VIVOTEK

A Delta Group Company
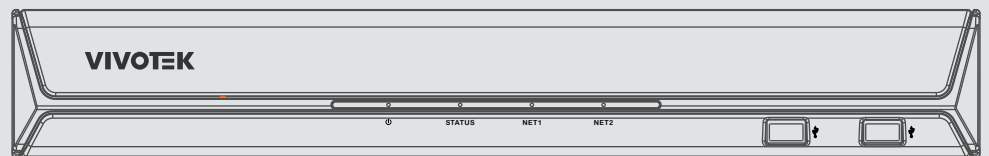
ND9442P

ND9542P

Network Video Recorder
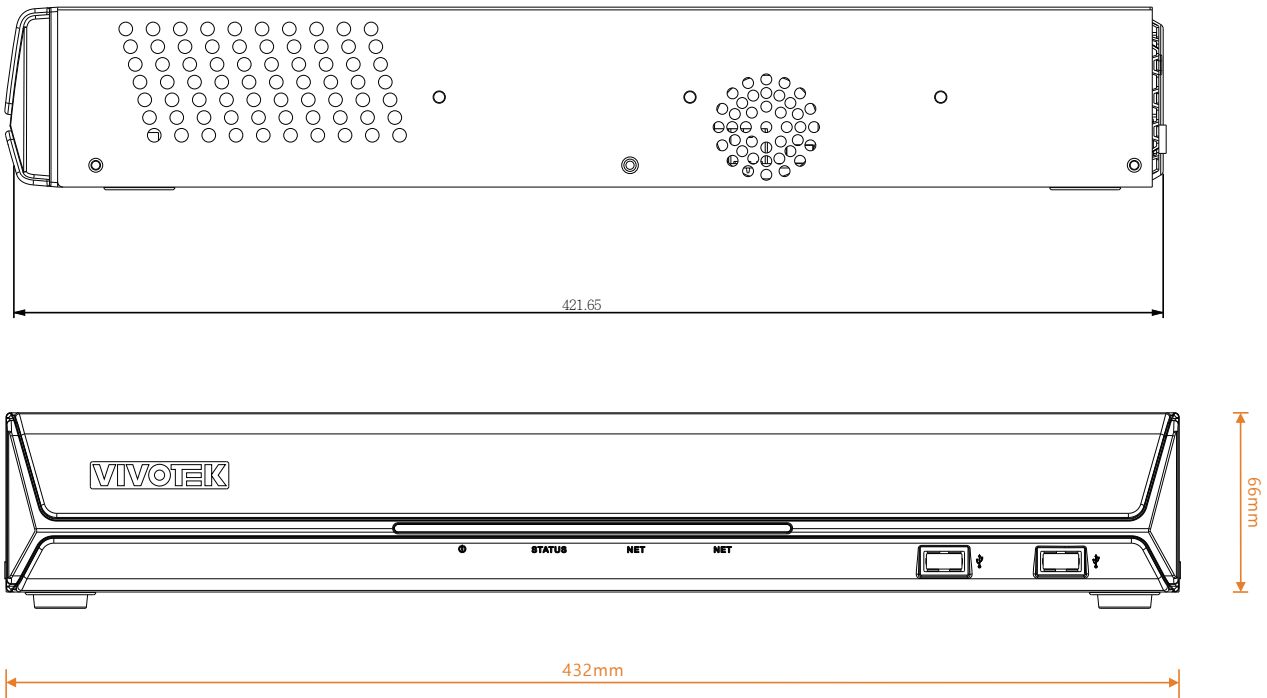
User's Manual

H.265/H.264 • 16-/32-CH • 4 HDD • ONVIF • PoE
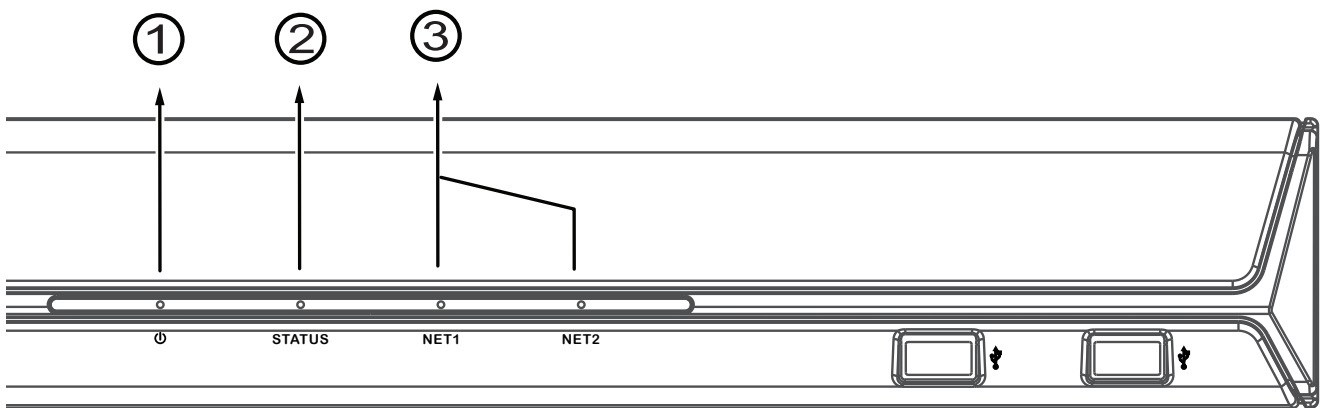HDMI/VGA Monitor Display

VIVOTEK

STATUS   NET1   NET2

Rev. 1.2

Chassis Dimensions

421.65

66mm

432mm

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1 Physical Description

⚫ **Front View**

① ② ③

⏻   STATUS   NET1   NET2

1	System power status
2	System status LED
3	Network uplink status/activity LED

⬤ **Rear View**
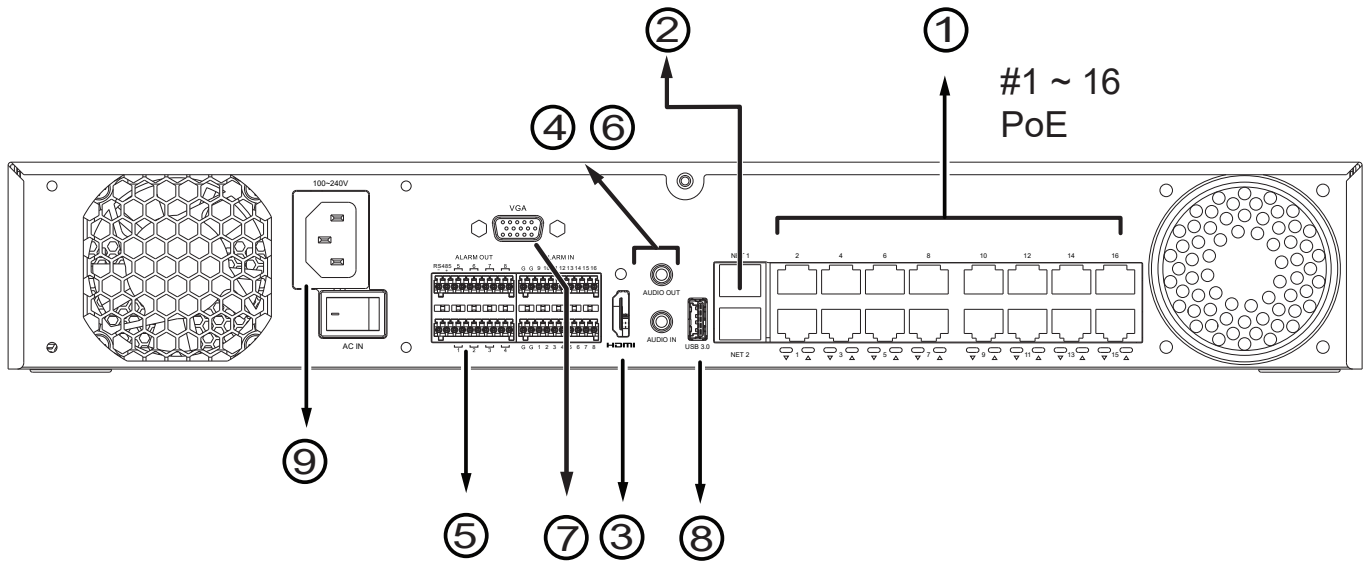
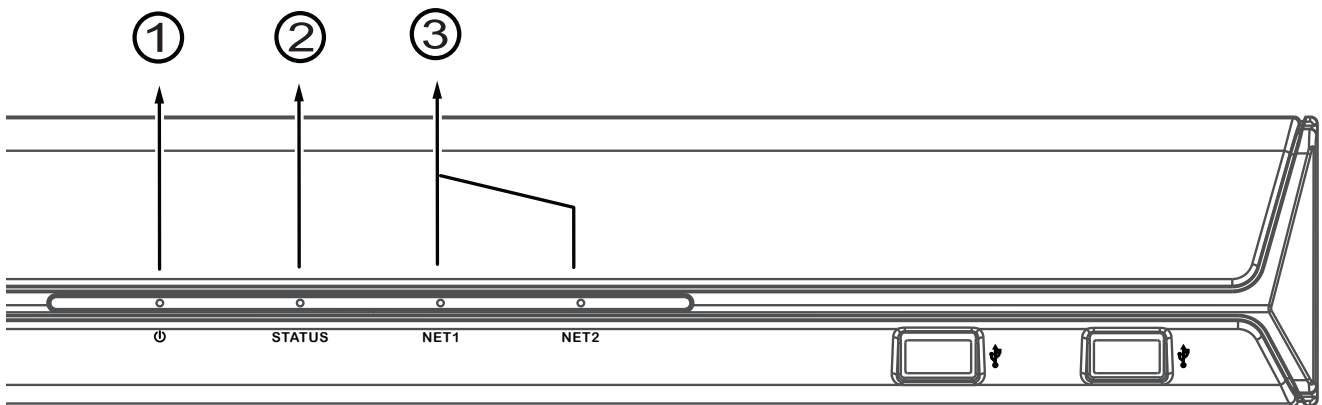| 1	PoE ports # 1 to #16	6	Audio OUT
2	RJ45 port - GbE uplink	7	VGA
3	HDMI	8	USB port 3.0
4	Audio IN	9	Power socket
5	DI/DO terminal block		

⚠ **IMPORTANT:**

The total power budget for the NVR's PoE ports is 200W.

Please ensure the camera PD specification meet the NVR PSE power supply specification be-fore installation.
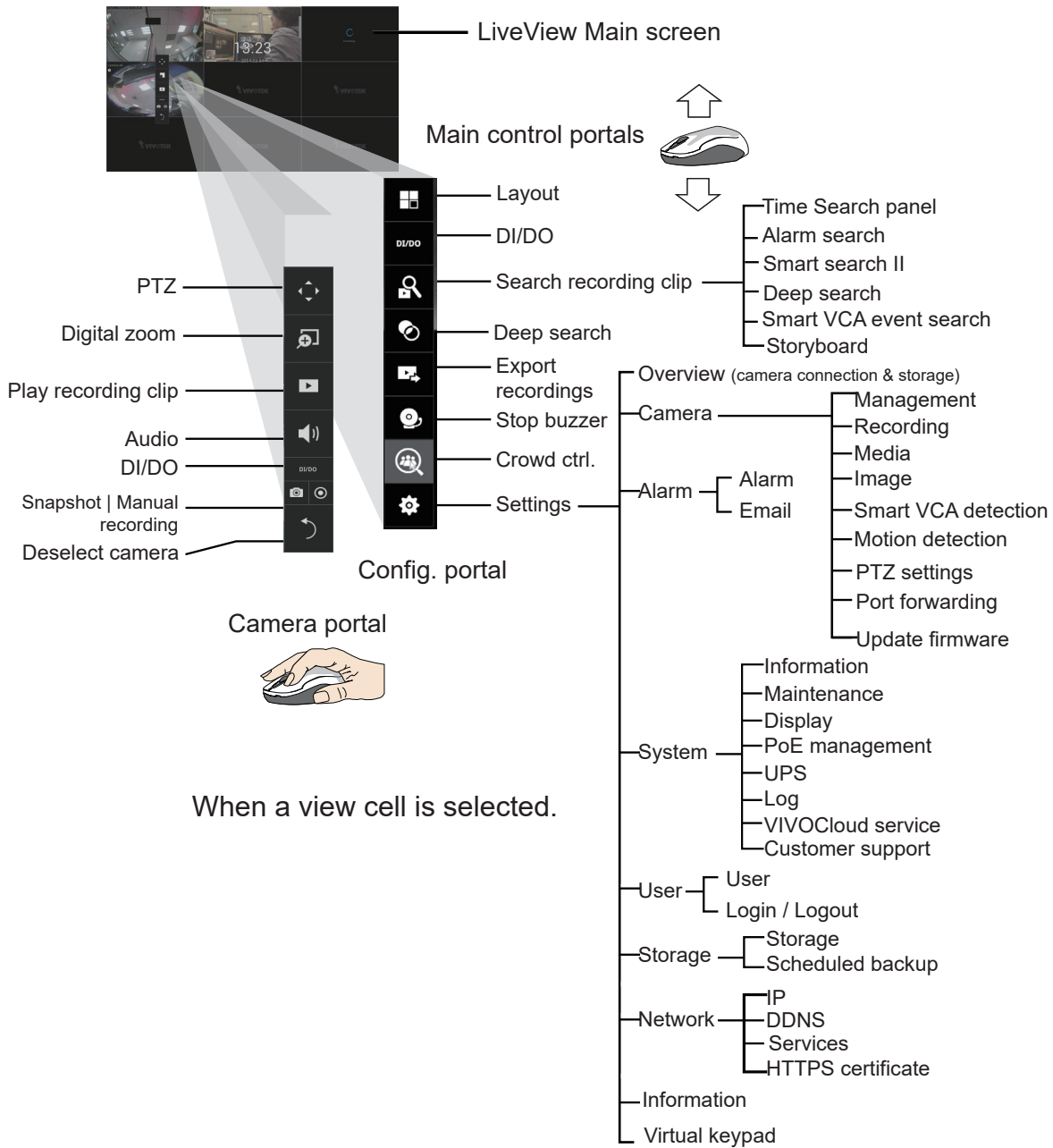
5 LED Indicators

Name	Behavior		Definitions
1. **Power** LED	1	Solid Red	The NVR is powered on.
	2	OFF	The NVR is powered off.
2. **Status** LED	1	Constant Green	System ready.
	2	Blinking Green every 1 second	Updating firmware or device pack.
	3	Constant Red	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. **NET** LED	1	Blinking Amber	Data is being transmitted or received.
	2	OFF	The Ethernet uplink is disconnected.

Section 1: Management over a Local Console

Chapter 2: Introduction to the Local Console Interface
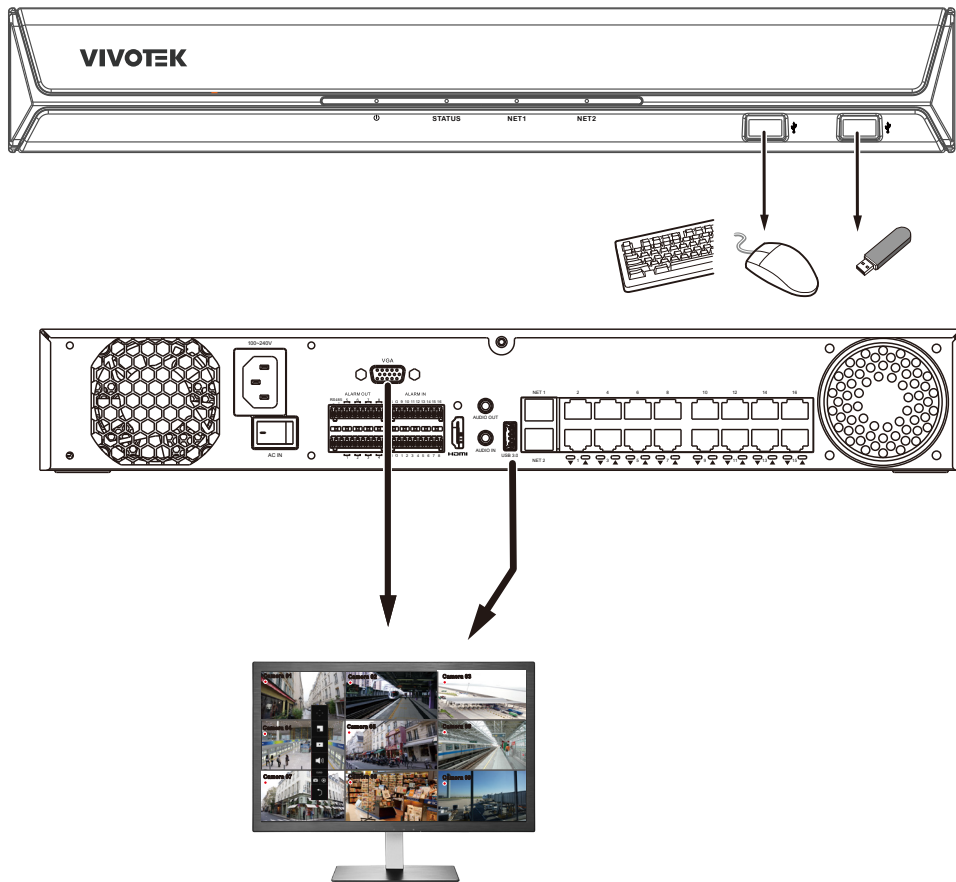
By default, a live view appears on an HDMI monitor. The interface architecture of the local console is illustrated as follows:

LiveView Main screen

Main control portals

Layout
DI/DO
Search recording clip
Deep search
Export recordings
Stop buzzer
Crowd ctrl.
Settings

PTZ
Digital zoom
Play recording clip
Audio
DI/DO
Snapshot | Manual recording
Deselect camera

Config. portal

Camera portal

When a view cell is selected.

Time Search panel
Alarm search
Smart search II
Deep search
Smart VCA event search
Storyboard

Overview (camera connection & storage)
Camera
— Management
— Recording
— Media
— Image
— Smart VCA detection
— Motion detection
— PTZ settings
— Port forwarding
— Update firmware

Alarm
— Alarm
— Email

System
— Information
— Maintenance
— Display
— PoE management
— UPS
— Log
— VIVOCloud service
— Customer support

User
— User
— Login / Logout

Storage
— Storage
— Scheduled backup

Network
— IP
— DDNS
— Services
— HTTPS certificate

Information

Virtual keypad

After you finish configuring using a Camera portal, click again on the camera view cell to reveal the main control portals.
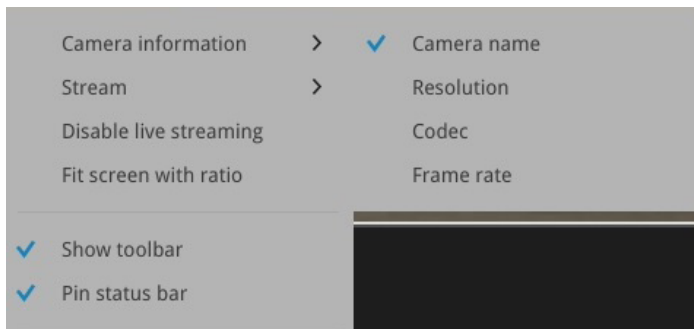
2-1. How to Begin

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 65.

You can also hide these portal toolbar. Right-click on the LiveView screen to display the option.

Camera information	>	✓ Camera name
Stream	>	Resolution
Disable live streaming		Codec
Fit screen with ratio		Frame rate
✓ Show toolbar		
✓ Pin status bar		

2. How to access the Camera Portal?

Single click to select a view cell, the Camera Portal will appear. The system automatically detects the characteristics of an individual camera when you select a view cell.
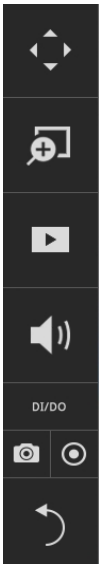
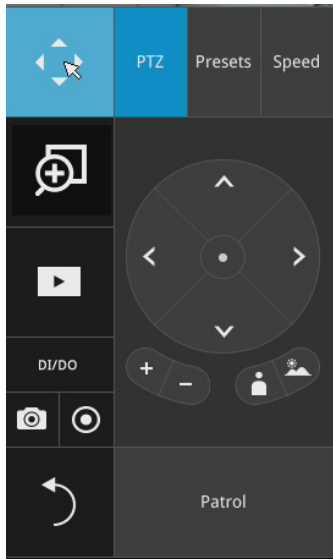This portal appears with a camera that supports mechanical PTZ.

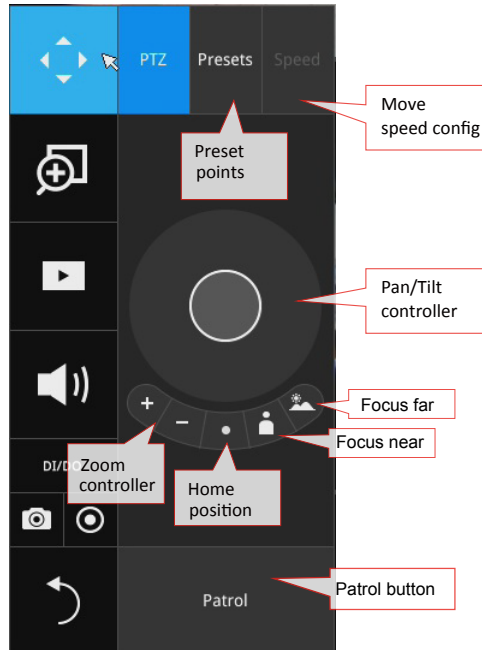This portal appears with a camera that does not support mechanical PTZ.

> **🔆 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

Move speed config

Preset points

Pan/Tilt controller

Focus far

Focus near

Zoom controller

Home position

Patrol button

PTZ presets: If your PTZ cameras have preset locations, click on the 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?

3-1. 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.
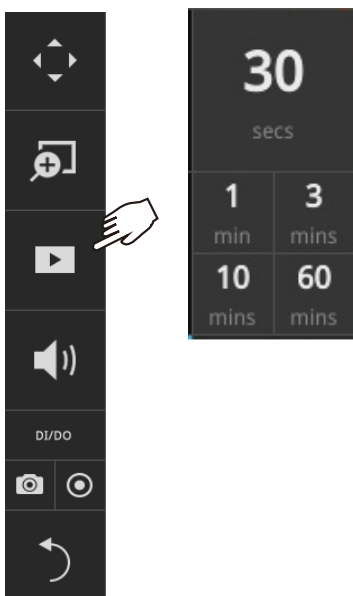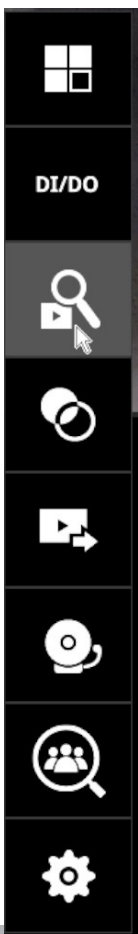

Select a time value by a single click. You will be prompted for User name and Password, enter **admin** and **admin** (the default user name and password), and then click **Login**.
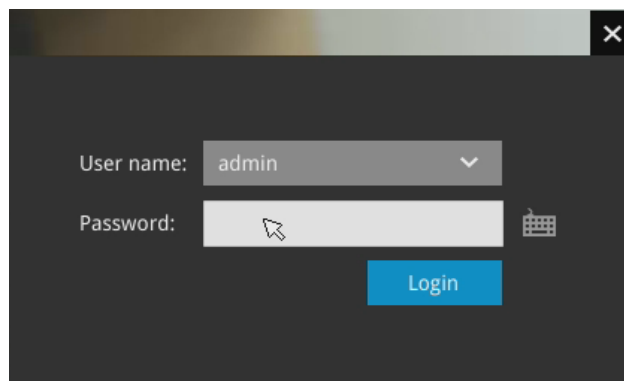
The **Playback** window will prompt, and a playback begins from the point in time you selected, e.g., 30 seconds ago. This function allows you to quickly review what has just happened.
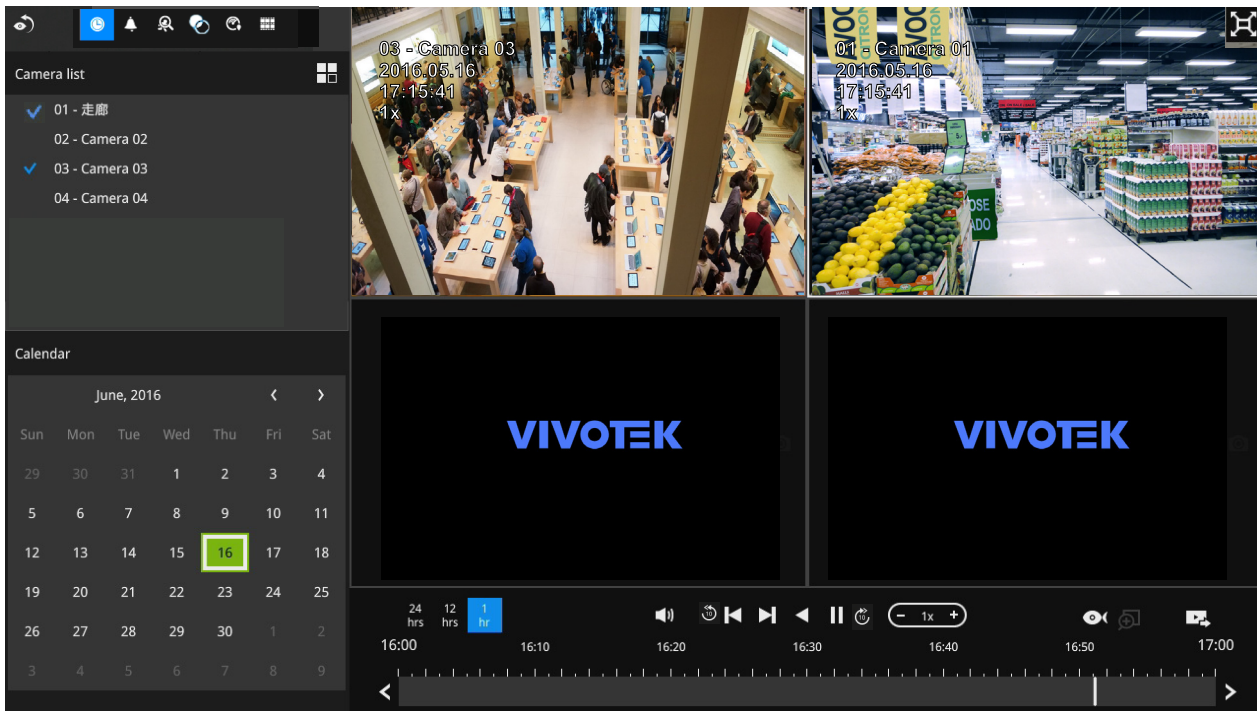

3-2. Another way to access past videos is to open the **Search recording clips** window. Move your mouse cursor to display the **Configuration Portal** (without selecting any view cell). Click on the Search recording clips button. Please refer to page 66 for more information about the search functions.

You will be prompted for User name and Password, enter **admin** and **admin** (the default user name and password) and click Login.

It is highly recommended to change the password after you log in.
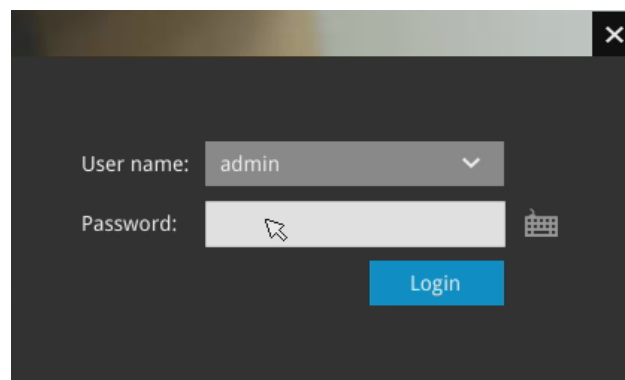
4. How to recieve system alarm?

Please refer to page 129 for how to configure system alarm triggers. When the alarm is triggered, e.g., 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.
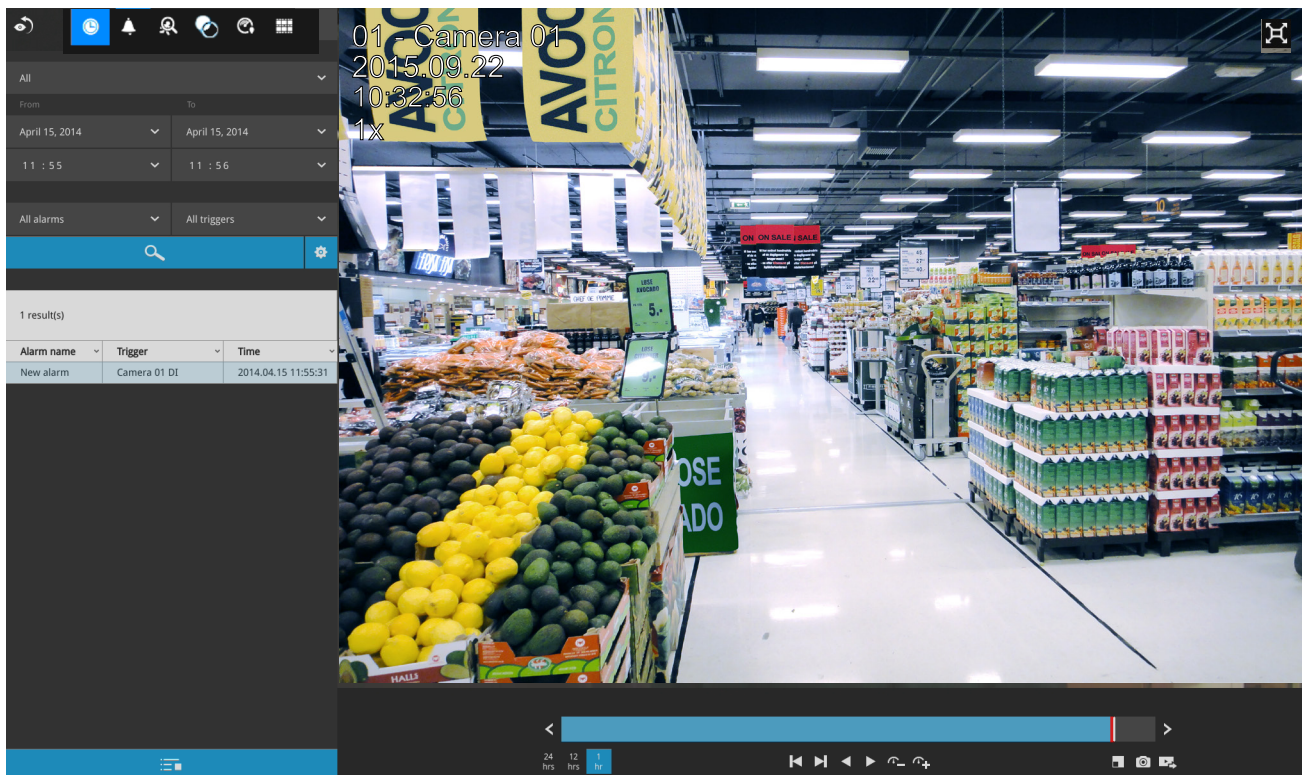
2-2-2. Digital zoom Panel

Digital zoom is a function that provides digital zoom into a live video. Be sure you 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.
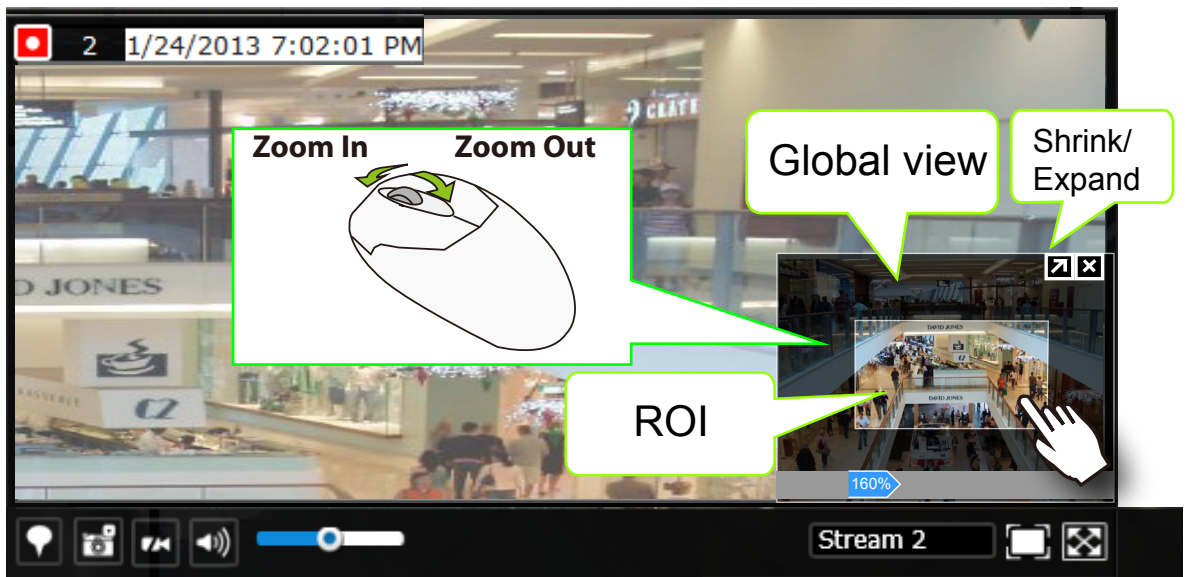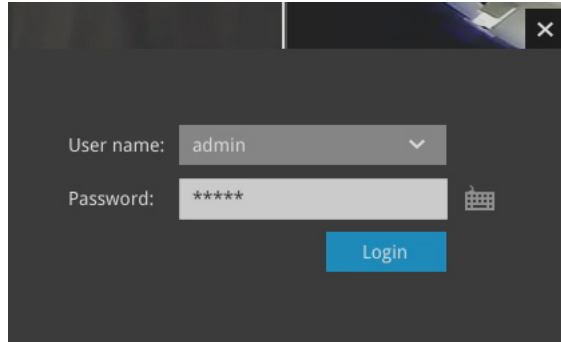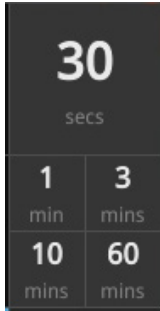

Note that not every camera supports the PiP function.

## 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 secs, 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, e.g., 30 seconds ago. This function allows you to quickly review what has just happened.
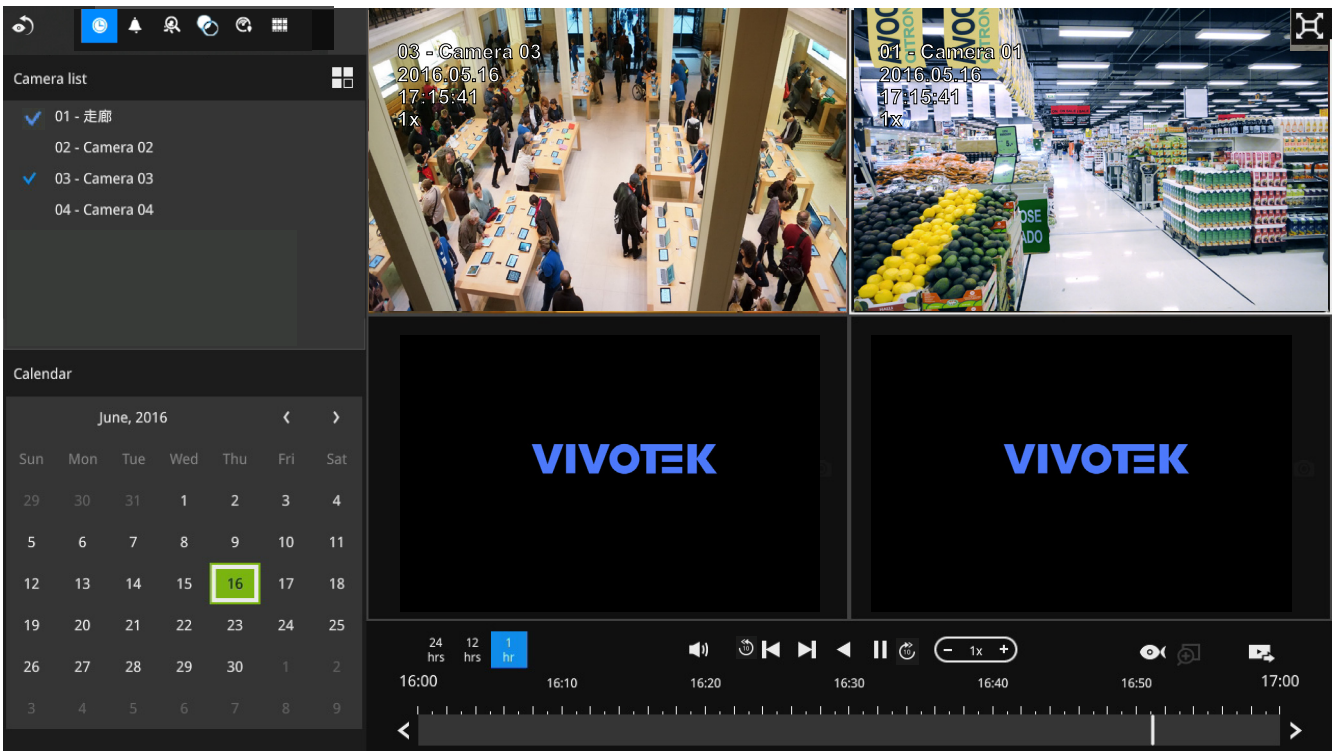
2-2-6. Right-click Commands

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. **Stream**: Select to display the main or subordinate stream.
3. **Disable live streaming**: Choose to display snapshots on the screen instead. The snapshots are regularly replaced.
4. **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.
5. **Show VCA rule**: Displays the Smart VCA rules you previously configured via a web console.
6**. Show tool bar**: You can hide the tool bars by deselecting this option.
7. **Pin status bar**: If selected, the status bar will constantly display on screen.
8. **Log in/Log out**: Log in to enable system configuration.
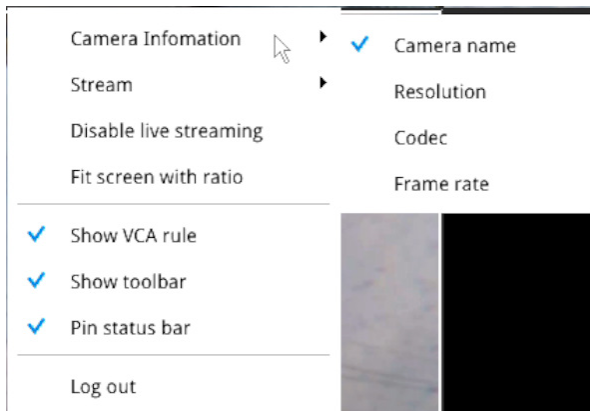
A time tab is displayed at the lower center of the screen. You can move your cursor to the lower center to display the time tab and the alarm panel.
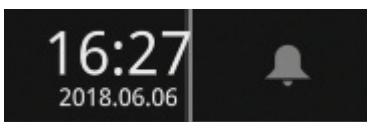
Chapter 3: Configuration Using the Local Console

The Main Control Portal

3-1. Layout

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

The local layouts:
1x1, 2x2, 3x3, 4x4, 1M+5, 1M+12, 1M+31(ND9542P only), 1P+3, 1P+6, 2P+3, 3V

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
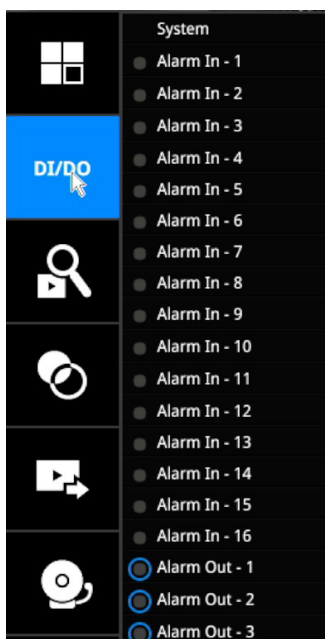
Click on the DI/DO button to display the full list of all DI and DO signals (whether they are connected or not) from all cameras in the configuration. If a digital input signal is triggered, e.g., the DI-4 on the left, its indicator will turn solid white.
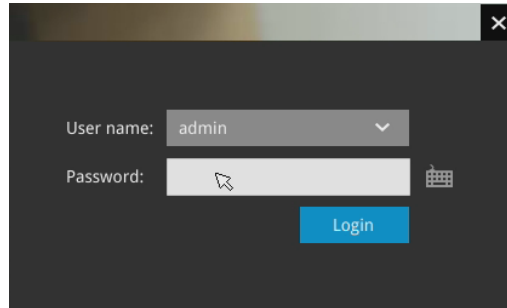
Note that you should click again to disable a DO after it is triggered. Otherwise, the DO will be constantly triggered.

3-3. Search recording clips

3-3-1. Basic Search
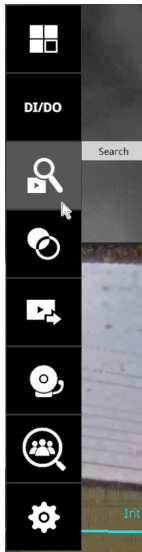
Click the button to start searching for recorded clips. A confirm box will prompt. Enter User name and Password to proceed.

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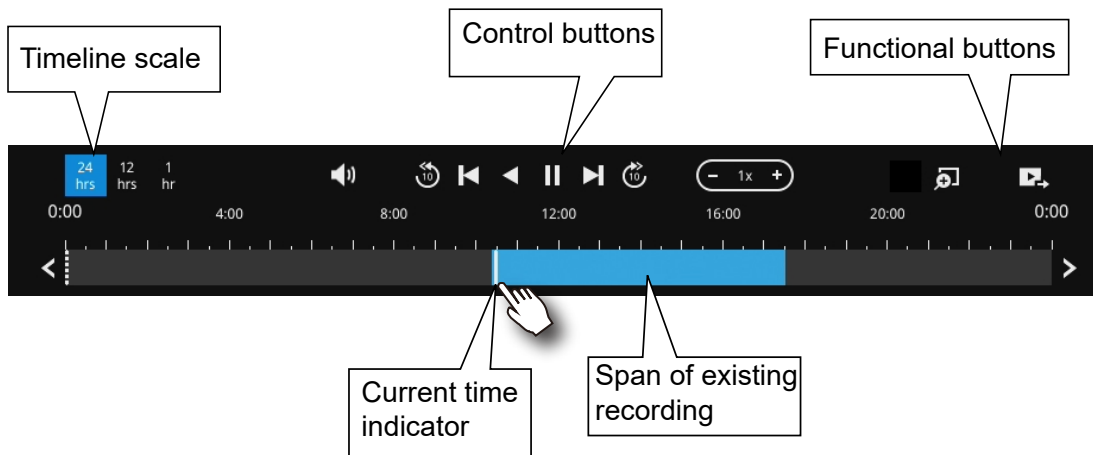Double-click on a day to begin playback and search.

The date highlighted in green indicates today, and the green indicator does not necessarily mean that there are recorded videos today.
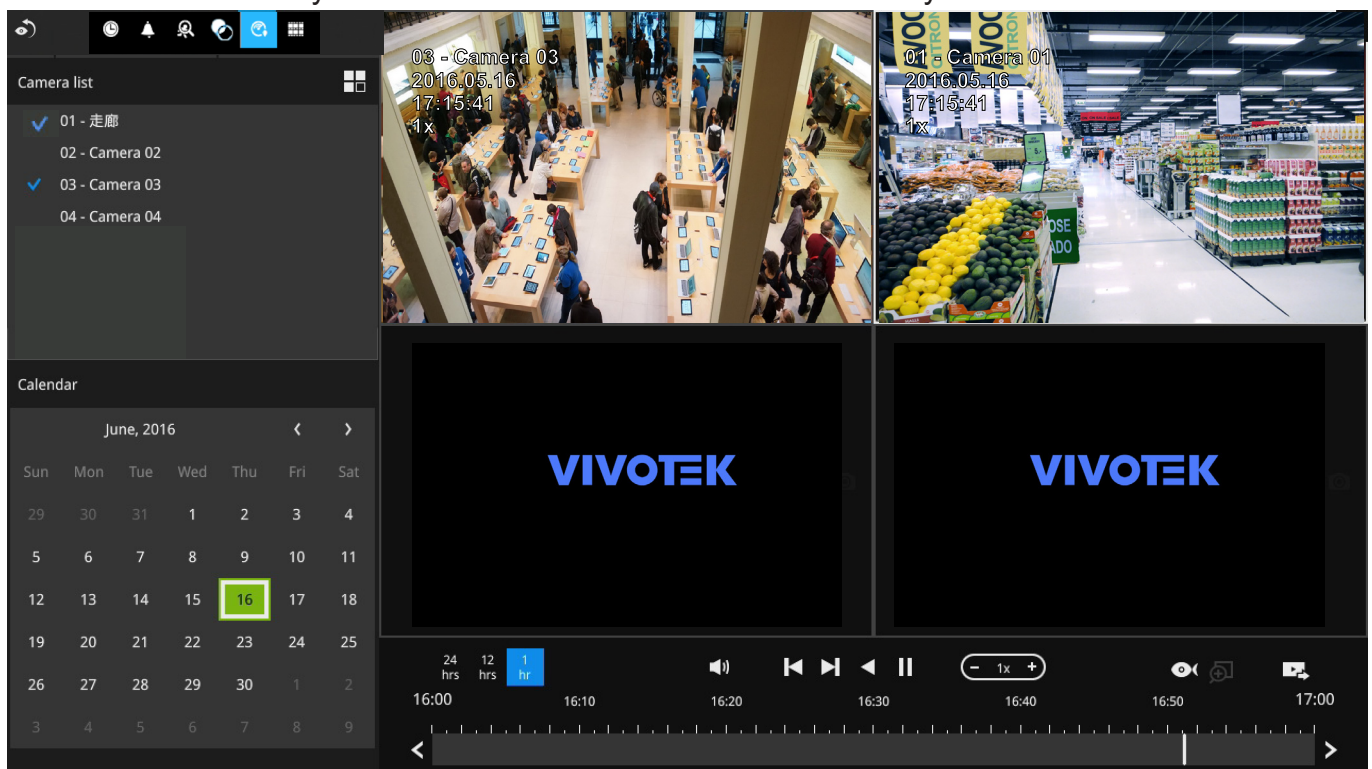
Use the layout button to adjust view cell arangement on screen. You can retrieve the recorded videos from a max. of 4 cameras at the same time.

Once you select to playback multiple cameras, the playback window will automatically turn 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.

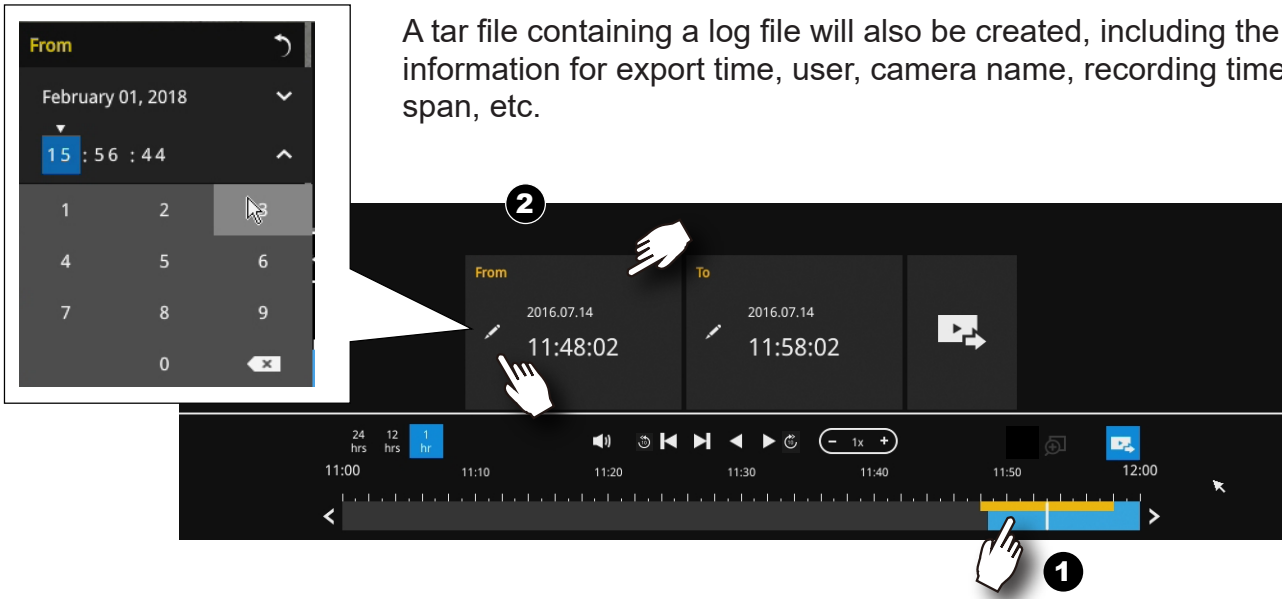The timeline bar enables quick skimming through the recording. Its functions are described as follows:

Timeline scale

Control buttons

Functional buttons

Current time indicator

Span of existing recording

Buttons	Description
24 hrs	Time scale selector. Use the buttons to select the span of time displayed on the tool bar.
(speaker)	Audio volume tuner.
(rewind 10)	Plays back from 10 seconds ago.
(prev)	Previous frame. (I-frame only)
(next)	Next frame. (I-frame only) After you paused a playback, use this button to browse video frame by frame.
(backward)	Play backwards.
(play)	Play. This button is available after you paused a playback.
(pause)	Pause.
(minus)	Each click on it speeds down by 1/2. The slowest speed is 1/16.
(plus)	Each click on it speeds up by 2x. The fastest speed is 16 times. The current playback status is indicated on the screen.
(zoom)	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)	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) | Snapshot. Takes a snapshot of the current FOV. The Snapshot button has been moved to the right-hand side of each view cell. |

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.

A tar file containing a log file will also be created, including the information for export time, user, camera name, recording time span, etc.

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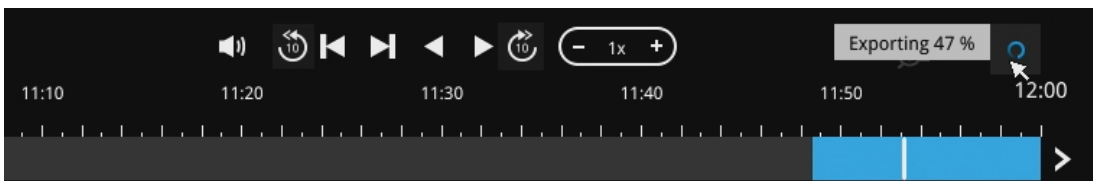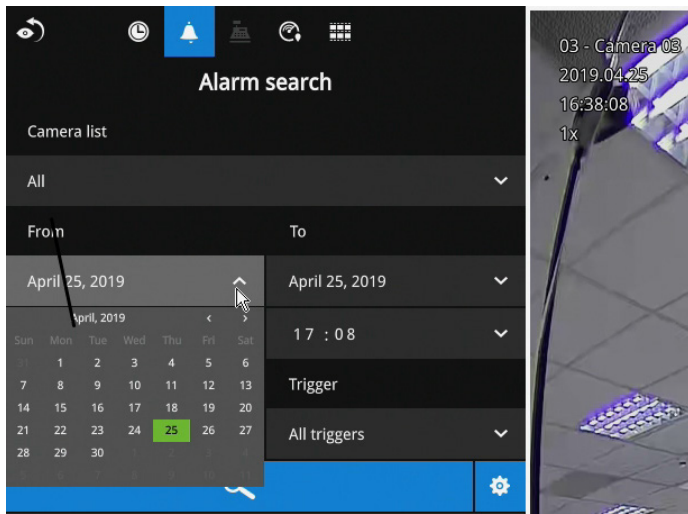

When completed, a message will display on screen.
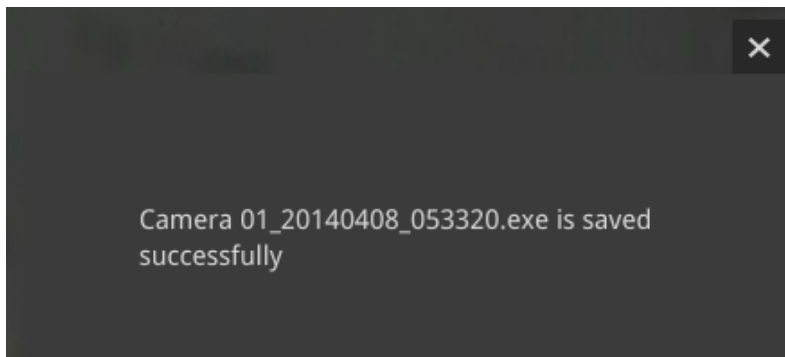
The default for export is 5 minutes before and 5 minutes after the point in time that is currently selected.

3-3-2. Alarm Search

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

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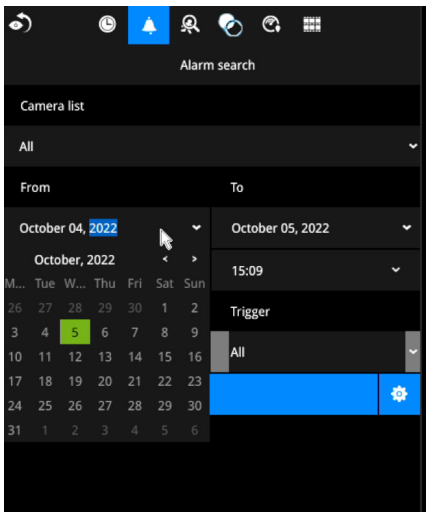
Use the combinations of these parameters to sort through the alarms.

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.
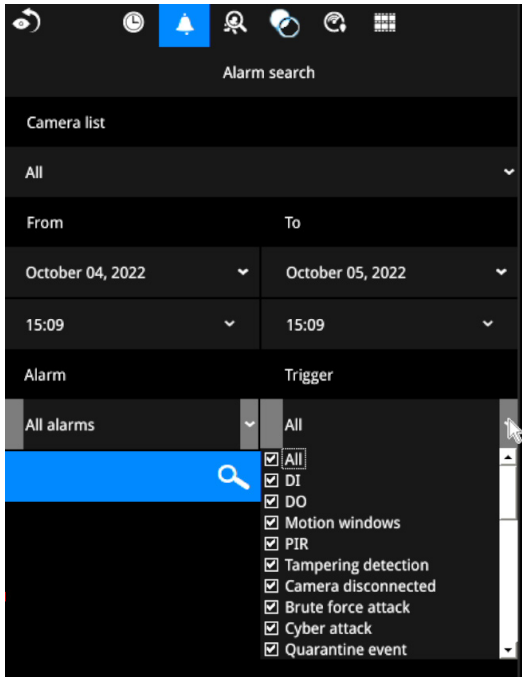
When done with the selection, click on the Search button. In the sample screen below, a list of alarms is displayed, and you can click on any of them to replay the moment when the alarm was triggered. The alarm-related recording will typically include a length of 5 seconds of pre-alarm and 20 seconds of post-alarm footage.
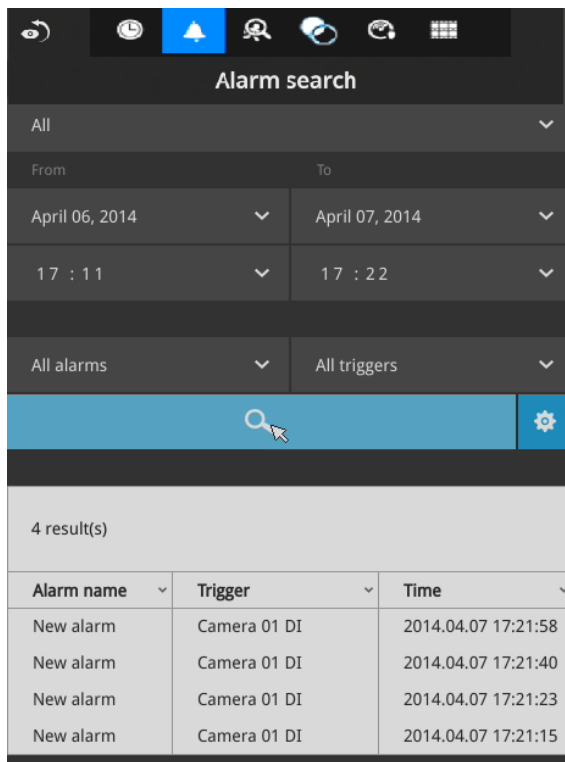
Up to 200 search result entries will appear. If more than 200 entries have been found, click on the New results button on the last entry page.

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

NOTE:

The NVR needs to store a database on the hard drives for keeping the Deep Search metadata. Such metadata will take up storage space, yet the database size will be smaller than Smart Search II.

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.
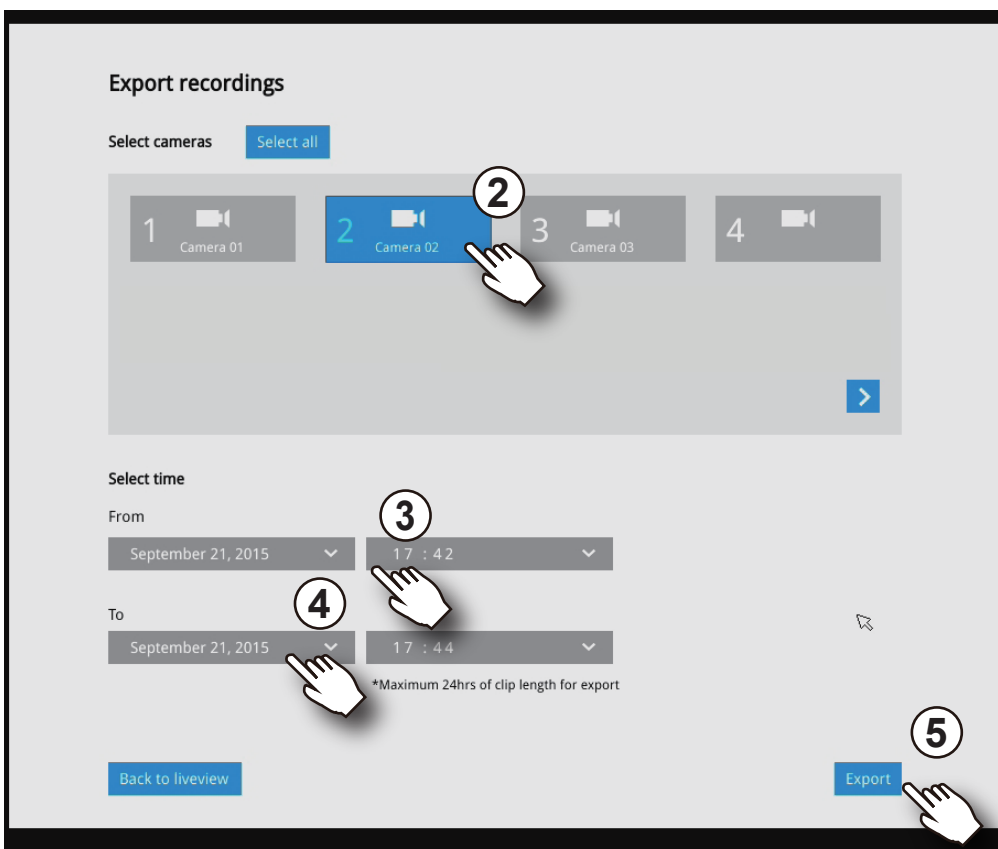
3-4. Export recordings

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. Users can select one or multiple cameras, select a period of time in which the recording took place, and then click export.

The max. 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 recoding time.
5. Click the Export button.

A tar file containing a log file will also be created, including the information for export time, user, camera name, recording time span, etc.

6. The Export progress will be shown.

Exporting...

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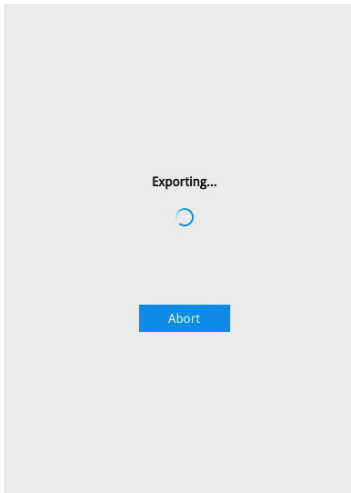
7. When the Export process is done, select to resume another export or go back to the live view.

Export successfully

Back to liveview   Export another recording
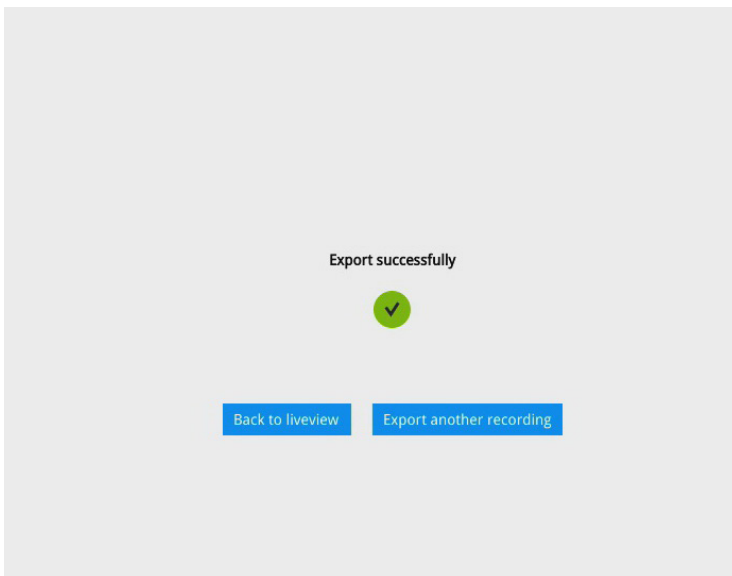
Note that the Export process can take a long time if the time span of the selected video is very long.

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 8 cameras in 2 2x2 layouts, the rotation can let you see the live views of all cameras by every few seconds.

If you have a 4K monitor, select the display resolution to 3840 x 2160.

You can also enable or disable the Alarm notification.
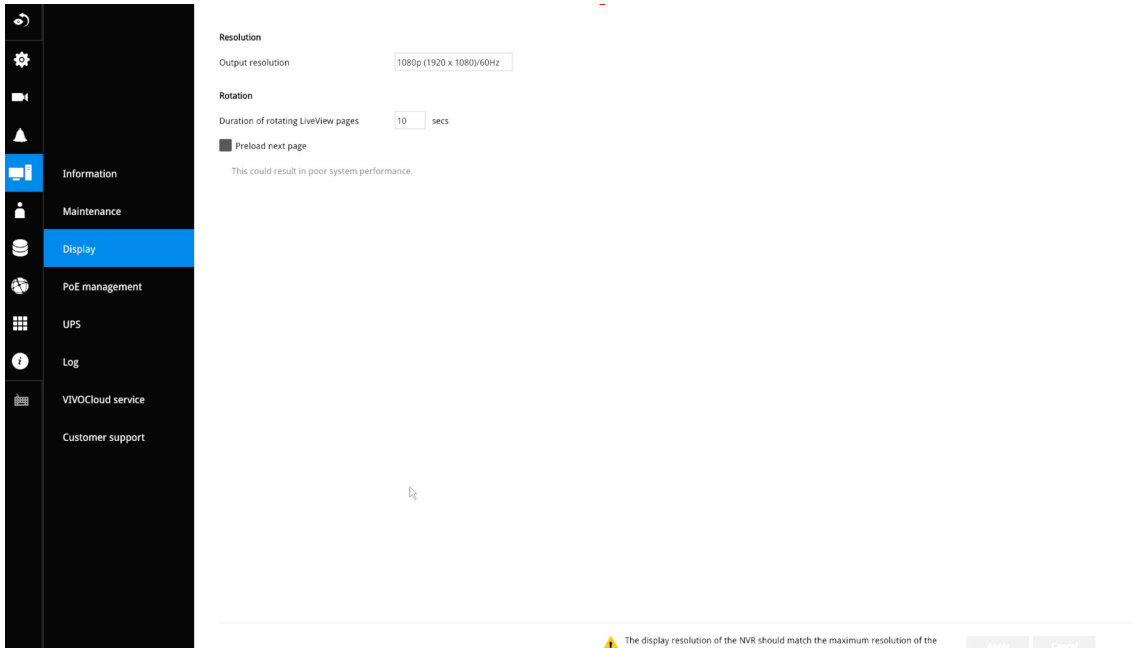
To enable the rotate function, click on the rotate button on the layout panel.
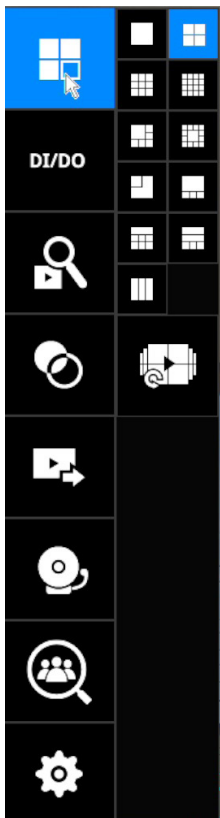
3-5-22. Settings–Storage

The storage page displays the volume information including physcial 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.
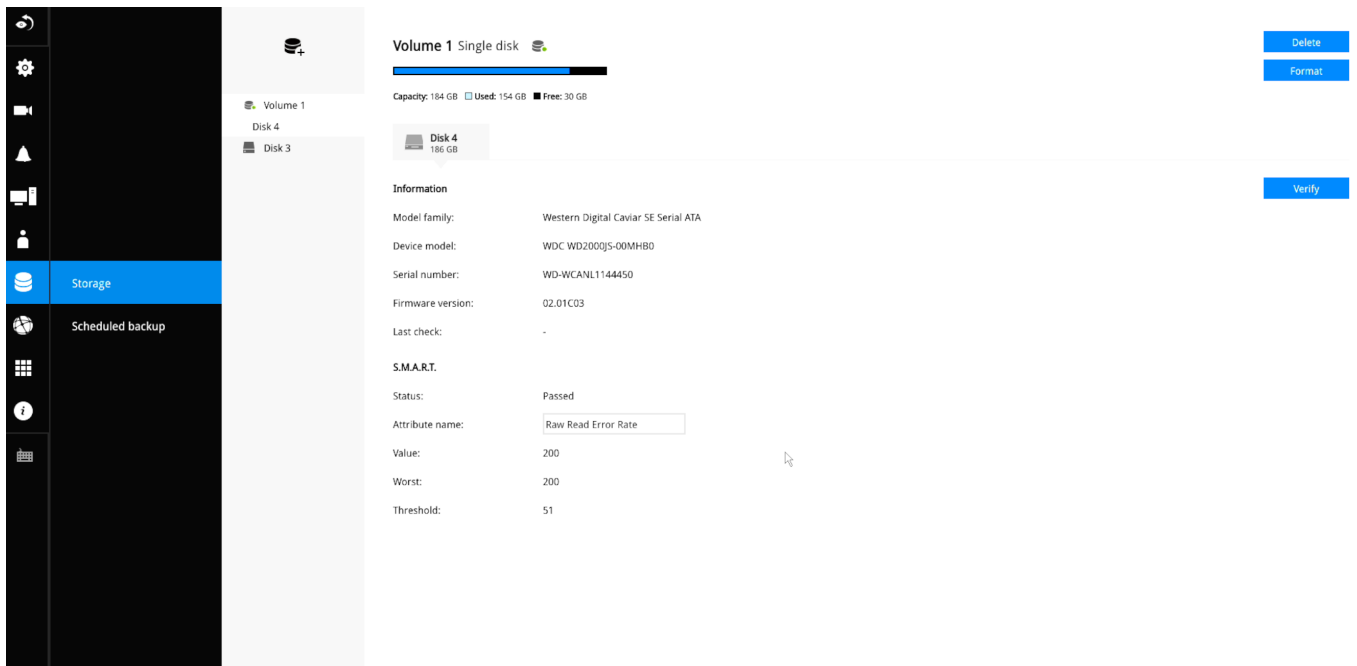
Disk Information:

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.
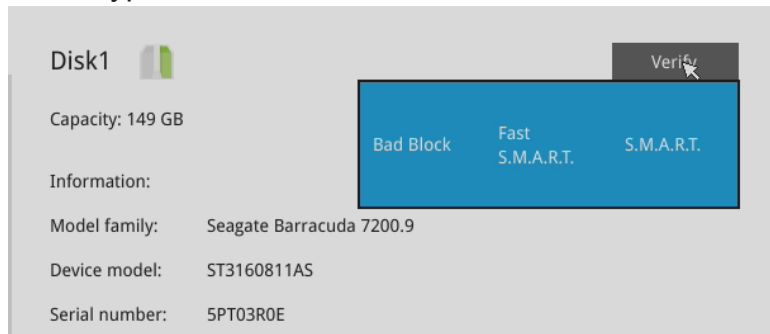**Raw value**: The detected parameters for that attribute.
Status: The judgement made to deem the current reading as OK or failed.
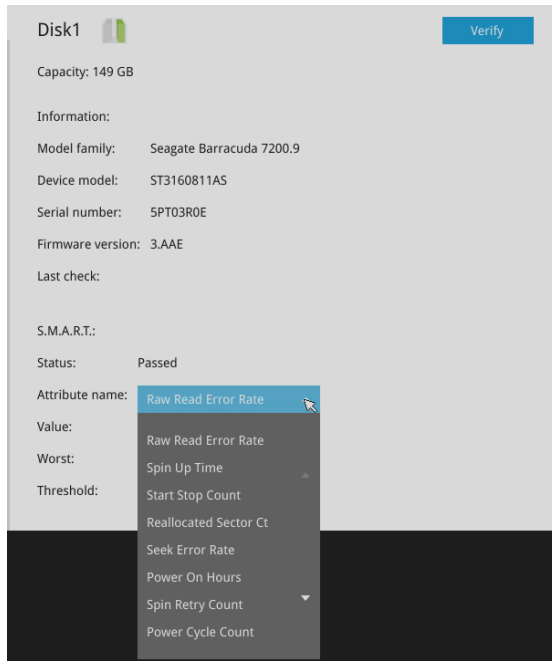
Verify:

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.

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:**

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.

Restore volume:

Volume restoration allows users to backup and restore recording files, logs, and other data from a pre-established volume with hard disks on an NVR device to another NVR device. For example, HDDs on an NVR can apply the restore volume feature to reserve the original data (such as videos and logs). These HDDs can then be installed on another NVR. For example, NVR A has three HDDs using RAID0. You can select these three HDDs from NVR A, then restore these three HDDS on NVR B (even using a different slot arrangement; without any volume created).
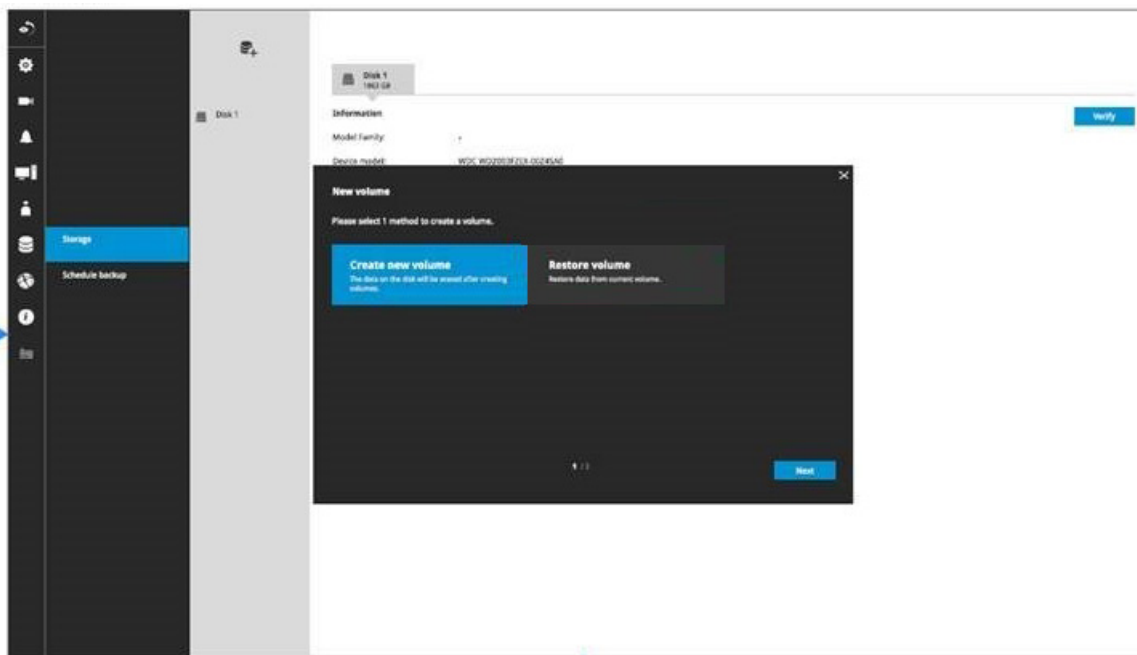
NOTES:

1. This NVR supports volume restoration regardless of the hard disk's slot position on the original NVR. This function only supports data restoration between ND9442P, ND9542P, ND9326P, and ND9426P models. Data restoration is limited to the maximum number of hard drives supported by the target device.
2. When restoring data to NVR B, please select the hard disk and configure the RAID settings to match the original configuration on NVR A.
3. Clear the target device before starting the restoration process to avoid data conflicts.
4. The backup process supports one volume at a time.

5. The following types of data can be backed up with the volume restoration:

- System logs and customer support logs
- Alarms (alarm results only, excluding alarm settings)
- Recording data, including all video recordings and metadata
- Search results (encompassing alarm search, smart VCA event, smart search II, storyboard, attribute search, rule search, TMIS search, bookmark search, and counting data)