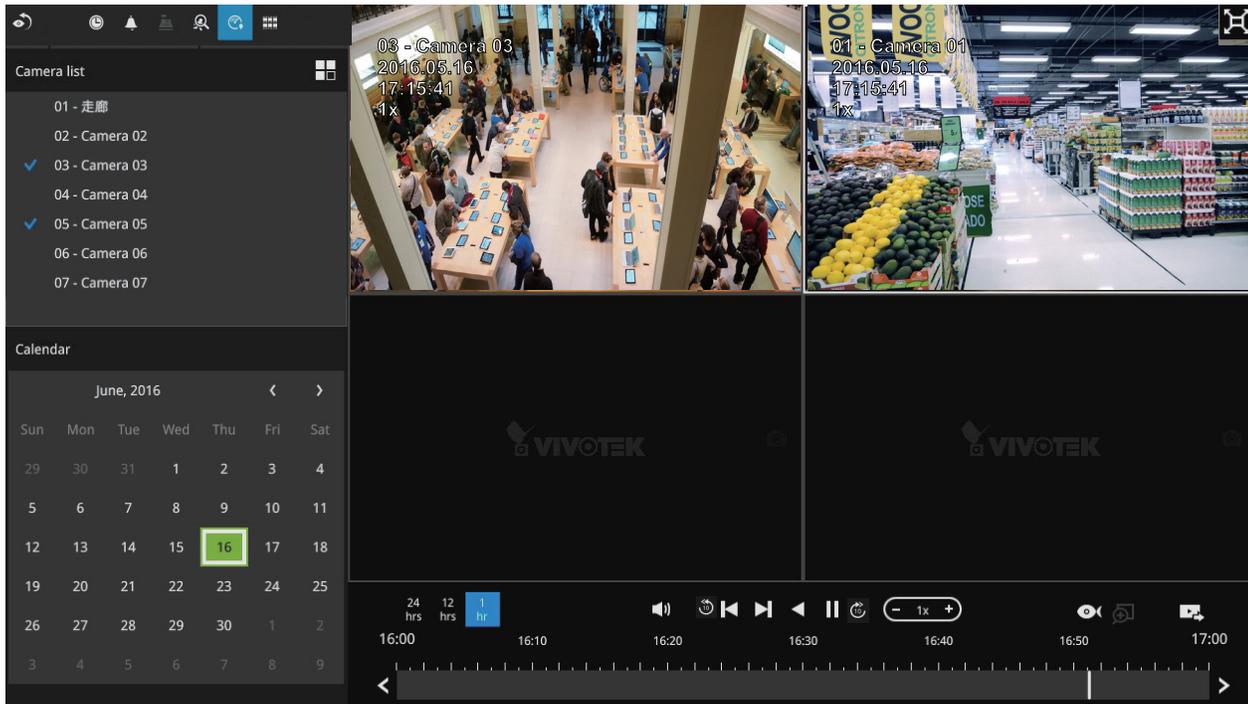
One is to access the video clips taken within 2 hours. Left-click to select a view cell, and then click on the **Recording Clips** button.



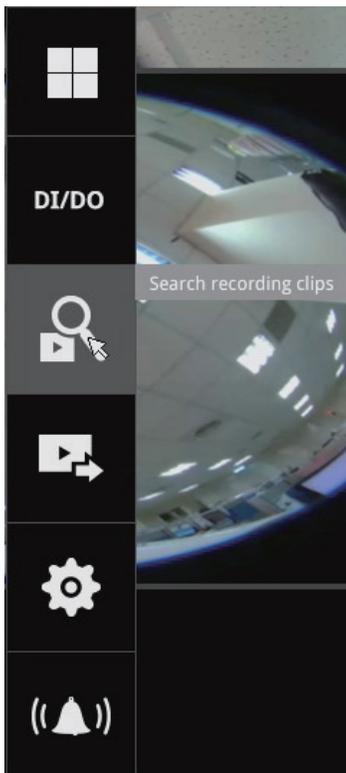
Select a time value by a single click. You will be prompted for User name and Password, enter **admin** and **linear** (the default user name and password) and then click **Login**.



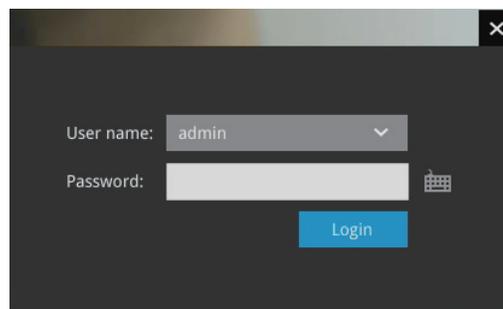
The **Playback** window will prompt, and a playback begins from the point in time you selected. This function allows you to quickly review what has just happened.



Another way to access past videos is to open the **Search recording clips** window. Move your mouse cursor to display the **Configuration Portal** (without selecting any view cell). Click on the **Search Recording Clips** button. Please refer to [page 44](#) for more information about the search functions.



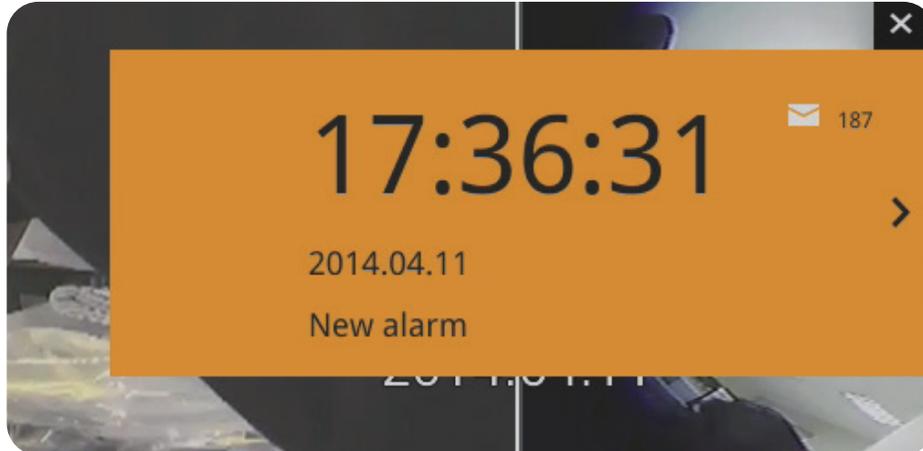
You will be prompted for User name and Password, enter **admin** and **linear** (the default user name and password) and click **Login**. It is highly recommended to change the password after you log in.



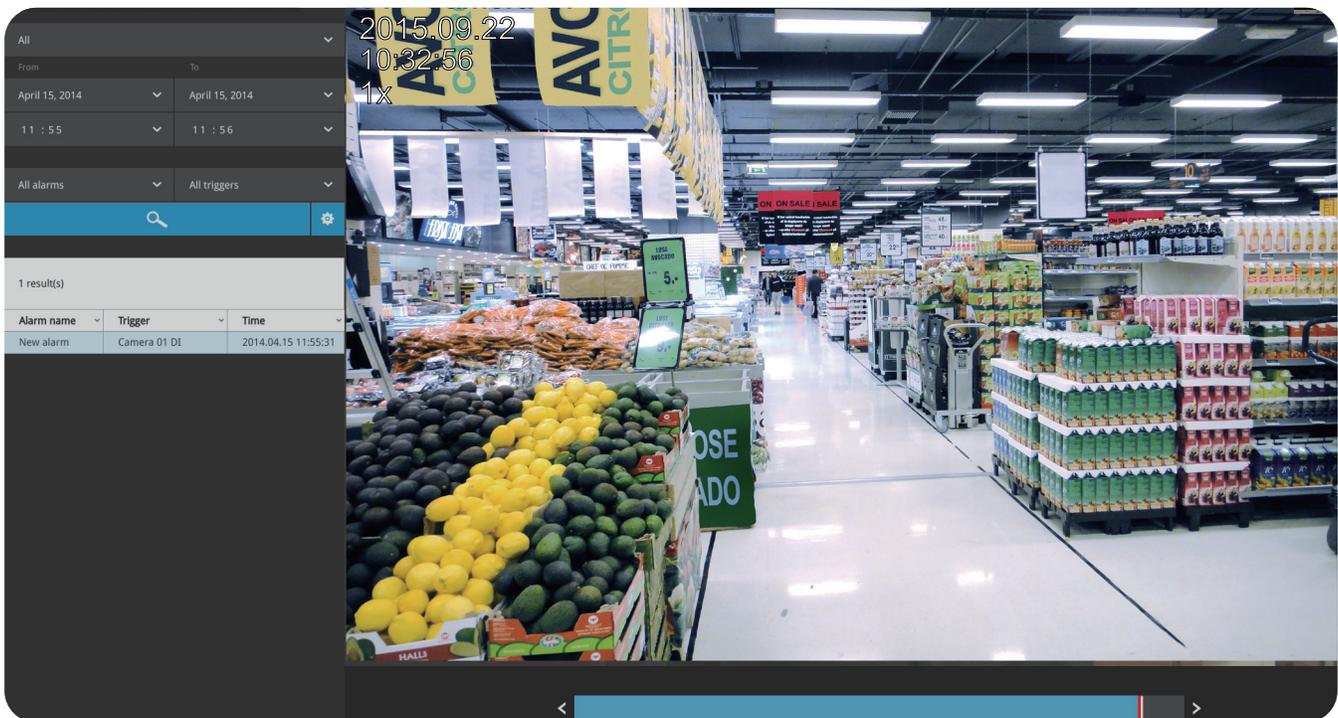
4. How to receive system alarm?

Please refer to [page 108](#) for how to configure system alarm triggers. When the alarm is triggered (for example, by digital inputs or motion detection), an alarm message will prompt on the screen.

Use the > **Arrow** button to browse through the alarm messages.



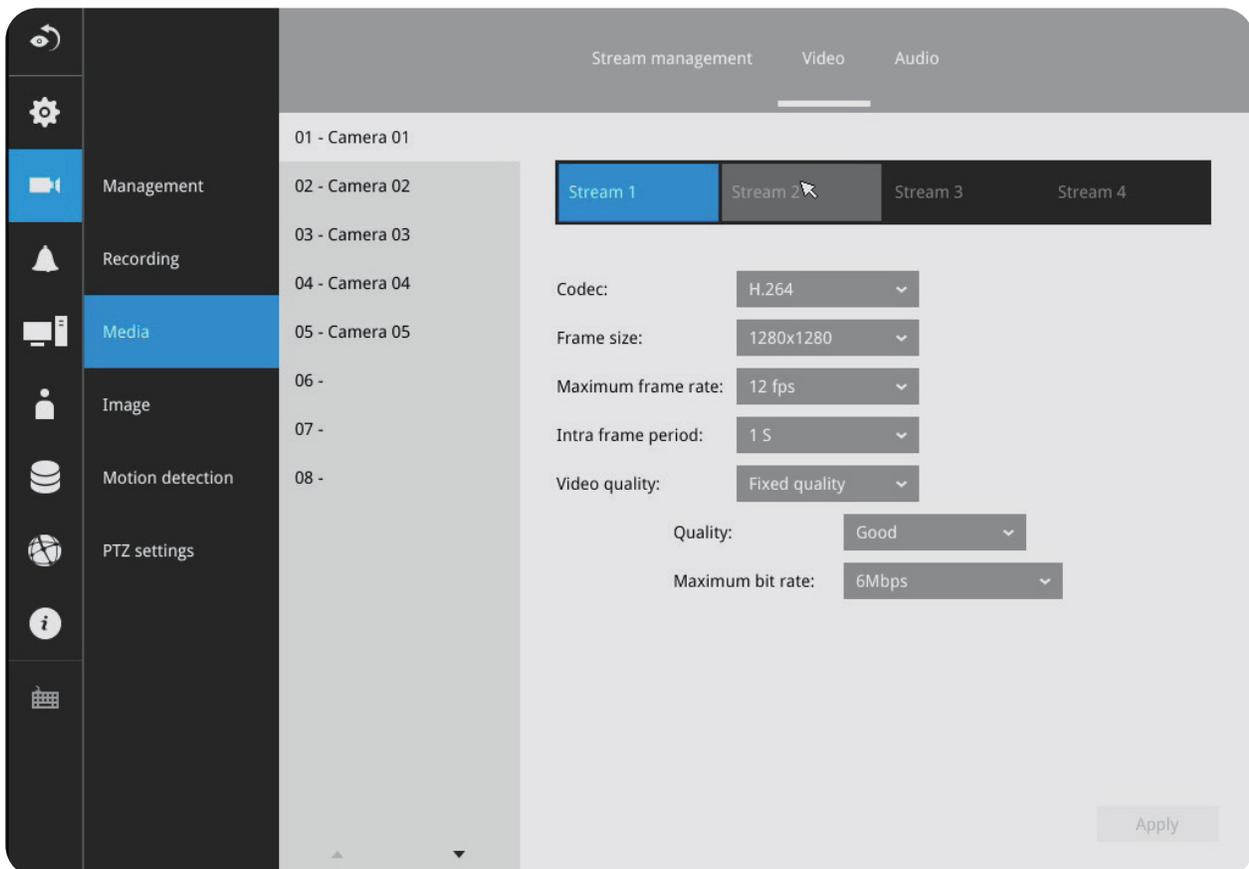
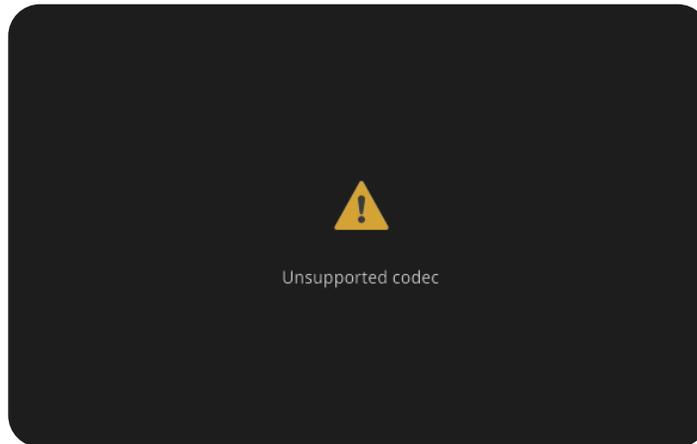
If the alarm is configured with video recording as the responding action, you can click on the alarm entry. The Playback window will appear, allowing an instant playback of the alarm-related footage. You will enter the "Search alarm results" page even if the alarm does not trigger a recording action.



5. Why live view is unavailable?

The default live view receives a camera's stream #1. If a camera's stream #1 is configured using **MPEG-4** as the video codec, the following message will prompt.

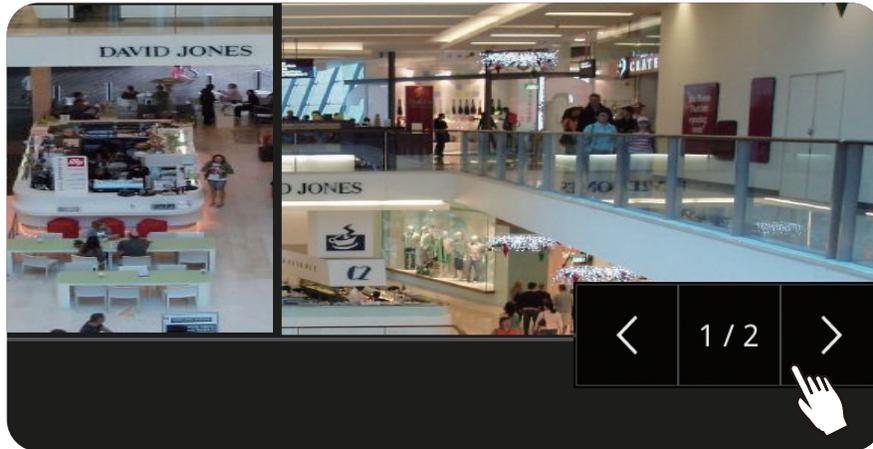
You can go to the **Settings > Camera > Media > Video** window to configure the video codec of stream #1 into H.264 or H.265.



6. How do I move to another layout page?

Move your cursor to the right hand side of your screen. The page turner buttons will appear as shown below.

For example, if you have 8 cameras placed on two 2x2 layout pages, use these buttons to visit different pages.



7. Why the onscreen tool bars disappear after some time?

The system comes with idle modes. Below are the applicable conditions:

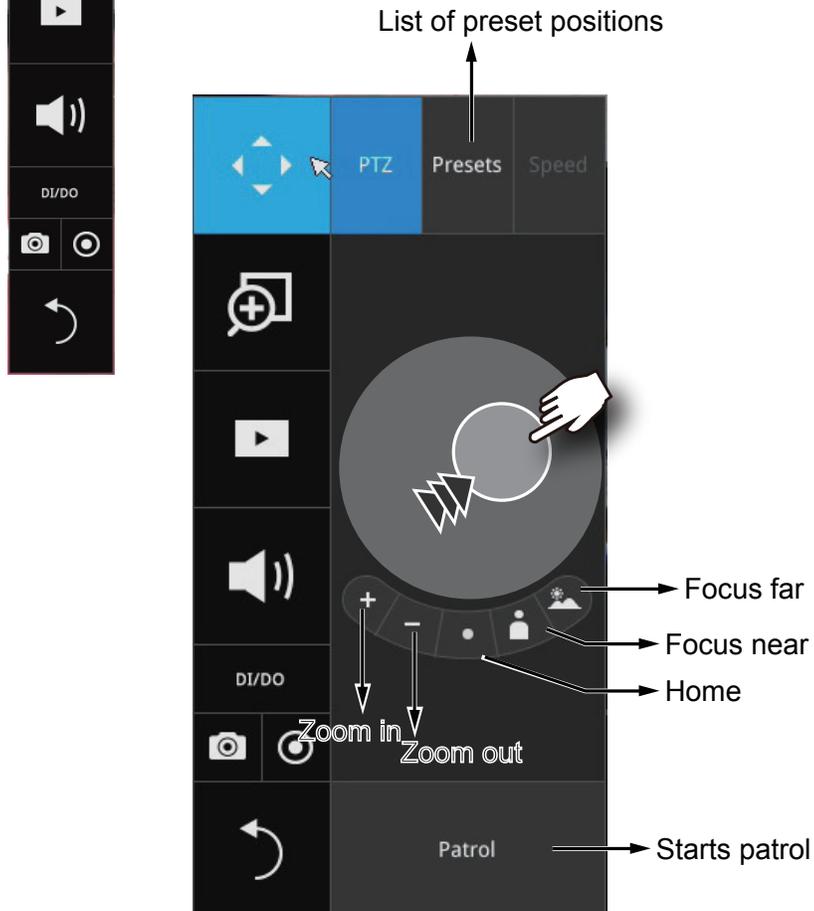
- 1. Live view:** if no management activities occur for 5 seconds, the tool bars disappear from screen. When in the idle mode, mouse cursor and tool bars will disappear. Moving the mouse cursor will re-activate the screen.
- 2. Settings page:** If left unattended for 10 minutes, system will automatically log out. The system will prompt for user credentials if a user tries to access the Settings page again.
- 3. Search recording clips window:** If currently there is a video playback, the system will not enter the idle mode.

2-2. Operation on Camera View Cell

2-2-1. PTZ Panel

Once you selected a camera, click on the **PTZ** button on a camera portal.

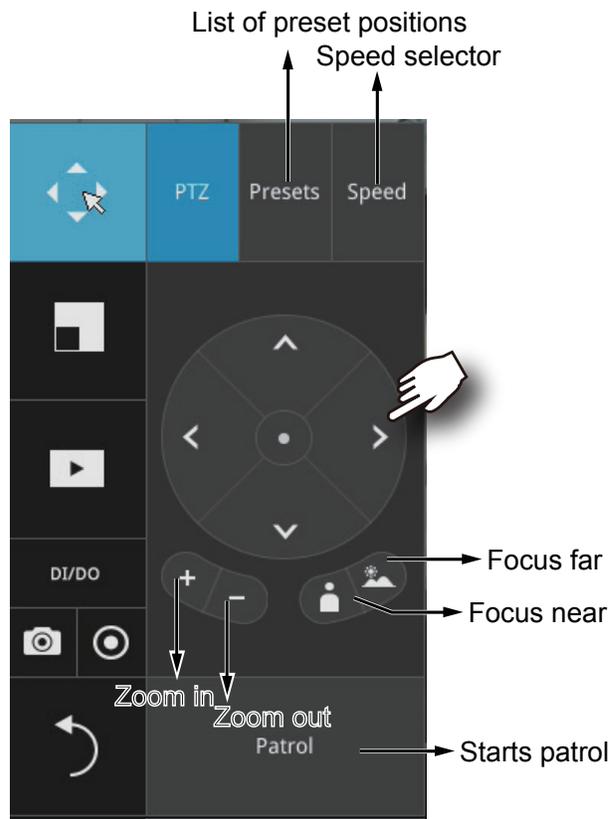
The PTZ panel will prompt. Below are the description of its functions:



- 1. PTZ control:** Click and drag the nudget in the center toward the direction you wish to move.
- 2. Focus:** Click on the Focus near and Focus far buttons to adjust camera focus.
- 3. Home:** Click to move the camera lens towards the default home position.
- 4. Zoom:** Use the Zoom in and Zoom out buttons to adjust the camera's zoom ratio.
- 5. Presets:** If you configured preset positions, a list of preset positions will appear.
- 6. Patrol:** If you configured preset positions into a patrolling tour, click on this button and the camera will proceed with patrolling through preset points.

Note that on a speed dome camera, the farther you pull the nudget away from the center, the faster the lens moves. This works like speed control.

Below is the PTZ panel that appears with ordinary PTZ cameras.



1. **PTZ control:** Click on the arrow buttons to move towards the direction you wish to move to.
2. **Focus:** Click on the Focus near and Focus far buttons to adjust camera focus.
3. **Zoom:** Use the Zoom in and Zoom out buttons to adjust the camera's zoom ratio.
4. **Presets:** If you configured preset positions, a list of preset positions will appear.
5. **Speed:** Adjusts the speed when moving across the field of view.
6. **Patrol:** If you configured preset positions into a patrolling tour, click on this button and the camera will proceed with patrolling through the preset points.

This portal appears with a fisheye camera. Since it is for the fisheye camera, the PiP and PTZ buttons will then be disabled.

! IMPORTANT:

Due to the limitation of system resources, the fisheye dewarp (1R & 1P) can only take place on one view cell, for one fisheye camera.



Joystick support



The joystick related operations are listed below:

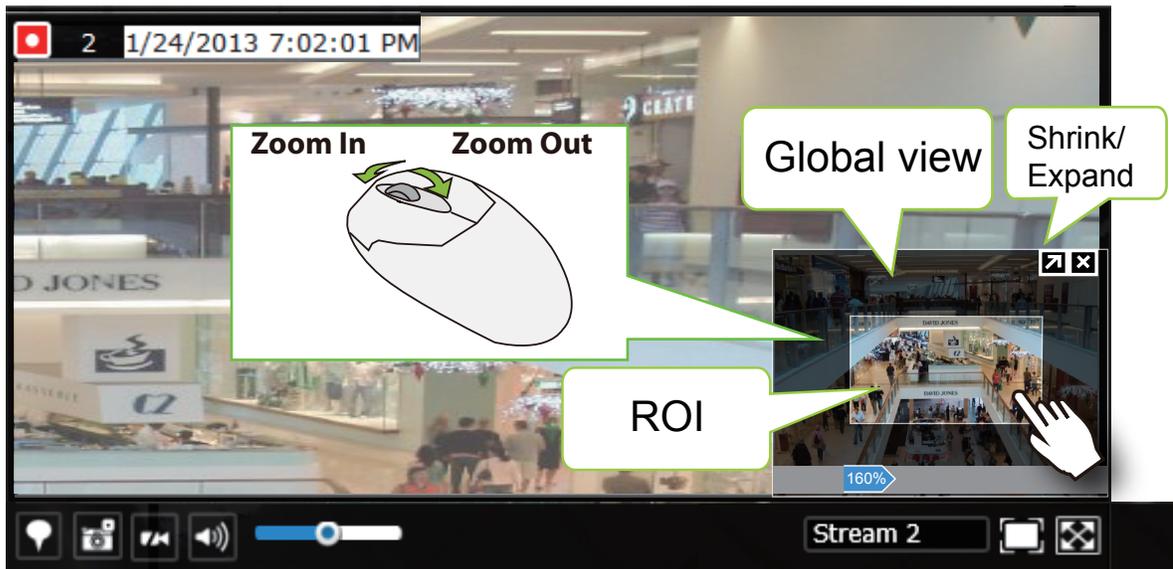
1. **Pan:** Continuous move is supported. (joystick X-axis movement)
2. **Tilt:** Continuous move is supported. (joystick Y-axis movement)
3. **Zoom:** Continuous move is supported. To zoom in, move joystick Z-axis clockwise (or use button #2). To zoom out, move joystick Z-axis counter-clockwise (or use button #3)
4. **Home:** Joystick button #1.
5. **Auto Pan:** Joystick button #5.
6. **Patrol:** Joystick button #7. Preset positions must be pre-configured for the camera.
7. **Stop:** Stops auto pan or patrol. Joystick button #6.

2-2-2. Digital Zoom Panel



Digital zoom is a function that provides digital zoom into a live video. To activate, place your mouse cursor inside the Global view window for the zoom function to take effect.

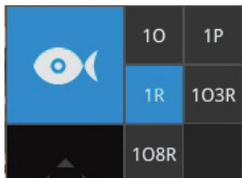
When activated, a Global view window will appear at the lower right of the view cell as shown below. You can display only a portion of the complete video frame as an area of your interest. Using a click and drag on the ROI window, you can instantly move to other areas within the video frame. Use the zoom ratio pull bar at the bottom to change the zoom ratio. You may also move the ROI around by click and drags.



Note that not every camera supports the PiP function.

NOTE:

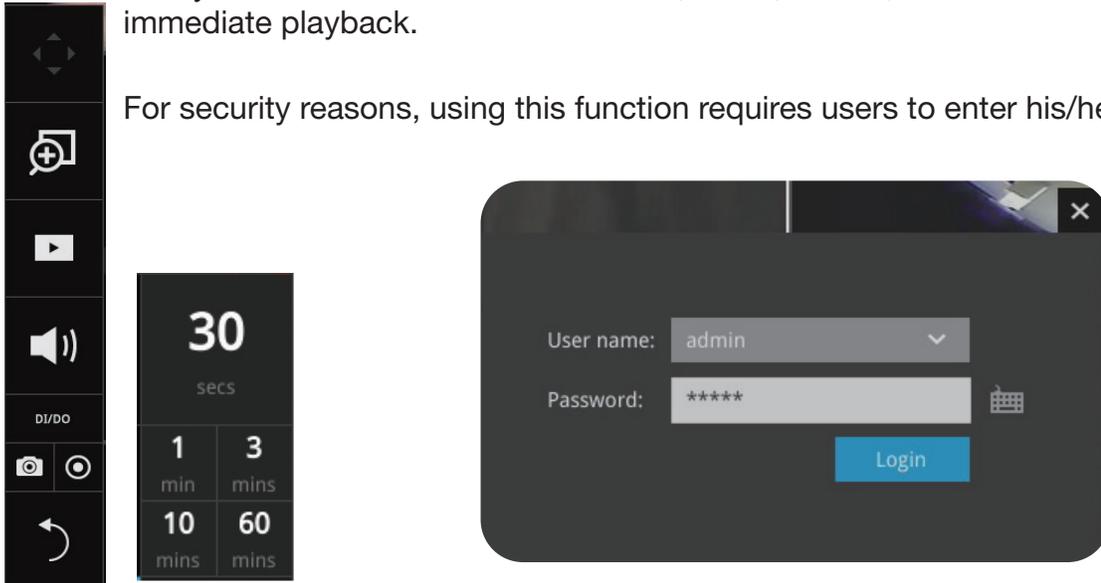
Please refer to [page 43](#) for the description of fisheye display modes. The working theory on fisheye modes is identical for use on both local and web consoles. The fisheye mount type setting is found in the Settings window.



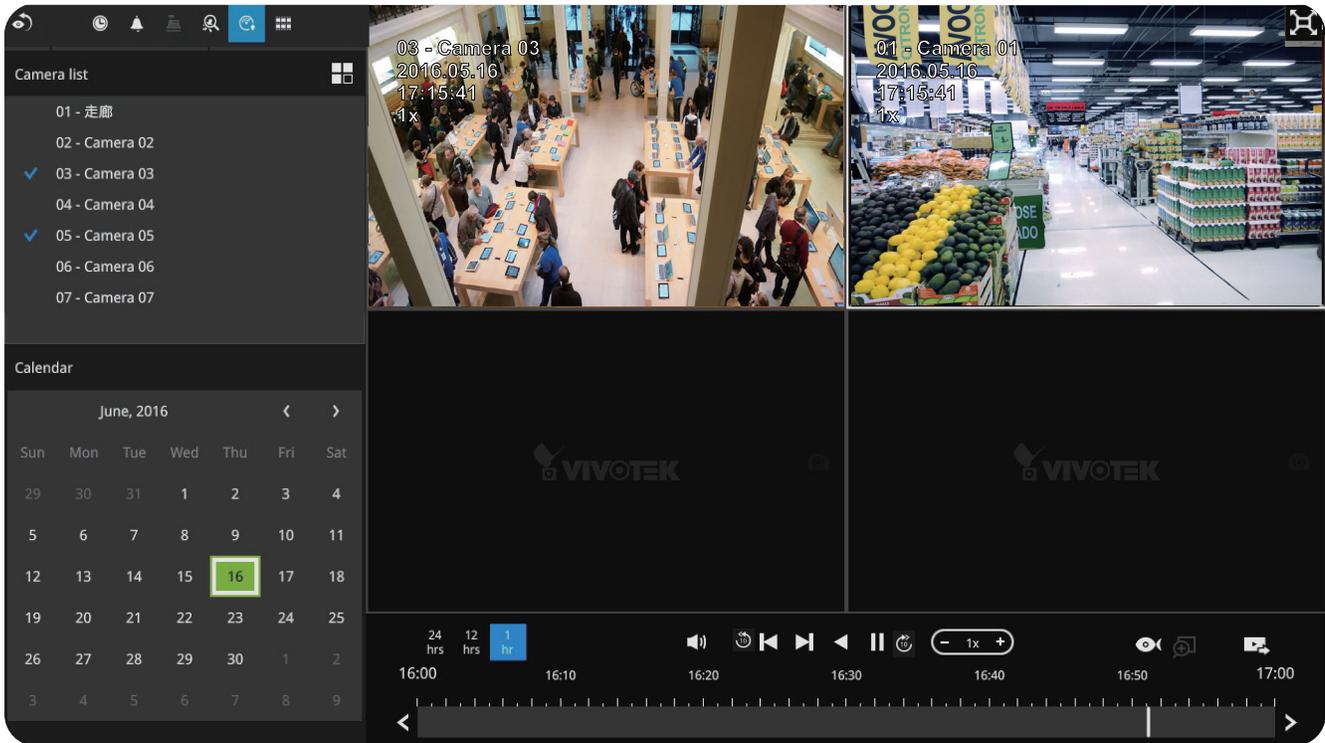
2-2-3. Play Recording Clips Panel

The Play Recording Clips function provides a shortcut to the latest recordings on the system. You can select 30 seconds, 1 min, 3 mins, 10 mins and 60 mins for an immediate playback.

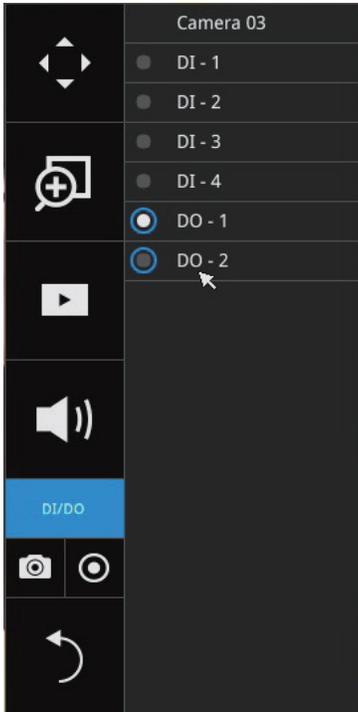
For security reasons, using this function requires users to enter his/her credentials.



The **Playback** window will prompt, and a playback begins from the point in time you selected. This function allows you to quickly review what has just happened.



2-2-4. DI/DO



The DI/DO panel provides a glimpse of all DI and DO signal statuses from the connected cameras. You can manually trigger a digital output by clicking on its indicators.

When a digital input is triggered, its status will also be indicated on the panel.

WARNING:

Please note that **DO** is triggered by one click. You should then click again to disable the **DO**. Otherwise, the **DO** signal will be continuously triggered. As the result, if the **DO** is configured as an alarm trigger, many alarm messages will be generated.

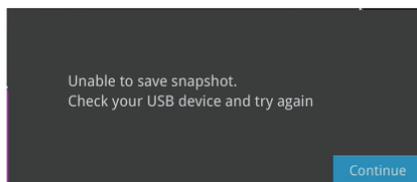
2-2-5. Others

1. Snapshot : is used to take a snapshot from the camera currently selected. Note that this function only saves the snapshot (in JPEG) to a USB thumb drive.

IMPORTANT:

The USB thumb drive has to be one that is formatted in FAT format.

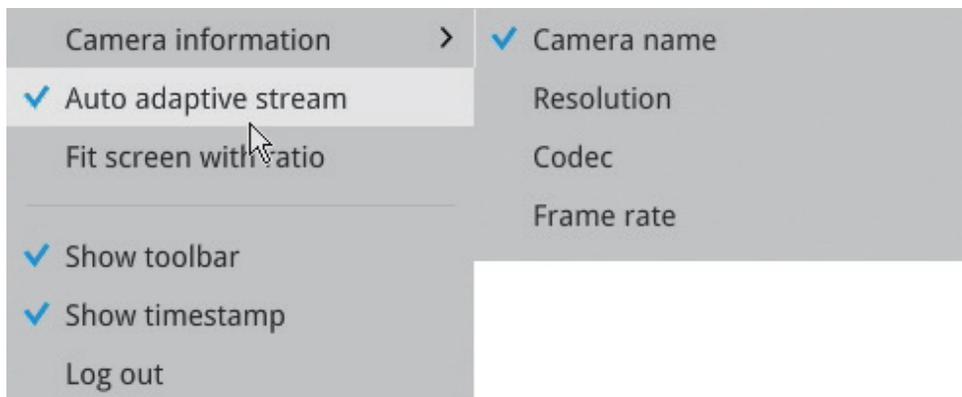
2. **Manual Recording** : Press the button to start a manual recording from a selected camera. Click again to stop the recording.
3. **Return** button : Click to return to the LiveView window.



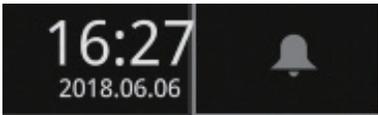
2-2-6. Right-click Commands

Left-click to select a camera. Right-click to display the selection menu.

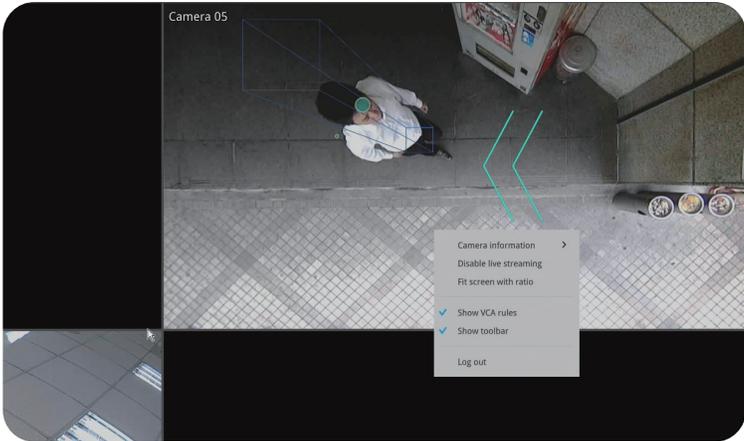
- 1. Camera information:** Click to display camera name, resolution, codec or frame rate on the view cell. The information will display on the upper left corner of a view cell.
- 2. Auto adaptive stream:** Default is enabled. The Auto adaptive stream automatically polls a video stream of a smaller resolution in order to reduce the streaming efforts. For example, when a view cell is placed in a 3x3 layout, it may not be necessary to stream the video in its full resolution. In a full view, the system displays a video in its full resolution. Due to the size of view cells on your monitor, when in a multi-cell layout, the system automatically polls the camera for a smaller resolution stream.
The Auto adaptive stream feature can be disabled if you prefer consistent display resolution.
- 3. Fit screen with ratio:** The NVR server automatically optimizes the display of camera view cells. However, you can still select this option to display the camera's original aspect ratio: for example, the original video feed can be 4:3. Without the fit screen, every camera's image will be expanded to fill the view cell.
- 4. Show VCA rules:** Displays the video analytics detection rules, such as the Line Crossing detection line, or the detection zone for the Intrusion detection. Note that this feature is not available for cameras that come without the VCA analytics features.
- 5. Show tool bar:** You can hide the tool bars by deselecting this option.
- 6. Show timestamp:** You can hide the time stamp bars by deselecting this option.
- 7. Log in/Log out:** Log in to enable system configuration.



A time tab is displayed at the lower center of the screen. You can move your cursor to the lower center to display the time tab and the alarm panel.



For the 3D counting cameras, right-click on its view cell to display the counting rule option. You can enable the display of counting lines, and the bounding boxes for detected objects.

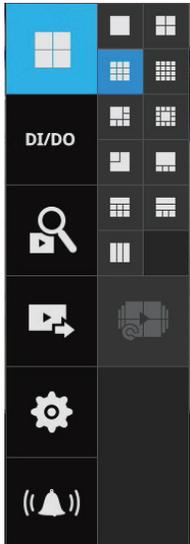


Note that the NVR supports the connection of up to 4 counting cameras. The VCA rule displays only on the 2x2 layout.

Chapter 3: Configuration Using the Local Console

The Main Control Portal

3-1. Layout

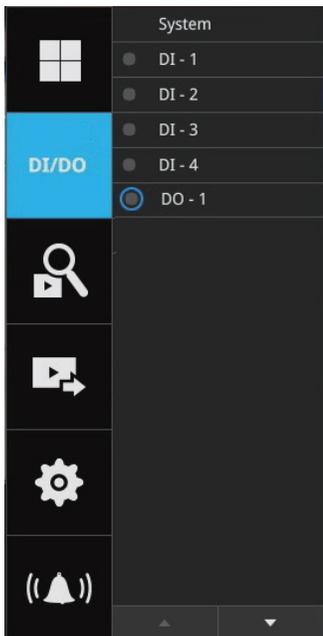


Move your mouse cursor across the screen to display the portal.

By default, 5 typical layouts are provided for the user. They include: 1x1, 2x2, 3V, 3x3, 4x4, 1P+3, 1M+5, 1P+6, 2P+3 and 1M+12 (LNVR1-16P). 1x1, 3V, 2x2, 3x3, 1P+3, 2P+3, 1M+5, 1P+6 (LNVR1-08P).

If you select the single view layout, the **Rotation** button  will appear. Click the **Rotation** button below to let the system swap the display of different cameras by every 10 seconds. The rotation speed is configurable via **Settings > System > Display**.

3-2. DI/DO



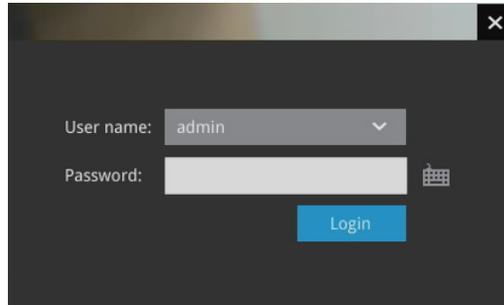
Click on the **DI/DO** button to display the full list of all DI and DO signals (whether they are connected or not) from all cameras in the configuration. The indicator will turn solid white when a digital input signal is triggered.

3-3. Search recording clips

3-3-1. Basic Search



Click the button to start searching for recorded clips. A confirm box will prompt. Enter **User name** and **Password** to proceed.



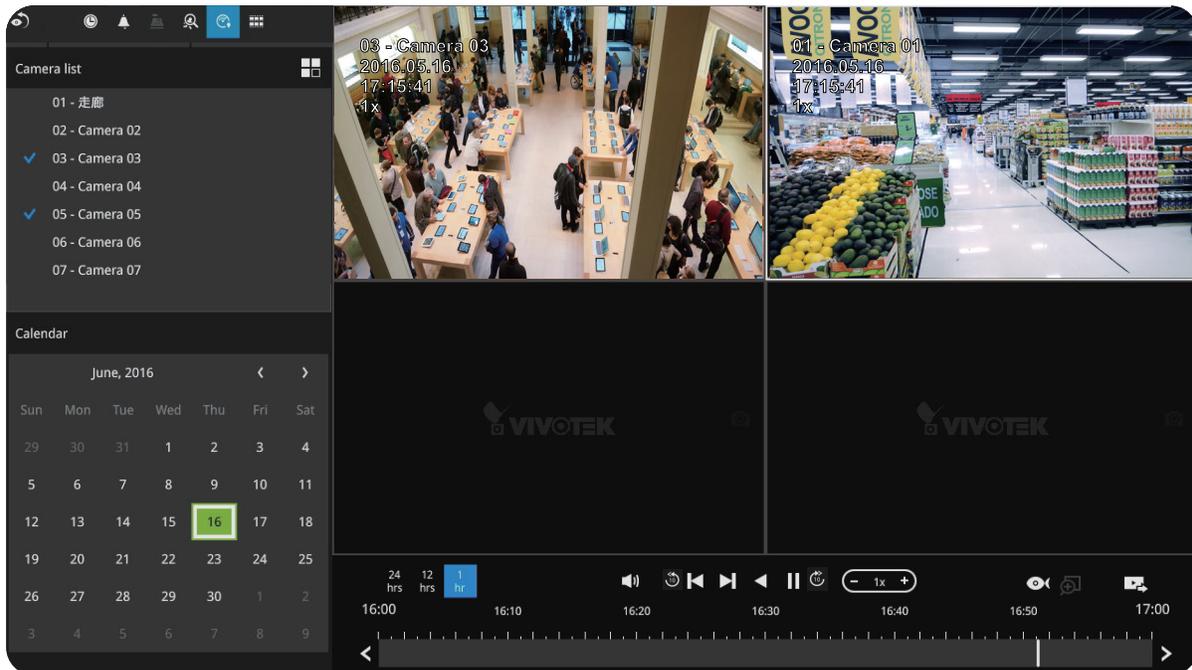
NOTE:

The **Search Recording** button becomes the **Smart Search II** button with cameras that come with the Smart Motion Detection feature.

The search and calendar view will appear. Select a day on the calendar to select the date when the recordings of your interest took place (the days with recorded clips will be highlighted in blue and green).

Double-click on a day to begin playback and search.

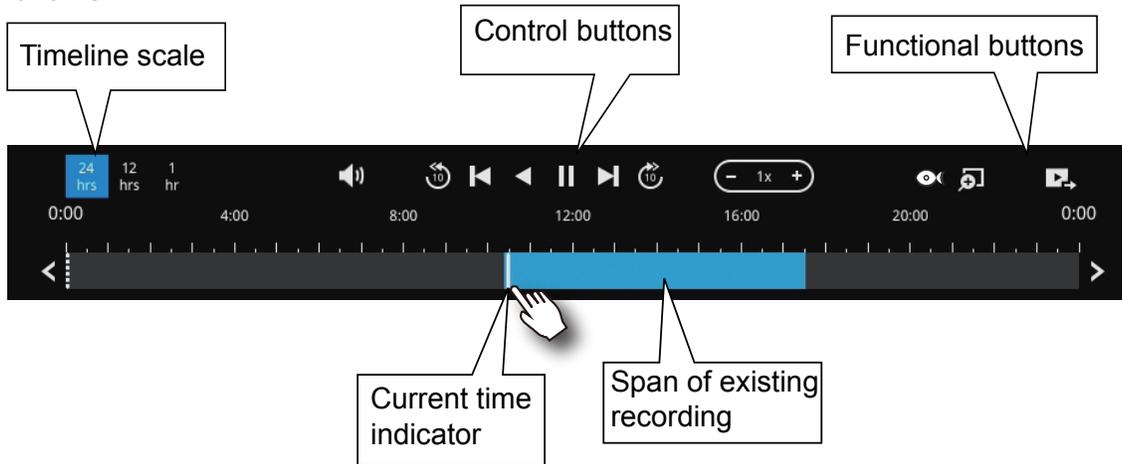
The date highlighted in green indicates today, and the green indicator does not necessarily mean that there are recorded videos today.



Use the **Layout** button to adjust view cell arrangement on screen. You can retrieve the recorded videos from a maximum of 4 cameras at the same time.

Once you select to playback multiple cameras, the playback window will automatically turns into the 2x2 layout. Up to 4 cameras' recording can be played back simultaneously. This enables the synchronized playback of video produced by multiple cameras. Users do not need to switch from one camera to another when searching for forensic evidences.

The timeline bar enables quick skimming through the recording. Its functions are described as follows:



Buttons	Description
	Time scale selector. Use the buttons to select the span of time displayed on the tool bar.
	Audio volume tuner.
	Plays back from 10 seconds ago.
	Previous frame. (I-frame only)
	Next frame. (I-frame only) After you paused a playback, use this button to browse video frame by frame.
	Play backwards.
	Play. This button is available after you paused a playback.
	Pause.
	Each click on it speeds down by 1/2. The slowest speed is 1/16.
	Each click on it speeds up by 2x. The fastest speed is 16 times.
	The current playback status is indicated on the screen. This button appears when you select to playback a fisheye camera's recording. This avails the selection of dewarp modes usable during the playback.
	Digital zoom. This applies when a camera is displaying the full of its field of view. You can use the Digital zoom function to zoom in on the field of view.
	Export clips. Use this function to select a span of time you want to export to other medias.

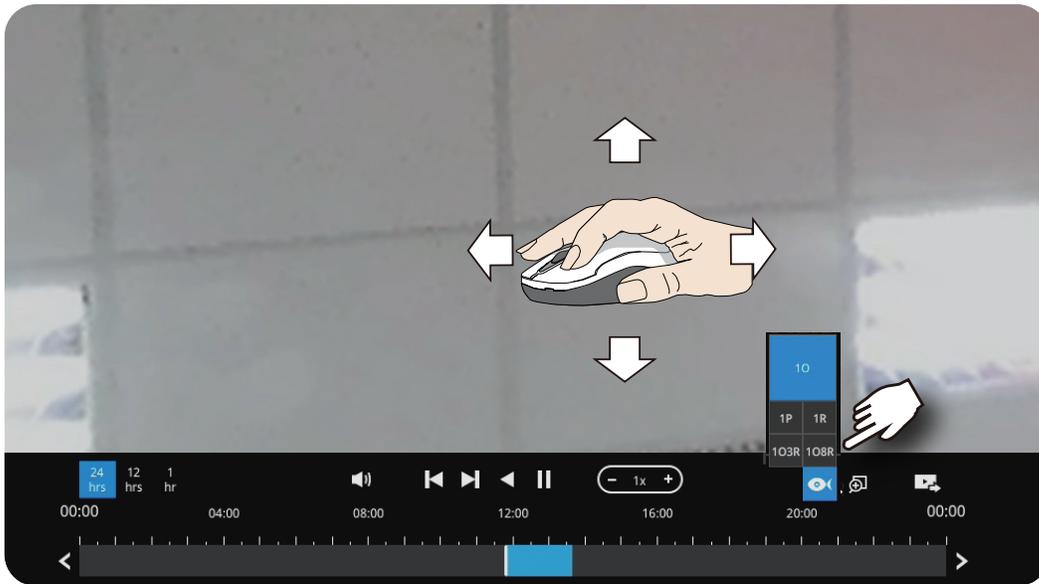
By default, the playback starts from the beginning of a day's recording. While playing the recorded video, click on the timeline to replay a point in time in the video.

	Snapshot. Takes a snapshot of the current FOV. The Snapshot button has been moved to the right-hand side of each view cell.
--	--



The fisheye dewarp modes can be selected during a playback: e.g., 1R, 1P, 1O3R or 1O8R.

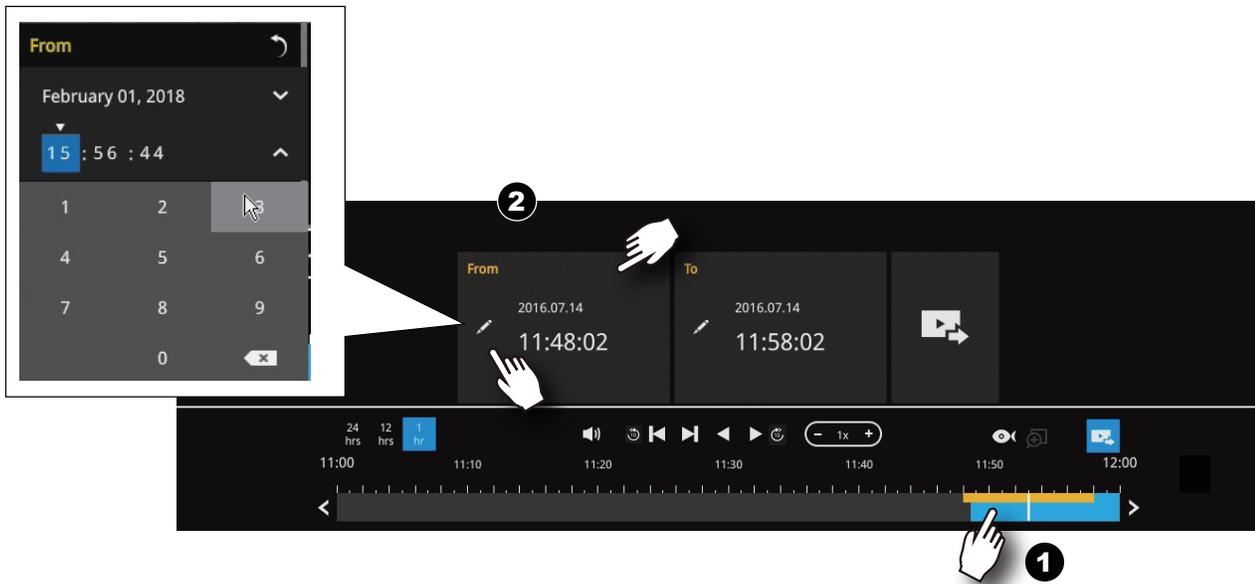
When playing the video recorded by a fisheye camera, the fisheye display options  will be available on screen. You can click to select the 1O, 1P (Panoramic), 1R (Regional), 1O3R (1 Original and 3 Regional) or 1O8R modes. If 1P, 1R, 1O3R or 1O8R mode is selected, you can exert the mouse control on screen, such as swiping the view, or hold down the **Mouse** button and swipe the field of view.



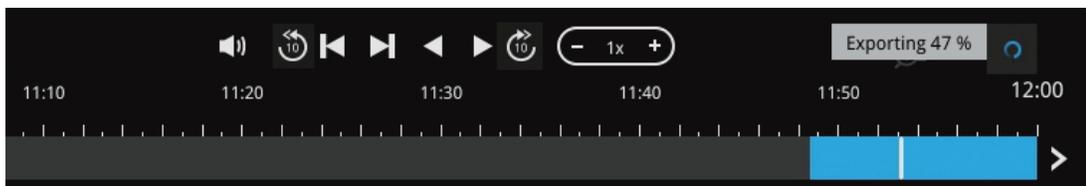
Please refer to the User Manuals that came with fisheye cameras, or [page 43](#) for description of fisheye display modes.

Note that to export a video segment from the playback timeline,

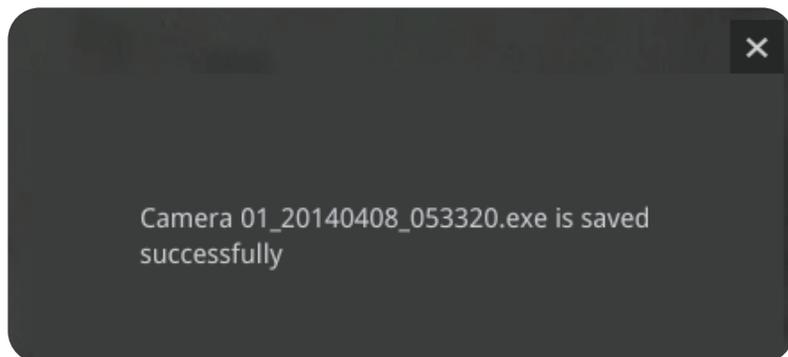
1. Click on the **Export** button .
2. Insert a USB drive formatted in the FAT format.
3. Select the "From time" by clicking on the timeline. You can also manually enter the "From time" and the "To time."
4. Click on the "From time" tab using a single click.
5. Repeat steps 3 and 4 to configure the To time.
6. Click on the **Export** button.



The export process is indicated on the right. Depending on the length of footage to be exported, this process can take minutes.



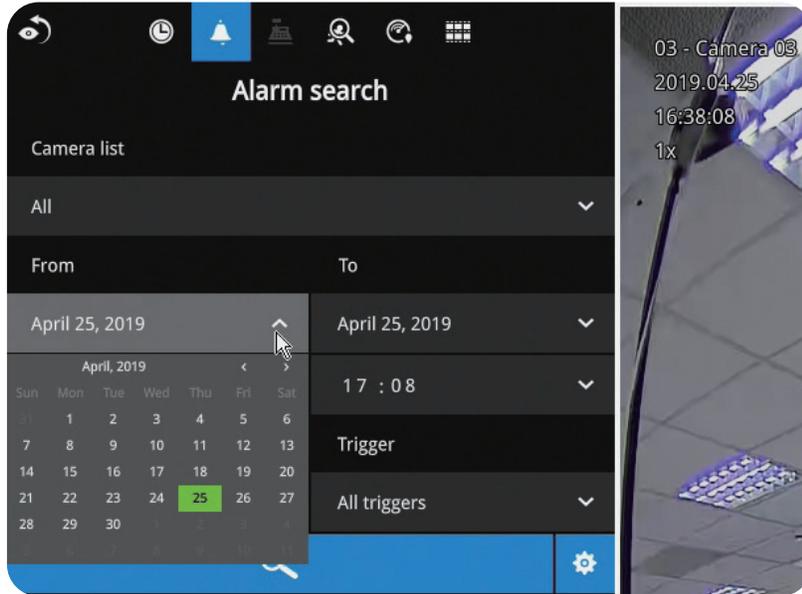
When completed, a message will display on screen.



The default for export is 5 minutes before and 5 minutes after the point in time that is currently selected.

3-3-2. Alarm Search

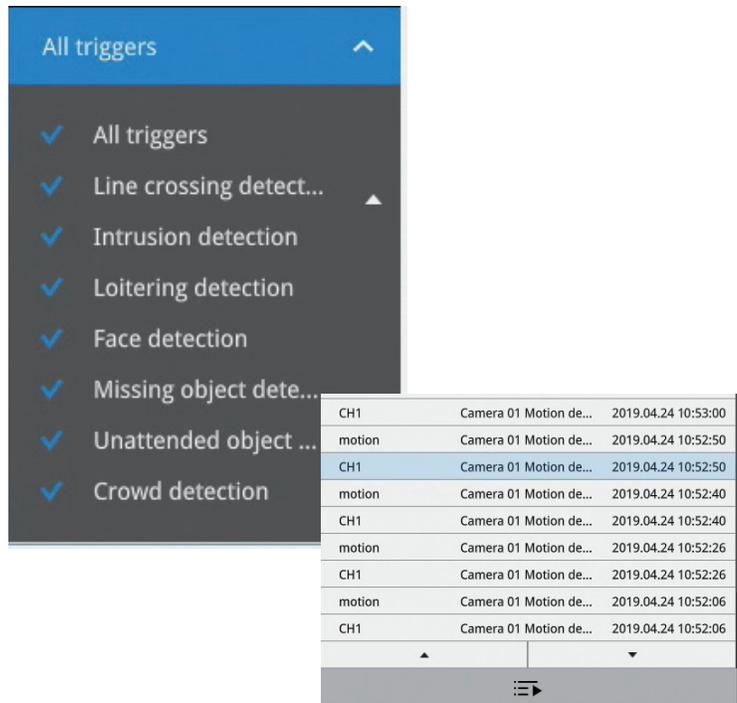
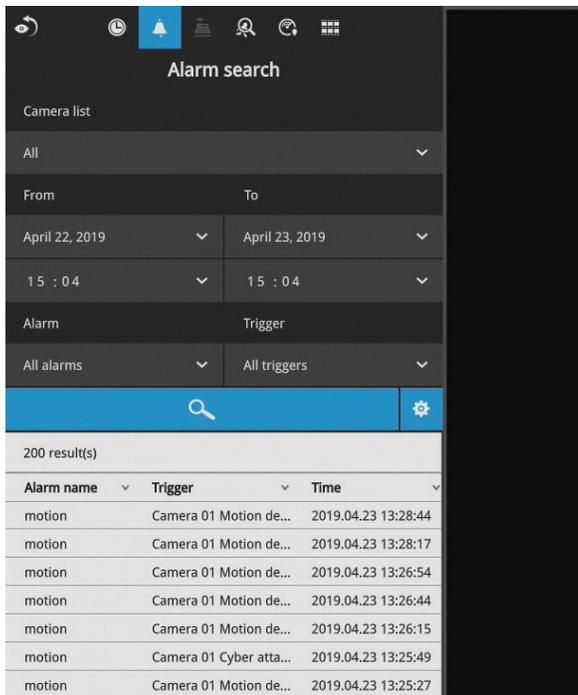
Click on the Alarm search tab on the upper left of the Search panel screen to enter the Alarm Search window.



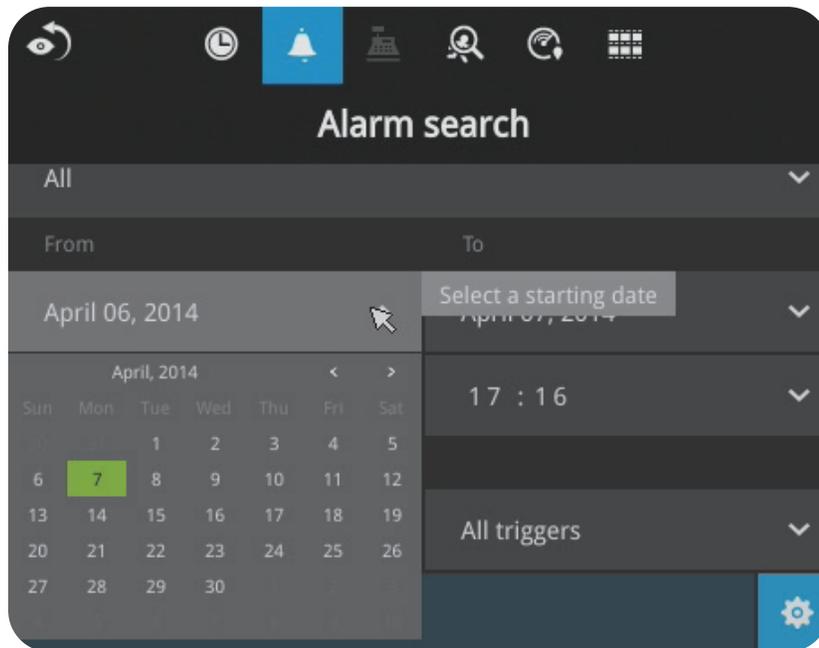
You can specify the search criteria by selecting the devices to be involved in the Alarm search.

1. Camera list.
2. The From and To time.
3. Pre-configured alarms, such as those associated with camera DI, motion detection or VCA analytics triggers, etc.
4. Trigger: DI, DO, tampering detection, disk failure, cyber security events and VCA video analytics events.

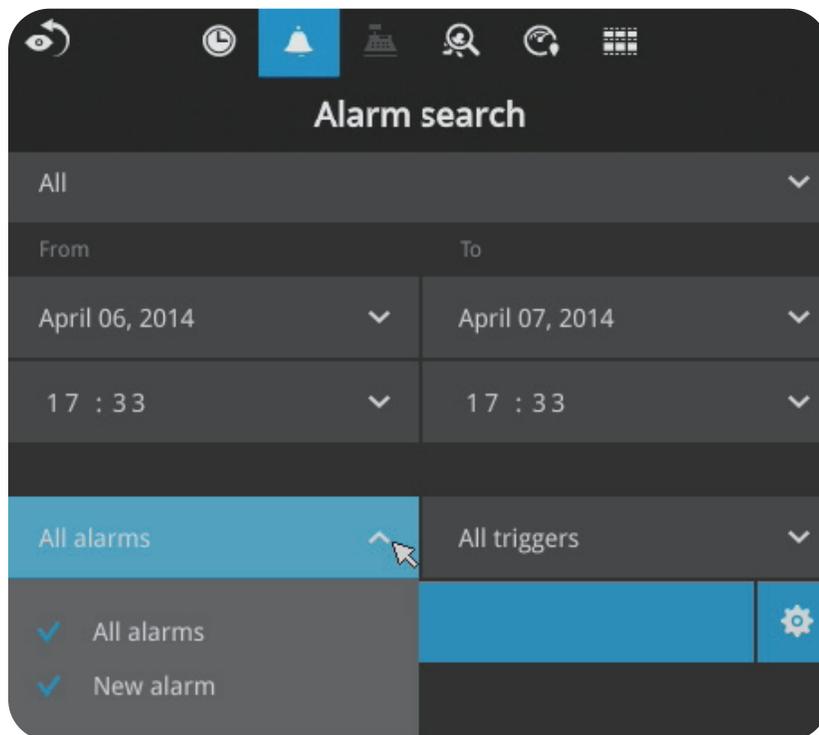
Use the combinations of these parameters to sort through the alarms.



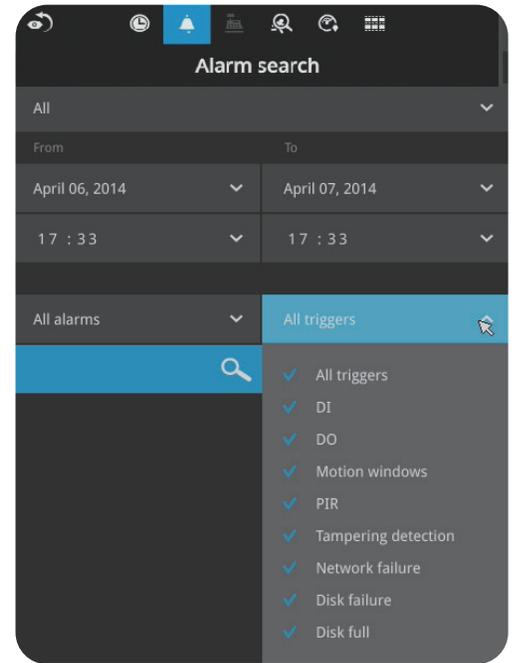
You can then specify the start time and end time to configure a span of time to be searched.



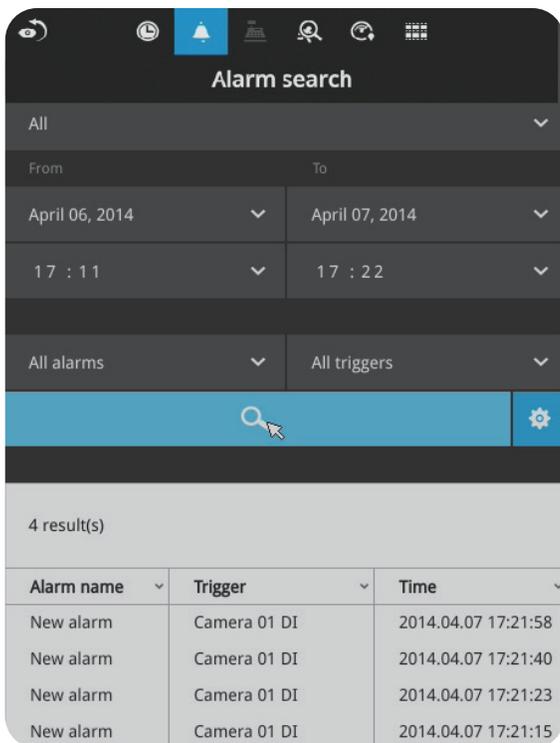
You can also determine what alarms will be included in the search.



You can select what types of triggers were associated with the recordings you want to find.



When done with the selection, click on the **Search** button. In the sample screen below, a list of alarms is displayed and you can click on any of them to replay the moment when the alarm was triggered. The alarm-related recording will typically include a length of 5 seconds of pre-alarm and 20 seconds of post-alarm footage.



Up to 200 search result entries will appear. If more than 200 entries have been found, click on the **New Results** button on the last entry page.

If two cameras participate in the recording of an alarm-related event, the footage of one camera will be played first, and then that of the other.

If a user's operation takes place (pause, rewind, etc.) during the playback, the system will stop the consecutive playback of multiple alarm footages.

 **NOTE:**

When the **Search** window is left unattended for 10 minutes, the NVR will return to the live view display. To enter the **Search** window, you will have to enter the user credentials again.

Use the page up and page down buttons to browse through the alarm list. Use the **Continuous Playback** button to let the system automatically play all alarm clips. The continuous play starts from the first alarm or from the alarm you currently clicked and selected. Click on the button again to stop the continuous play.

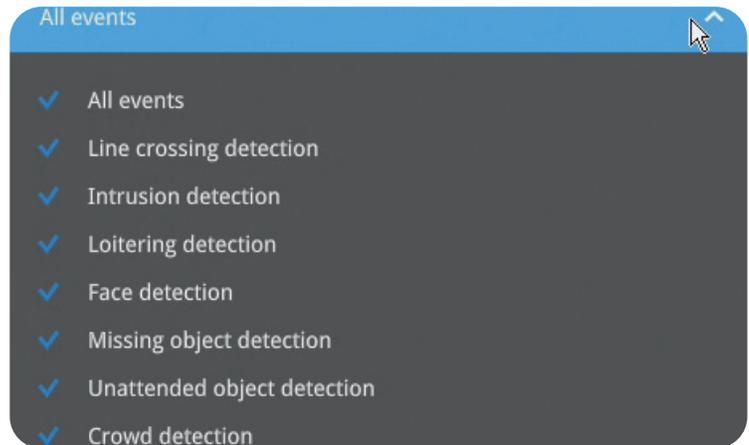
CH1	Camera 01 Motion de...	2019.04.24 10:53:00
motion	Camera 01 Motion de...	2019.04.24 10:52:50
CH1	Camera 01 Motion de...	2019.04.24 10:52:50
motion	Camera 01 Motion de...	2019.04.24 10:52:40
CH1	Camera 01 Motion de...	2019.04.24 10:52:40
motion	Camera 01 Motion de...	2019.04.24 10:52:26
CH1	Camera 01 Motion de...	2019.04.24 10:52:26
motion	Camera 01 Motion de...	2019.04.24 10:52:06
CH1	Camera 01 Motion de...	2019.04.24 10:52:06
▲		▼

3-3-4. Smart VCA event search

This search panel enables the search for the detection results from Smart VCA analytics functions.

They include:

- » Line crossing detection
- » Intrusion detection
- » Loitering detection
- » Face detection
- » Missing objection detection
- » Unattended object detection
- » Crowd detection

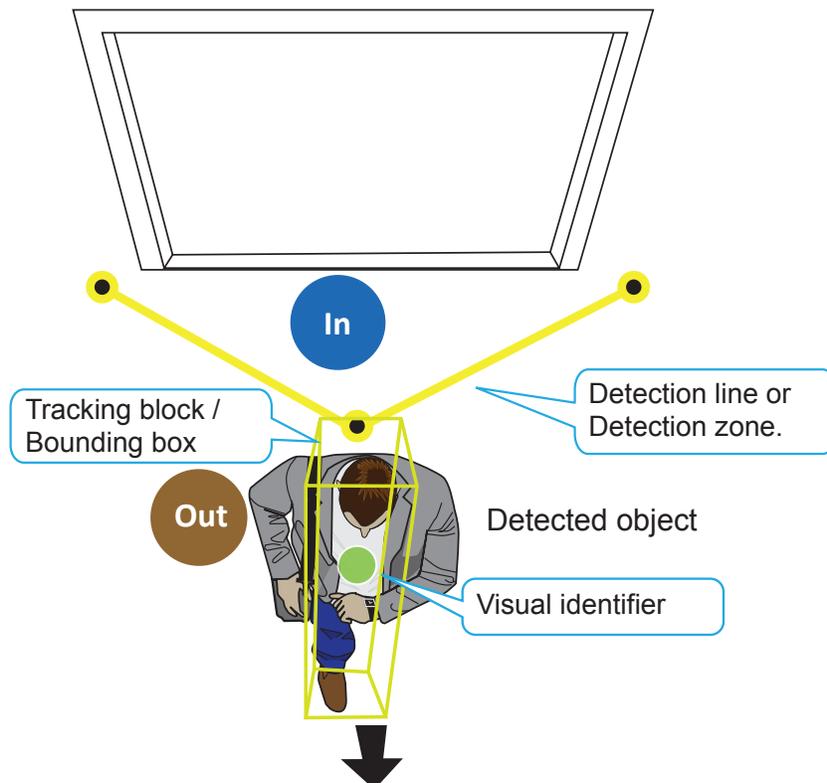


The event search takes effect when the related cameras are currently recording videos to the NVR.

The search function helps sorting through hours of videos, enabling you to quickly find a person or an event of your interest. This facilitates an effective search for a deployment across large surveillance areas. VCA events are recorded along with video recordings.

The NVR automatically detects cameras that come with the video analytics functionality. Note that the video analytics configuration should be separately configured on individual cameras; such as drawing the detection zone and detection line for Line-crossing detection.

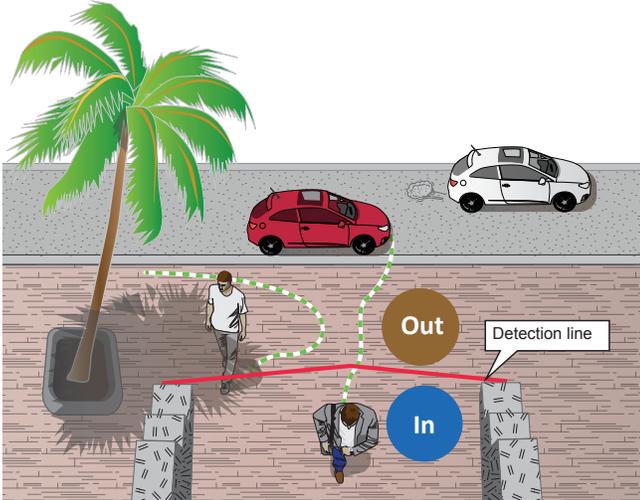
On the live view, you can also see the analytics rules and the bounding boxes indicating the detected objects while the analytics is taking place.



Below are the short introductions to these analytics functions:

Line Crossing Detection

The Line Crossing detection detects one or multiple persons crossing a virtual trip-wire. The traffic direction can be assigned on screen for persons passing the line in one specific direction or in both directions.

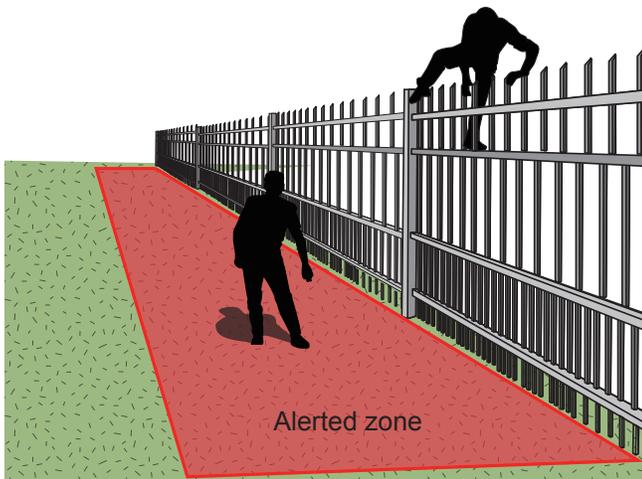


The applicable scenarios of this feature can be:

- Detects someone who enters a driveway, entrance or exit through the virtual line.
- Detects and triggers an alarm in a predetermined direction.
- The detection line can be used as a fence boundary to know if someone has crossed the articulated line around a perimeter.

Intrusion Detection

Intrusion Detection can be used to detect people entering or leaving a virtual area in the camera field of view.

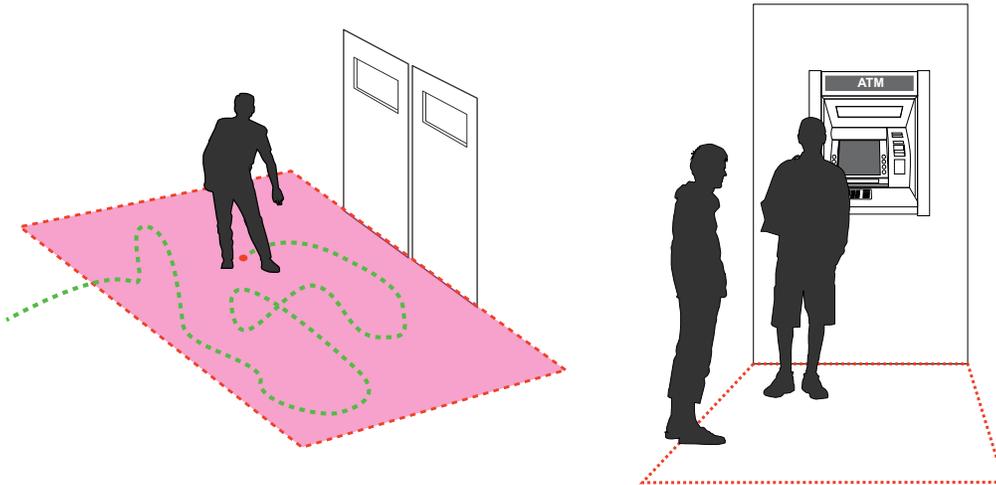


The applicable scenarios of this feature can be:

- Detects when a person enters a bank vault or school after the office hours.
- Detects when a person leaves an emergency exit or fire escape or any place that is normally forbidden from access.

Loitering Detection

The Loitering detection can be used to detect a person or a group of people lingering in an area for longer than a preset time threshold.

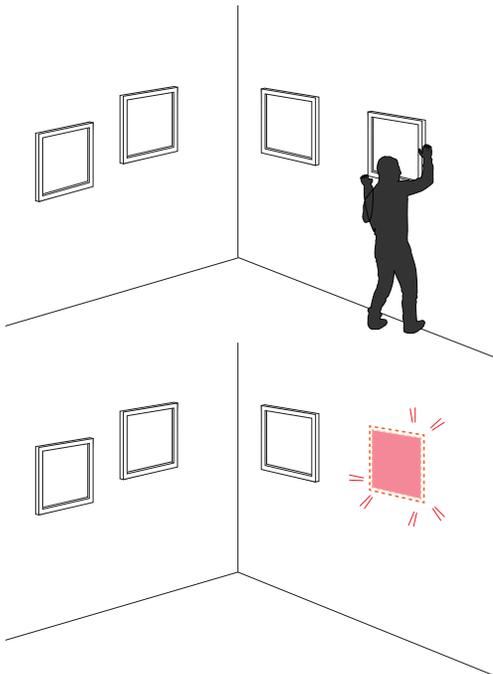


The applicable scenarios of this feature can be:

- Detects when a person is loitering at a walk-up of ATM lane.
- Detects when a person is loitering in a high-theft area of a store, or to prevent vandalism and break-ins.
- Detects when a person is loitering in an area that is normally not an access for visitors.

Missing Object Detection

The Missing Object detection can be used to detect the removal of a predefined asset from a surveillance scene.

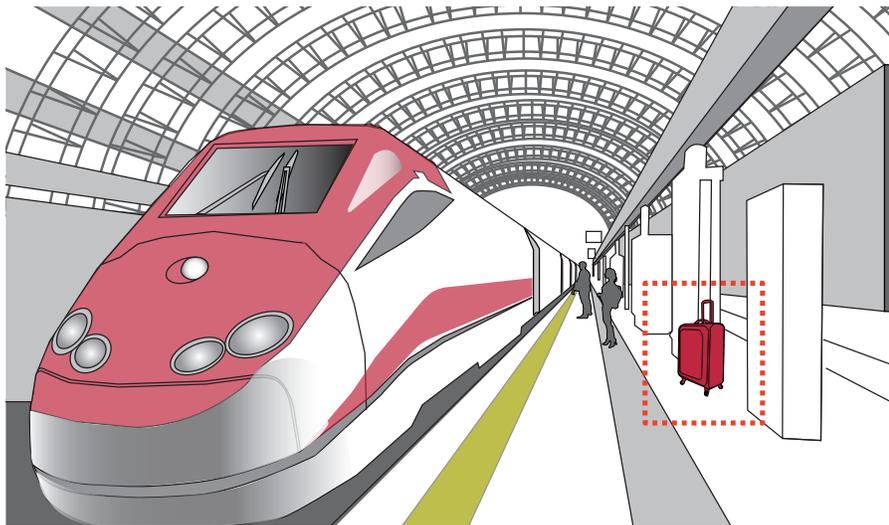


The applicable scenarios of this feature can be:

- In a campus setting, the Missing Object feature can be used to monitor high-risk areas for theft, such as the administrative offices, computer labs or science laboratories.
- Detects when theft occurs in storage areas or warehouses. It is helpful when there are security personnels monitoring the scene, yet their attention went down through time.

Unattended Object Detection

The Unattended Object detection can be used to detect objects intentionally or unintentionally left in scene.

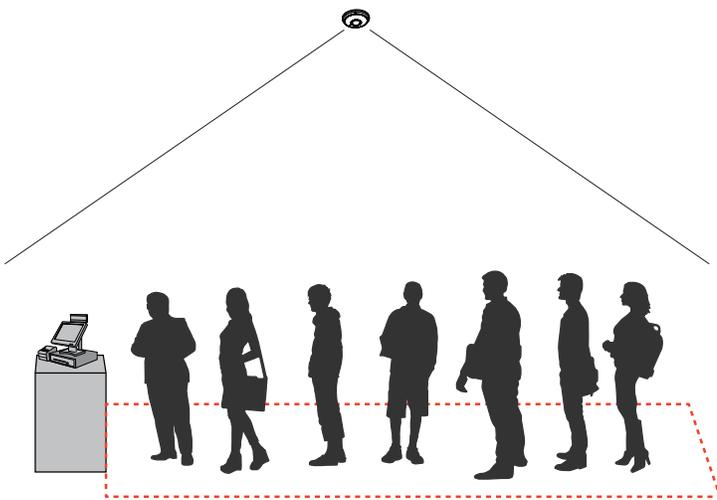


The applicable scenarios of this feature can be:

- Detects objects placed in front of an emergency exit.
- Detects objects left on subway tracks, platform, on a bridge or in a bank lobby.

Crowd Detection

Crowd detection calculates the number of people in a specific area. When the number exceeds a preset number, an event is triggered.

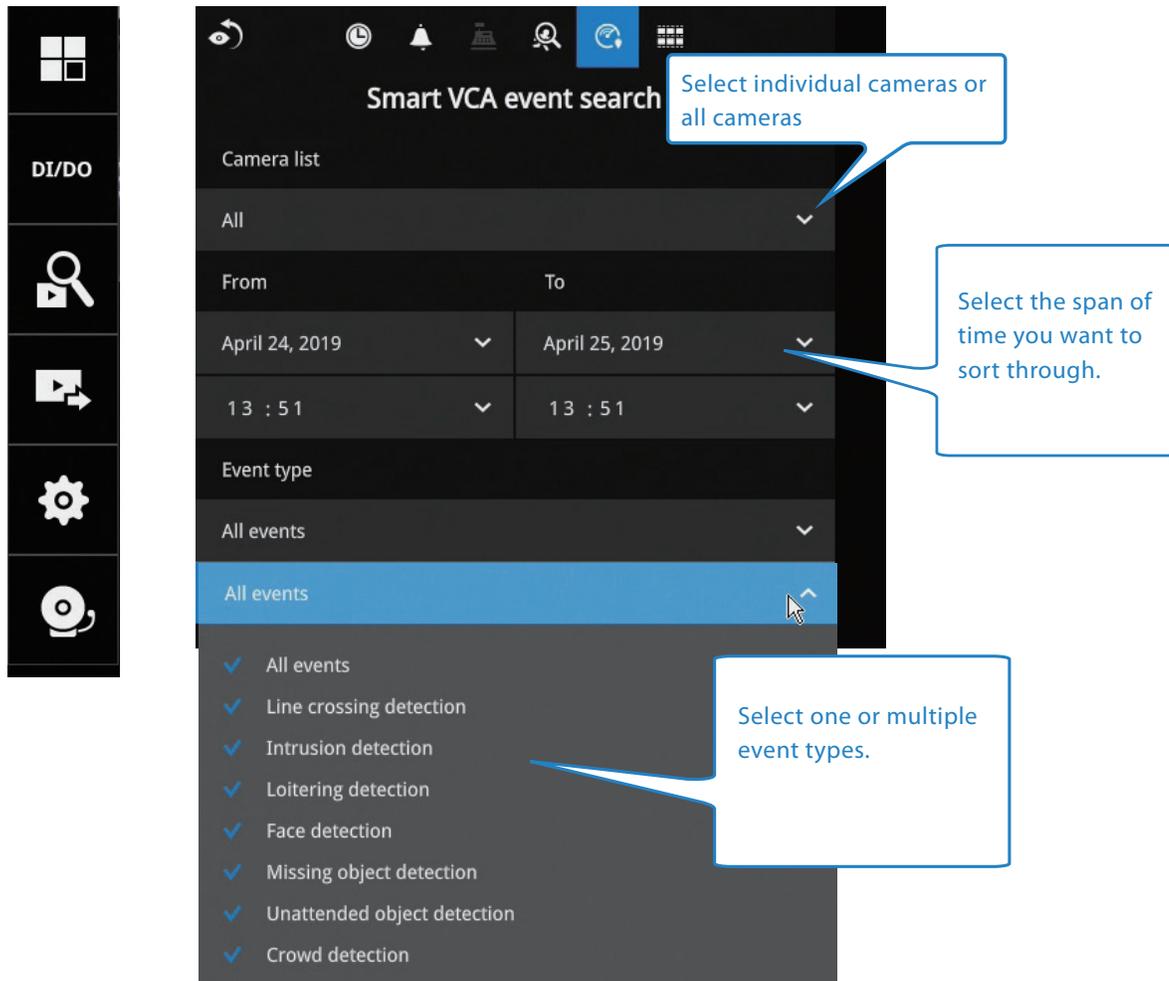


The applicable scenarios of this feature can be:

- Detects the congestion when the number of people in a region exceeds a preset number. For example, 10 in a waiting line. For example, at an airport when too many passengers are waiting in line, new checkpoints can be opened and they can be directed to other checkpoints.
- To monitor a special area where at most one person is allowed inside. For example, one person is normally allowed in the area in front of an ATM machine or a strictly guarded entrance. Tailgating can occur if one uses his/her access card to open a gate while the other sneaks in following behind.

The Smart VCA search function can be accessed from the main portal using the **Search** button. When you are at the search panel, click on the Smart VCA search tab.

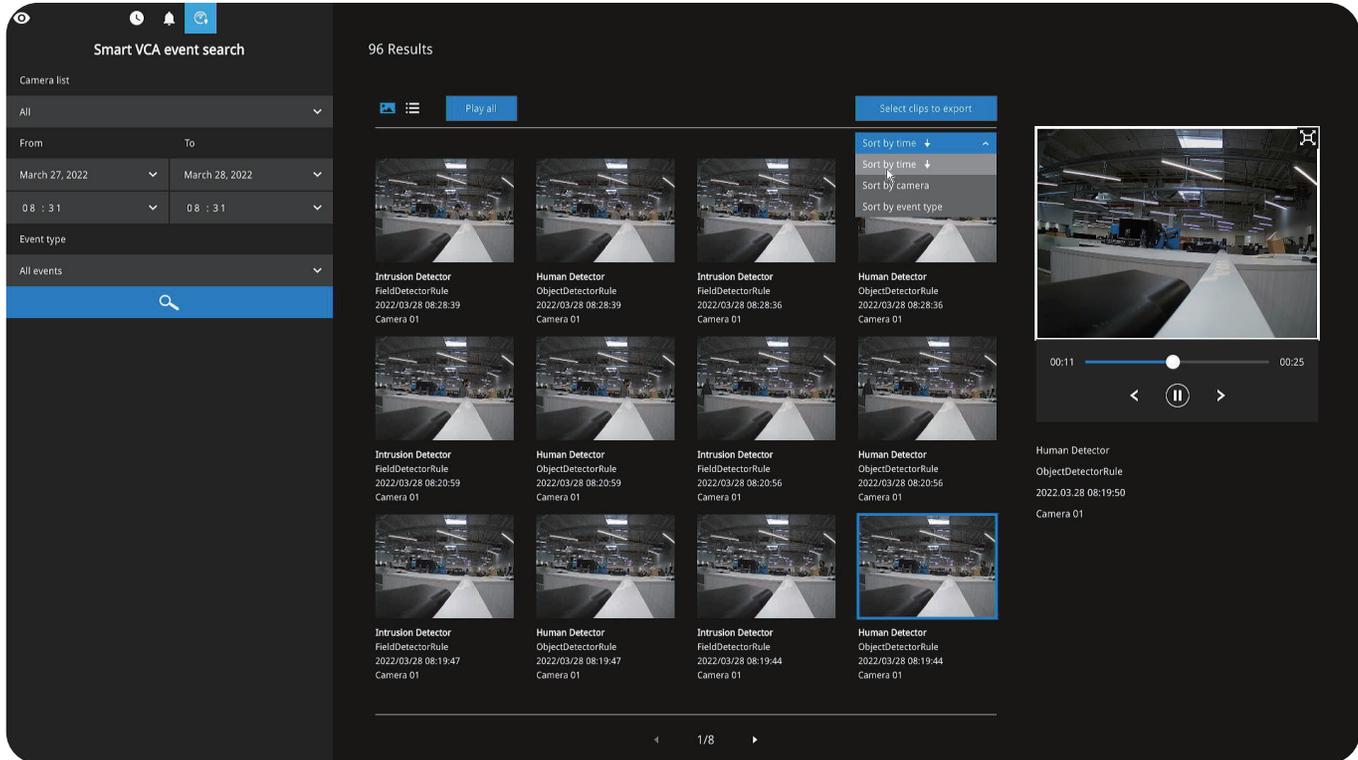
1. Select the cameras that generate VCA events. Select at least one camera.
2. Configure the time span within which the events occurred. Use the pull-down menu to change the From and To times.
3. Select the **Event** types, namely, the pre-configured VCA analytics rules. Note that the event rules should have been properly configured on the individual cameras.



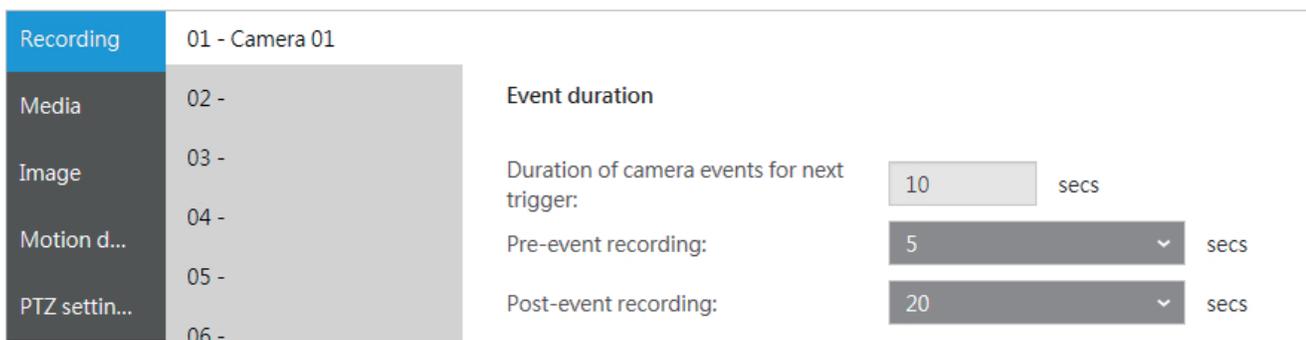
4. Click the **Search** button to begin the search. Depending on the scale of the search (how many cameras involved; the span of recordings in search), the search should be completed in a few minutes.

5. The search results will display as thumbnail images. To view each short video clip, click on the thumbnail. The playback video window is located on the right. Click on the **Expand/Shrink** button  to watch the video in a full screen.

You can use the **Esc** button to leave the full screen. Click to select another thumbnail, or use the < or > buttons to view the previous or successive clips.

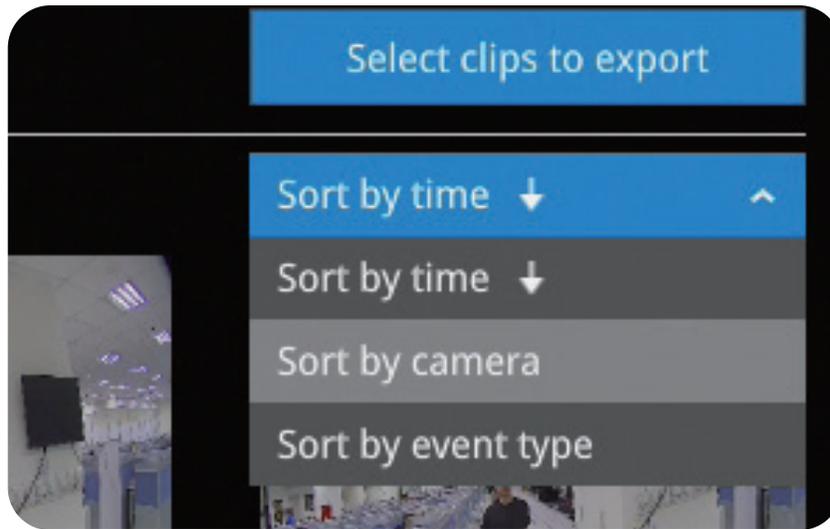


The default for the event recording setting is 5 seconds for pre-event, and 20 seconds for the post-event recording. You may change the parameters if the need should arise.

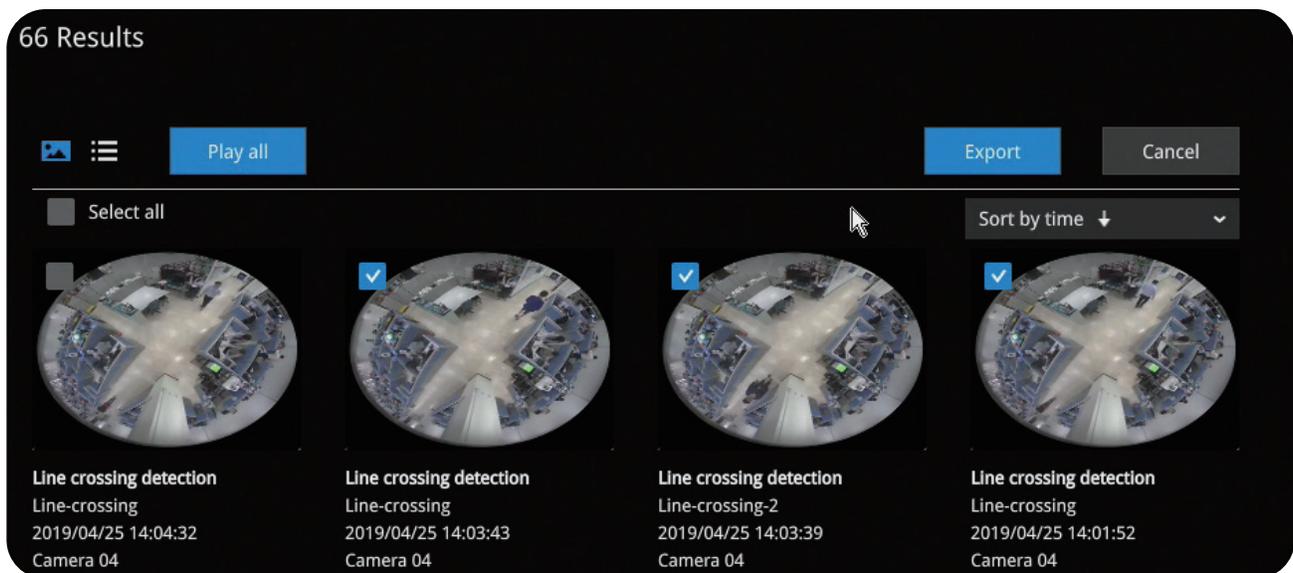


You may then select clips of your interest and click the **Select clips to export** button. The associated clips can be exported to a USB thumb drive.

You may use the sort menus on the upper right to sort your search results. If using the "Sort by event type" option, events of different types will be displayed in a successive order.



When exporting video clips, mouse over and select the small checkboxes on the thumbnails. Single-click to select video clips. When the selection is done, click the **Export** button to proceed.



3-4. Export recordings

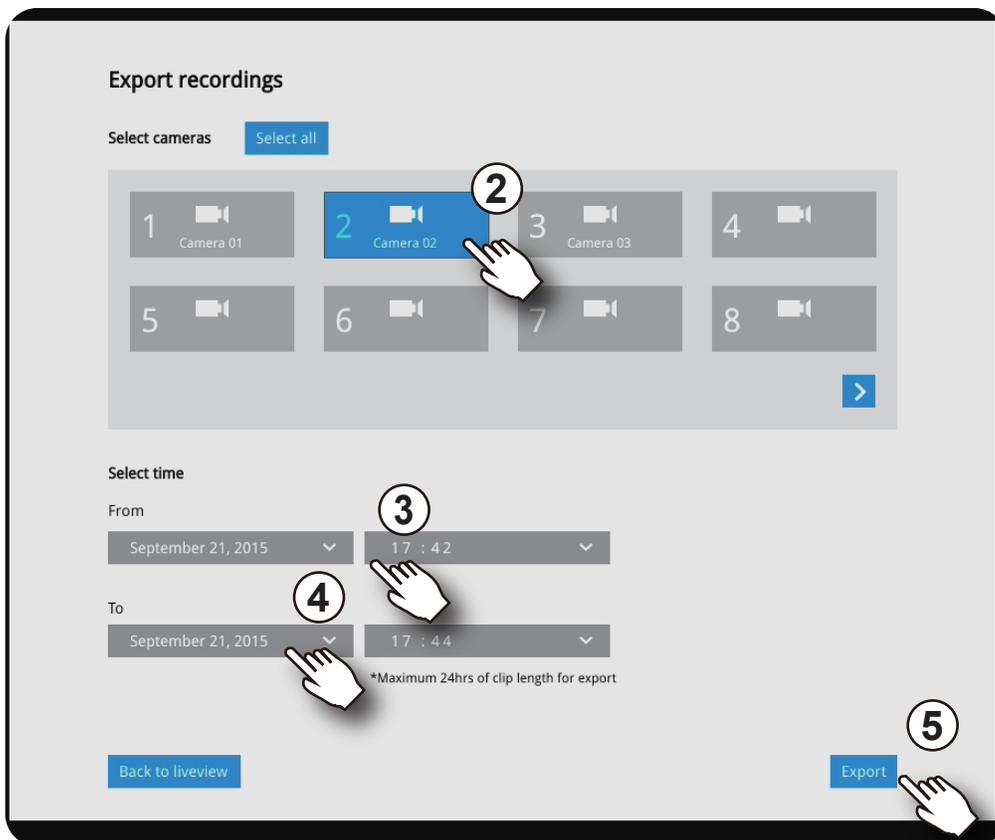


The **Export Recordings** button allows users to directly select a piece of recordings by a specific camera, and export that to a USB thumb drive. Select one or multiple cameras, select a period of time in which the recording took place and then click **Export**.

The maximum length of recording export is 24 hours.

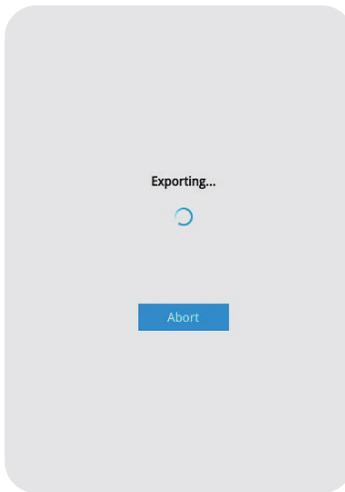
To export recordings:

1. Attach a USB thumb drive formatted in FAT format to the NVR's USB port.
2. Select one or multiple cameras from the list.

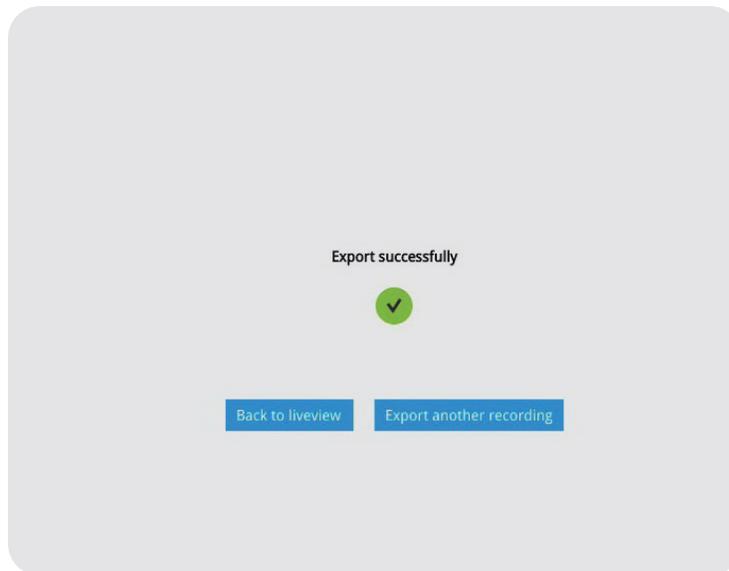


3. Select the start time of the period of recording time.
4. Select the end time of the period of recording time.
5. Click the **Export** button.

6. The *Exporting* progress will be shown.



7. When the export process is complete, select to resume another export or go back to the live view.



Note that the export process can take a long time if the time span of the selected video is very long.

3-5. Settings

3-5-1. Settings - Overview



Click the **Settings** button to start the camera and system settings window. A confirm box will prompt. Enter **User name** and **Password** to proceed.

A dark-themed login dialog box with a close button (X) in the top right corner. It contains two input fields: 'User name:' with a dropdown menu showing 'admin' and a small downward arrow; and 'Password:' with a text input field and a keyboard icon on the right. A blue 'Login' button is positioned below the password field.

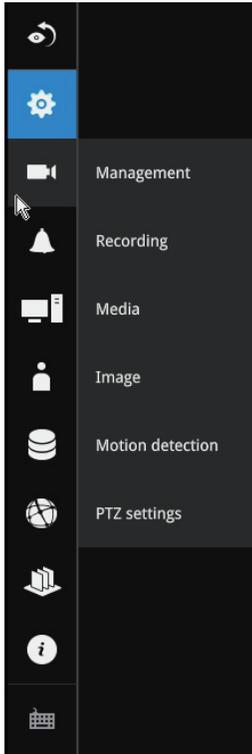
The system will default to the overview page displaying the camera connection and storage statuses. An empty position will be left in blank, and a disconnected camera will be indicated as . The storage volume usage is displayed as the used and unused spaces.

The **Stop Buzzer**, **Reboot** and **Power-down** buttons are also available on this page. There are critical conditions that can sound the system buzzer, such as a disk failure.

The main dashboard area. At the top, it says 'Camera connection'. Below this is a 2x4 grid of camera status cards, numbered 1 through 8. Each card contains a green camera icon, indicating all cameras are connected. Below the camera cards is a 'Storage' section. It features a bar chart with two blue bars representing storage usage. Below the bar chart, it displays 'Remaining: 2787 GB' and 'Total: 2789 GB'. At the bottom right of the dashboard, there are two buttons: a blue 'Reboot' button with a gear icon and an orange power button with a power symbol.

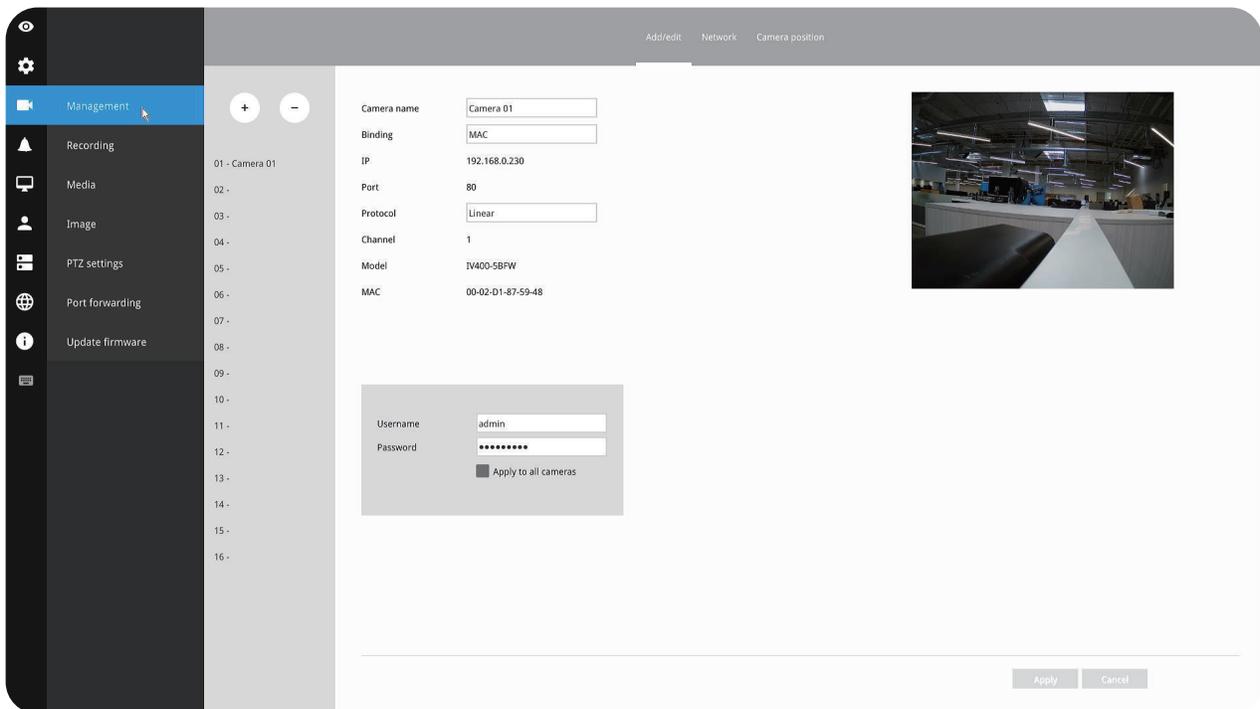
The Camera menu provides access to **Management, Recording, Media, Image, Motion detection** and **PTZ** settings pages.

3-5-2. Settings - Camera - Management



On the camera Management page, you can configure the following:

1. Recruit or disband cameras.
2. Create a camera name.
3. **Binding:** Designate how a camera is recognized. The default is MAC binding. The NVR recognizes a camera by its MAC address regardless of IP changes. If set to IP binding, static IP setting is preferred. If IP changes occur, the NVR may not be able to access the cameras.
4. **Protocol:** Linear cameras will default to the Linear protocol. ONVIF can be used to other cameras and RTSP for older non ONVIF cameras.
5. Assign User name and Password or apply the credentials to all cameras in your configuration.
6. Change the Network settings.
7. Change the cameras' positions on the layout screen.



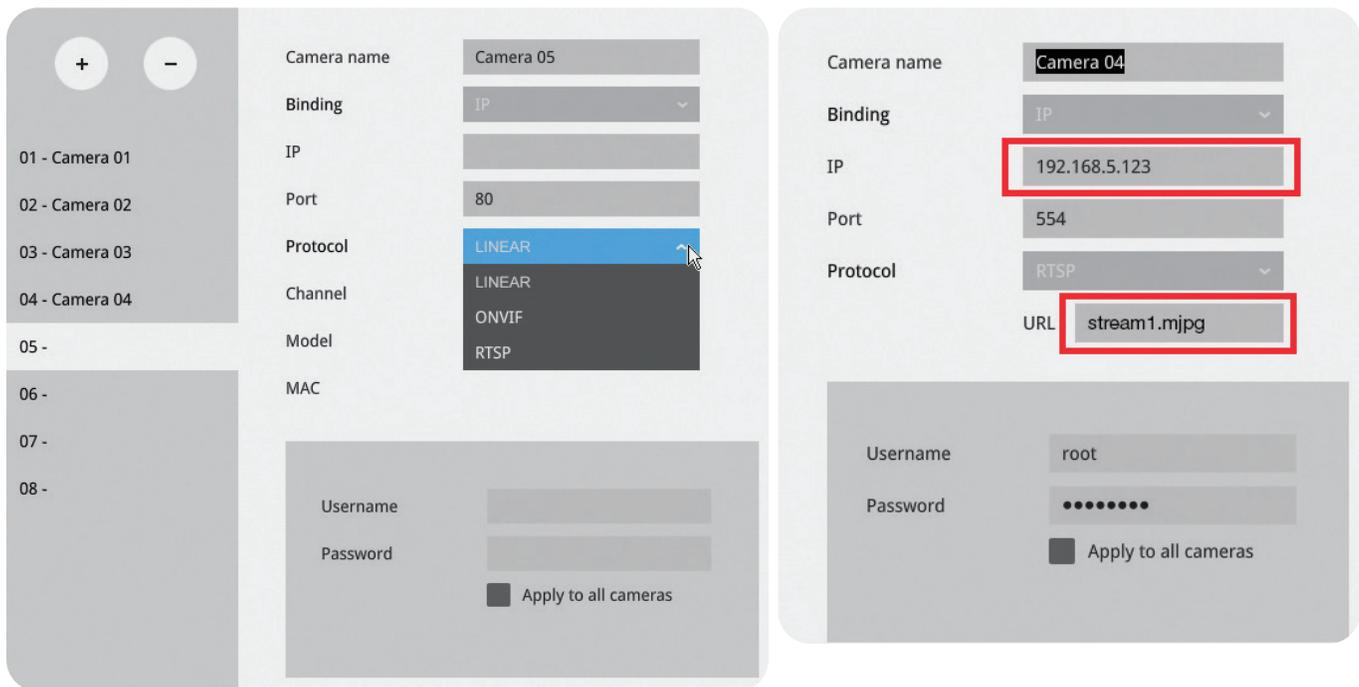
For camera name, you can enter up to 64 alphabetic and numeric characters including [0-9][a-z][A-Z][_][~][]. For user name and password, you can enter up to 64 alphabetic and numeric characters including [0-9][a-z][A-Z][!][\$][%][^][_][.][@]['][~].

For legacy cameras, the NVR supports RTSP connections.

To manually add a legacy camera,

1. Select an empty camera entry,
2. Click the **Add** button,
3. Select **RTSP** as the protocol.
4. The original rtsp address is: `rtsp://<ip address>:<rtsp port>/<access name for stream 1 to 3>`. For example, when the access name for stream 1 is set to `stream1.mjpg`:
<rtsp://192.168.5.151:554/stream1.mjpg>.

However, you only need to enter **IP address** and stream name, such as “`stream1.mjpg`”, in the URL field. The system automatically fills in the other parameters.

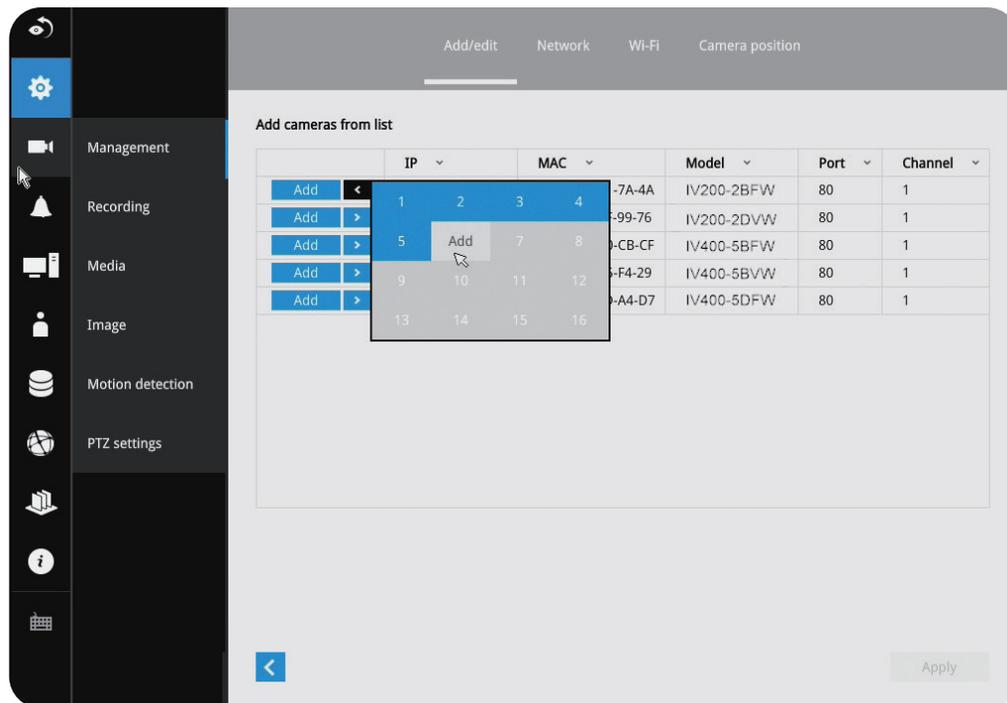


Note the following when using RTSP connections:

1. RTSP cameras do not support event recording in the *Schedule* settings.
2. RTSP cameras do not support *FTP*, *Camera DO* and *PTZ* as the *Alarm* action.
3. RTSP cameras do not support camera's related settings such as *Network*, *Video*, *Audio* and *Display* configurations.
4. RTSP cameras will be indicated by an RTSP tag in the device list.
5. RTSP cameras do not support *Motion detection* configuration.
6. RTSP cameras can not be selected as an alarm trigger.

To recruit cameras:

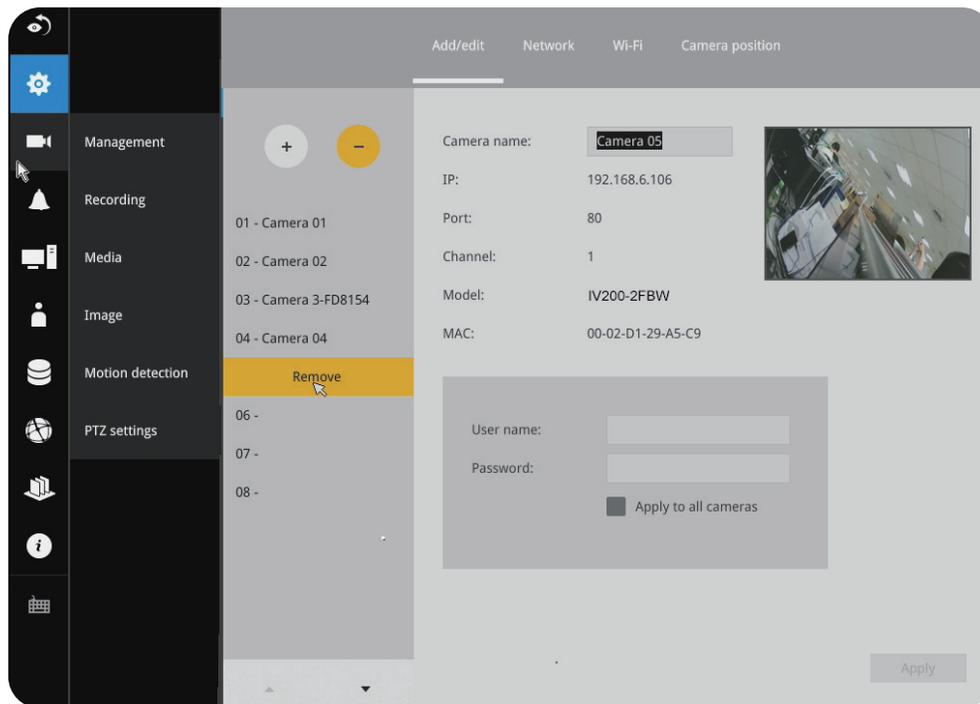
1. Click on the **Add**  button. A list of cameras in the same subnet will appear.



2. Click the **Add** button, the camera will be placed at an unoccupied position. You may also expand the menu on the side of the **Add** button to select a position number.
3. When a camera is added, it should appear on the graphical placement below.
4. Click the **Apply** button after you added cameras.
5. You may click the **Page Back** button  to return to the previous window.

To disconnect cameras:

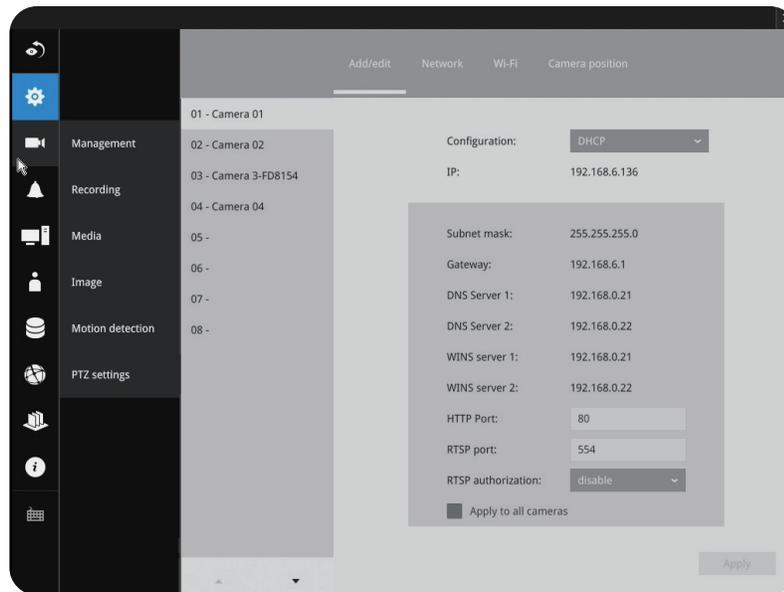
1. Click on the **Remove**  button. A list of cameras will appear.



2. The **Remove** button will turn yellow . Mouse over to the camera you want to remove, and its entry will display the **Remove** message.
3. Click on the **Remove** message. The camera should then disappear from the camera list. The recording from that camera will also be discontinued.

Network

On the *Network* tabbed window, you can configure the network type, IP address and the connection ports for video streaming.

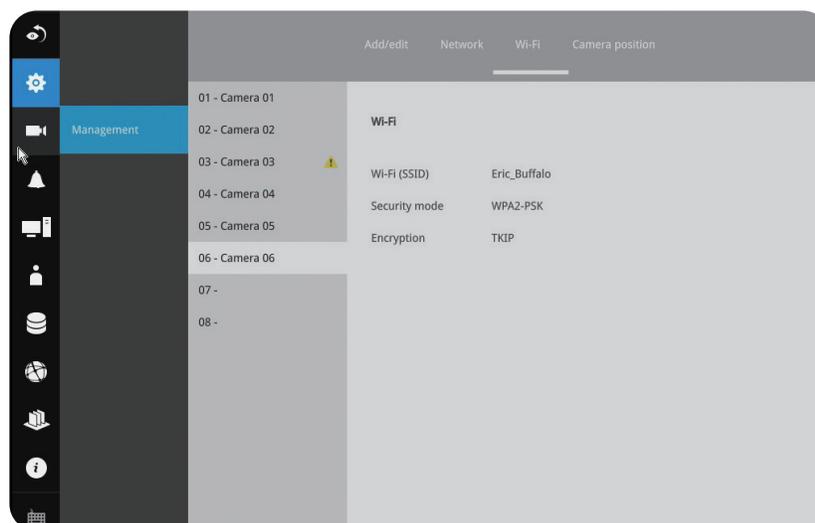


You can select DHCP as the method for cameras to acquire IP addresses, or you can manually configure static IPs for a single or all cameras. Using static IPs is recommended. Although the NVR can remember the MAC addresses of cameras (if IPs are changed under the DHCP configuration), your NVR may still fail to connect the cameras. Please consult your network administrator for details about network settings.

It is usually not necessary to change port numbers for the HTTP and RTSP ports unless there is a conflict in your network environment.

Wi-Fi

If wireless cameras are recruited by the NVR, its wireless connection details are shown in here.

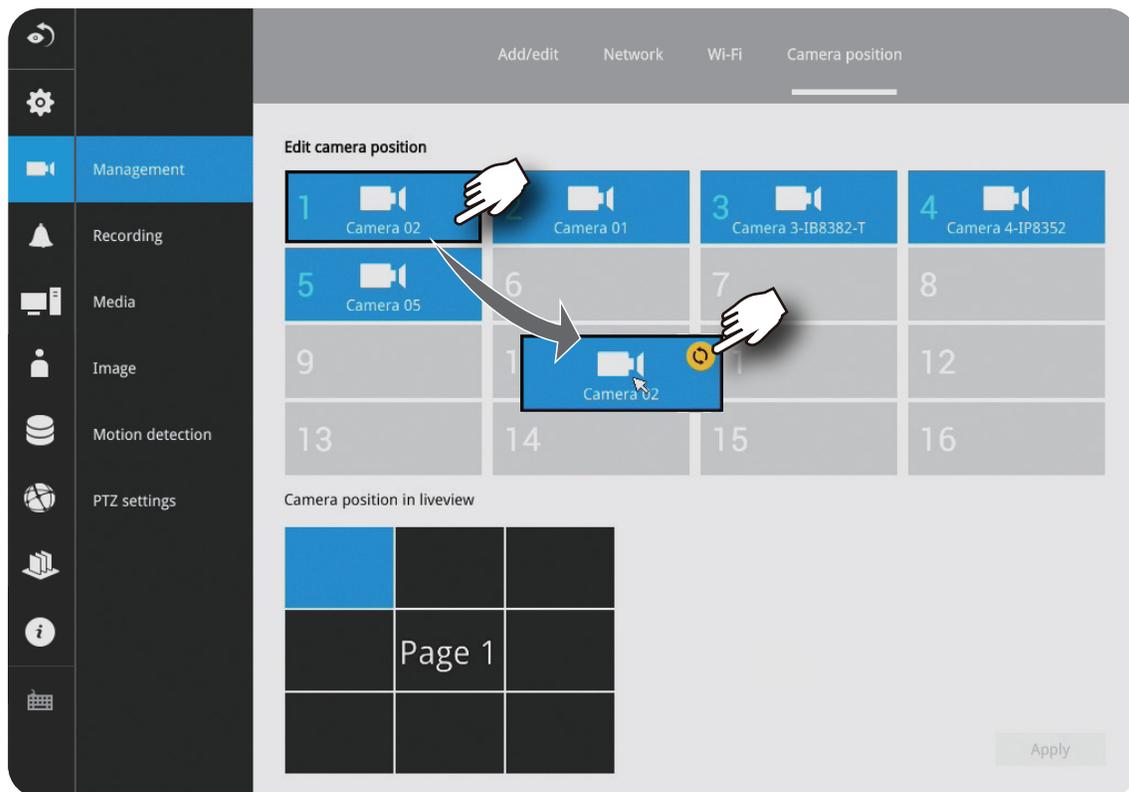


1. **Wi-Fi (SSID):** Displays the AP (Access Point) this camera is connected to.
2. **Security mode:** Displays the security mode used for the security encryption.
3. **Encryption:** Displays the encryption standard currently applied.

Camera position

To change a camera's position on the Liveview layout, click and drag a camera to an unpopulated position. Note that you cannot swap the positions of two cameras by dragging a camera onto a position already populated by the other. Also, the camera index number on the management list is not affected by the change of positions.

Click the **Apply** button for the configuration change to take effect. The position screen displays the current layout on the Liveview screen.

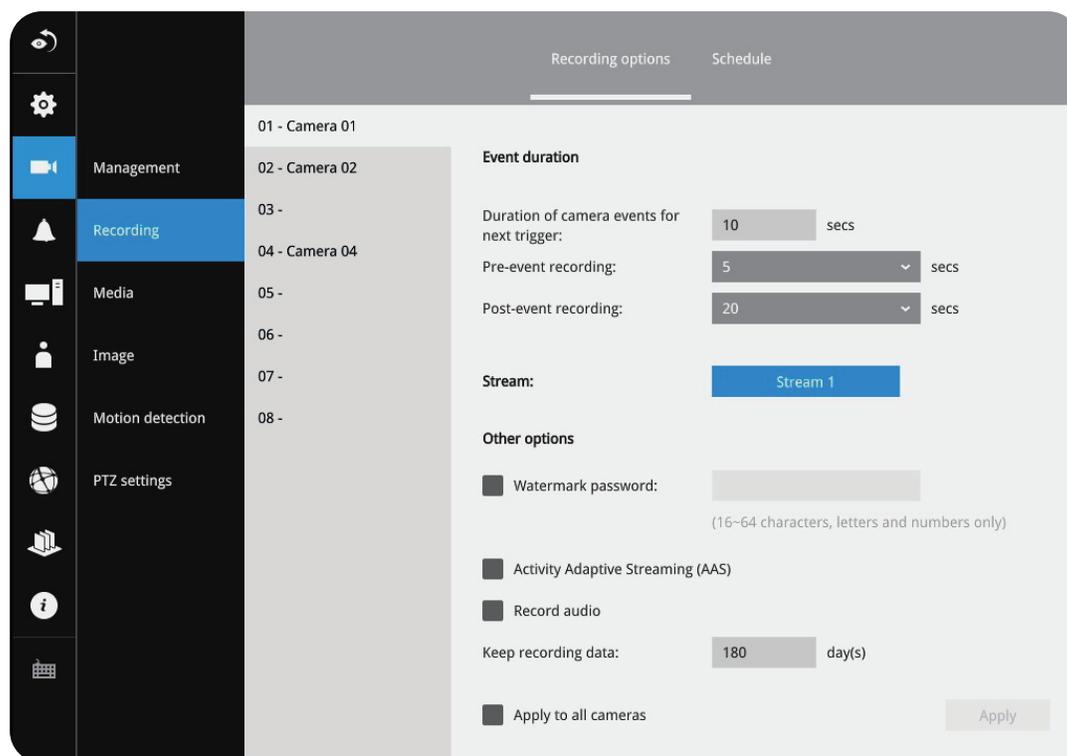


3-5-4. Settings - Camera - Recording

Recording options

On the camera Recording page, you can configure the following:

1. Configure the duration of camera events to help control the frequency in which the camera is being triggered.
2. Enter the Pre- and Post-event recording time. The triggering events can be *DI*, *DO*, *Motion detection*, *PIR* or *Tampering detection*. A recording length of 10 seconds of pre-event and up to 300 seconds of post-event can be configured.
3. The default recording stream is Stream 1, and the system automatically adjusts the frame rate, resolution, etc. for optimum performance. However, you can still change the streaming characteristics. Note that you can not assign the recording task to other video stream.
4. Enable the Activity Adaptive Streaming feature. This feature records the I-frames only when there are no activities detected. When activities or alarm are triggered, the camera raises the recording stream to the full frame rate. This feature can save tremendous amount of bandwidth.
5. Enable or disable audio recording. Note that audio transmission through HDMI cable is currently not available.
6. Change the life expectancy of the recording data.
7. You can apply a typical configuration to all cameras using the **Apply to all cameras** checkbox.

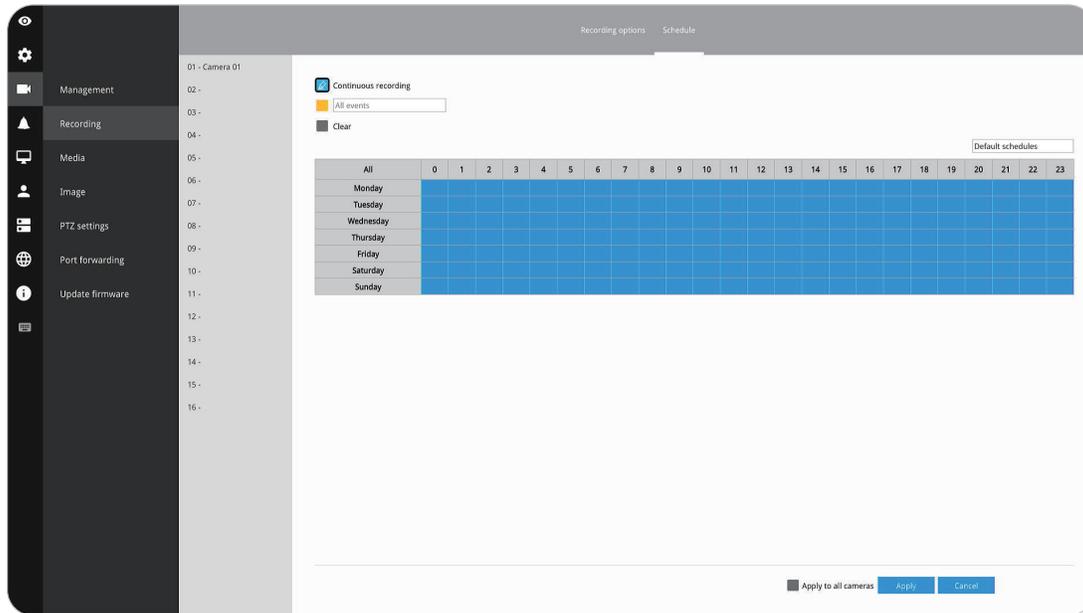


You can refer to the User Manuals that come with your network cameras for more discussions of these configurable options.

Recording Schedule

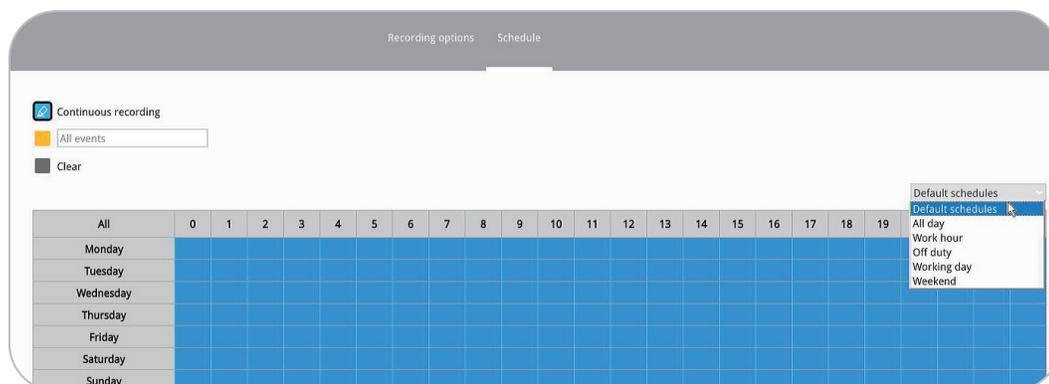
By default, all video feeds from cameras are recorded at all time. You can modify the recording task using the schedule tool:

1. Click to select a recording condition's checkbox—1.
Continuous recording , Event recording , and Clear  (no recording).
2. Click and drag the mouse over the cells on the time table. For example, to stop the recording during a period of time, select the **Clear** checkbox and move the cursor across the time table. The minimum unit on the table is half an hour.



1. You may also use the scheduler tool on the right to facilitate the process. You can select a condition checkbox, and then select the *All day*, *Work hour*, *Off duty*, *Working day*, *Weekend* options to apply a time selection.
2. Repeat the process on individual cameras, or select the **Apply to all** checkbox if the schedule can apply to all cameras.
3. When done with the configuration, click on the **Apply** button.

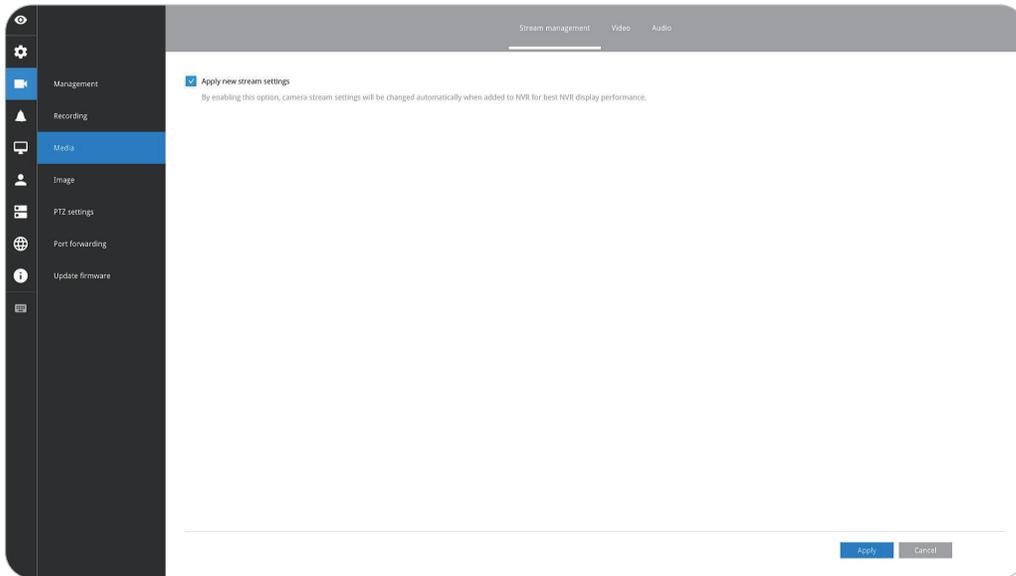
Note that Event-triggered recording and continuous recording can not be taking place at the same time.



3-5-5. Settings - Camera - Media Live

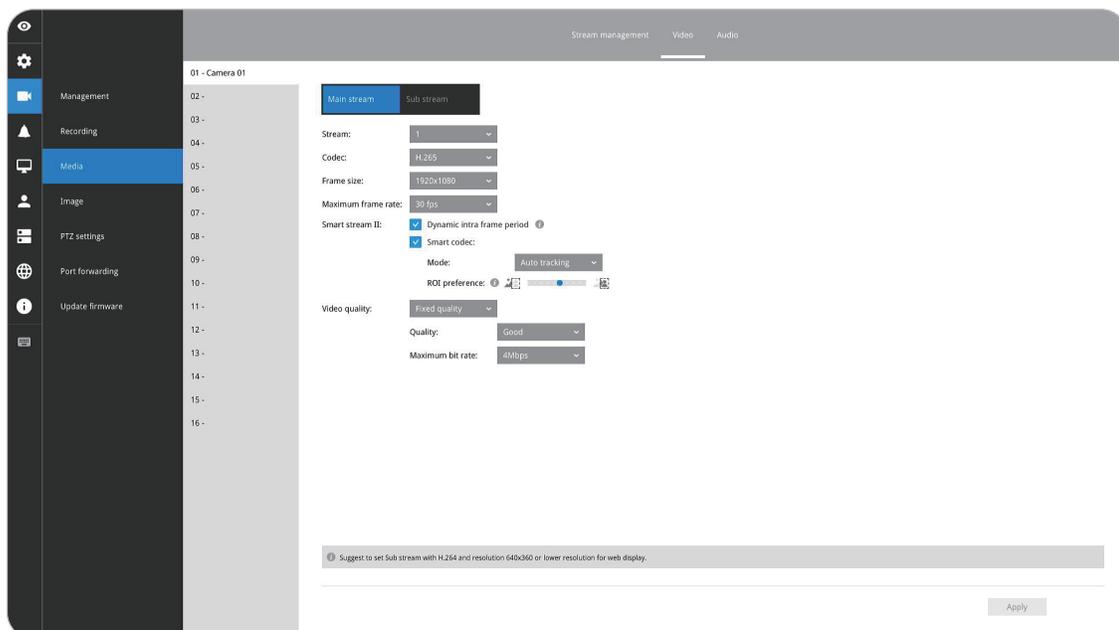
Auto adaptive stream: Default is enabled. The Auto adaptive stream automatically polls a video stream of a smaller resolution in order to reduce the streaming efforts. For example, when a view cell is placed in a 3x3 layout, it may not be necessary to stream the video in its full resolution. In a full view, the system displays a video in its full resolution. Due to the size of view cells on your monitor (when in a multi-cell layout), the system automatically polls the camera for a smaller resolution stream.

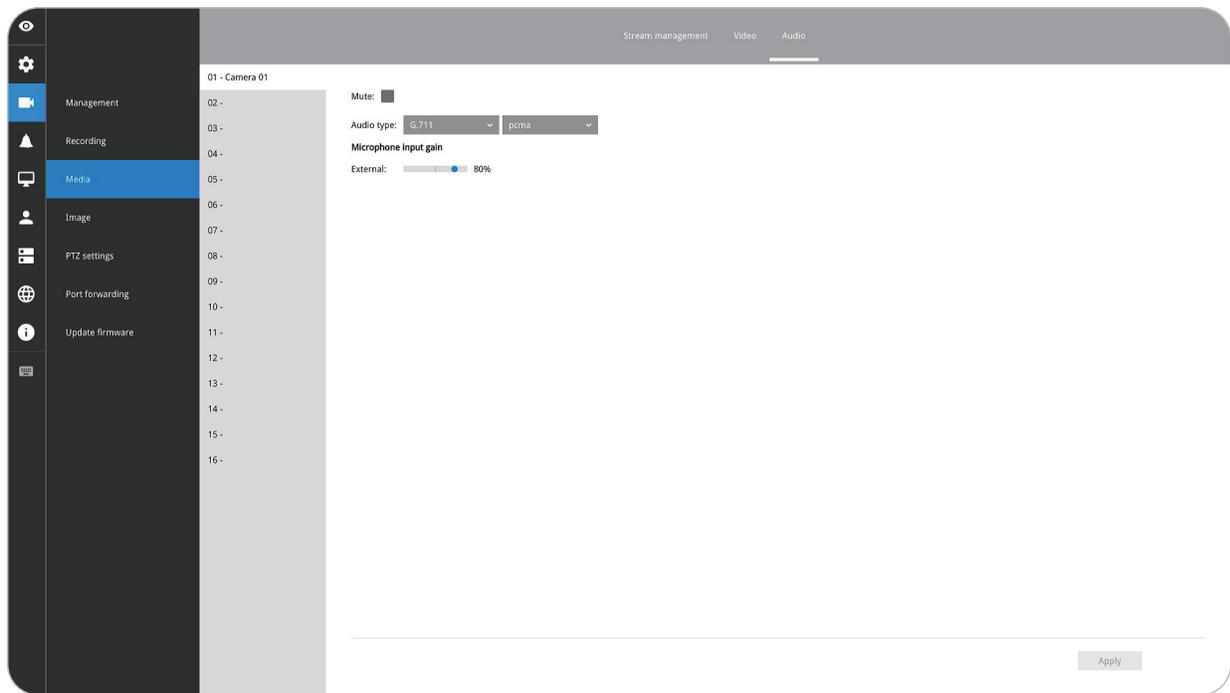
The Auto adaptive stream feature can be disabled if you prefer consistent display resolution.



The NVR adapts and selects to display a video stream of a different resolution when it is displaying on a smaller view cell or a full screen.

By default, the Recording stream is Stream 1. It is recorded to the H.D.D.





Video

The Video window allows you to configure all video streams (the number of streams available can be different for different models). You can configure the following:

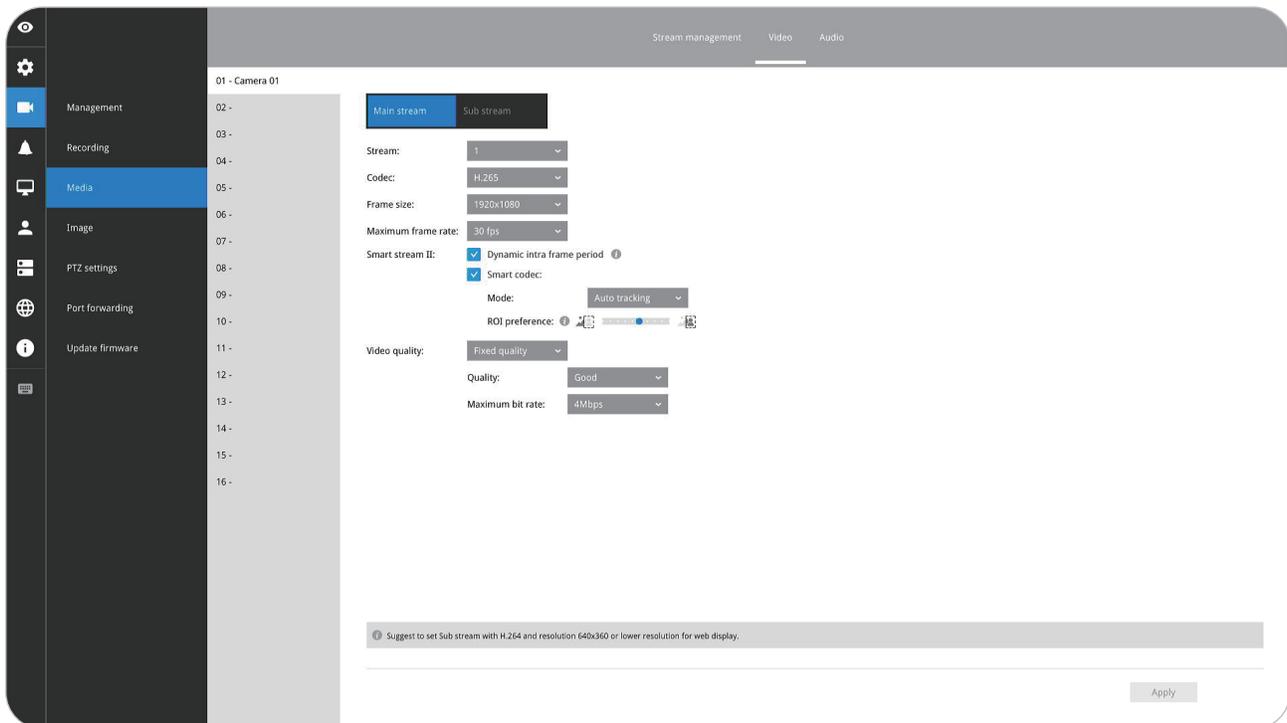
1. **Codec:** video compression codec in H.264, MPEG-4 or MJPEG. Note that MPEG-4 is not supported for Liveview.
2. **Frame size:** Video resolution. Note that due to the limited CPU resources, you may not be able to change the resolution to a very high value. For example, 5MP in the 1920x1920 resolution.
3. **Maximum frame rate:** the highest frame rate.
4. **Intra frame period:** This setting determines how often an I-frame will be inserted into the video stream.
5. **Smart Stream II:** Some newer camera models come with Smart Stream features. Please refer to [page 97](#) for detailed information.
6. **Video quality:** You may either select Constant bit rate or Fixed Quality as the defining rules for video transmission:

Constant bit rate

Places a packet size threshold on video frames. This guarantees the frame rate per second performance, yet image quality can be compromised if bandwidth is not sufficient in your network environment.

Fixed Quality

Guaranteed video quality and to ensure image quality, some frames may be dropped when bandwidth is not sufficient.

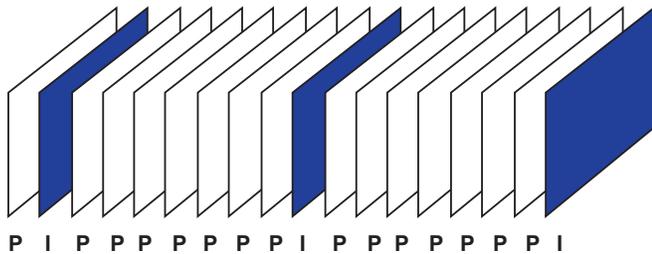


When done with the configuration, click the **Apply** button.

- Dynamic Intra frame period

High quality motion codecs, such as H.265, utilize the redundancies between video frames to deliver video streams at a balance of quality and bit rate.

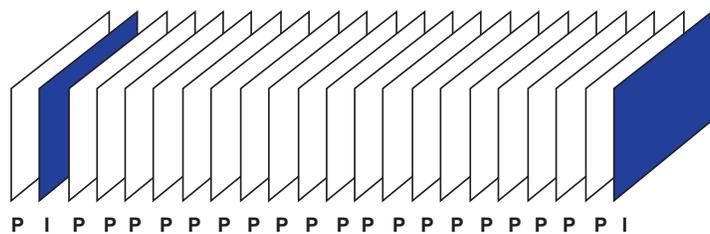
The encoding parameters are summarized and illustrated below. The **I-frames** are completely self-referential and they are largest in size. The **P-frames** are predicted frames. The encoder refers to the previous I- or P-frames for redundant image information.



H.264/265 Frame Types

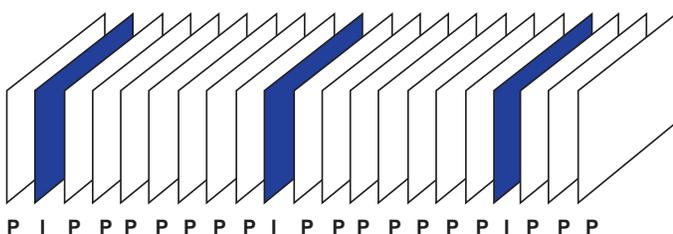
By dynamically prolonging the intervals for I-frames insertion to up to 10 seconds, the bit rates required for streaming a video can be tremendously reduced. When streaming a video of a static scene, the Dynamic Intra frame feature can save up to 53% of bandwidth. The amount of bandwidth thus saved is also determined by the activities in the field of view. If activities occur in the scene, firmware automatically shortens the I-frame insertion intervals in order to maintain image quality. In the low light or night conditions, the sizes of P-frames tend to be enlarged due to the noises, therefore the bandwidth saving effect is also reduced.

Streaming a typical 2MP scene normally requires 3~4Mb/s of bandwidth. With the Dynamic Intra frame function, the bandwidth for streaming a medium-traffic scene can be reduced to 2~3Mb/s. During the no-traffic period of time, reduction can reduce to 500kb/s.



Dynamic Intra Frame w/
static scenes

Static scene



Dynamic Intra Frame w/
activities in scenes

Activities

- **Smart codec** effectively reduces the quality of the whole or the non-interested areas on a screen and therefore reduces the bandwidth consumed.

You can manually specify the video quality for the foreground and the background areas.

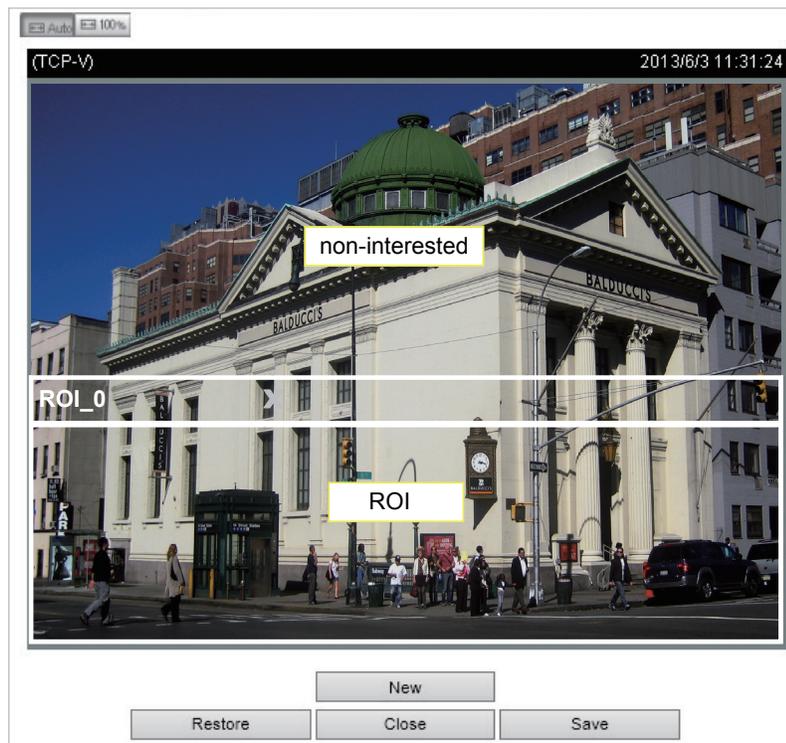


Slide bar to the right - higher quality in the ROI areas
 Slide bar to the left - higher quality in the non-ROI areas.

Select an operation mode if Smart codec is preferred.

- **Auto tracking:** The Auto mode configures the whole screen into the non-interested area. The video quality of part of the screen returns to normal when one or more objects move in that area. The remainder of the screen where there are no moving objects (no pixel changes) will still be transmitted in low-quality format.
- **Manual:** The Manual mode allows you to configure 3 ROI windows (Region of Interest, with Foreground quality) on the screen. Areas not included in any ROI windows will be considered as the non-interested areas. The details in the ROI areas will be transmitted in a higher-quality video format.

As illustrated below, the upper screen may contain little details of your interest while the sidewalk on the lower screen is included in an ROI window.



As the result, the lower screen is constantly displayed in high details, while the upper half is transmitted using a lower-quality format. Although the upper half is transmitted using a lower quality format, you still have an awareness of what is happening on the whole screen.



- **Hybrid:** The major difference between the “Manual” mode and the “Hybrid” mode is that:

In the “**Hybrid**” mode, any objects entering the non-interested area will restore the video quality of the moving objects and the area around them. The video quality of the associated non-interested area is immediately restored to normal to cover the moving objects.

In the “**Manual**” mode, the non-interested area is always transmitted using a low-quality format regardless of the activities inside.

Quality priority: ([Help](#))



- **Quality priority:** Use the slide bar to tune the quality contrast between the ROI and non-interested areas.

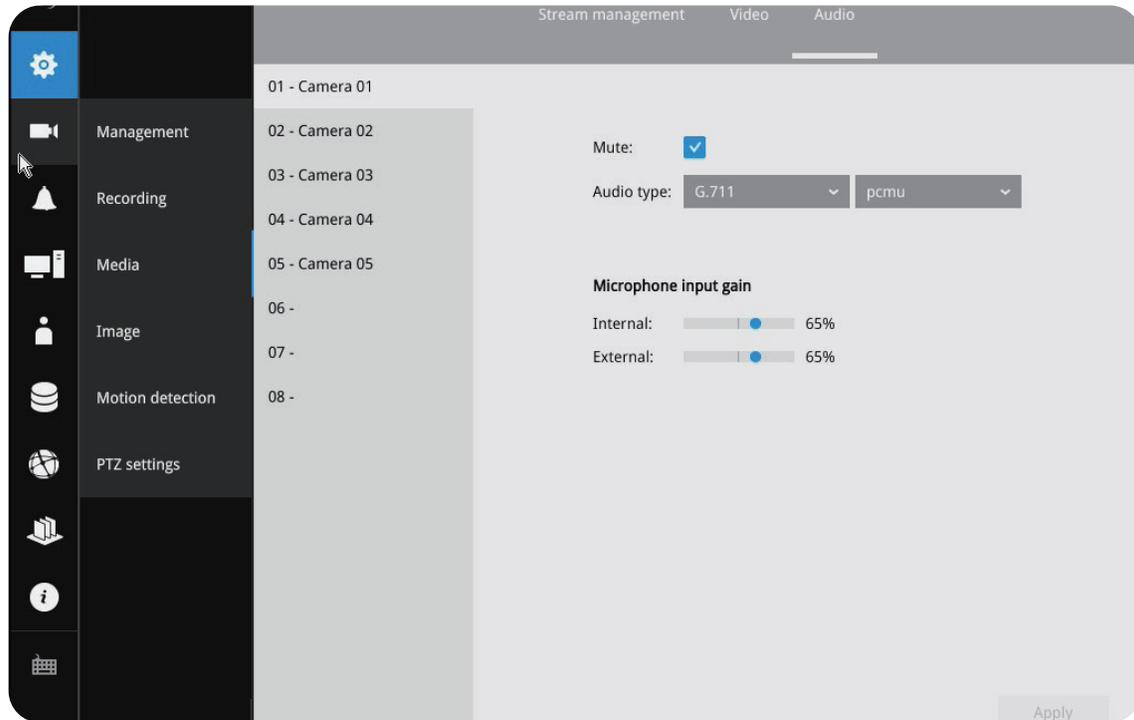
The farther the **Slide Bar** button is to the right, the higher the image quality of the ROI areas. On the contrary, the farther the **Slide Bar** button to the left, the higher the image quality of the non-interested area.

In this way, you may set up an ROI window as a privacy mask by covering a protected area using an ROI window, while the remaining screen become the non-interested area. You may then configure the non-interested area to have a high image quality or vice versa.

You should also select the Maximum bit rate from the pull-down menu as the threshold to contain the bandwidth consumption for both the high- and low-quality video sections in a smart stream.

Audio

The Audio window allows you to configure all audio codec, sampling rate and Microphone input gains. Depending on design of the camera models, some codecs may not be available. Also, there are cameras that come without embedded microphones.

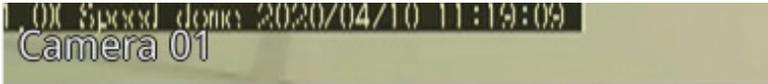


3-5-6. Settings - Camera - Image

Display

The Display window allows users to tune the image display options:

1. **Video name:** the video name is displayed on the title bar that is displayed on each view cell. The screen shot below shows a name as "Speed dome".



2. **Video name and timestamp:** Default is enabled. If enabled, the video name and time is displayed on the view cell.
3. **Power line frequency:** Depending on power line frequency of your country, select a matching option (NTSC 60Hz or PAL 50Hz) to avoid image flickering due to unmatched electricity.
4. **Video orientation:** Select these options if the image from camera needs to be vertically or horizontally flipped.
5. Click **Restore** to poll for the original settings or click the **Apply** button to finish the process.

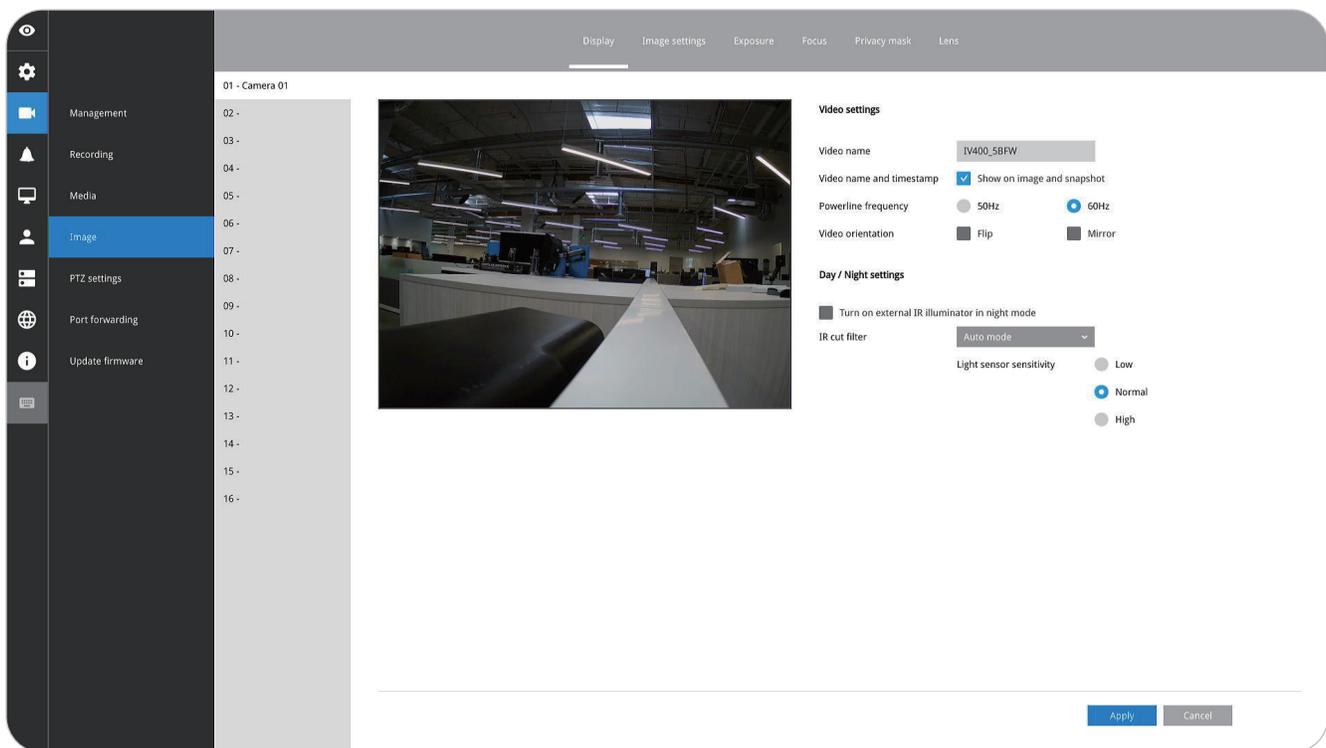
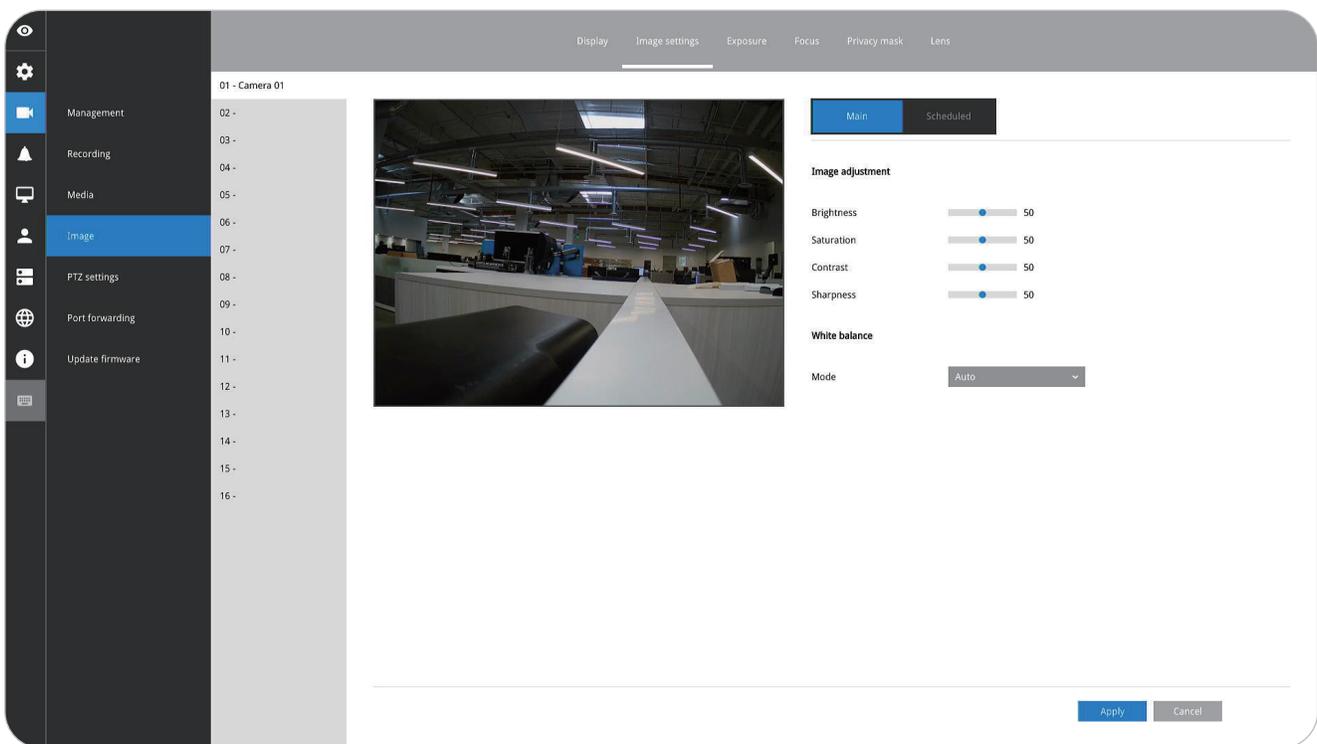


Image adjustment

The Image adjustment window allows users to tune the basics about image display options:

1. Color
2. Brightness.
3. Saturation.
4. Contrast.
5. Sharpness.
6. High TV line, Gamma curve, low light compensation, etc. The rest of the options depend on the lens and image sensor type of each individual camera. Therefore, the options here can vary. For unique options coming with each individual camera, please refer to their User Manuals for more information.

Click **Restore** to poll for the original settings, or click the **Apply** button to finish the process. For features common among cameras, you may select the **Apply to all cameras** checkbox.



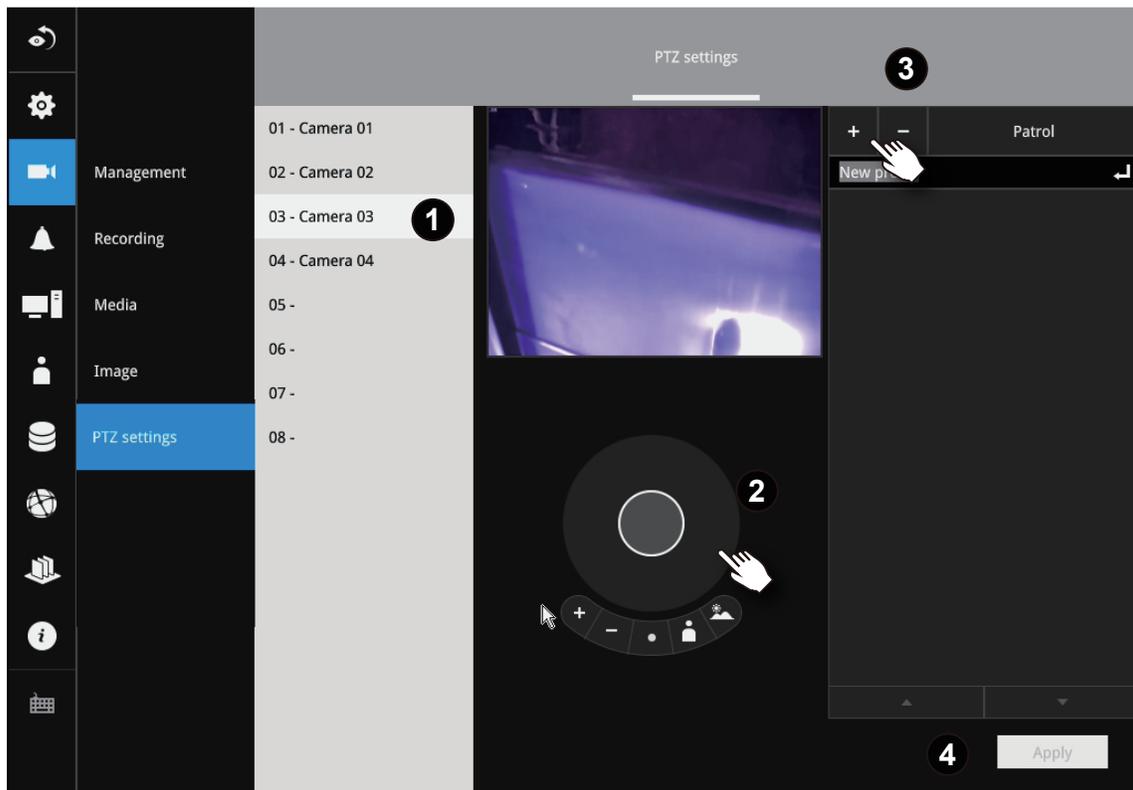
Exposure, Focus, Privacy mask, Lens

For specific image settings, refer to the camera's documentation for details. Cameras coming with different lens or zoom modules will display different configuration parameters.

3-5-8. Settings - Camera - PTZ settings

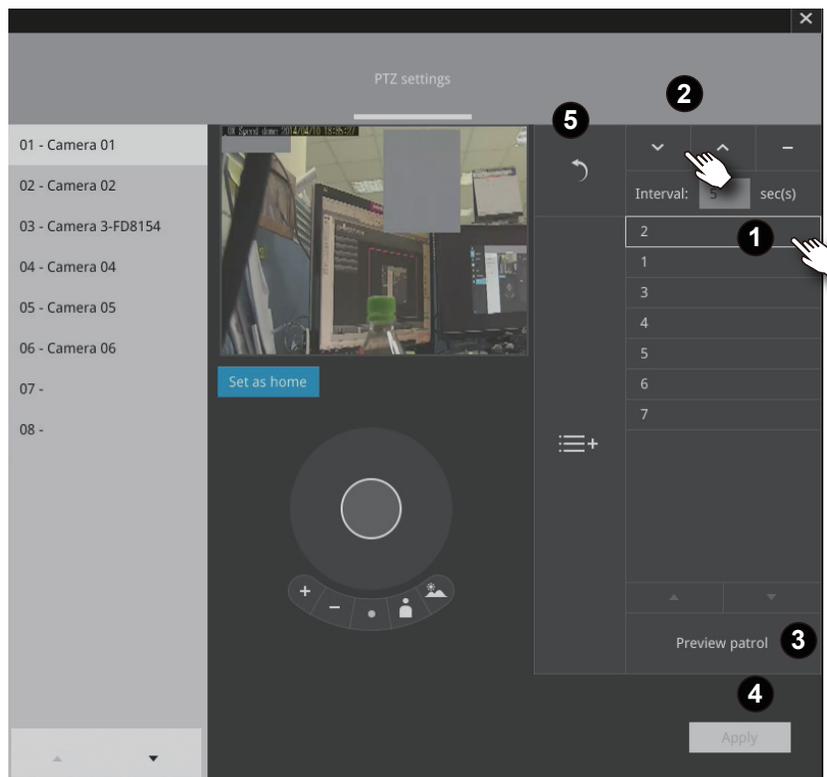
To configure PTZ preset positions:

1. Select a PTZ camera (single click).
2. Use the PTZ panel to move to a field of view where you want to designate as a preset position.
3. Click the **Add (+)** button, and enter a name for the position. Press **Enter** to proceed. Repeat the configuration to create more positions.
4. Click the **Apply** button for the configuration to take effect. Note that the PTZ panel can vary with different PTZ cameras.

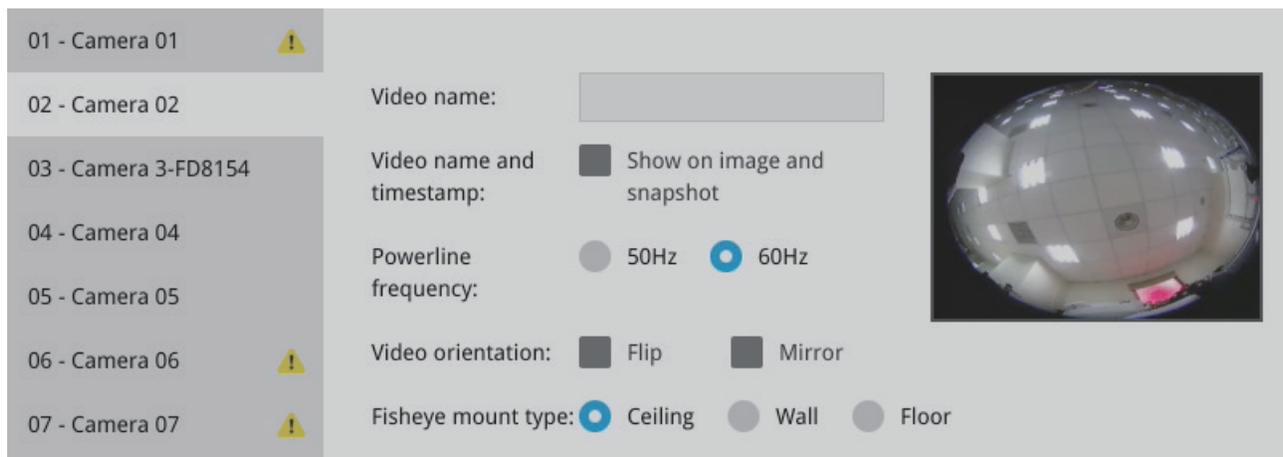


To configure a patrol:

1. Click to enter the Patrol menu. Select a preset position if you want to change its position on the patrolling order.
2. Click the **Up** and **Down** buttons to change the position on the order, or click the **Remove** button to disband a position from the order. You can also change the interval to stay before moving from one position to the next position.
3. You may then click on the **Preview Patrol** button to see if it runs as expected.
4. Click the **Apply** button for the configuration to take effect.
5. Click on the **Back to Preset List** button to return to the preset window.



Fisheye camera has its unique options such as the mount types.



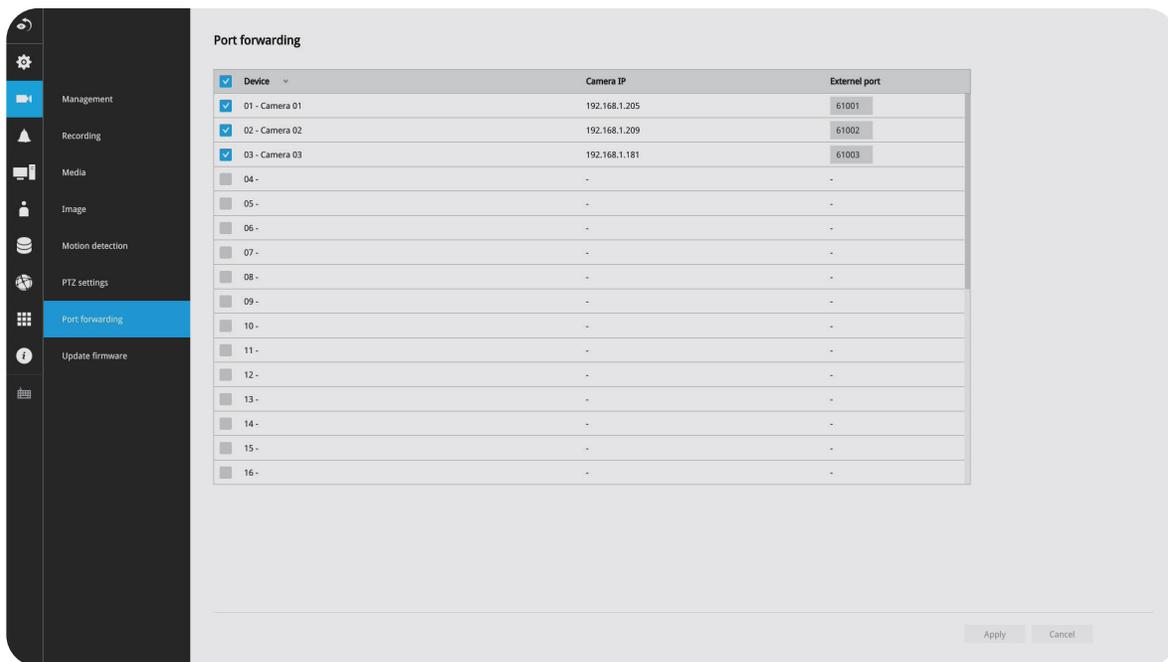
3-5-9. Settings - Camera - Port forwarding

You can associate an external port number to the cameras managed by the NVR. You can then configure the router, virtual server or firewall, so that the router can forward any data coming into a pre-configured port number to a network camera on the private network and allow data from the camera to be transmitted to the outside of the network over the same path.

From	Forward to
122.146.57.120:8000	192.168.2.10:80
122.146.57.120:8001	192.168.2.11:80
...	...

When properly configured, you can access a camera behind the router using the HTTP request such as: <http://122.146.57.120:61001>

If you change the port numbers on the Network configuration page, please open the ports accordingly on your router. For example, you can open a management session to your router to configure access through the router to the camera within your local network. Please consult your network administrator for router configuration if you have troubles with the configuration.



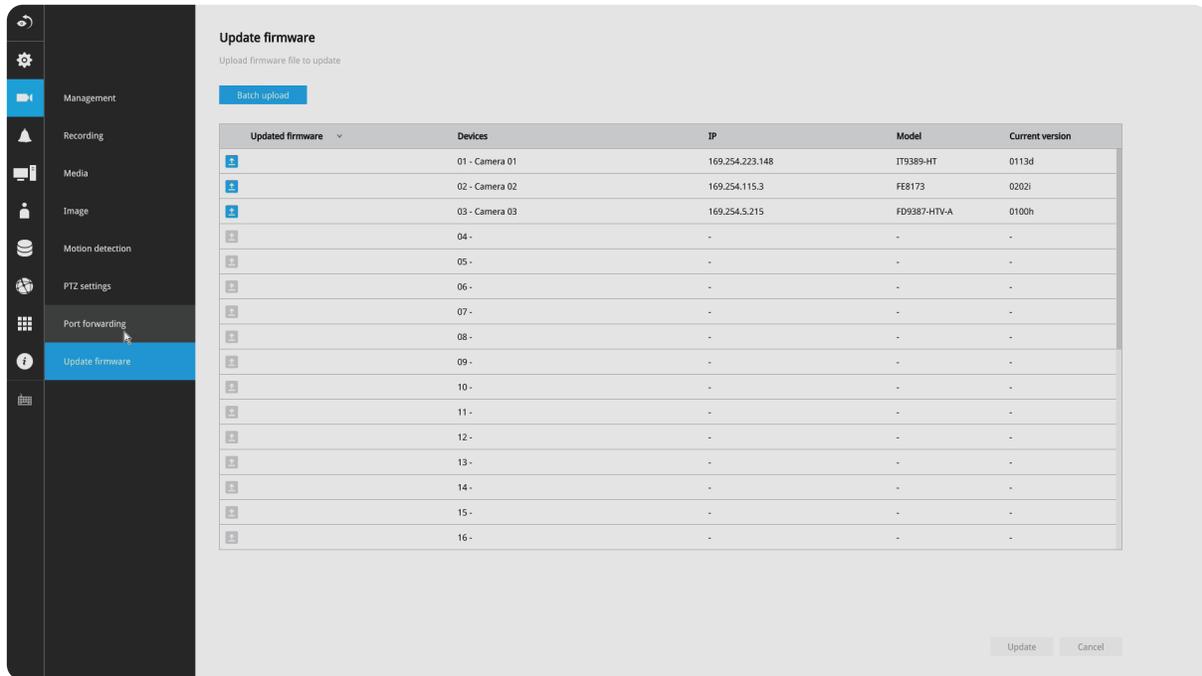
NOTE:

1. This port forwarding feature does not support cameras connected via the RTSP method.
2. The configurable range of port numbers is between 61001 ~ 61128.
3. Port forwarding can create a network security vulnerability please contact your IT administrator for proper guidance on accessing equipment on the local network from outside the network.

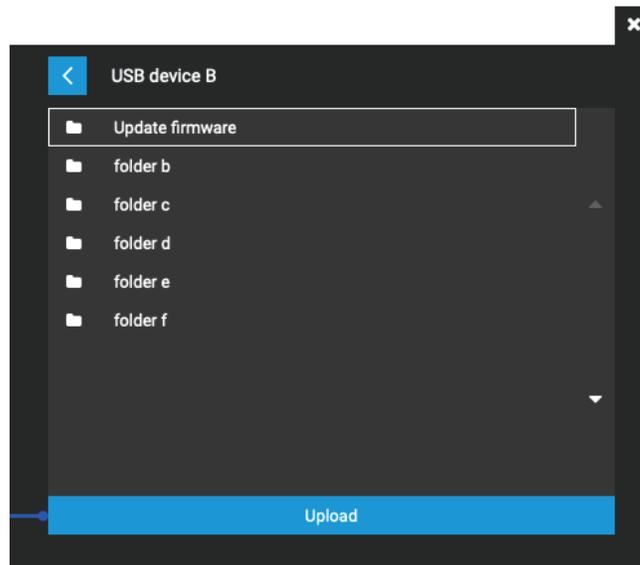
3-5-10. Settings - Camera - Update firmware

Prepare the camera firmware files in a USB thumb drive. Connect the thumb drive to the NVR's USB port.

Select a camera, and click the **Upload** button.



An upload panel will appear. Select the firmware file. Click the **Upload** button.



The Batch upload function allows you to update the firmware of multiple cameras. The firmware update can take place on up to 8 cameras at a time. The *Waiting...* message will display for cameras that are waiting for the update to take place.

Different messages can appear with different update results.

A13.1 Complete to update 1

1. Update successfully.
 2. If interrupted.
 3. Failed to update. Please check your device.
 4. If the same revision is discovered, firmware displays Invalid firmware or upgraded the same version of firmware.

1. Firmware revision number will be updated, if successfully updated.

Update firmware
 Upload firmware file to update

[Batch upload](#)

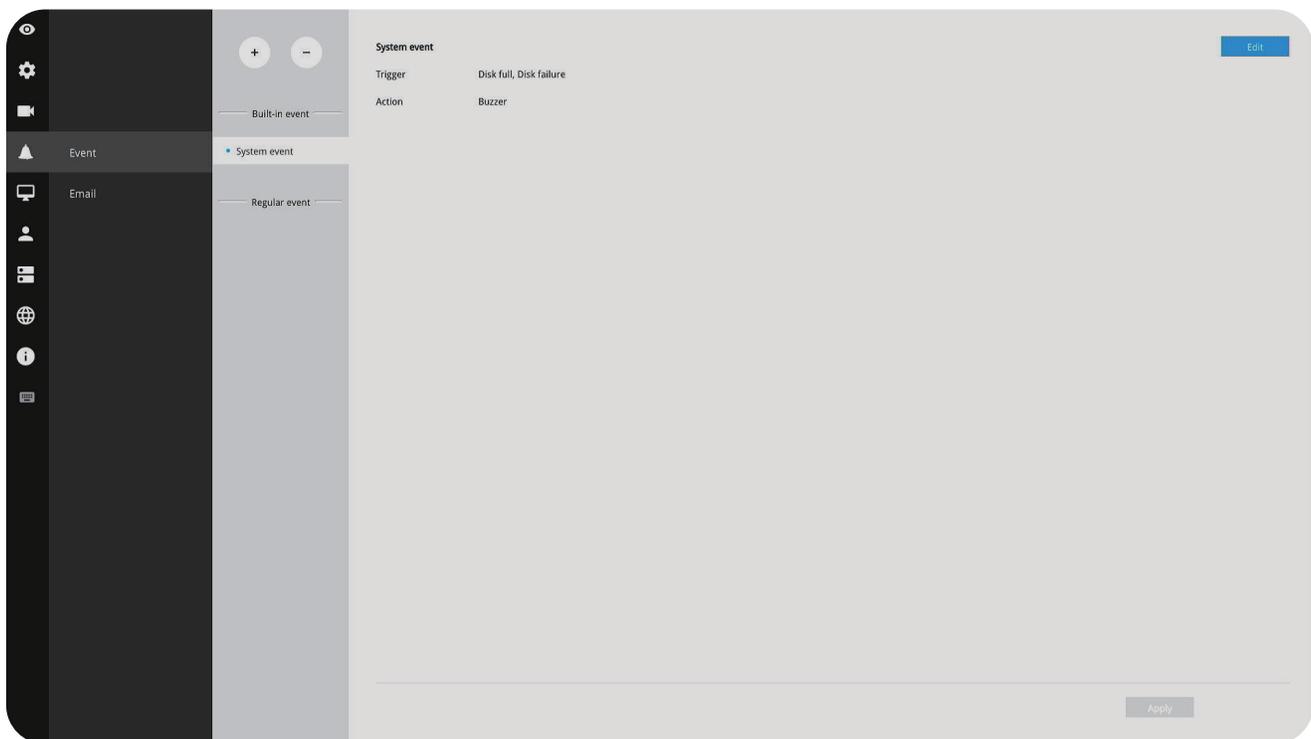
Updated firmware	Devices	IP	Model	Current version
Failed to update. Please check your device.	01 - Camera name Camera name Camera name Came...	172.168.1.101	SC8131	0107a
Update successfully.	02 - Camera name	1223:f2f2:0012:d3r4:ed12:99ff:7373:ffee	SC8131	0107b
Failed to update. Camera is disconnected.	03 - Camera name	172.168.1.103	SC8131	0107a
-	04 - Camera name	172.168.1.104	-	-
Failed to update. Please check your device.	05 - Camera name	172.168.1.105	FE9191	0201a
Invalid firmware or upgraded the same version of firmware.	06 - Camera name	172.168.1.106	FE9191	0201a
-	07 - Camera name	172.168.1.107	IP9171-HP	0301a
-	08 - Camera name	172.168.1.108	IP9171-HP	0301a
Update successfully.	09 - Camera name	172.168.1.109	IP9171-HP	0301a
Update successfully.	10 - Camera name	172.168.1.110	SC8131	0107b
-	11 - Camera name	172.168.1.111	SC8131	0107a
-	12 -	-	-	-
-	13 -	-	-	-
-	14 -	-	-	-
-	15 -	-	-	-

3-5-11. Settings - Alarm - Events

The events reported from individual cameras' digital inputs, digital outputs and motion detection can be accommodated in the NVR system's alarm settings. These events will then be reported or trigger corresponding actions as follows:

1. Record the video by the time the event is triggered.
2. Reporting events via **Email** with **snapshots** attached.
3. Sound the onboard **buzzer**.
4. Triggering video snapshot and text message by the occurrences of events to an **FTP** site.
5. Triggering a camera's **DO**.
6. Triggering a **PTZ** camera(s) for its lens to move to a **preset** position.
7. Sending notification to the **VAST CMS** software.
8. Sending a **full screen** live view on the connected monitor.
9. You can create up to 10 instances of alarm.

Hardware connections to DIs or DOs (for example, window sensors), should be made separately. The motion detection configuration can be made in the Camera configuration window.



When an event is triggered, a message prompt will appear on the Liveview or any configuration window.



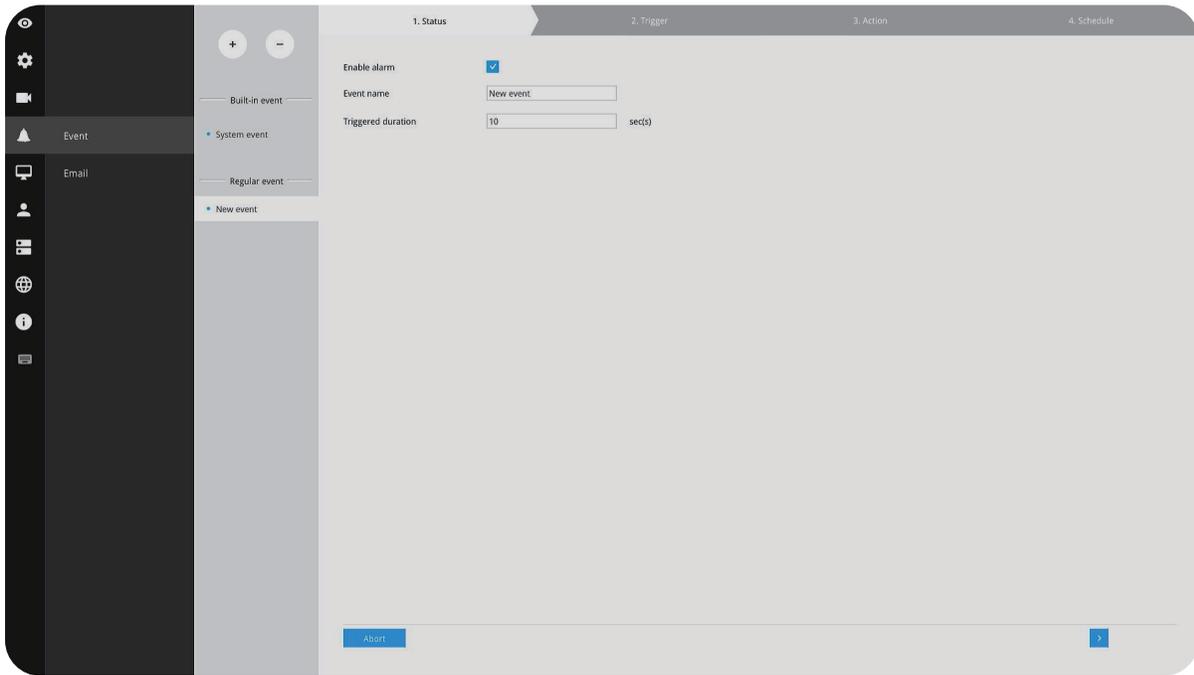
Below is a glimpse of event sources and actions:

Sources		Actions	
System DI		Video recording	▶ video footage
System DO		Email snapshot	▶ snapshots
Disk failure		Buzzer	
Disk full		FTP	▶ snapshots
- Camera sources below		Camera DO	
Camera DI		Pan-tilt-zoom	▶ Pan-Tilt-Zoom
Camera DO		System DO	
Motion detection		Send to CMS	
PIR		Send video to full screen	
Tampering detection			
Camera disconnected	▶		
Brute force attack			
Cyber attack			
Quarantine event			
Line crossing detection			
Intrusion detection			
Loitering detection			
Face detection			
Missing object detection			
Unattended object detection			

- Camera DI/DO, motion detection, and tampering are not supported for ONVIF cameras.

To create an event:

1. Click on the **Add** button .

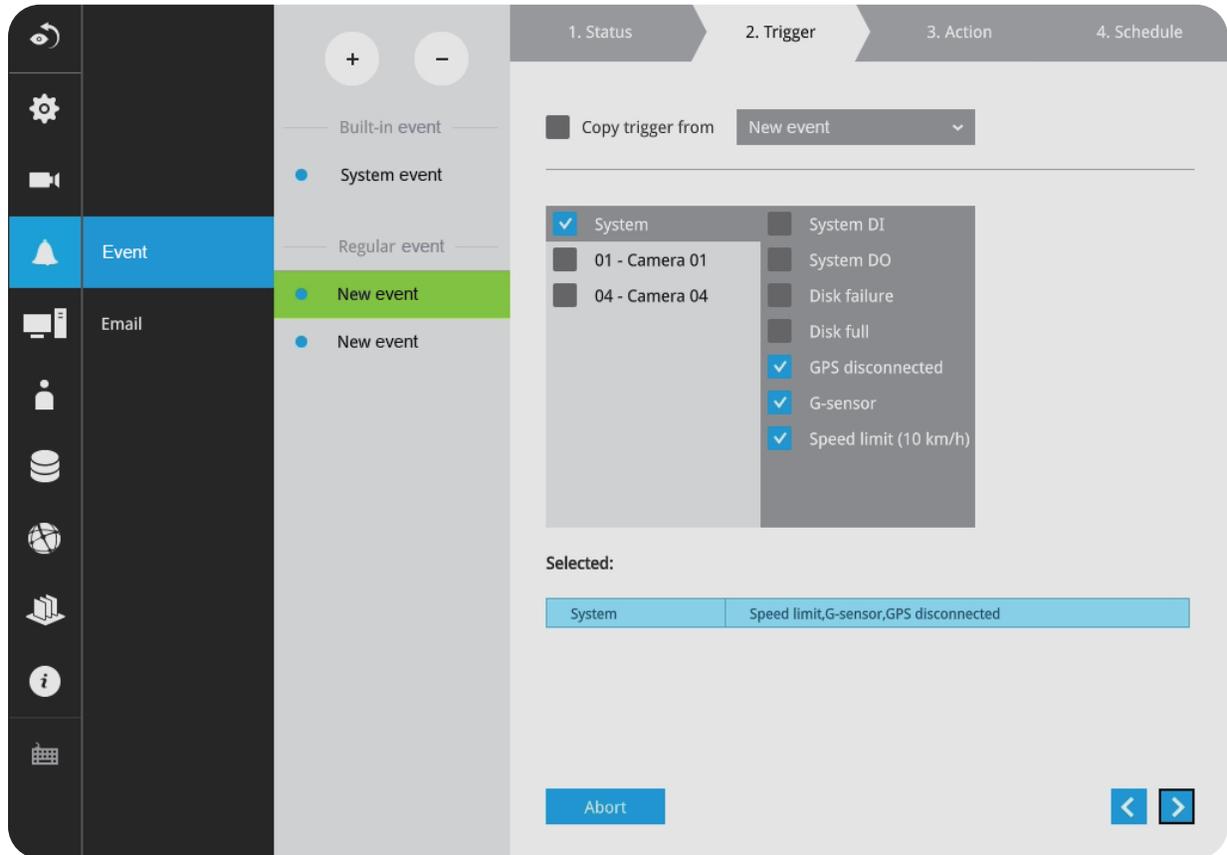


You can manually enter a name for the current setting. You can enter up to 16 numeric or alphabetic characters for the name, including symbols such as [0-9][a-z][A-Z][_][]. You can also designate the interval between one event and the next triggered alarm to avoid the situation that the alarms can be too frequently triggered.

2. Click on the **Next** button  to proceed.

3. On the Trigger window, select system triggering conditions, or one or more cameras by selecting their checkboxes. The number of DI or DOs on each camera is automatically detected and displayed through individual checkboxes. The Motion detection function, if there are many detection windows configured on a camera, is all triggered by one checkbox.

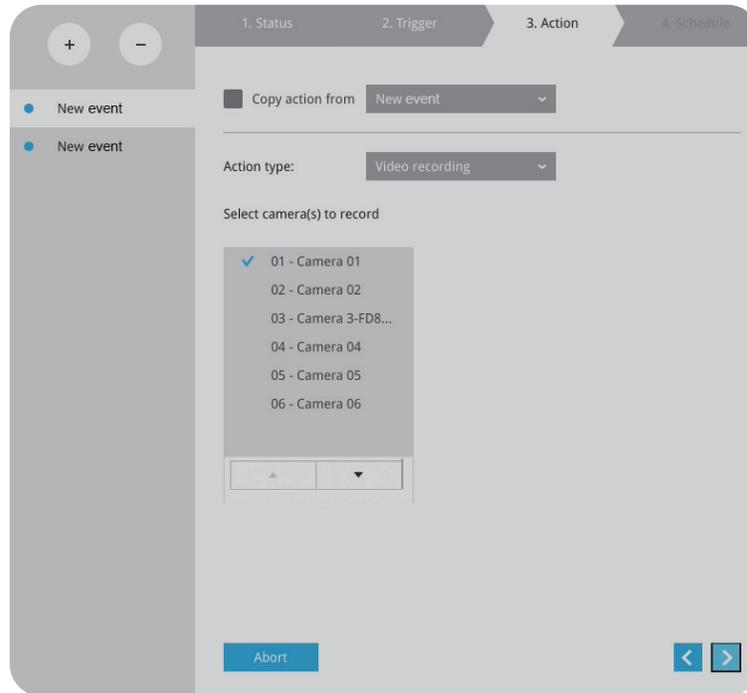
Note that the triggering sources will be listed even if the camera is currently not connected.



You may also select the **Copy trigger from** menu to borrow the setting you previously configured. Click on the **Next** button  to proceed.

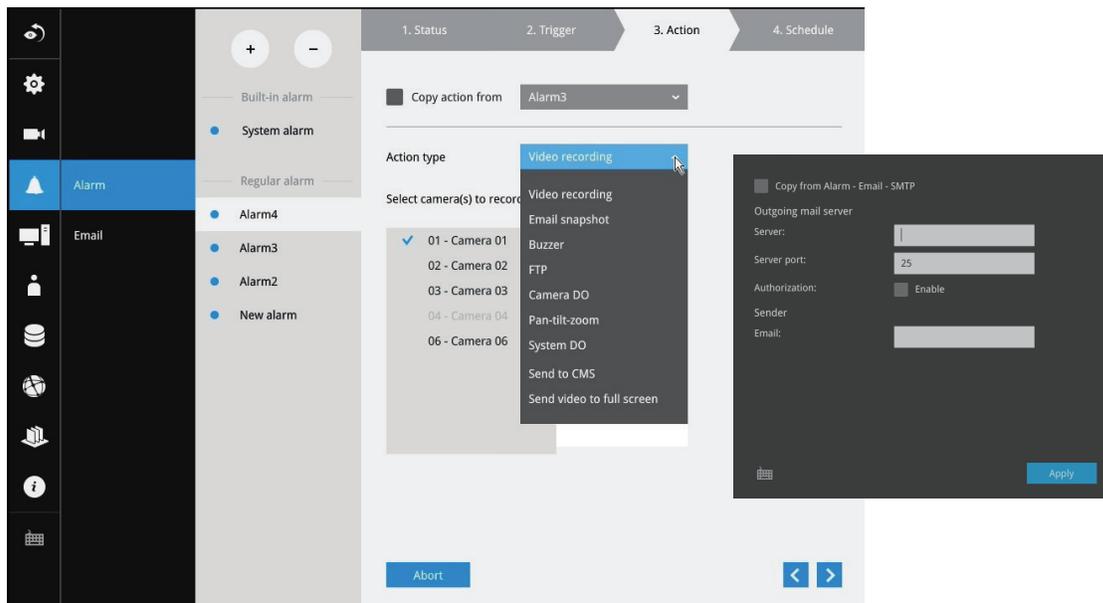
4. On the **Action** window, you can select the Action type from a drop-down menu. The configuration details of each action type is discussion below.

4-1. **Recording:** When an event is triggered, the selected camera will record a video footage of the length defined by the pre-/post-event setting to the NVR system.



4-2. **Email:** The Email action sends an Email to the administrator along with a snapshot of the event.

To configure Email notification, enter valid Email addresses as the Sender and Recipient addresses, an Email subject and the SMTP server address through which the Email will be delivered. If you need to log in to SMTP server to deliver an **Email**, enter the **User name** and **password** for access to that account.



The Email subject and addresses can be composed of 254 characters in numeric or alphabetic characters including: [0-9][a-z][A-Z][_][][-].[,][@]. You can enter the addresses of multiple recipients. Use semicolons, (;), to separate the addresses of multiple recipients.

4-3. **Buzzer:** The buzzer is sounded on the occurrence of the event. The buzzer tones are categorized into: **Critical** (1 long, 1 sec interval) **Major** (1 long 2 shorts, 1 sec interval), **Normal** (3 shorts, 2 sec interval), **Minor** (2 shorts, 2 sec interval) and **Notify** (2 very shorts) depending on the importance of an event. Select a **Buzzer** modulation from the drop-down list.

A long tone has a duration of 1 second, while a short tone 0.5 second. A very short tone lasts only for 0.1 second.

Select how many times the buzzer tones will be repeated on the occurrence of an event.

The screenshot shows a configuration window with four tabs: 1. Status, 2. Trigger, 3. Action, and 4. Schedule. The '3. Action' tab is active. Below the tabs, there is a 'Copy action from' section with a dropdown menu set to 'New alarm'. Below this, there are three rows of configuration options, each with a label and a dropdown menu: 'Action type:' set to 'Buzzer', 'Buzzer severity:' set to 'Normal', and 'Repeat times:' set to '10'.

If events of different importance are issued at the same time (for example, one major and one minor event), the system will ignore the minor event and sound the buzzer tone for the major event only. The buzzer can be sounded either by the event actions or the system events. If event actions and system service events occur at the time, Alarm actions have the higher priority.

If multiple event actions occur, the currently-sounded events can be depleted by the new event.

There are conditions that the system will sound the buzzer, and the conditions are not configurable.

1. **Disk failure** - missing drives or SMART detected failures.
2. **Disk full** - the free space is too small for recording tasks.

4-4. **FTP:** Snapshots from specified cameras can be uploaded to an FTP site on the occurrence of an event. Enter the FTP site address in the dotted-decimal notation. For example, 159.22.151.20. Enter the login name and password for the user account. You can enter a directory name you prefer on the FTP site. The server port default is 21, a different number between 1025 and 65535 can also be assigned.

The snapshot thus delivered has a size of 320x240 pixels. If authentication is not applied, login will proceed using the [anonymous] account.

The file names of the snapshot jpeg files will look like this:

[MAC]_[DATE]_[TIME]_[CAMERA_INDEX].jpg

If similar files already exist, an additional index number will be added to the end of file name.

The screenshot shows a configuration window with four tabs: 1. Status, 2. Trigger, 3. Action, and 4. Schedule. The 'Action' tab is active. At the top, there is a 'Copy action from' dropdown menu set to 'New alarm'. Below this, the 'Action type' is set to 'FTP'. On the left, under 'Select camera(s) to snapshot', a list of cameras is shown: '01 - Camera 01' (checked), '02 - Camera 02', '03 - Camera 3-FD8...', '04 - Camera 04', '05 - Camera 05', and '06 - Camera 06'. On the right, under 'FTP setup', there are fields for 'FTP Server:', 'Port:' (set to 21), 'Authorization:' (checked 'Enable'), and 'Upload folder: /'. A blue button labeled 'Upload test file' is located at the bottom right.

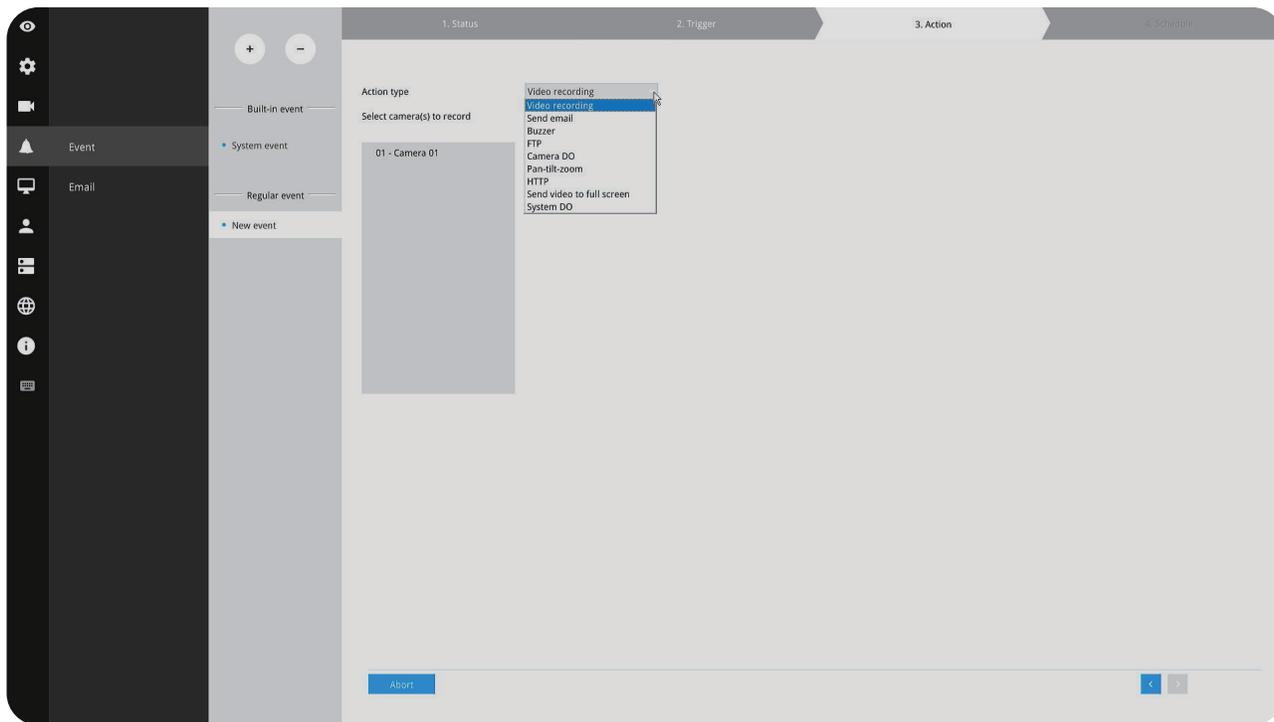
4-5. **Camera DO:** A triggered event triggers a camera's DO. For example, an alarm siren.

The screenshot shows a configuration window with four tabs: 1. Status, 2. Trigger, 3. Action, and 4. Schedule. The '3. Action' tab is active. It contains a 'Copy action from' dropdown menu set to 'New alarm'. Below this, there are three fields: 'Action type:' with a dropdown menu set to 'Camera DO', 'Camera:' with a dropdown menu set to '01 - Camera 01', and 'DO:' with a dropdown menu set to 'DO - 1'. A mouse cursor is pointing at the 'Camera DO' dropdown menu.

4-6. **Camera pan-tilt-zoom:** A PTZ capable camera can move its lens to the preset position in case of a triggered alarm. For example, a triggered sensor may indicate an area of interest has been intruded, and a camera's field of view should be moved to cover that area. The precondition is that you properly set up preset positions on your PTZ cameras using a local or a web console.

The screenshot shows a configuration window with four tabs: 1. Status, 2. Trigger, 3. Action, and 4. Schedule. The '3. Action' tab is active. It contains a 'Copy action from' dropdown menu set to 'New alarm'. Below this, there are two fields: 'Action type:' with a dropdown menu set to 'Pan-tilt-zoom' and 'Select camera angle:' with a dropdown menu set to '01 - Camera 01'. Below these fields is a video player showing a live feed of a supermarket aisle. To the right of the video player is a vertical list of seven numbered buttons (1-7) representing camera angles. At the bottom of the window, there is an 'Abort' button on the left and navigation arrows on the right.

4-7. **System DO:** A triggered alarm can be used to toggle the NVR's digital output. For example, to sound a siren.



4-8. **Send video to full screen:** The video feed from a related camera will be displayed on the occurrence of a triggered condition.

5. On the **Schedule** page, you can select to activate or de-activate alarm triggers throughout a specific timeline. For example, in some situations you can disable the alarm triggers during the office hours and choose to enable the triggers only during the off-office hours.

1. Status 2. Trigger 3. Action 4. Schedule

Copy schedule from New alarm

Apply Alarm

Clear Default schedules

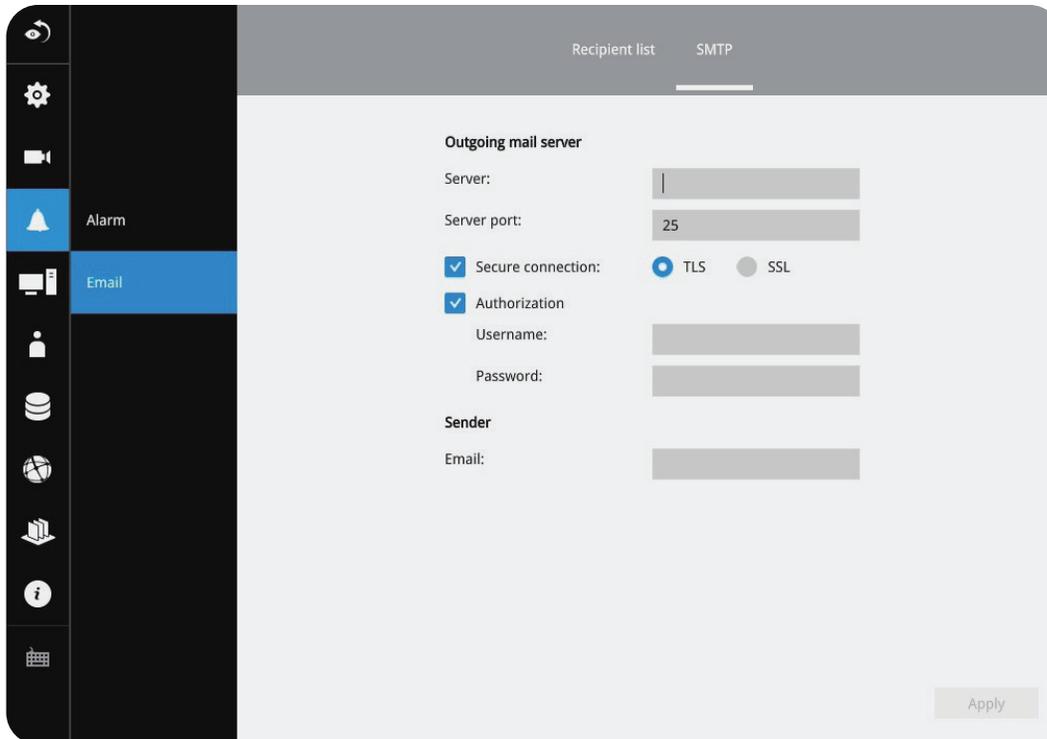
All	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Monday																								
Tuesday																								
Wednesday																								
Thursday																								
Friday																								
Saturday																								
Sunday																								

Abort < Finish

6. Click **Finish** to end the configuration.
7. Repeat the process above to create more alarms according to the needs in your surveillance deployment.

3-5-11. Settings - Event - Email

This window provides an interface where you can configure the connection to a Mail server. Via the Mail server, the system can deliver emails containing system event messages to multiple receivers. A reachable Mail server and Email accounts must be provided before you can apply the settings.



The configuration options are identical to those found in the Email configuration in Settings - event window.

3-5-12. Settings - System - Information

On this window, you can configure the following:

1. Change the system name. Using a name in different languages is supported via a web console.
2. Select the UI text language.
3. Configure system time, the time zone, and if you are connected to a DNS server where Auto Daylight Saving time can be applied, you can acquire the associated setting from a server within your network. You can use the **Auto Setup** button to automatically update the daylight saving configuration. A system reboot is required. You can also manually update the daylight saving profile in the GZ format using the **Import File** button below.
4. Click the **Apply** button for the configuration to take effect.

Note that if **NTP** time server configuration (Auto) is preferred, the system will automatically configure all cameras to be listening to the system and therefore to the same time server.

The screenshot shows a web interface for system settings. On the left is a dark sidebar with icons and labels for 'Information', 'Maintenance', 'Display', 'PoE management', 'Power management', 'UPS', and 'Log'. The 'Information' section is highlighted in blue. The main content area is titled 'Name and language' and 'Time'. Under 'Name and language', 'System name' is 'LNVR1-08P' and 'Language' is 'English'. Under 'Time', 'Set system date and time' is 'Manual setup', with date 'January 27, 2018' and time '15 : 54 : 11'. A 'Now' button is next to the time. 'Time zone' is 'Asia/Taipei (CST, GM...)' and 'Auto setup Daylight Saving Time' is selected. Below this is a 'Manual setup' box with three steps: 1. Download update file from <https://www.iana.org/time-zones>, 2. Save file to USB device, and 3. Import file to update (with a button).

IMPORTANT:

Changing system time can produce disruptions to the existing recordings. Turning the current system time back to a time when video recording was taking place can generate duplicate files. And those files may not be playable.

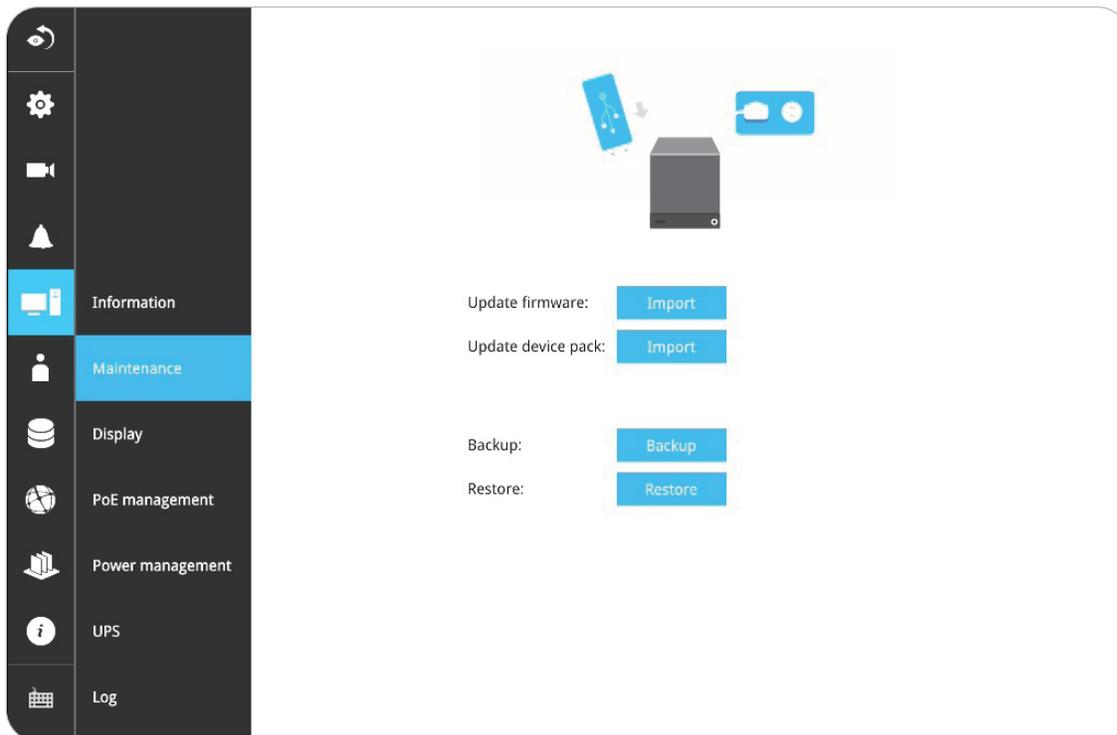
3-5-13. Settings - System - Maintenance

If the system firmware requires an update, download the update from www.linear-solutions.com. Locate the firmware binaries, and click the **Import** button. The upgrade should take several minutes to complete. Note that during the upgrade, the recording task will be interrupted.

On this window, you can perform four (4) maintenance tasks:

- 1. Update firmware:** Download firmware and save it to a USB drive in the FAT format, attach the USB device to the NVR for firmware upgrade.
- 2. Update device pack:** A device pack allows you to import associated configurations and parameters for new camera models so that these cameras can be integrated into your NVR configuration. The information in the device pack is related to some tunable parameters.
- 3. Backup:** You can backup your system configuration using the Backup function. Click **Backup**, and a message window will prompt. Click **Save** to preserve your system configurations.

Select a location for your backup file, then click **Save** to complete the process. If you back up to a USB thumb drive, that thumb drive must be formatted using the FAT format.



Note that the backup action does not involve the following:

- » Recorded videos and database
- » Alarm records, bookmarks and bookmarked footages.

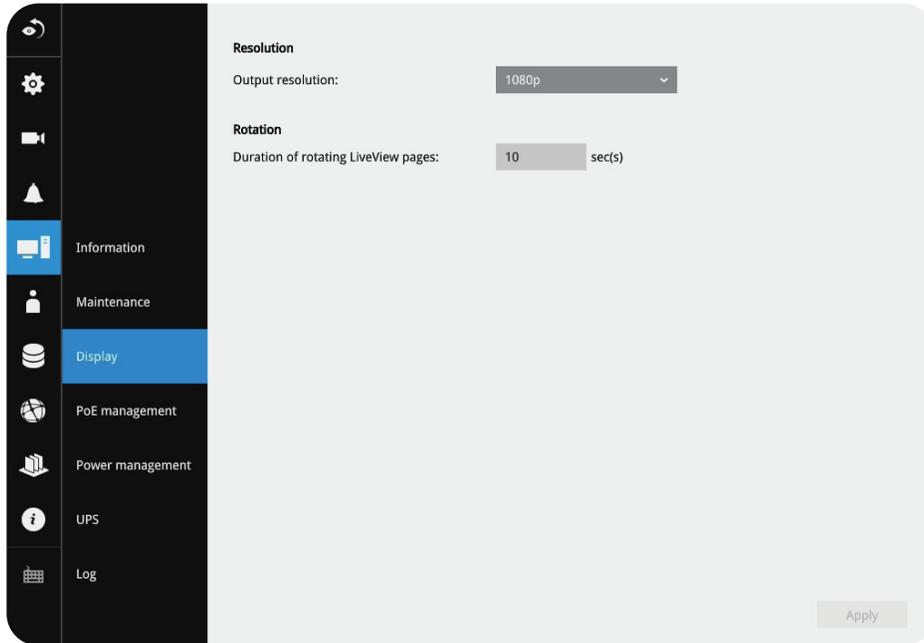
- 4. Restore:** If you have a previously-saved profile, you can restore your previous configuration. Click the **Restore** button.

A file location window will prompt. Locate the backup file, and click **Open**. The *Restore* process will take several minutes to complete, and system operation will be interrupted during the process.

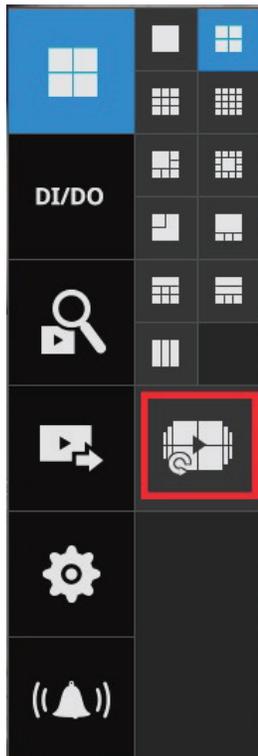
3-5-14. Settings - System - Display

On this page, you can configure the system to consecutively display (rotate) cameras' view cells on the Liveview window. For example, if you have eight (8) cameras in two 2x2 layouts, the rotation can let you see the live views of all cameras.

You can also enable or disable the Alarm notification.

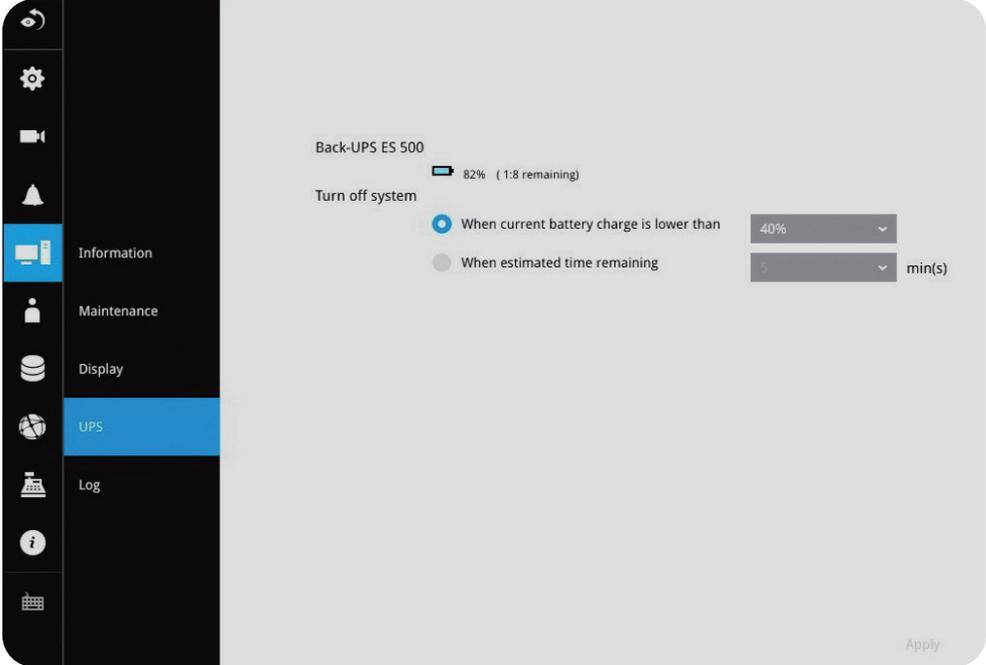


To enable the rotate function, click on the **Rotate** button on the layout panel.



3-5-15. Settings - System - UPS

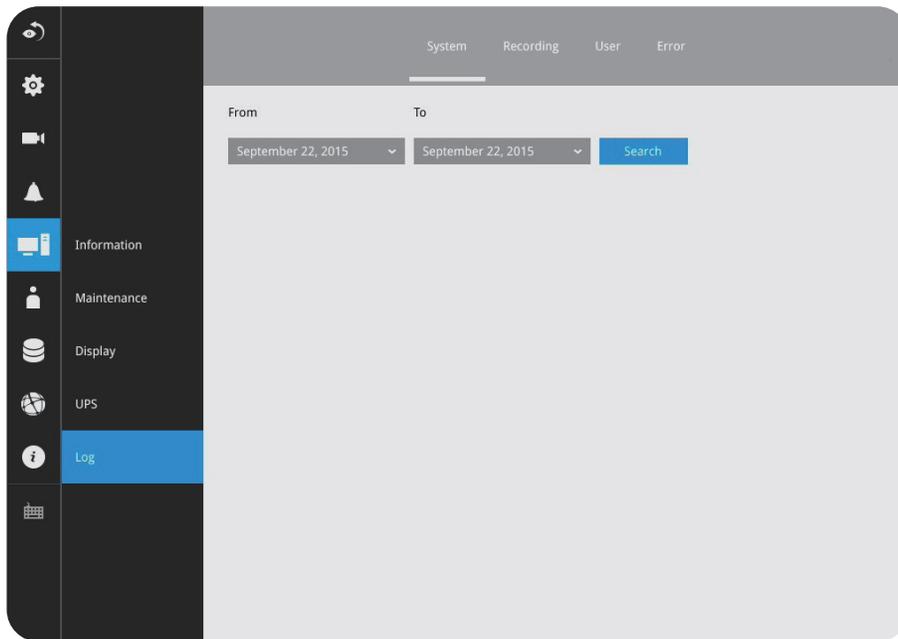
On this page, you can configure the system to gracefully shut down when UPS battery is lower than a certain level. You may also let it shut down when the estimated sustainable time is reached. We support APC Black 500 UPS.



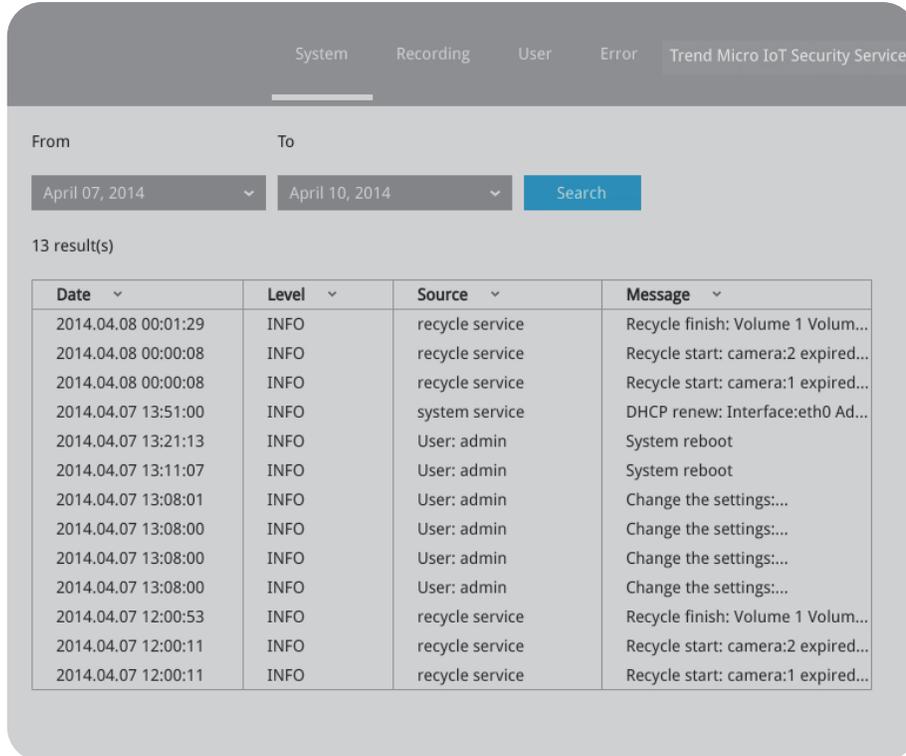
3-5-16. Settings - System - Log

System logs are categorized as **System**, **Recording**, **User** and **Error**.

To display system logs, select a range of time and click on the **Search** button.



You can search for past logs in each category window.



3-5-18. Settings - User

The User window allows you to create more users, change user password and place limitations on users' privileges and administration rights. Up to 16 users can be created, including the default administrator.

1. By default, there are two user groups: **Administrator** and **Regular user**.
2. The regular users cannot access the **Settings** window, meaning that regular users can not add or remove cameras, make changes to alarm, network and all other system settings.
3. When users try to access the Settings window, the login window prohibits regular users to log in. There is simply no regular user's name on the login window.
4. The administrator users can access all cameras recruited in the configuration, while the regular users can be configured to have access to some or all cameras.
5. The system blocks out the video feeds from users who are denied of the access to particular cameras. The alarms and the alarm-triggered recordings from those cameras will also be inaccessible for unauthorized users.

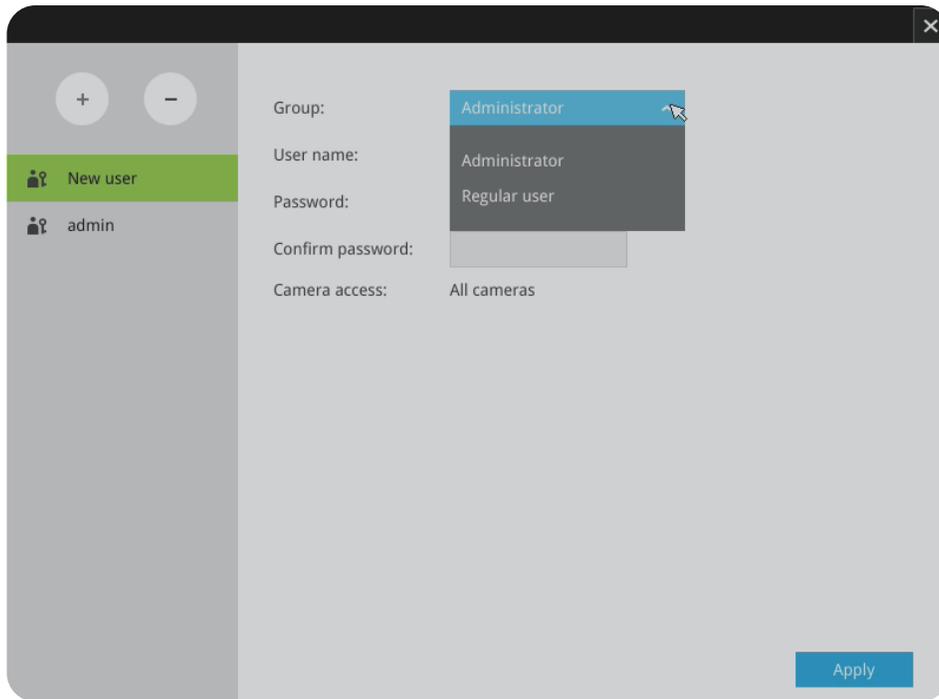
Authorization	All
01 - Camera 01	✓
02 - Camera 02	✓
03 - Camera 03	✓
04 - Camera 04	✓
05 - Camera 05	✓
06 - Camera 06	✓
07 - Camera 07	✓
08 - Camera 08	✓

IMPORTANT:

The default administrator name and password are: *admin* and *linear*. For security purposes during initial setup the system will force a password change.

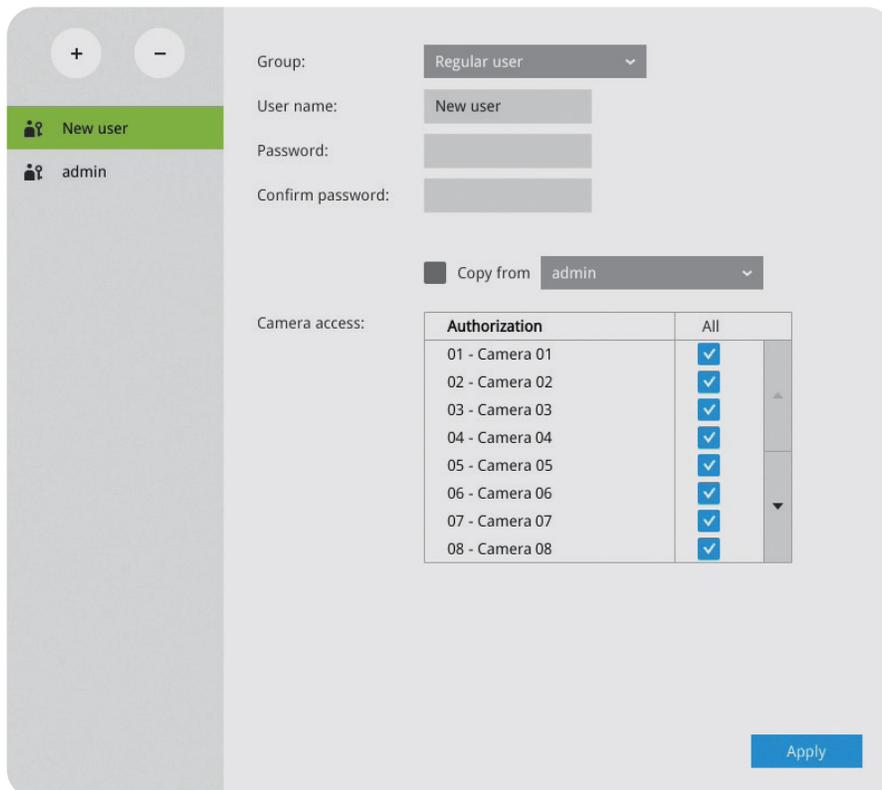
To create or edit users

1. Select a User group by unfolding its pull-down menu. Select either an *Administrator* or regular user as the user group.



The screenshot shows a user creation window with a sidebar on the left containing '+', '-', 'New user', and 'admin'. The main form has fields for 'Group', 'User name', 'Password', 'Confirm password', and 'Camera access'. The 'Group' dropdown is open, showing 'Administrator' (selected) and 'Regular user'. The 'Camera access' is set to 'All cameras'. An 'Apply' button is at the bottom right.

2. Enter the **User name** and **Password**. The maximum number of characters for a user name is 64, with alphabetic and numeric characters including [0-9][a-z][A-Z][_][][-].[,][@]. The maximum number for password is also 64.



The screenshot shows the user creation window with 'New user' entered in the 'User name' field. The 'Group' is set to 'Regular user'. The 'Password' and 'Confirm password' fields are empty. The 'Copy from' dropdown is set to 'admin'. The 'Camera access' table is shown with all cameras selected.

Authorization	All
01 - Camera 01	<input checked="" type="checkbox"/>
02 - Camera 02	<input checked="" type="checkbox"/>
03 - Camera 03	<input checked="" type="checkbox"/>
04 - Camera 04	<input checked="" type="checkbox"/>
05 - Camera 05	<input checked="" type="checkbox"/>
06 - Camera 06	<input checked="" type="checkbox"/>
07 - Camera 07	<input checked="" type="checkbox"/>
08 - Camera 08	<input checked="" type="checkbox"/>

1. If you are creating a regular user with limited access to cameras, deselect the checkboxes by the cameras to deny the user access.
2. Click **Apply** to close the configuration window. Repeat the process to create more users.

3-5-17. Settings - User-Login / Logout

Login

3. **Login required to view live streaming:** If selected, users will be required to enter his/her credentials before displaying a live view. If not selected, the NVR displays live view first. Login will be required when performing specific tasks, such as entering the *Settings* page.

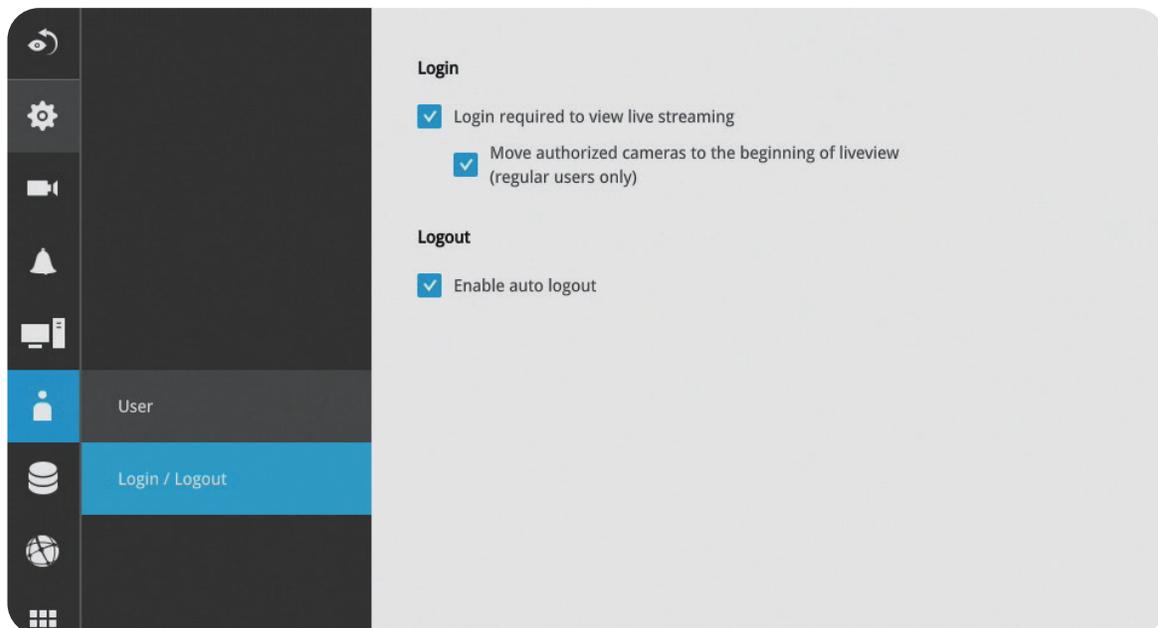
Auto Logout should also be enabled when the NVR will be left unattended for an extended period of time. Default is 10 minutes.

Camera views will be available for users according to their privilege settings as designated in the User account configuration. Some camera views will be available for some users, while others are not.

4. **Move authorized cameras to the beginning of live view (regular users only):** For users who have access to specific cameras only, it will be required to enter credentials before viewing a live view.

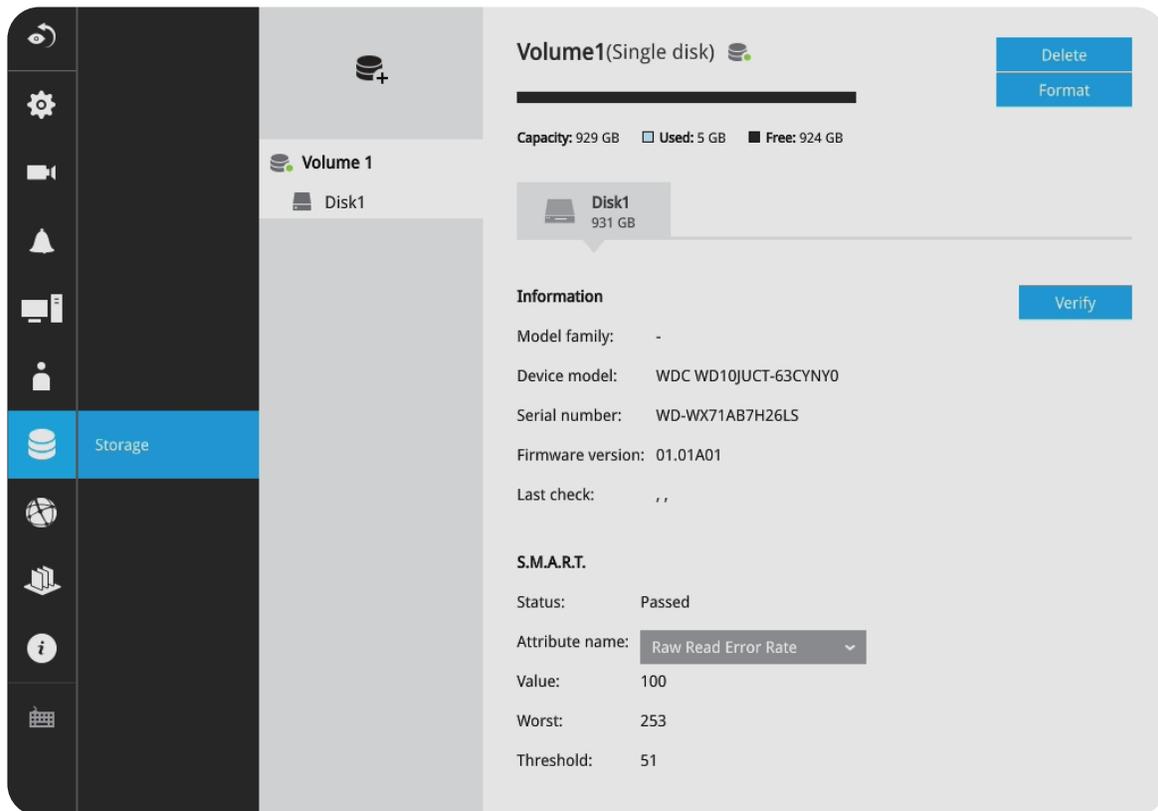
Logout

5. **Enable auto logout:** By default, a user is logged out automatically after being idle for 10 minutes. If not selected, the NVR will not log out automatically. A user can only log out manually.



3-5-18. Settings - Storage

The storage page displays the volume information including physical position, total capacity, used and free space and associated commands such as **Format** and **Delete**. Since each volume contains only 1 hard drive, detailed information about the hard drive is also displayed on this page. You can format an existing storage volume in situations such as when you need to re-deploy the system elsewhere.



Disk Information:

Model family : The brand name of the HDD manufacturer.

Device model : The disk model name.

Serial number : Serial number assigned to the disk drive.

Firmware version : The version of firmware running on this disk drive.

Last check : The bad block check or S.M.A.R.T. test previously executed on this drive.

Status : S.M.A.R.T. status polled from the disk drive. This is not the results from a manually-executed S.M.A.R.T. test.

Attribute: The various attributes can vary from different HDD manufacturers.

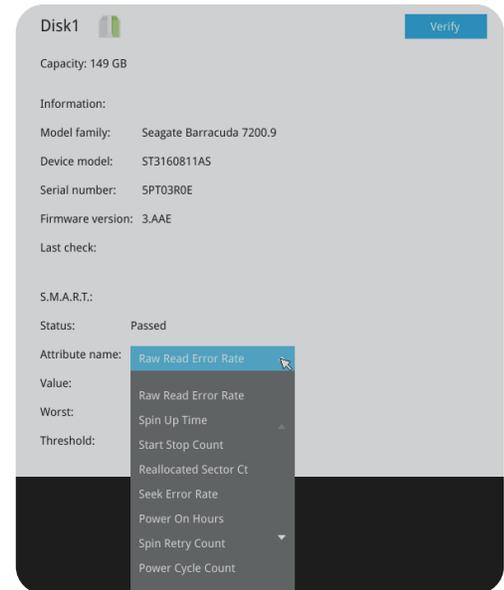
Value: Value for the currently selected attribute.

Worst: Worst value acquired for that attribute.

Threshold: A predefined threshold or triggering value. The threshold below which the normalized value will be considered exceeding specifications.

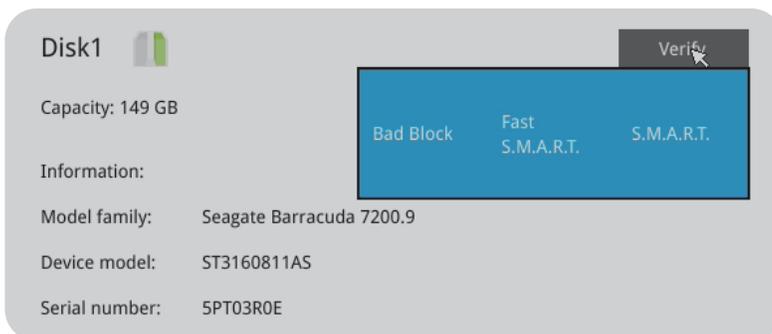
Raw value: The detected parameters for that attribute.

Status: The judgement made to deem the current reading as *OK* or *Failed*.



Verify:

Three types of check disk actions can be initiated through this button.



Note that disk verify function requires a volume to be temporarily disabled; namely, the video recording will be stopped before disk verify can be performed.

Bad block check: Performs read/write test to drive sectors to locate bad blocks. This action may take several hours to complete.

Fast S.M.A.R.T. test: Tests the electronic and mechanical performance and disk read performance, including those on disk buffer, read head, seek time and integrity of drive sectors. The short test is performed on a small section of disk platters, and takes about 2 minutes to complete.

S.M.A.R.T. long test: The long test is more thoroughly and is performed to all drive sectors. The actual completion time depends on drive sizes and the attributes put to test.

The Check disk functions mentioned above, when performed during active I/Os, can consume system resources and cause dropped frames with the recording tasks.

Storage Volume RAID Levels

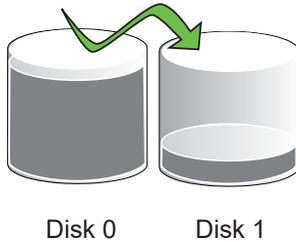
IMPORTANT:

By default, the Installation Wizard configures all disk drives into individual single-disk volumes. If you need to create RAID protected volumes, delete these single-disk volumes to free them from the configuration.

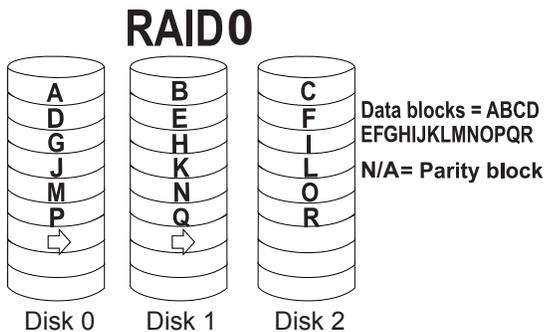
With up to 2 disk drives, you have the following options for configuring storage volumes:

1. **Single disk:** The single disk configuration provides no fault tolerance. The system stores video recordings to one or more single disk volumes in a consecutive order.

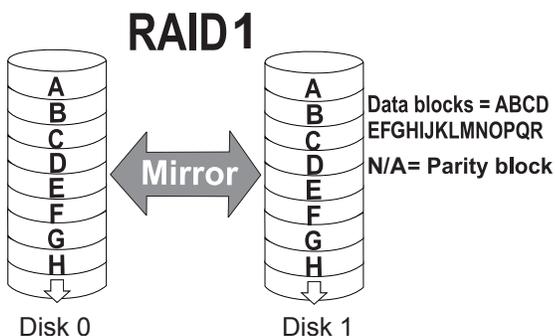
Single disks Each single disk volume contains one disk drive.



2. **RAID0:** A RAID0 volume spreads data blocks of each file across multiple disk drives. The volume provides no redundancy. RAID0 provides high performance by simultaneously reading or writing to disk drives, but if a drive fails, all data within is lost. Select at least 2 disks to build a RAID0 volume.



3. **RAID1:** A RAID1 volume provides high fault tolerance by writing the same data blocks simultaneously to duplicate disks. Select at least two (2) disks (or 4 disks) to build a RAID1 volume.



On this configuration window, a "disk" refers to a physical disk drive, a "volume" refers to the logical configuration of disk drives which may include multiple disk drives.

 **IMPORTANT:**

If you remove a disk drive and insert it into a different drive bay, the system will consider it as a new and different disk drive.

Some of the RAID levels provide data protection. Below is the summary of RAID level features:

RAID level	No. of HDD	No. of HDD failure Allowed	Capacity
RAID0	≥ 2	0	HDD # x (smallest HDD size)
RAID1	2	1 or 2 (if counterparts in the mirrored pair survives)	HDD # / 2
	\geq		

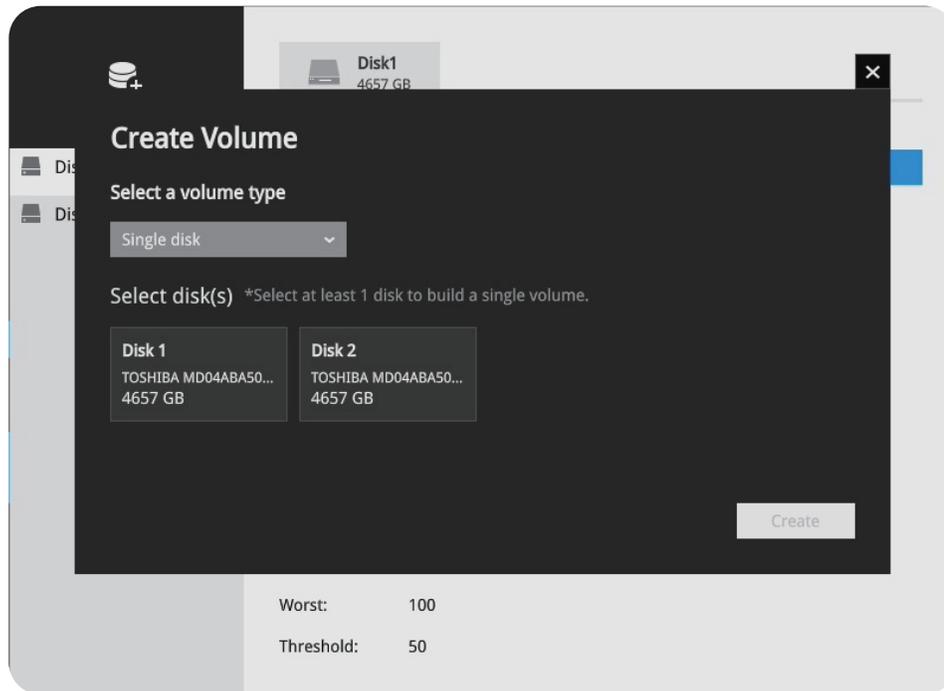
 **IMPORTANT:**

There are conditions that disk drives will not be available for storage configuration:

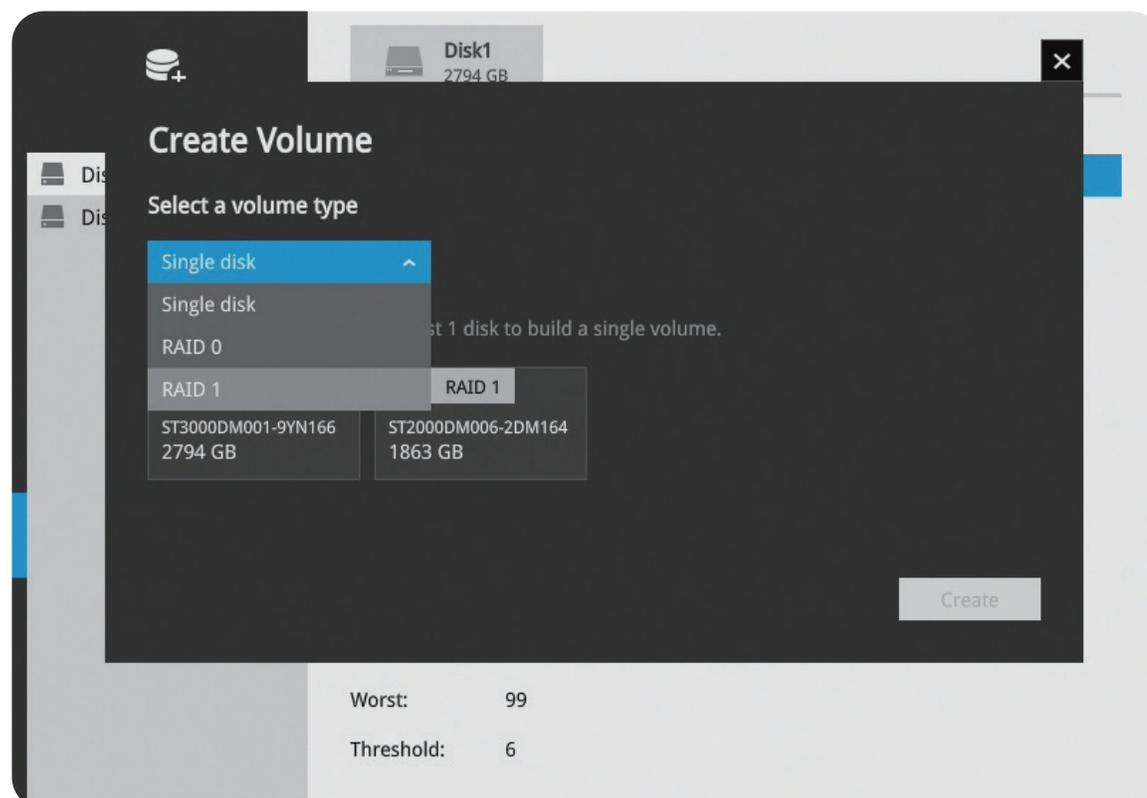
1. The disk drives are performing the Verify process.
2. The disk drives considered as "failed" drives by the S.M.A.R.T. self detection.
3. When you create a RAID volume, the disk drives in an external storage enclosure will not be available.

To create a RAID volume:

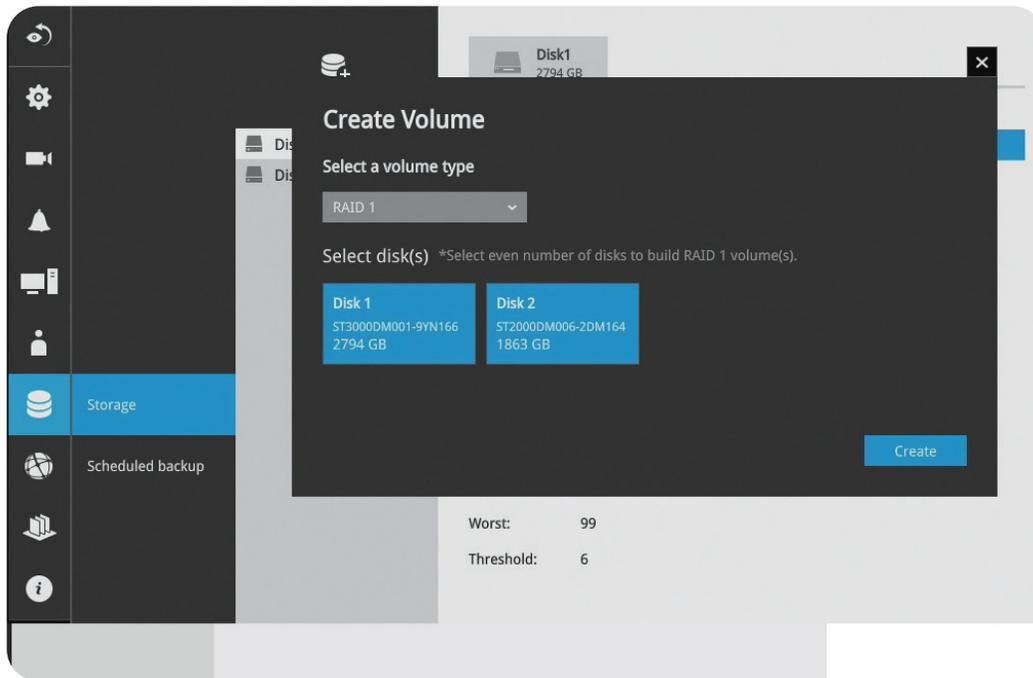
1. Click on the **Create Volume** button on top of the listed disk drives. The Create Volume window will appear.



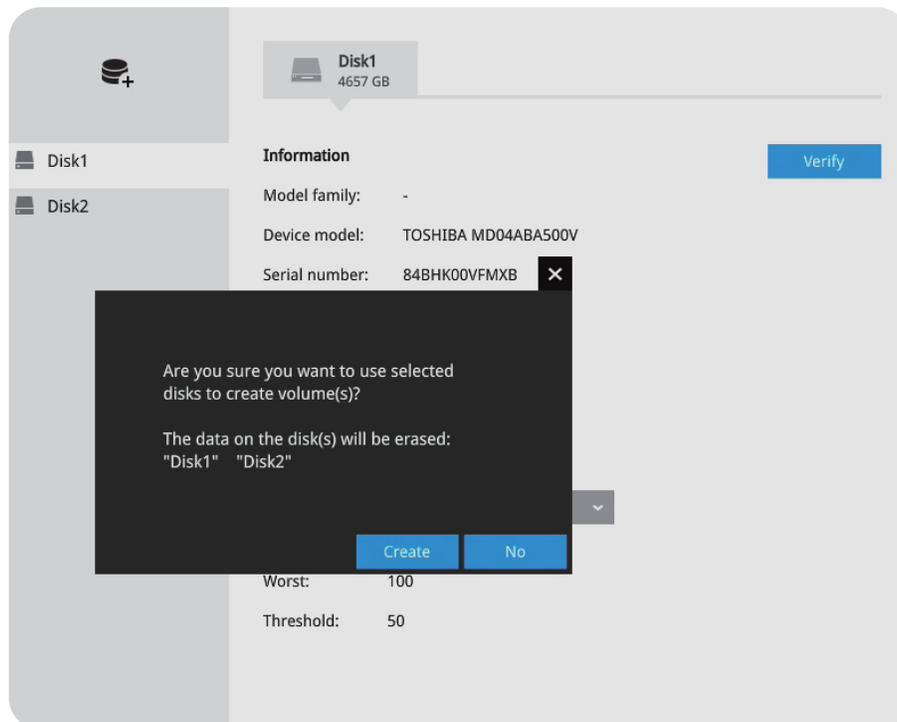
2. Select a RAID level from the pull-down menu.



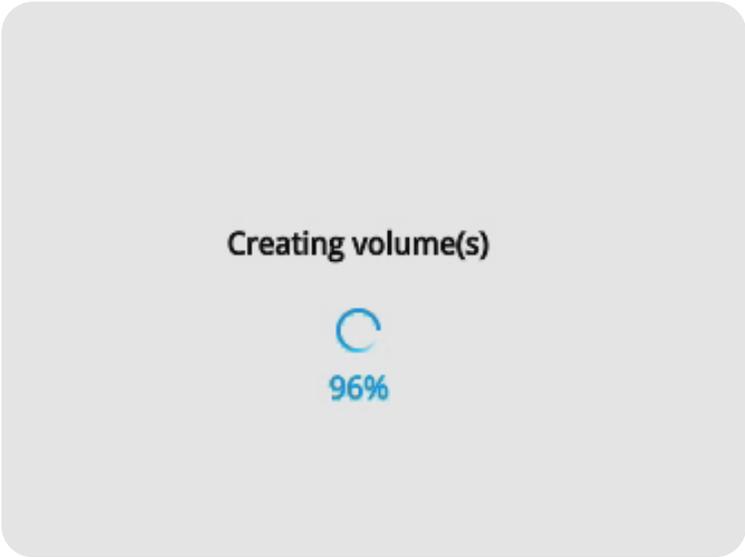
3. Click to select the members for the volume. When done, click **Create** to begin the process.



4. Creating a RAID volume will erase all data on the member drives. A message prompt will remind you of the situation. Click **Create** to continue.



6. The RAID volume should be created in a short while. When a volume is created, video recording should also start immediately.



3-5-19. Settings - Storage - Scheduled backup

Enable: Default is not selected. The scheduled backup function is not enabled by default. You must click to enable the configuration options.

Type: Currently the NVR supports the backup to an FTP server. Enter the Static IP, domain name and other parameters for access to an FTP server.

Site: The fully qualified domain name of a network host or its IP address. The maximum length is 253 characters. Note that hyphen “-” cannot be used at the beginning or the end of the address.

Port: The port that the remote FTP server listens on. The default ports (which are the most commonly used) are 21 for standard FTP and explicit FTPS, 990 for implicit FTPS and 22 for SFTP via SSH. If necessary, change the port number. The range is 1 ~ 65535.

Path: The path is effectively a path name of a resource and corresponds to a series of FTP commands, such as a directory tree:”ftp://NAME:PASSWORD@COMPANY.com”. The applicable alpha-numeric characters are [0-9][a-z][A-Z][_][-], with a maximum length of 64 characters. If not specified, destination will be the root directory.

Authorization: Click to enter user name and password for the FTP site. Click the **Test FTP** button to test a connection with the FTP server. The applicable alpha-numeric characters are [0-9][a-z][A-Z][_], with a maximum length of 64 characters.

Daily backup time: Default is 2:00 AM. Click to reveal the pull-down menu to specify a time when the daily backup will take place, such as that system can perform the backup in the off-office hours when network load is lower.

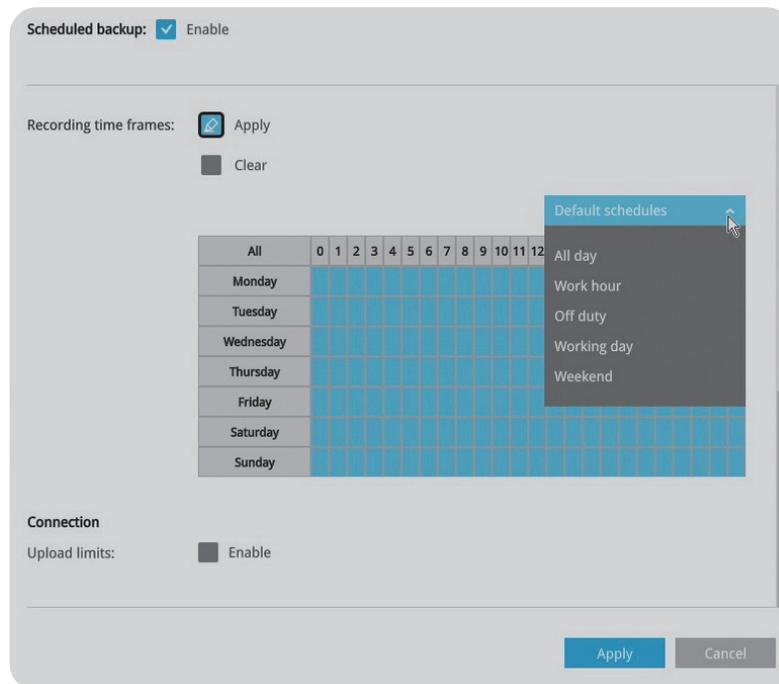
Backup Recording: Select the recording cameras each by a single click. The recorded videos from the selected cameras will be backed up according to your configuration.

The screenshot displays the 'Scheduled backup' configuration interface. On the left is a dark sidebar with navigation icons, including a gear for settings and a database icon for 'Storage'. The 'Scheduled backup' option is highlighted in blue. The main content area is light gray and contains the following settings:

- Scheduled backup:** A checkbox labeled 'Enable' is checked.
- Backup location:**
 - Type:** A dropdown menu is set to 'FTP'.
 - Server:** A text input field contains 'ftp.linear.com'.
 - Port:** A text input field contains '21'.
 - Path:** An empty text input field.
 - Authorization:** A checkbox labeled 'Enable' is checked.
 - Username:** A text input field contains 'admin'.
 - Password:** A text input field with masked characters (dots).
 - Test FTP:** A blue button to test the connection.
- Daily backup time:**
 - Time:** A dropdown menu is set to '02 : 00'.
- Back up recording:** A section header with no visible options.

At the bottom right of the configuration area are two buttons: a blue 'Apply' button and a gray 'Cancel' button.

Recording time frames: Select the span of time of the recorded video to back up. Default is all around the clock. You can use the **Apply** and **Clear** buttons to edit the applicable span of time. You may also select a preset schedule from the pull-down menu on the right. For example, select to back up only the recordings of the work hours.



Upload limits: If network bandwidth is concerning, enter an upper threshold for the bandwidth. The backup related messages are shown below:

- Scheduled backup is starting
- Scheduled backup has been completed successfully
- Scheduled backup settings have been changed
- Failed to connect to FTP server
- Succeed to connect to FTP server
- FTP server error (error code)

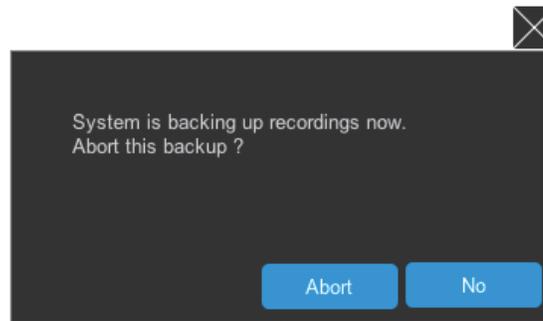
If the FTP backup errors occur, the system will retry the connection every five (5) minutes until the connection is remade or cancelled. Error messages will display on every failed attempt. For errors not related to connection problems, retry takes place every three (3) seconds for five (5) times for each recording file. Error messages will display on every failed attempt.

In the event of backup failures, any failures will be recorded into system logs. The possible causes can be:

1. The previous backup is not finished when the succeeding backup starts due to very slow upload speed or network problems.
2. The on-going scheduled backup is cancelled.
3. Errors occur on the storage volume while the backup is taking place. For example, when the hard disk is disconnected, formatted or the system detects an un-configured volume.
4. Path errors (the destination directory does not exist).

When finished with the network settings, click on the **Apply** button.

A proceeding backup can be manually cancelled.



3-5-2. Settings - Network - IP

DHCP: The server obtains an available dynamic IP address assigned by the DHCP server each time the system is connected to the LAN.

Manual setup: Select this option to manually assign a static IP address to the NVR. By default the system has a static IP address of 192.168.0.240.

Enter the Static IP, Subnet mask, Default router and Primary DNS provided by your ISP.

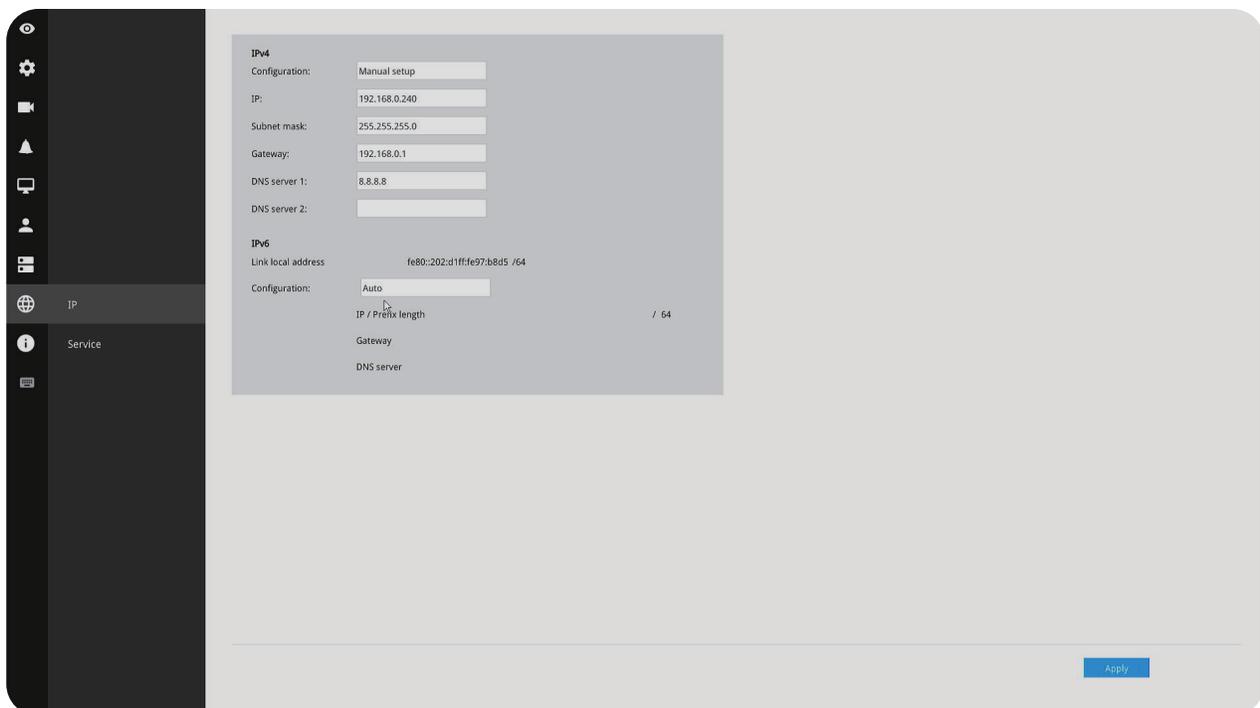
Subnet mask: This is used to determine if the destination is in the same subnet. The default value is "255.255.255.0".

Default router: This is the gateway used to forward frames to destinations in a different subnet. Invalid router setting will fail the transmission to destinations in different subnet.

Primary DNS: The primary domain name server that translates hostnames into IP addresses.

Secondary DNS: Secondary domain name server that backups the Primary DNS.

When finished with the network settings, click on the **Apply** button.



3-6. Information

This window shows the revision number of the firmware running on this machine.

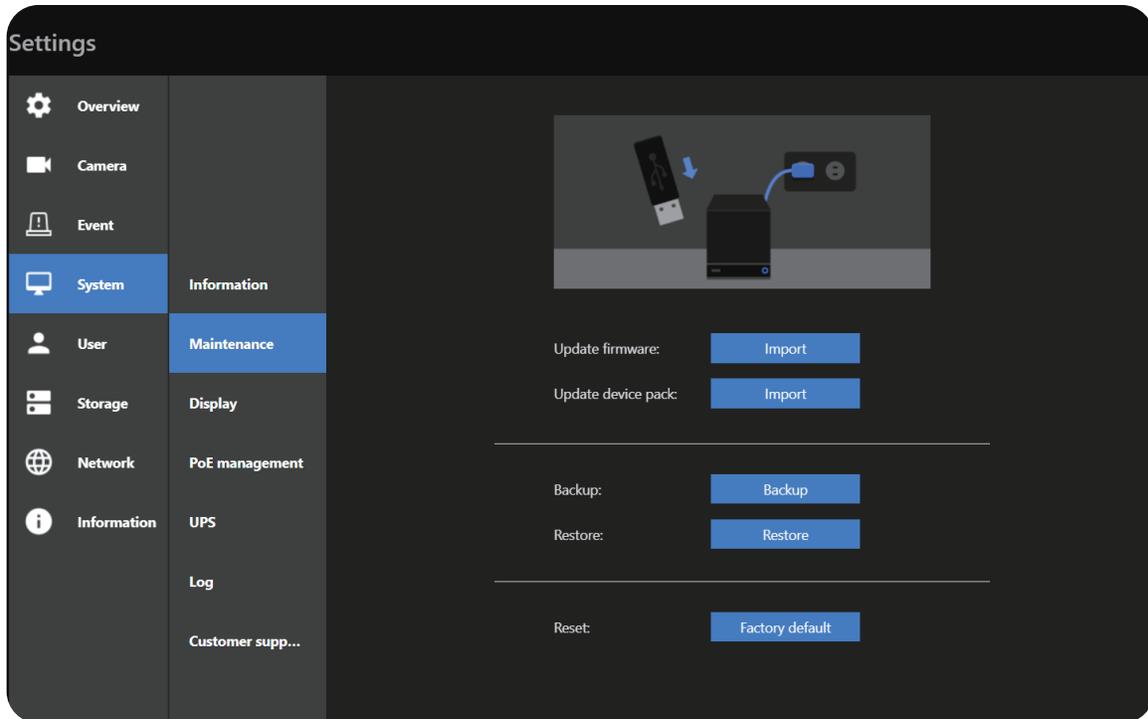


Chapter 4: System Settings

The *System Settings* pages are made identical to those on the local console. Since the Setting pages are identical, the following pages will be omitted. Please refer to [page 84](#) for the description of **System Settings** via a local console.

Some minor differences between the web console and local console exist. One is the *Restore Factory* default function. It is only available on the web console.

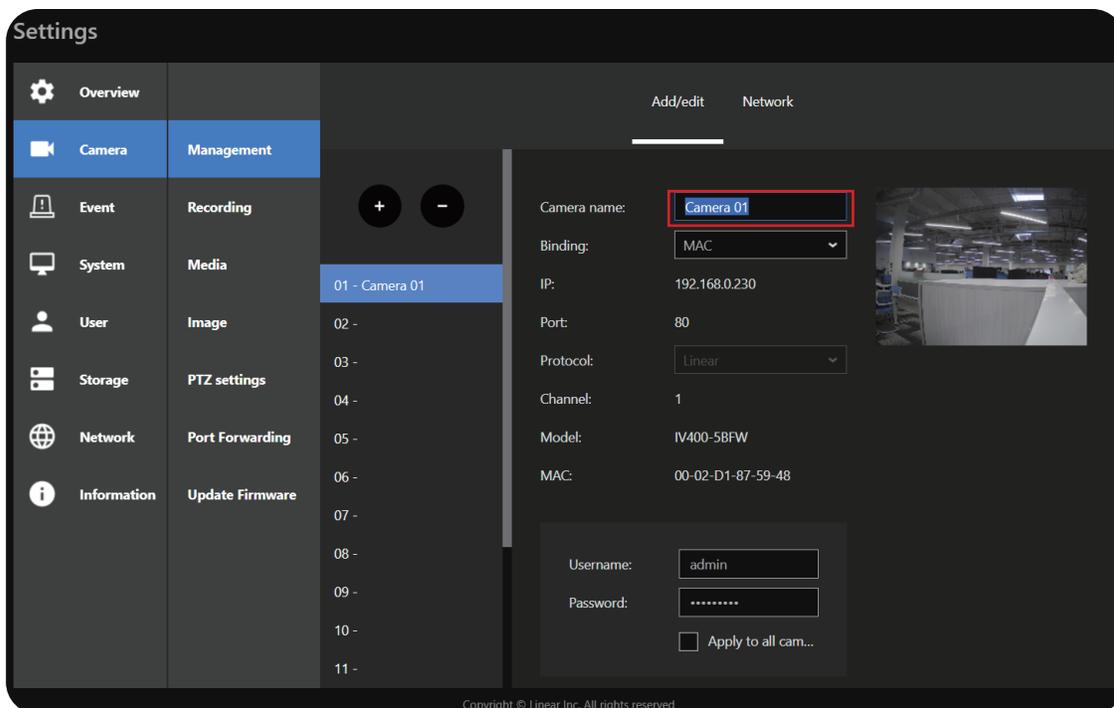
The restore function is not available on the local console, for users can use the **Reset** button to perform the system default restoration.



Another difference is the ability to enter a camera or system name using languages other than English. The NVR's system name also supports the use of other languages. This is only achievable through a web console.

The following characters are not supported:

[>][<][D][([["][%][;][#][&][+][-][\]



Chapter 5: Operation

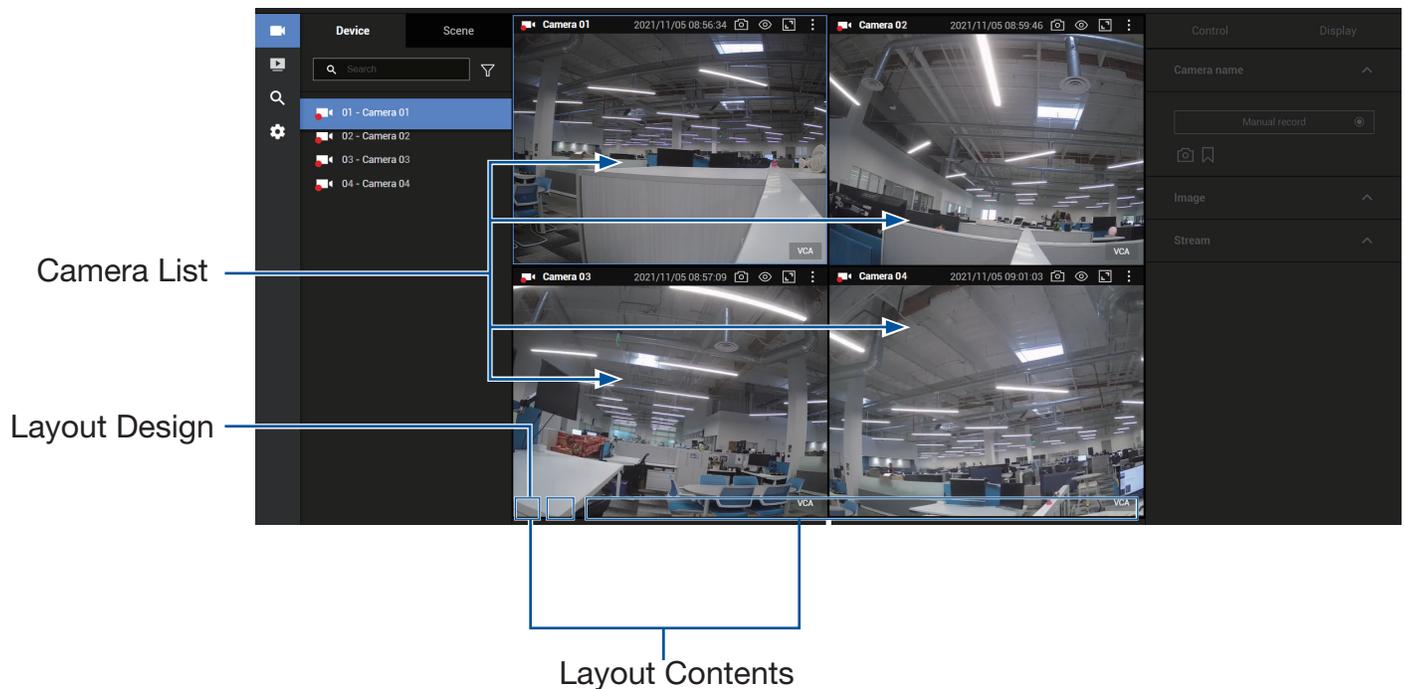
IMPORTANT:

1. Before operating the NVR, make sure you have properly installed hard drives and configured the storage volumes. Otherwise, you will not be able to operate most of the system's functionality.

5-1. Liveview

5-1-1. Placing Cameras into the Layout

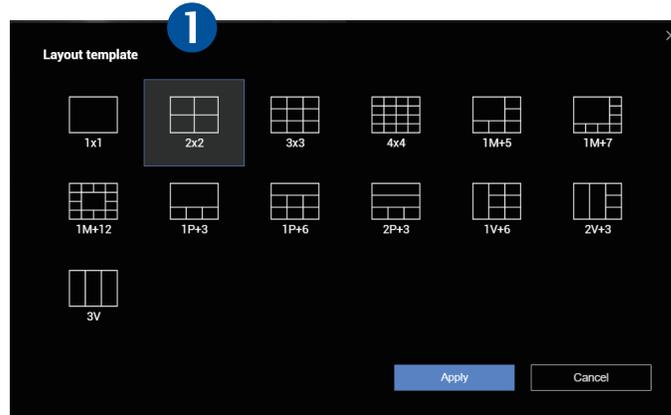
Legends and definitions of icons on the layout panel have been described on [page 85](#). It's presumed that you have properly inserted all network cameras in your deployment as previously described on [page 85](#). All eight (8) cameras should be listed on the Camera list.



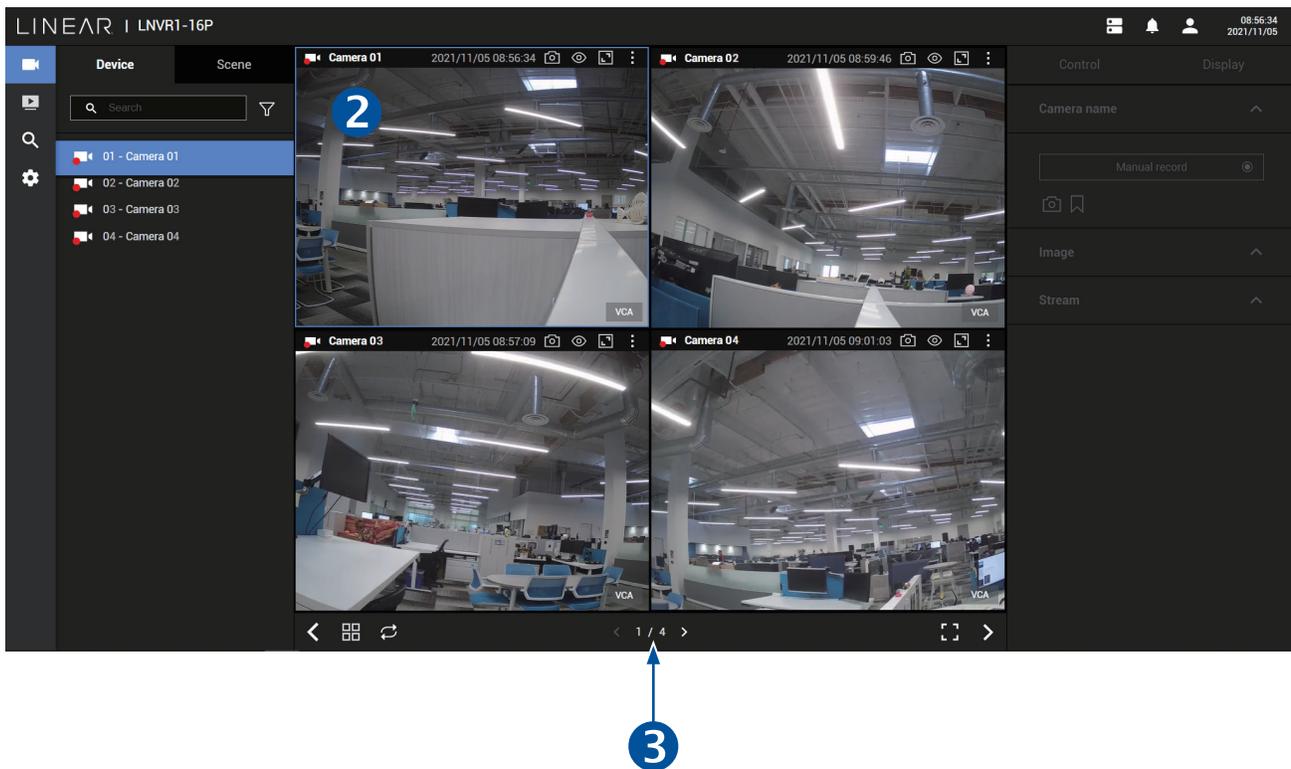
Note that layout design can only be performed by the system administrator.

To begin the design of your layout:

1. Select a layout pattern by a single click. Available options are: 1x1, 2x2, 3x3, 4x4, 1M+5, 1M+7, 1M+12, 1P+3, 1P+6, 2P+3, 1V+6, 2V+3 and 3V.

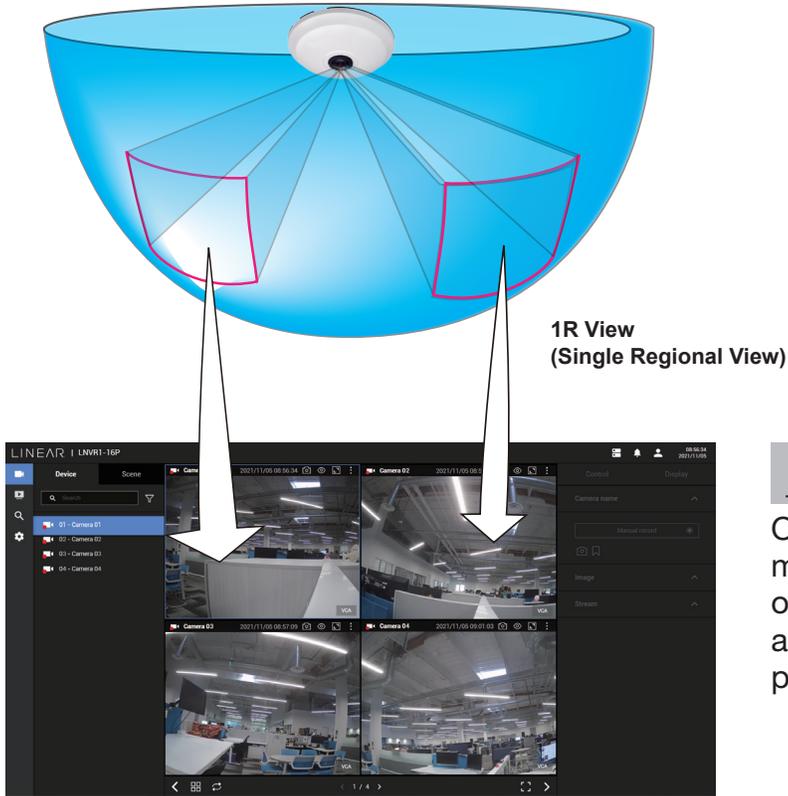


2. Double-click on a camera's thumbnail to fill it into the first unoccupied view cell.



3. If you've selected a layout design that requires multiple page of cameras, click the page switch **< 1 / 4 >** button (< or >) to continue on the next camera layout page.

Placing different regional views of a fisheye camera into view cells will look like this:



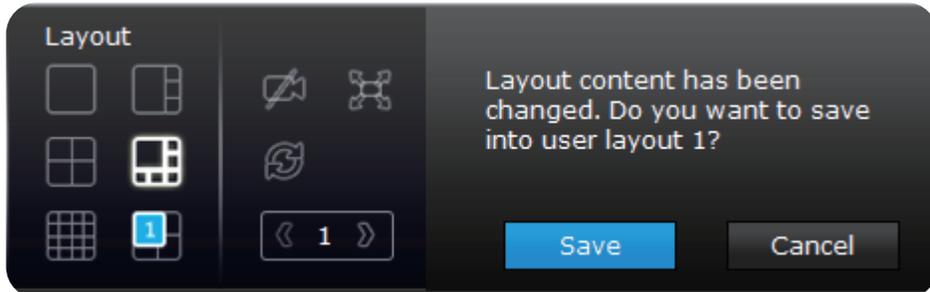
 **NOTE:**

Only an administrator can alter the display modes of fisheye cameras. Although ordinary users can make changes to a regional view, changes will not be preserved after a console is re-started.

In addition to fisheye cameras (if a camera has a wide field of view), you may also display its different fields of view in multiple view cells. Some view cells may also contain a PiP view that is digitally zoomed.

The **Fisheye Mode** button is available on the view cell where you inserted a fisheye camera. When a regional view is displayed, the shooting angle and image orientation is kept with the layout. See [page 43](#) to see more about fisheye viewing modes.

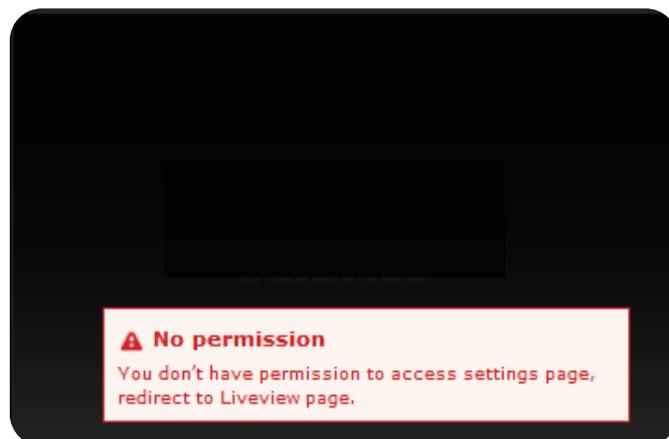
- When you are done with the current layout design, such as the **user layout 1**, click **Save** to preserve your settings. This message prompts on the screen whenever any change is made to the current layout.



- You can create more user layouts by mouse-overing the **User Layout** button. You may create more user layouts for different purposes, such as for the use of different users, or playing different views of a camera on multiple view cells.



If users were created and some cameras are excluded from their access, a user may log in and see the locked-on cells as shown below:



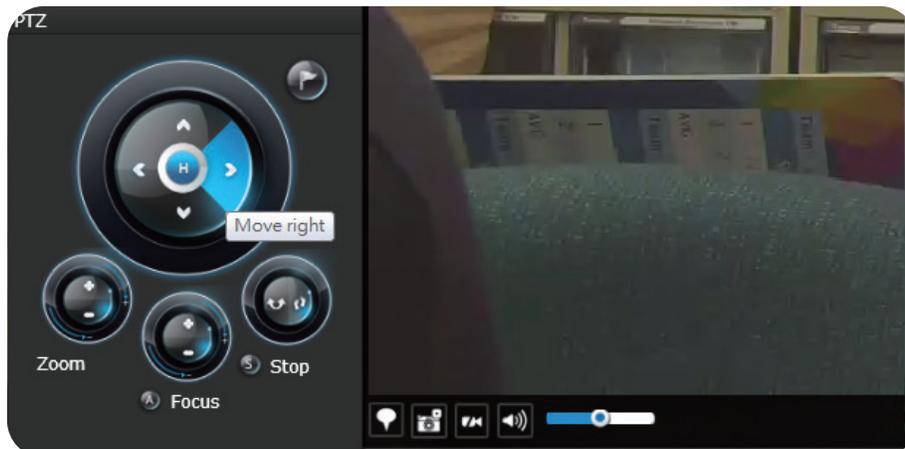
A user with limited access rights may still re-arrange the layout of view cells. However, the configuration change will not be saved after logging out of the current console.

 **NOTE:**

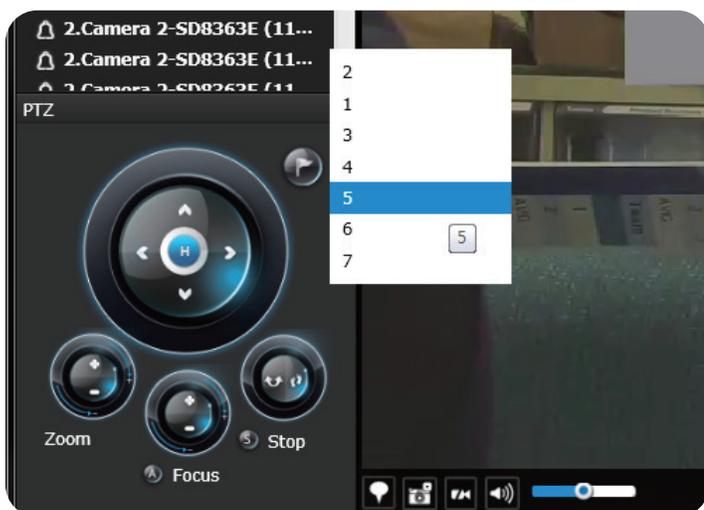
By default, when a user or administrator logs in to the Live view window, the last layout page visited will be displayed. This layout becomes the default layout.

5-1-2. PTZ and Other Screen Controls

Note that the PTZ control panel only applies when you select a view cell with a camera that comes with mechanical PTZ functions. Currently, the e-PTZ function is not supported by the NVR system. With a PTZ camera, the buttons on the PTZ panel become functional when you mouse over its GUI elements. For all compatible cameras and exerting Zoom, Focus and Patrol functions, please refer to [page 58](#) for details. The Zoom function, for example, requires a camera that comes with a motorized zoom module and may not be applicable to every PTZ camera.



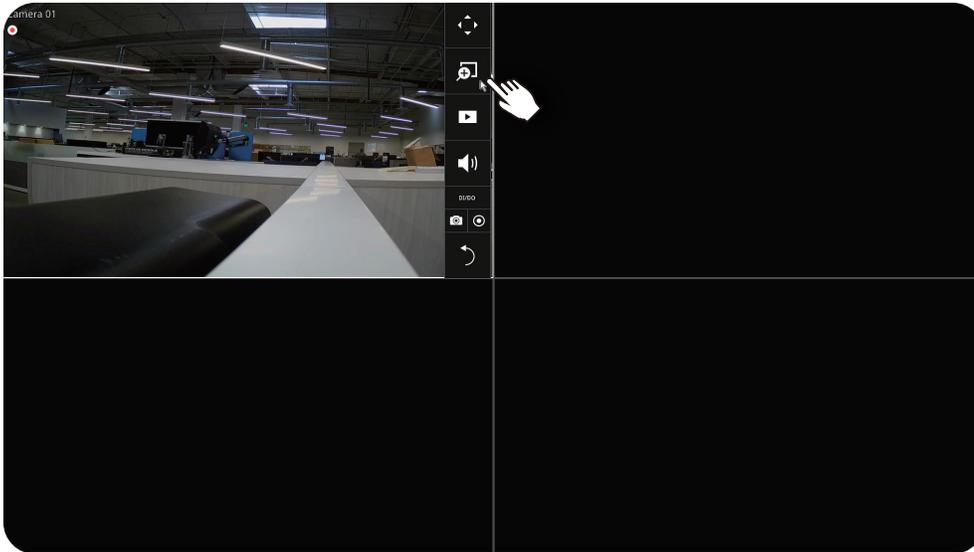
The preset positions and the patrol functions require the associated configuration on the cameras via a web console. Before you make use of these functions, you should set up the preset positions on a web console with the camera. The NVR GUI does not provide the configuration options with PTZ preset positions.



You can use **Preset** button to display preset positions and tell the camera to move and point at the preset direction, as well as perform a camera tour to visit these positions in a consecutive order.

To access live view control:

1. **Click** on a view cell. The view cell will become a focused view cell.
2. A **Triple click** on a view cell enlarges it to the full of the live view area. **Double click** to reduce its size to the original focused view.
3. To deselect a view cell, you can click on another view cell in the display area.



You can also click the Digital Zoom  to toggle full screen view.



Click the Digital Zoom  again to toggle to the previous view.

NOTE:

If you have concerns with the display quality and frame rate per second, refer to [page 95](#) for how to configure video feeds for live viewing as well as for video recording. The configuration options can be found in **Settings > Camera > Video**.

Note that the constant bit rate methodology is applied in this system, and it sets an upper threshold on the size of IP packets sent with the video streams. Image quality will be slightly compromised if reaching the ceiling of allowable bandwidth.

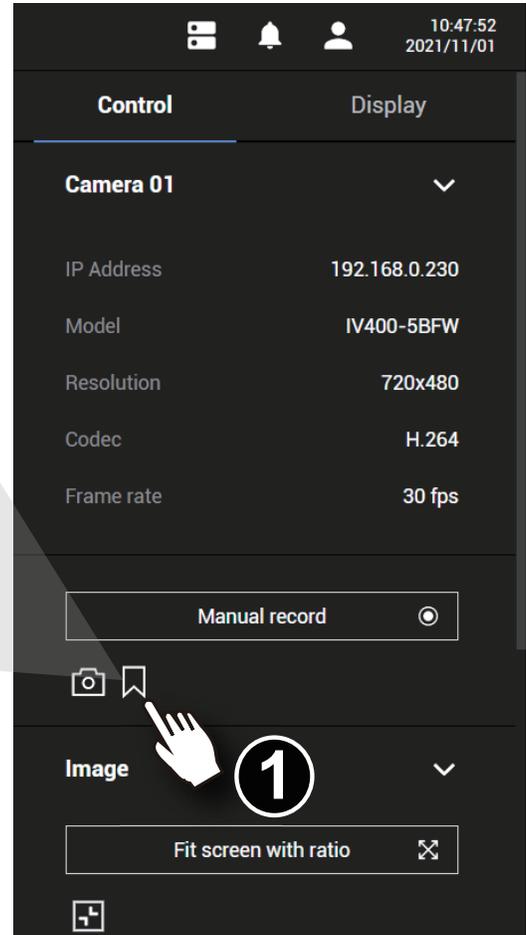
To place bookmarks and exert screen controls:

On a focused view cell, you can place a bookmark  that saves a short description and a one-minute footage from the current feed. The bookmark is also displayed along with the recorded video, making it easier to look for a specific moment in time when you need to trace back for a scenario later.

The bookmark function can be executed on a live or recorded stream when you observe a situation from your Live view or Playback window. The precondition of using this function is that the video stream, while you are watching it on the view cell, must be recorded to the NVR at the same time.

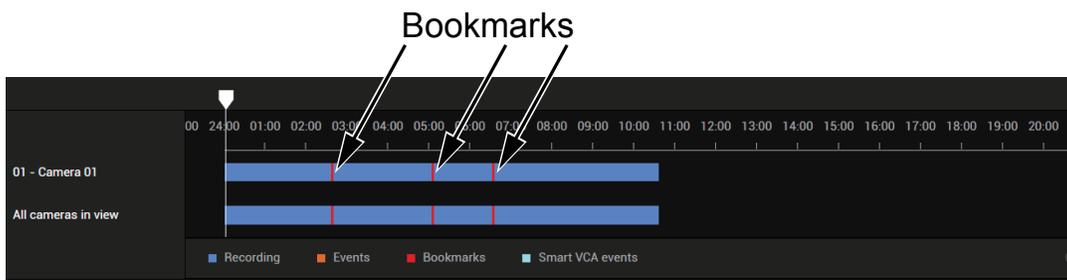
To add a bookmark:

1. Click on the **Bookmark Flag** button  on the right control panel.
2. Enter a short description that can be as long as 120 characters.
3. Click on the **Add** button, or simply press **Enter** on your keyboard.



Note that the bookmarks inserted on the Liveview window will be listed on the Alarm panel, and the bookmarks will also appear on the slide bar of the Playback window.

To retrieve or view the video clip tagged by the bookmark, click it to play the video that was recorded by the time bookmark was inserted.



5-1-3. Audio

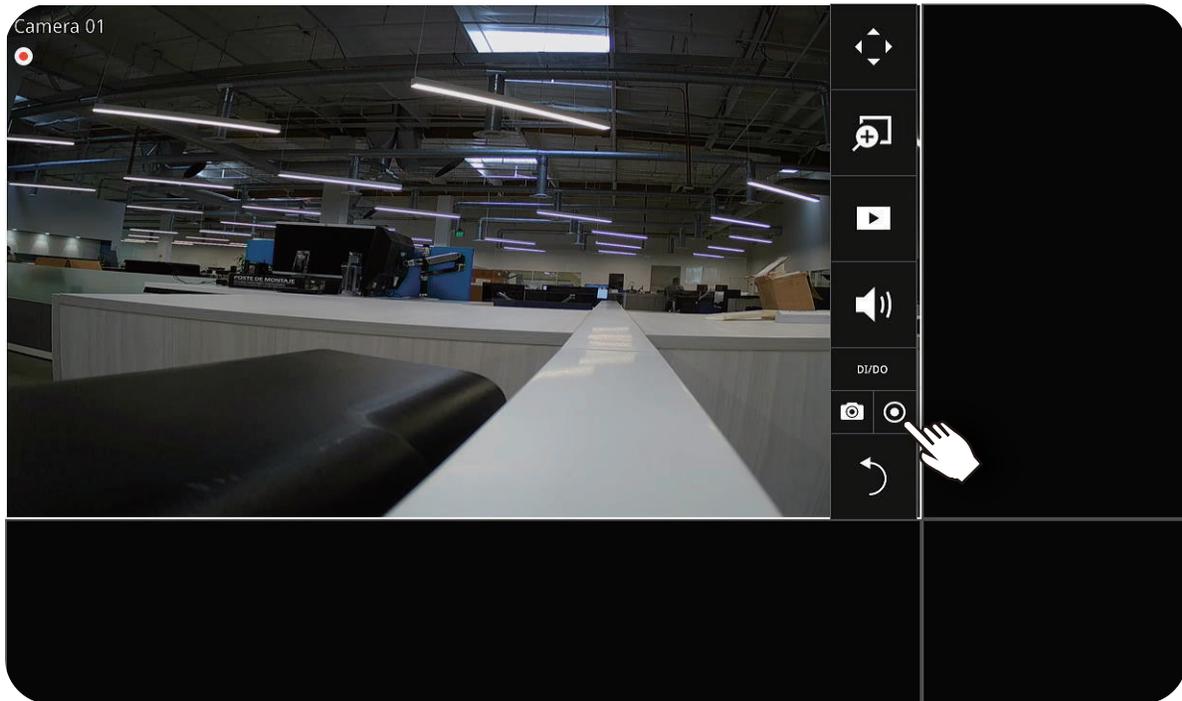
Audio is only transmitted through the camera in a view cell that is currently selected. You can manually tune the volume level, mute or unmute the audio feed through a view cell.

5-1-4. Camera Properties and Controls

Click on a camera to view the camera control properties on the right side of the screen. Here you can find a description of the camera name, address, model name, resolution, codec and frame rate.

For a camera that is not performing a continuous recording, you can click on the **Manual Recording** button  to start a manual recording. Press it again to stop recording.

You can also manually turn on the digital output. For example, triggering an external alarm that is connected to a specific camera.



	PTZ: Pivot/Tilt/Zoom
	Digital Zoom
	Play Recording Clips
	Audio
	DI, DO
Snapshot 	 Manual Recording
	Back to deselect Camera

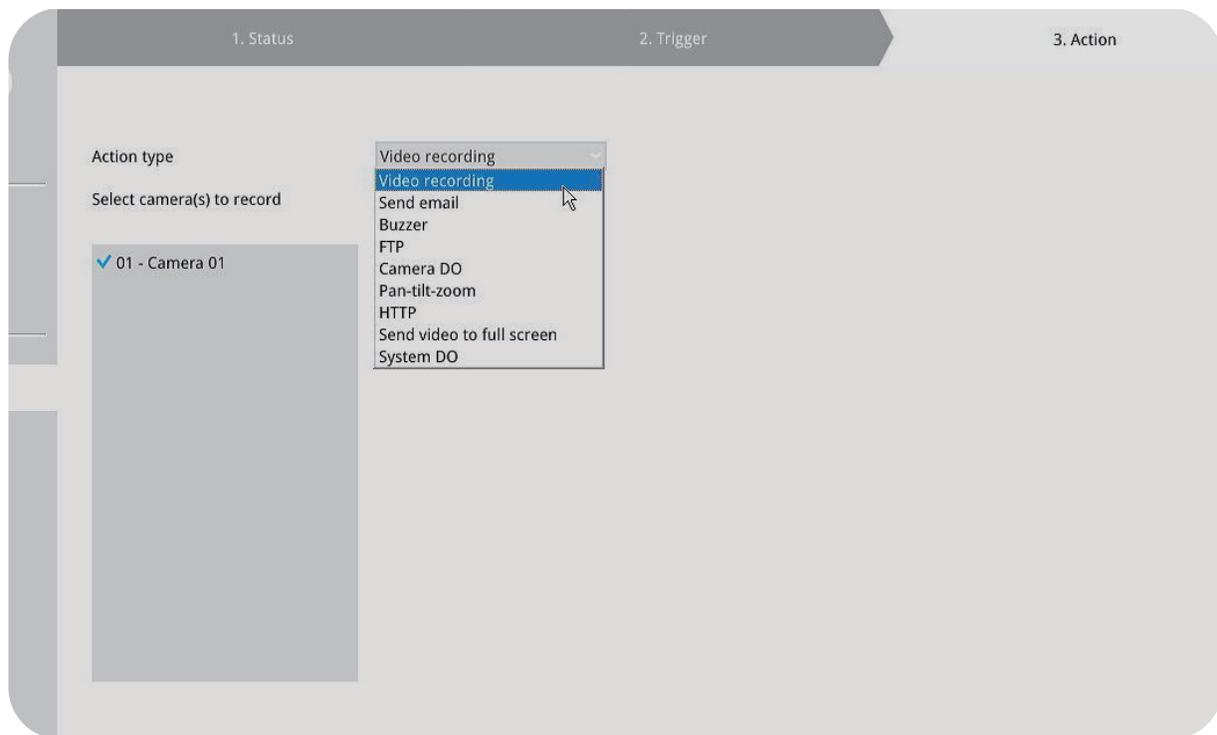
	Layout and Rotation
	DI, DO
	Search
	Export Recordings
	Settings
	Stop Buzzer

5-1-5. Events Panel

To receive events from cameras, you need to configure event triggers in the **Settings > Event** configuration window (see [page 107](#)). Network cameras' digital inputs, digital outputs or motion detection can all be used to detect conditions in external environments. You can configure certain kind of actions to take place in response to the alarms, such as:

- » Recording the immediate image
- » Sending an Email notification
- » Sounding the onboard buzzer
- » Sending snapshots to an FTP server
- » Sending videos to a web server
- » Moving camera lens to a preset location
- » Triggering a camera's digital output.

The operation details of the Alarm panel and Alarm Playback utility have been described on [page 152](#).



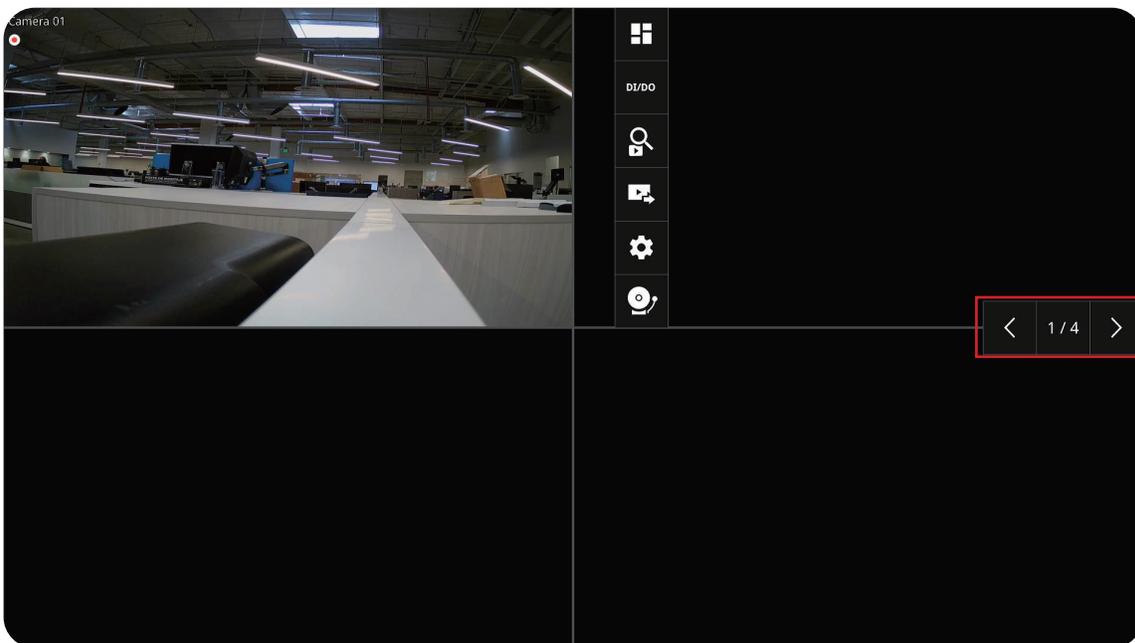
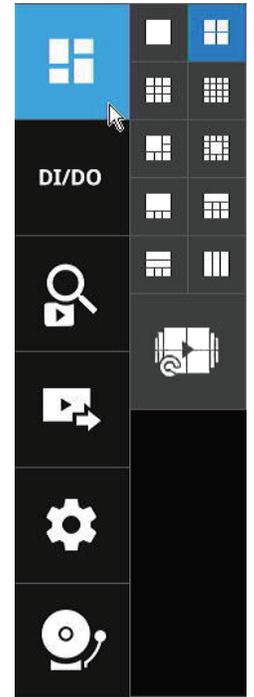
5-1-6. Layout view Control Buttons

At the bottom of the view screen are control buttons for the view layout, view rotation, full screen view and left/right arrows to show/hide the left/right panels.

1.  This button extends the current layout to the full of the screen.
2.  The Rotate function lets system display successive pages in a user layout by the intervals of 10 seconds. The layout page that does not contain camera views will be skipped.

A Rotate action will stop when you:

- » Move to another page in the user layout.
- » Move to another user layout.
- » Click to select a view cell.
- » Remove a camera from view cell.
- » Click to disable the rotation function.



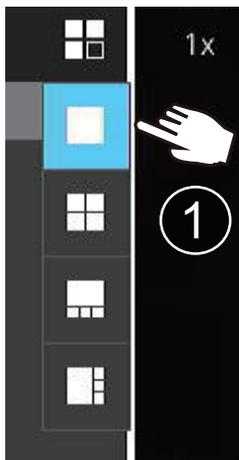
When your current layout spans across multiple pages, use the arrow buttons to switch from one page to another. The index number of the current page will be shown between the arrow buttons.

5-2. Search Recording Clips

The elements in the Camera list on a **Search recording clips** window are similar to those on a **LiveView** window.

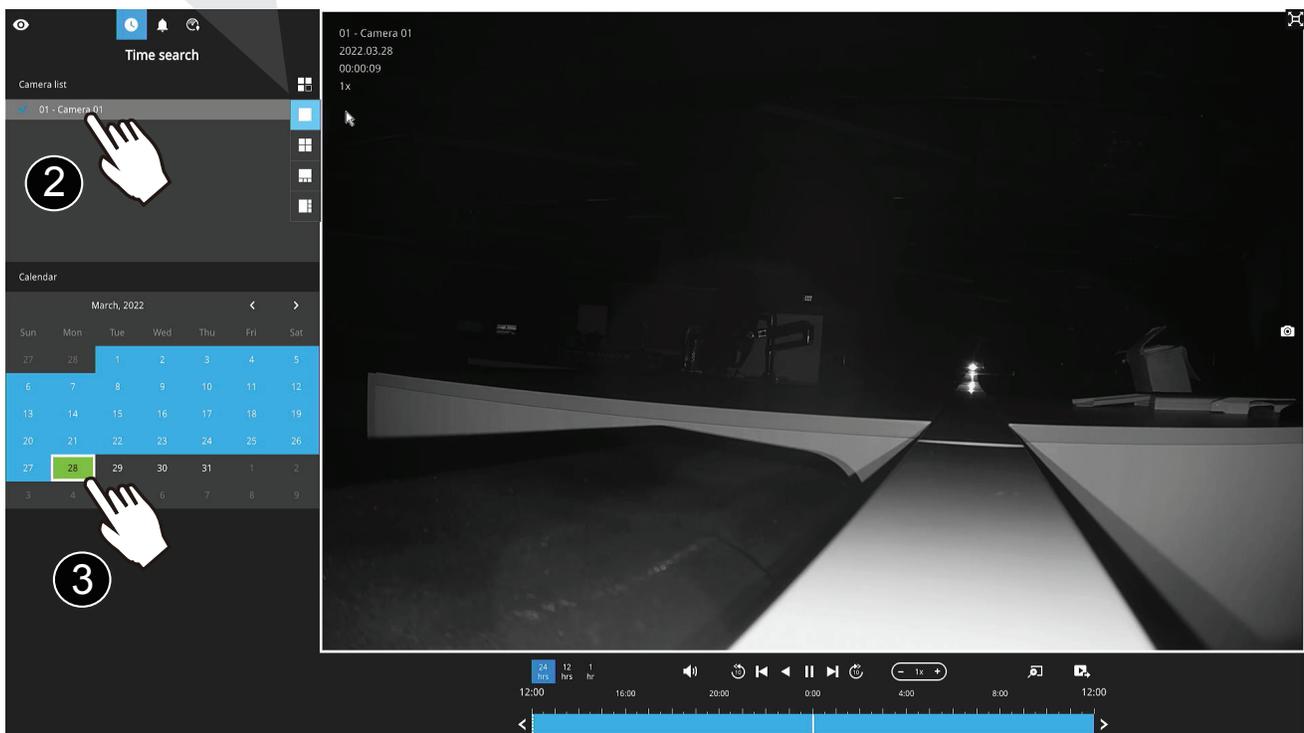
Search recording clips window:

1. Select a view layout at the bottom if you want to view multiple recording simultaneously.
2. Select the camera(s) from the left panel.
3. Select the date for playback.



NOTE:

If a video stream was recorded in the **MPEG-4** format, it will not be playable on the Playback window.

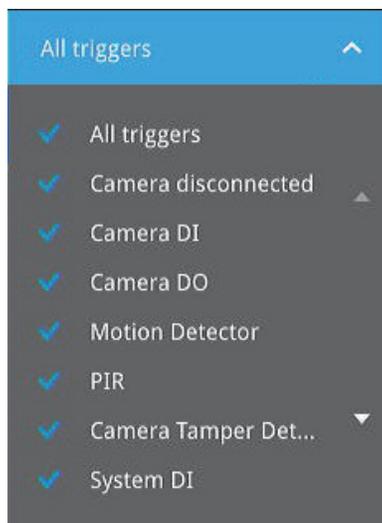
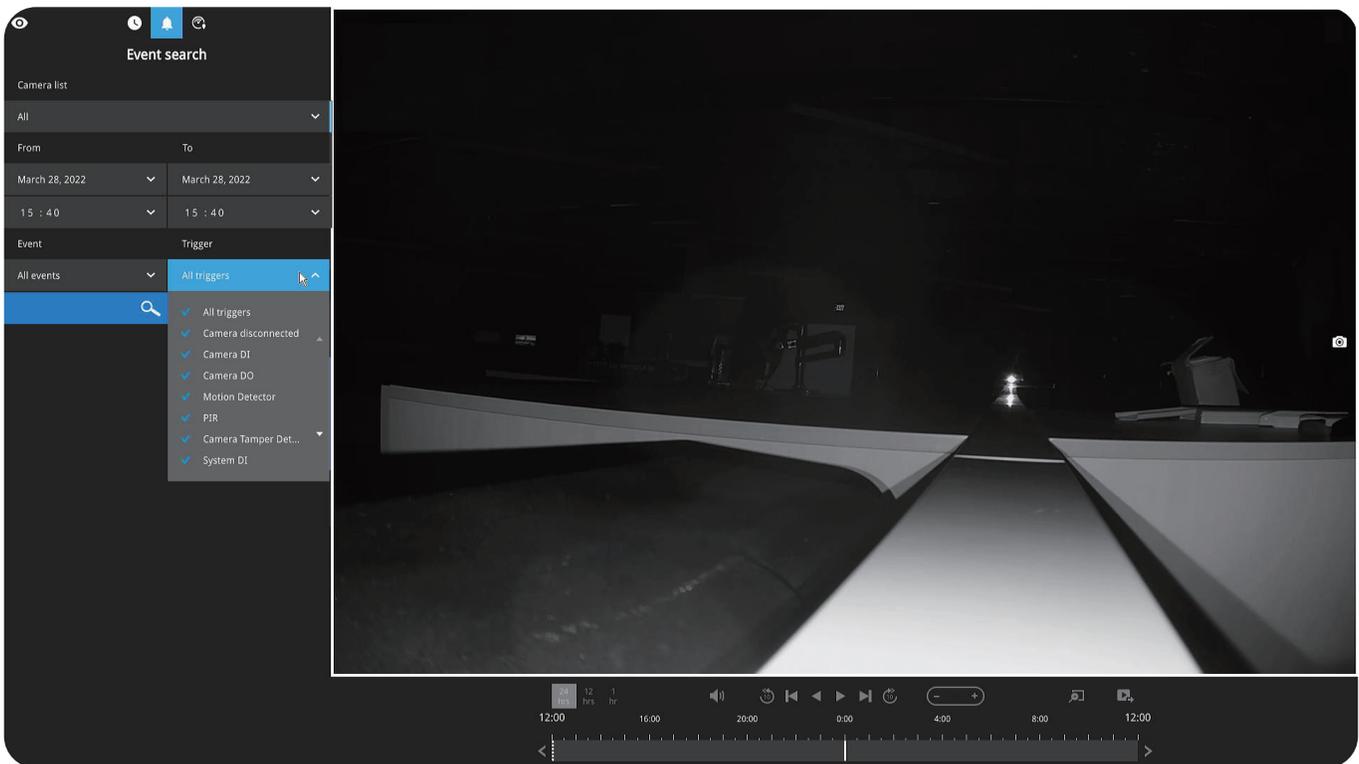


5-2-2. Past Events and Bookmarks

When you selected a day that events took place on a camera, the events will be listed on the Event panel.

You may then:

1. In Thumbnail or List View, click the **Play** button of the recorded video. The Playback window will then play back the video recorded by the time of the occurrence.
2. If you select the **Playback** button on the video window, the view will change to a full screen playback window.



If you set up multiple triggering sources on a camera, you can use the **Event Filter** button to find the alarms of a specific type.

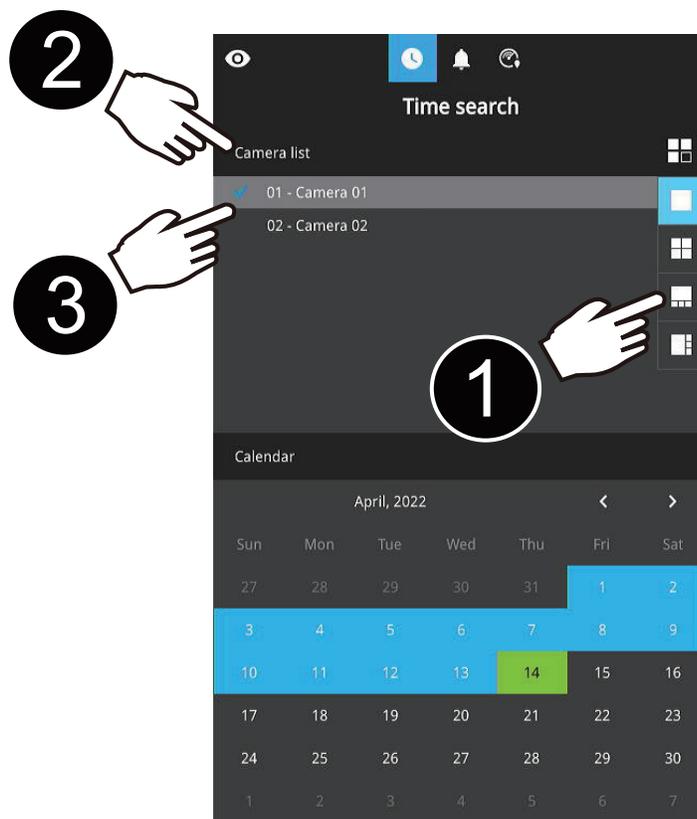
You can select the types of listed events using search criteria, such as *Motion Detector*, *Camera DI*, *Camera DO*, *Camera Tamper Detection*, *PIR*, etc. You can also select **All Triggers** to include them all.

5-2-3. Synchronous Playback

The NVR supports synchronous playback, which allows you to review video clips from up to four (4) cameras at the same time. These video clips will be retrieved simultaneously all playing for a specific point in time.

To perform synchronous playback:

1. Select a layout from the Layout panel.
2. Select up to four cameras from the camera list.
3. Select a camera to be the master and select the playback date.
4. Click on the **Time Align** button.



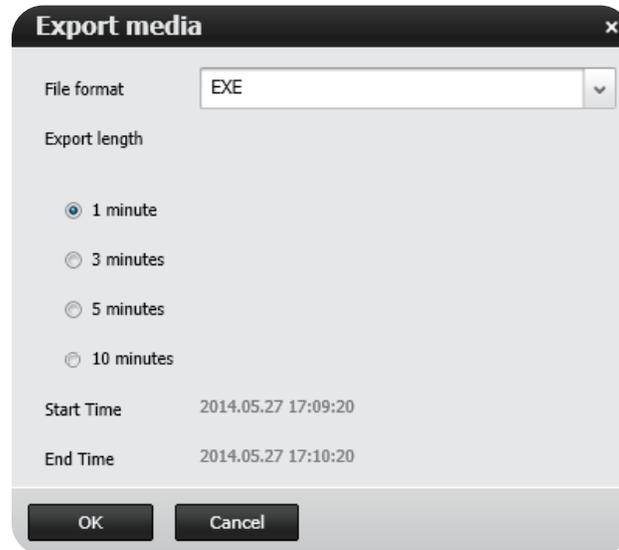
Note the following when using the Synchronous playback:

1. Only the alarms triggered on the Master camera will be shown. In the Synchronous mode, you can not find the alarms or bookmarks generated for other cameras.
2. The playback speed, selection of video clips and alarm playback of all cameras are made synchronous.

5-2-4. Export media

To export video clips:

1. Click on the **Export** button at the bottom right of the video image, while the Playback window is playing a video section of your interest.
2. An *Export media* window will prompt.



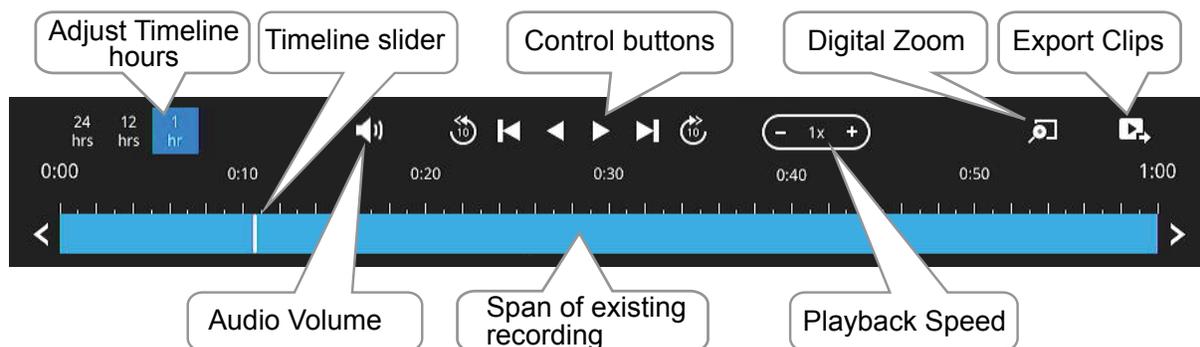
The file will be exported and compressed as a .tar file.

The file name will be *CamearName_Date_Time_Clip.tar*.

3. Select the directory to where to save the file.
4. Use an appropriate decompression utility to uncompress the file. Once uncompressed you can use the supplied VMS viewer application provided in the file or VLC to view the video export.

5-2-5. Time Search

Use the time line area to find the nearest recording from a specific point in time.



If the need arises to more accurately pin-point the occurrence of an event, you can use the Timeline zoomer and the slider thumb on the time line for a closer view into the existing recording.

	Timeline hours. Use this option to reduce or increase the hour(s) [1, 12 or 24 hours] displayed in the timeline.
---	--

In the *Synchronous* play mode, a change to the zoomer will be reflected by all synchronously playing view cells.

If recordings take place by an event-triggered recording, the intervals between recordings can be down to 1 minute and the individual recordings will not be easily discernible. In this situation, you can mouse over the timeline to pin-point individual recording instances.

Safety and Compatibility

Federal Communications Commission (FCC) Statement

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 instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



Warning:

[A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.]

[Use only shielded cables to connect I/O devices to this equipment.]

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

[]: depend on EUT condition.

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Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

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If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

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This symbol is only valid in the European Union. If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

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