ND8312 - wired
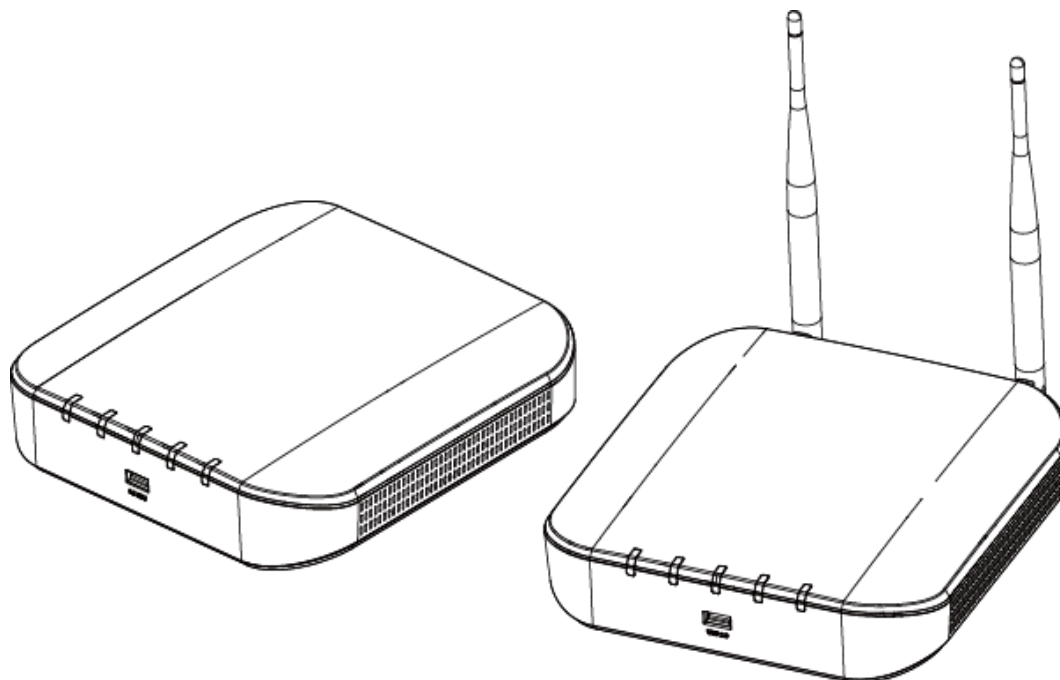
ND8212W – wireless Network Video Recorder

Hardware Installation Guide

NOTE:

The latest VIVOTEK 9xxx series supports H.265 encoding. If the H.265 cameras are attached to the NVR, you need to manually configure its video streaming codec to H.264 in order to properly stream video.

In a complicated wireless network environment where many WiFi APs reside, transmission latency can occur due to the interference of wireless signals or overlapped channels.

Read Before Use

The use of surveillance devices may be prohibited by law in your country. The Network Video Recorder 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 Video Recorder 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 Video Recorder 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, video recording, general security/surveillance, etc. The Configuration chapter suggests ways to best utilize the Network Video Recorder and ensure proper operations. For creative and professional developers, the URL Commands of the Network Video Recorder section serves as a helpful reference to customizing existing homepages or integrating with the current web server.

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Package Contents

■ ND8212W (wireless) or ND8312 (wired version)	■ a Mouse
■ Power adapter	■ Screws and HDD brackets
■ Quick Installation Guide	
■ 2x wireless antennas	

Introducing the Network Video Recorder

VIVOTEK ND8312 and ND8212W series is a compact Linux embedded 8-CH or 4-CH standalone desktop NVR designed for any small-scale video surveillance installation. The series features ease of installation, and facilitates "One Button Setup" with its plug & play and auto setup functionality. With a wireless 2.4Ghz/5Ghz connectivity, wireless cameras can easily connect and record to the ND8212W NVR.

The ND8312 is the wired version.

Supporting the HDMI local video output, users can control the GUI OSD interface via mouse & keyboard, eliminating the need for a separate PC to search video or to playback from the NVR. The new local display design - Auto Adaptive Stream will dynamically modify Stream 2 resolution of a camera to best fit the display resolution according to the layout type, resulting in an efficient display, while maintaining superb image quality.

Together with the VAST CMS software, users can set up an easy-to-use IP surveillance system with ease. VIVOTEK also provides the mobile application, iViewer or VIVOCloud, for both iOS and Android handheld devices, enabling users to monitor live video anytime, anywhere.

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 the 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~ 1.5A, 60-50Hz**; the max. consumption: **15.6W** (DC12V, 3A)
- 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.
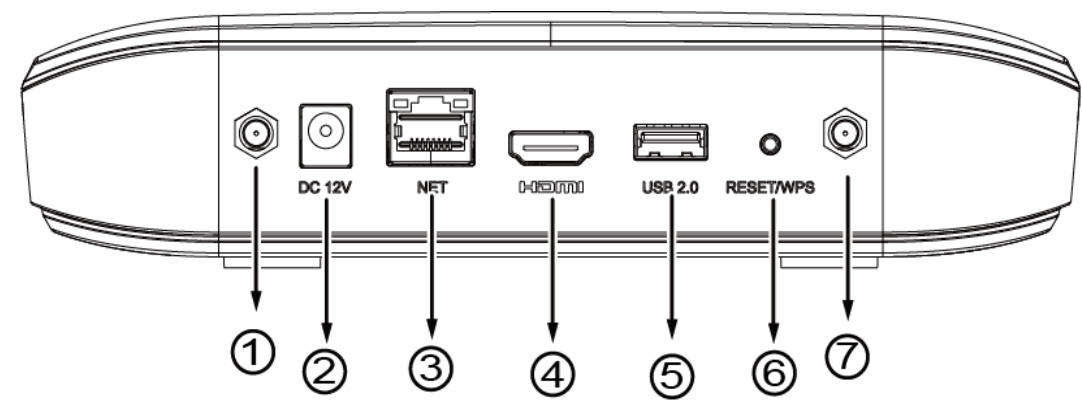
Chassis Dimensions
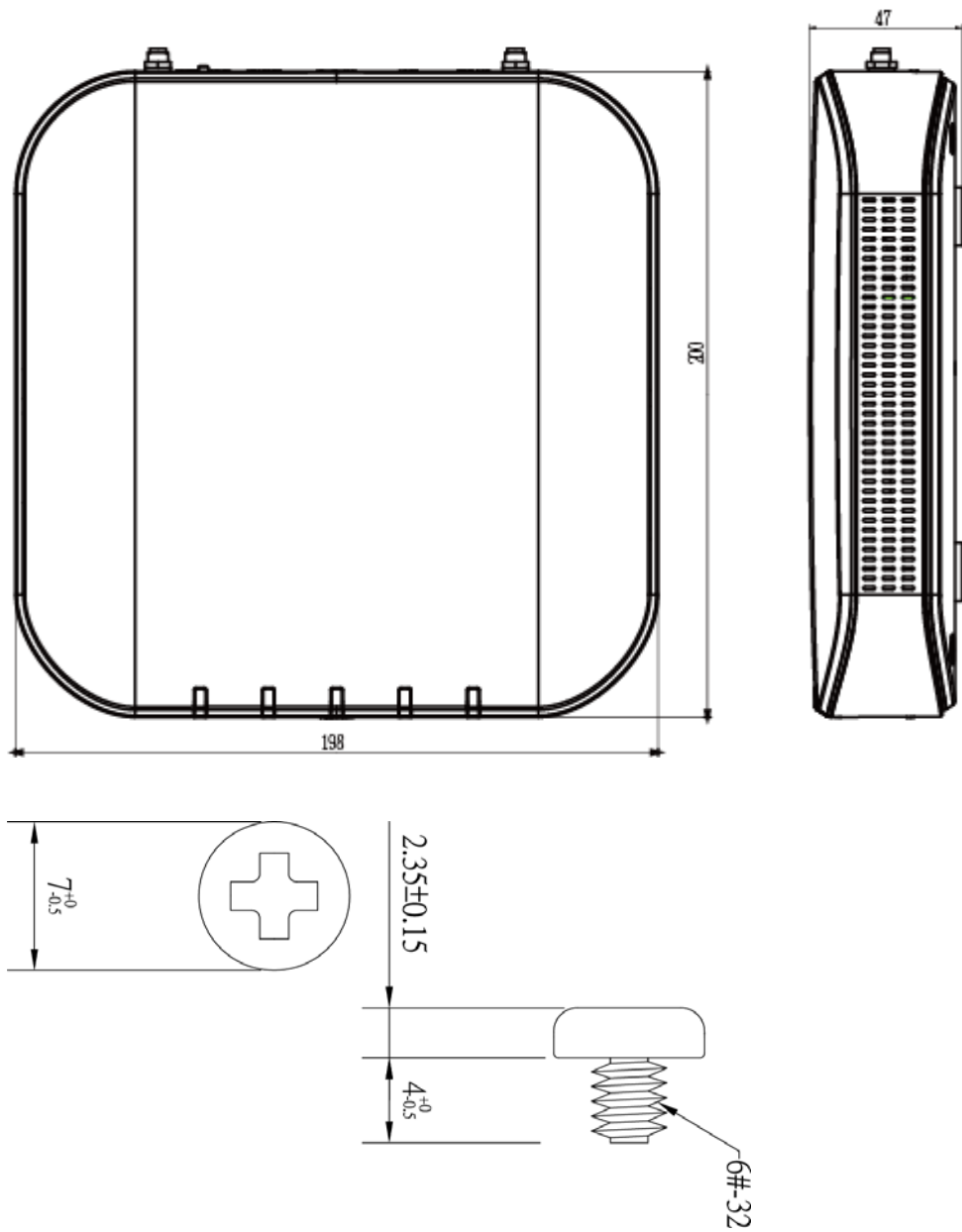
Physical Description
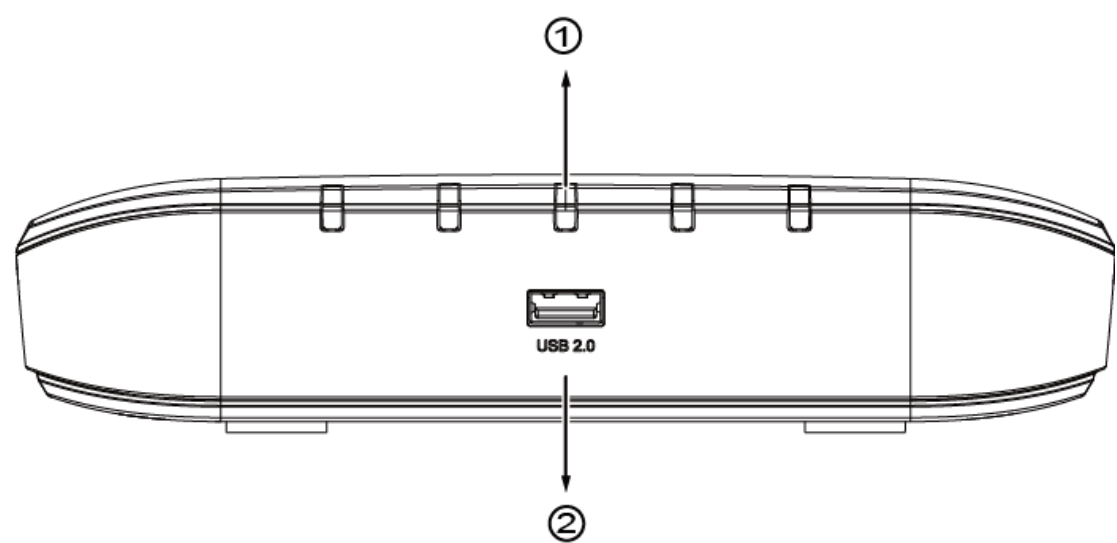
1	LAN and PoE activity LED: Please refer to page 28 for LED definitions.
2	USB 2.0 port

Rear View

The difference between the ND8212W and ND8312 is the antenna. The ND8312 comes without the antenna.

1	Antenna connector	5	USB port
2	Power socket (DC12V, 3A)	6	WPS/Reset button
3	10/100Mbps uplink port	7	Antenna connector
4	HDMI		

It is important to leave a clearance of 10cm around 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

SATA hard disk(s) are user-supplied. The network video recorder can readily accommodate most of the off-the-shelf SATA hard drives.

1. Use a Phillips screwdriver to loosen the retention screws from the bottom of the chassis. Remove the top cover.
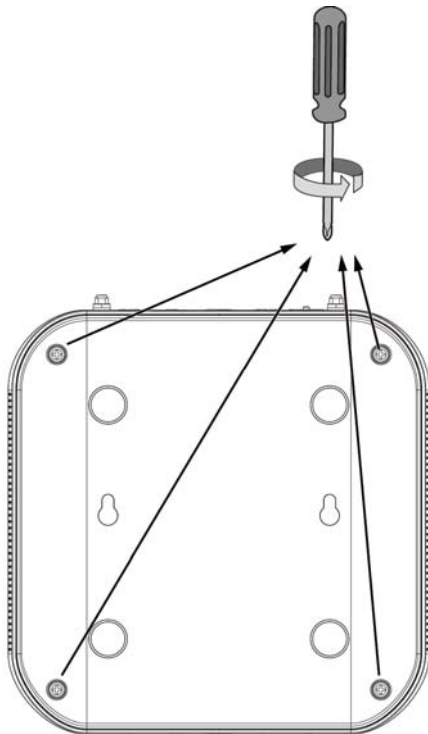
2. Secure the HDD brackets to the hard drive.
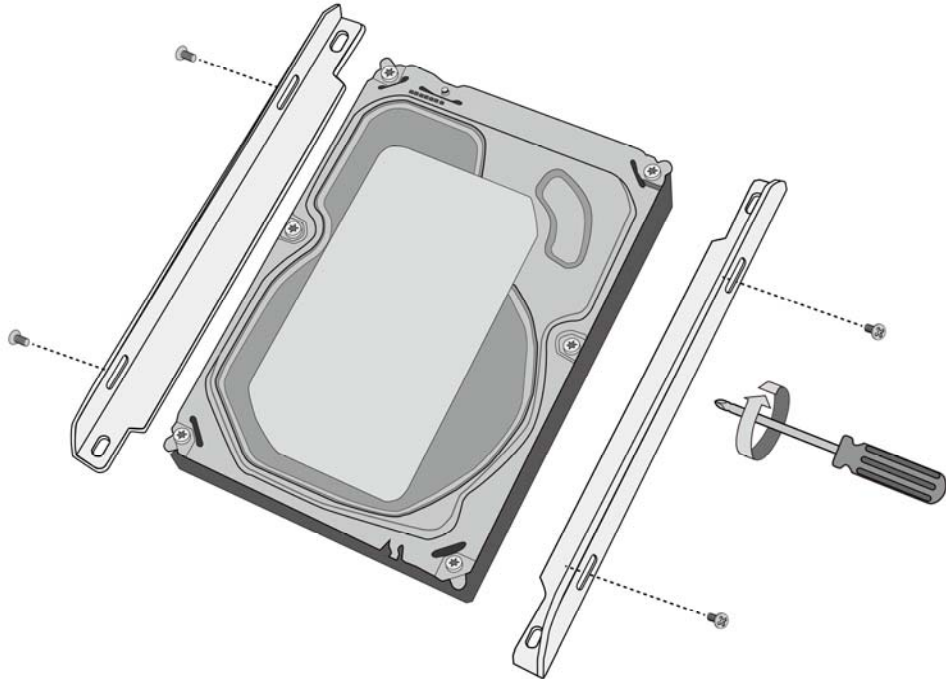
3. Connect SATA data and the SATA power cables to the hard drive.
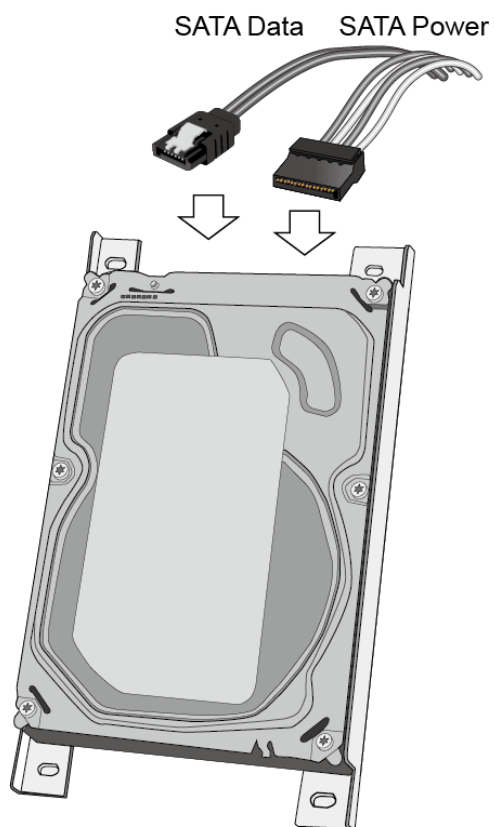
4. Secure the hard drive to the mounting positions in the chassis with its label side facing up, and the connectors facing the right hand side of the chassis.
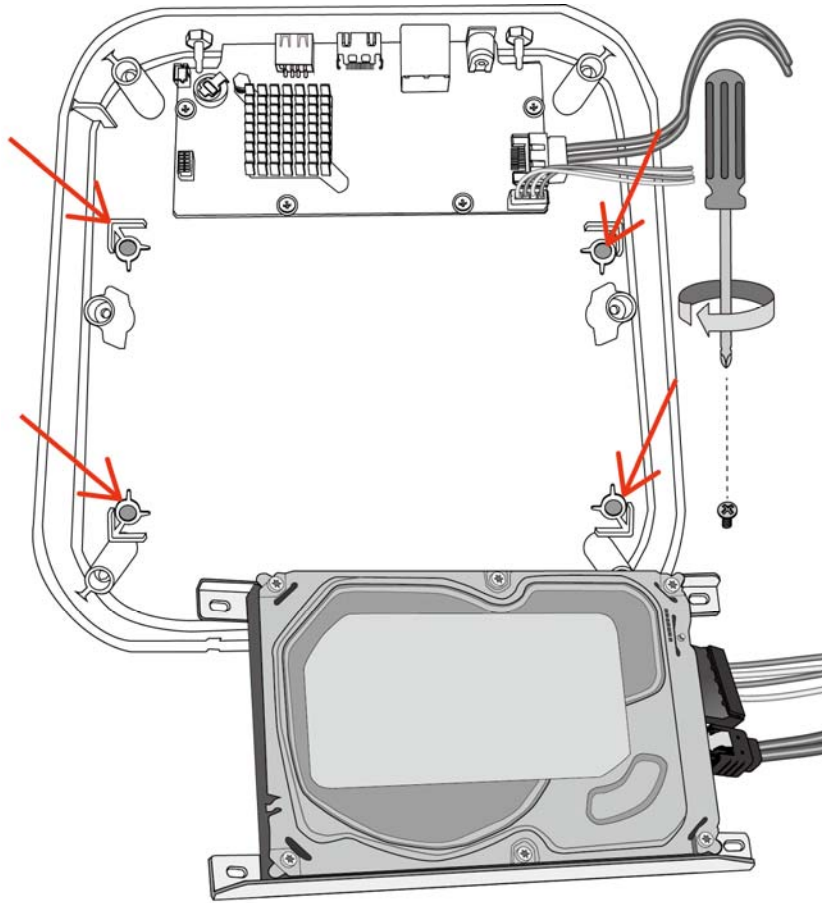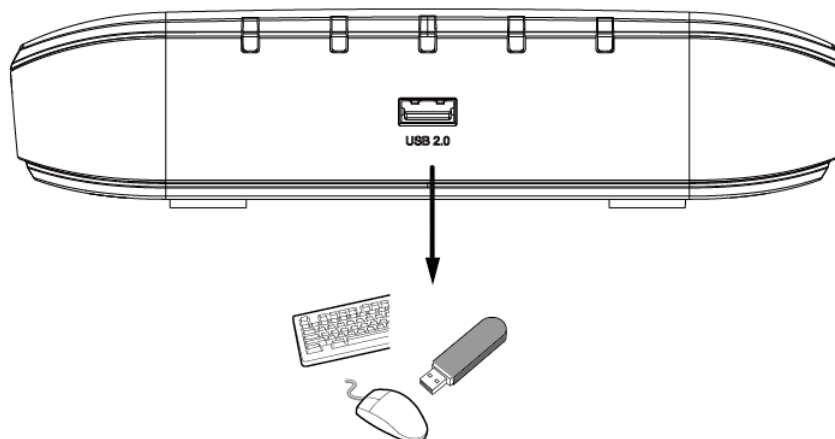

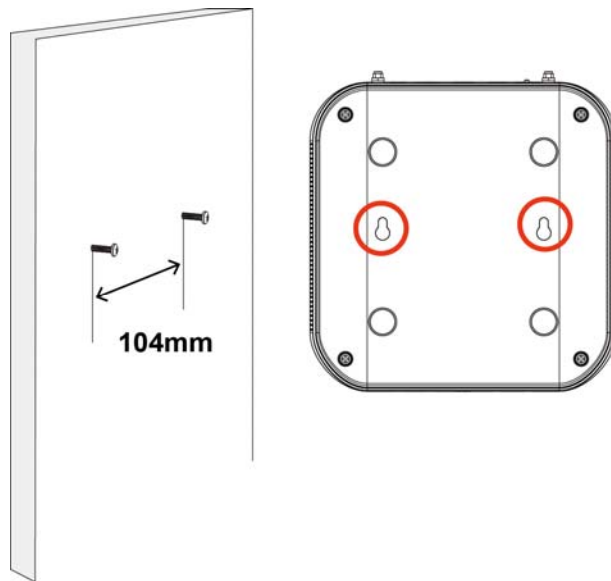5. When done, install the top cover.
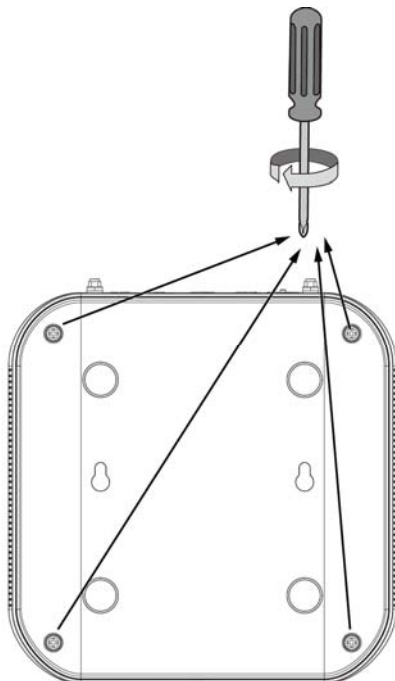
6. Install the included wireless antennas. (ND8212W)

DC 12V   NET   HDMI   USB 2.0   RESET/WPS
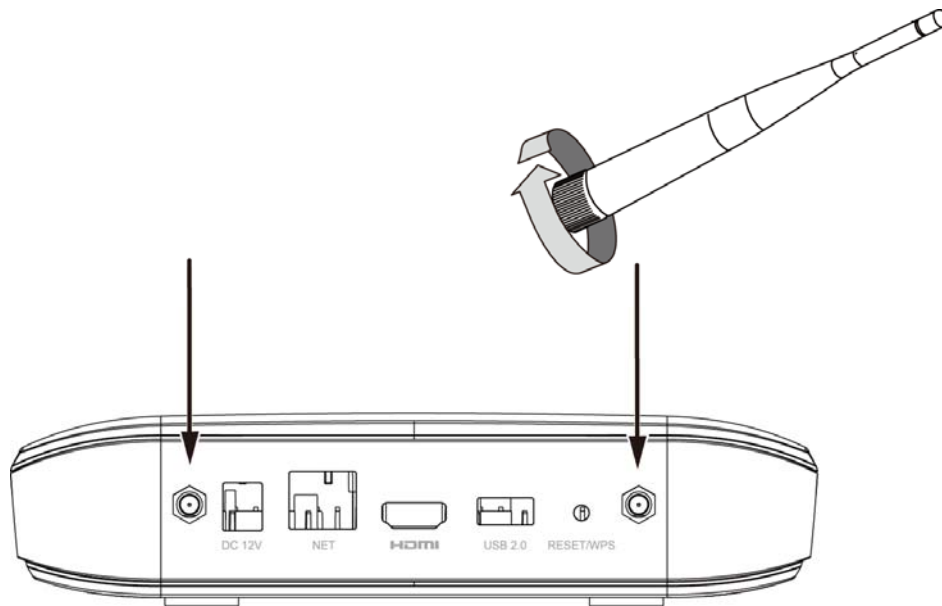
7. Connect a mouse and/or keyboard to the USB connectors.

USB 2.0

If you prefer to hang the NVR on wall, drill and install two screws

104mm apart.

Interface Connections

1. Connect to a monitor using an HDMI cable.
2. Connect CAT5e or better-quality Ethernet cable to the network.
3. Connect USB devices such as mouse, keyboard, or USB thumb drive (formatted in FAT format), or UPS.
4. Connect the power adaptor to the power mains and the system.

The NVR works with both wired and wireless cameras.
The ND8312 comes without the wireless connectivity.

LAN/WAN

DC 12V   NET   HDMI   USB 2.0   RESET/WPS

AC100~240V
50/60Hz, 1.5A

USB 2.0
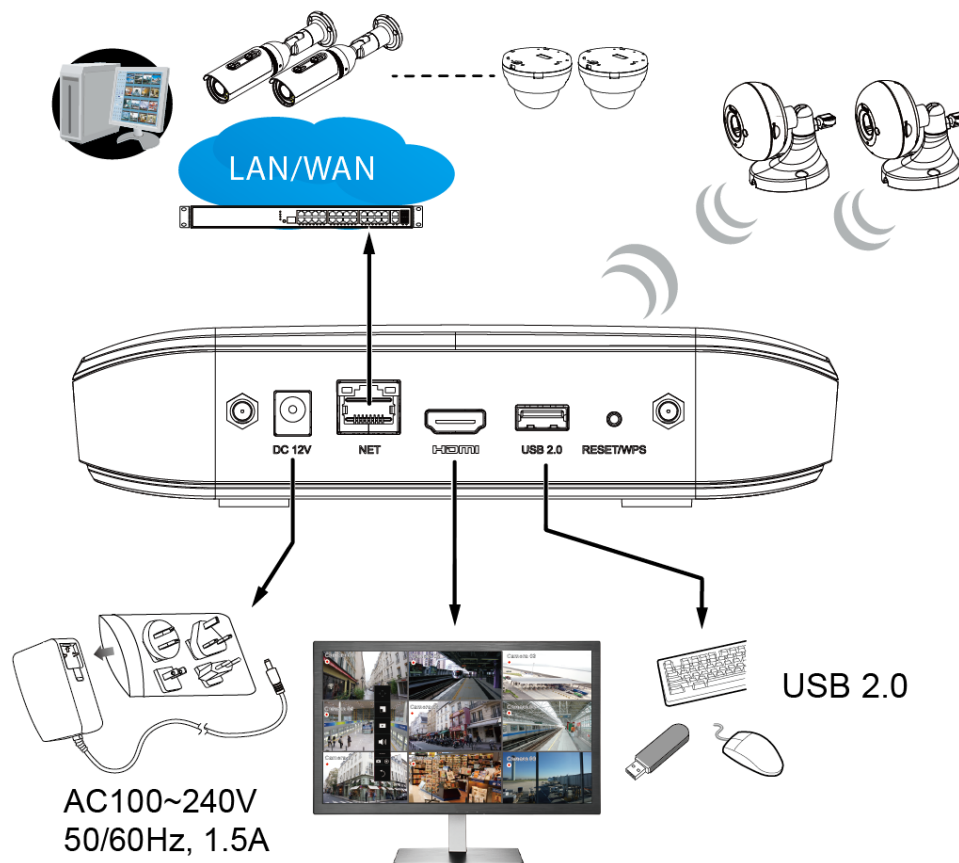
Pressing the Reset button for longer than 10 seconds will restore the factory
 defaults.

Initial Configuration - via a Local Console

A local console requires the following:
 1. A monitor is connected via an HDMI 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. The Installation
    wizard only appears for an unconfigured machine or one that was restored
    to its default.

Follow the onscreen messages to complete the initial configuration:
1. When started for the first time, the system will prompt for the forceful
    configuration of a password. This ensures security from malicious network
    attack.

    The applicable alpha-numeric characters are
[0-9][a-z][A-Z][!][$][%][-][.][@][^][_][~], with a max. length of 64 characters.

Click the **Apply** button when the new password is accepted.

2. Select the UI language, Time zone, and current date and time. Click on the
   **Continue** button to proceed.

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.

3. The system will then start to scan the local subnet for connected cameras.
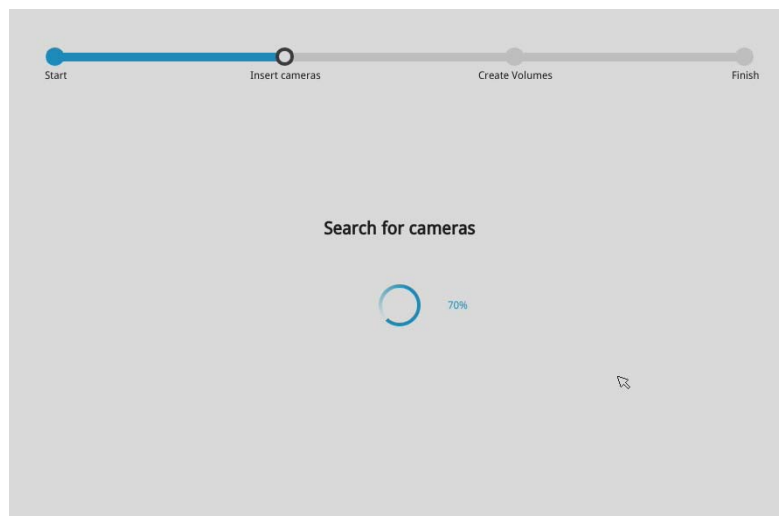
4. All cameras detected on the network will be automatically selected. If necessary, deselect the cameras you want to exclude from the configuration. Click **Continue** to proceed.

Cameras properly installed in the same subnet should all be listed. If you cannot find a camera, examine its network connections.
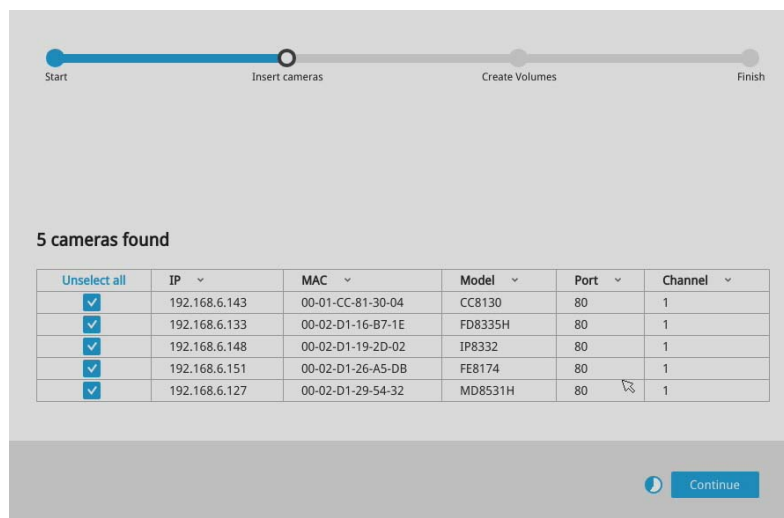
NOTE:

1. The maximum recording bandwidth is 24Mbps. 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.

2. If there are less than 8 cameras, the Auto Setup will automatically move to the next configuration step.

3. Up to two clients viewing 2x 720P streams is acceptable. If more clients are simultaneously viewing more video streams, the machine can be stressed.

5. The system will automatically create a volume from the installed disk drive. The process may take several minutes.
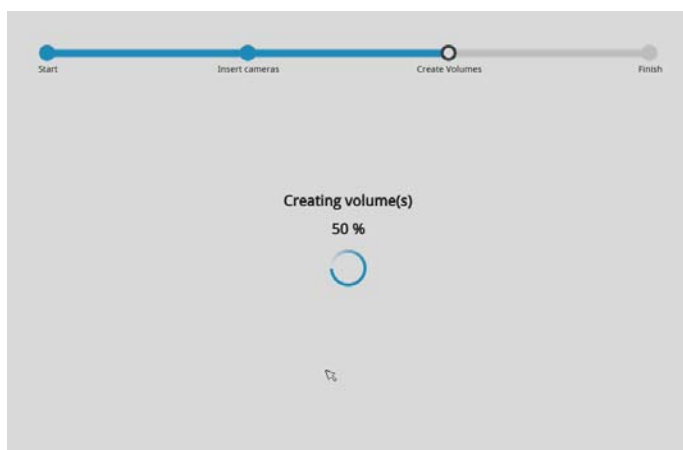

6. An optional utility, **VIVOCloud**, is available through the Apple and Android App Stores. The VIVOCloud works with a server hosted by VIVOTEK for bridging and tunneling video requests between client devices and network cameras/CMS/NVR. The utility simplifies and facilitates network configuration for access across the Internet.

   The prerequisites for using the VIVOCloud are as follows:
   1. Download and install the VIVOCloud utility to your cell phone.
   2. Both the NVR and your cell phone have access to the Internet.

   With this utility, you do not need to configure IP port forwarding on router or

set up a DDNS address for the NVR. You do not even need to know the IP address of the NVR. The VIVOCloud utility automatically manages the network parameters required for making the connection. The VIVOCloud comes with viewing and playback interfaces very similar to those in the iViewer utility.
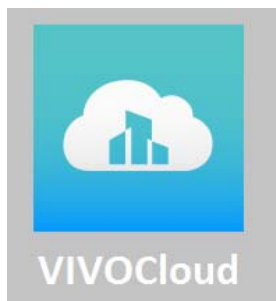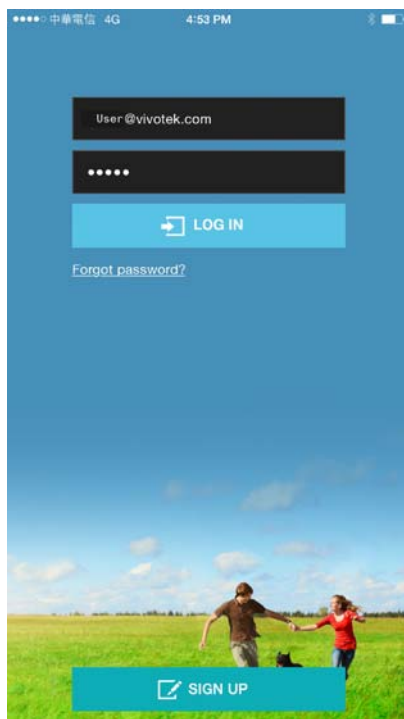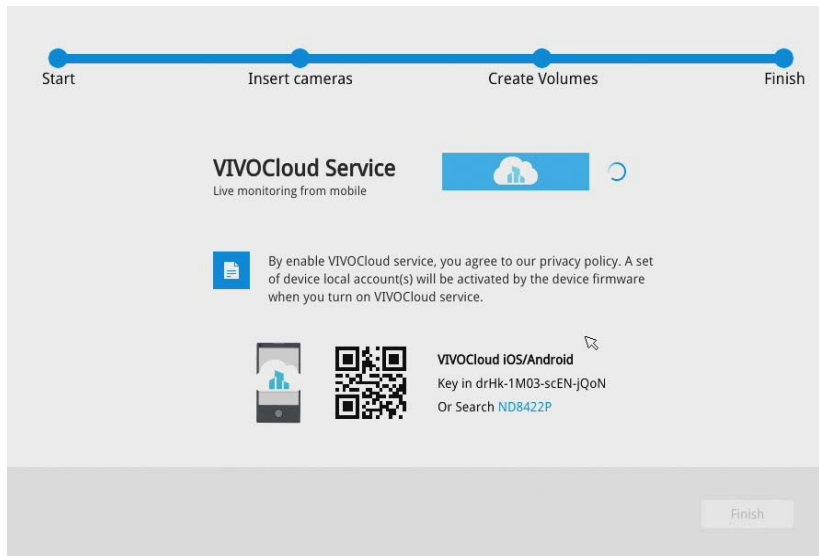

To connect the NVR from a cell phone using the VIVOCloud:

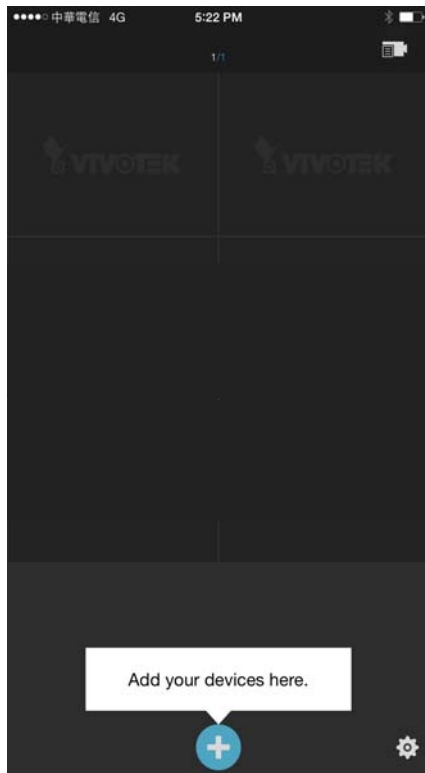6-1. Click on the **VIVOCloud** button on the wizard.
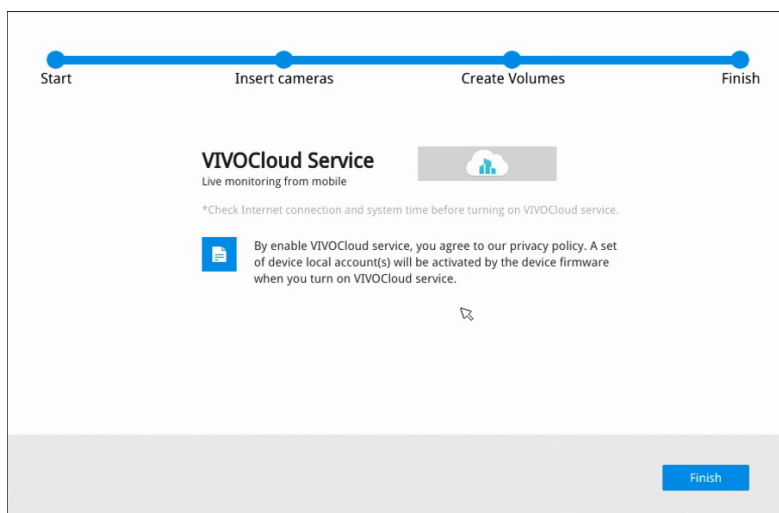
6-2. The QR code will be generated.

6-3. Open the utility from your cell phone. If you already registered an account, tap **LOG IN**. If not, tap **SIGN UP** to register an account from a VIVOTEK server.

6-4. You can be defaulted to the Live view page. Tap the Add button below to add devices.

6-5. Tap the **ADD DEVICES MANUALLY** button.
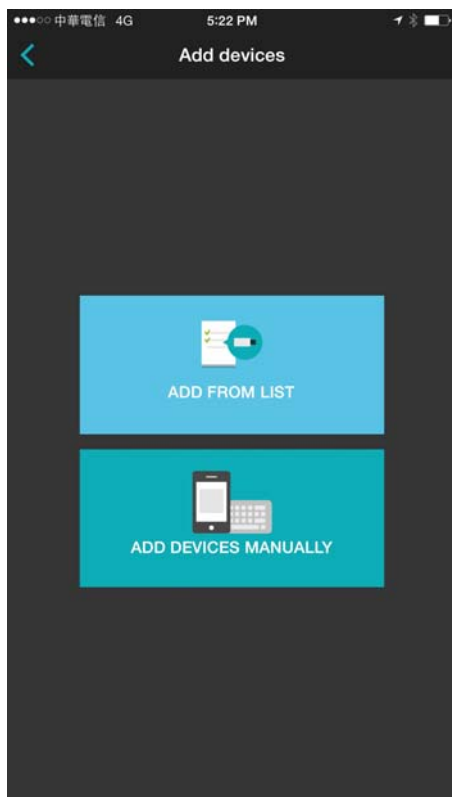
6-6. You can then point your cell phone lens at the NVR screen (Step 5-3.) and use the **SCAN QR CODES** function to establish the connection. You may

also manually enter the device ID.
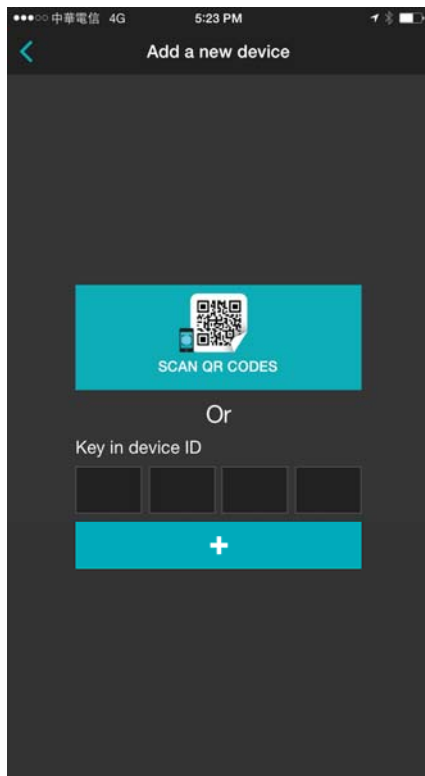
6-7. The process will take several seconds to complete.

6-8. The NVR and the cameras under it will be ready for access.

7. Click the Done button. The **LiveClient** screen will display, and, by default, the recording from the selected cameras will immediately take place.

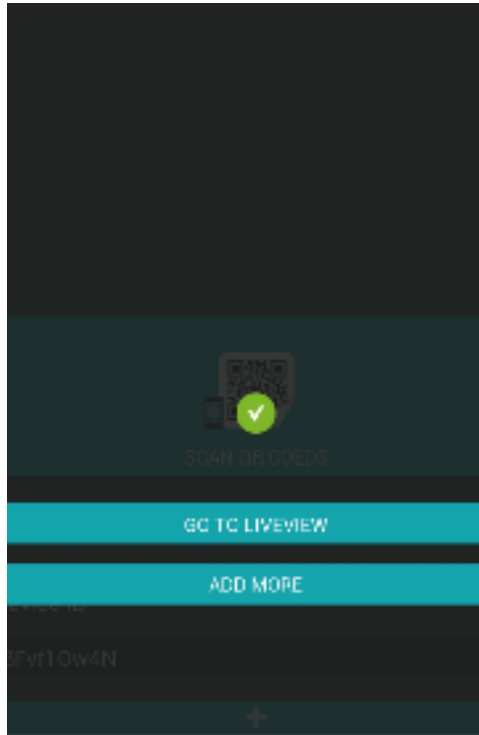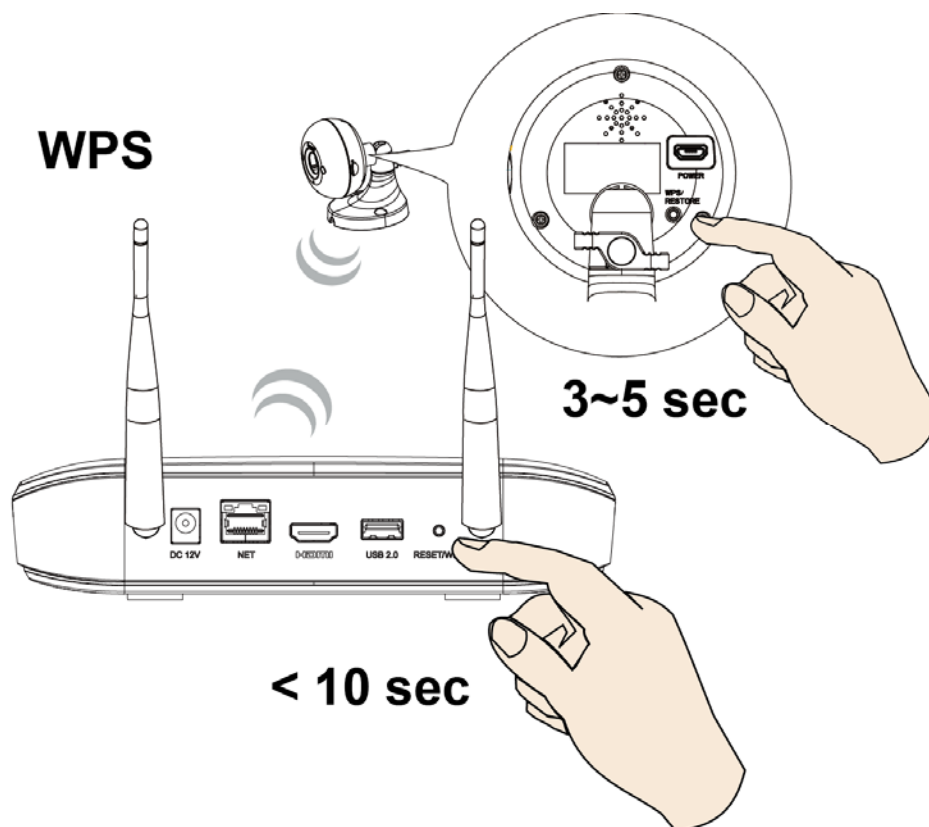# Initial Configuration - Wireless Connection (ND8212W)

1. Press the WPS button on wireless camera for 3 to 5 seconds. Refer to VIVOTEK cameras' Installation Guide for wireless connection details.
2. Press the WPS button on the NVR for less than 10 seconds. Wait for the system status LED to change to green.

3. Open the system **Settings** > **Camera Management** page. When successfully connected, the wireless camera will be listed. If the camera is accessed for the first time, you should enter a new password to access the camera.
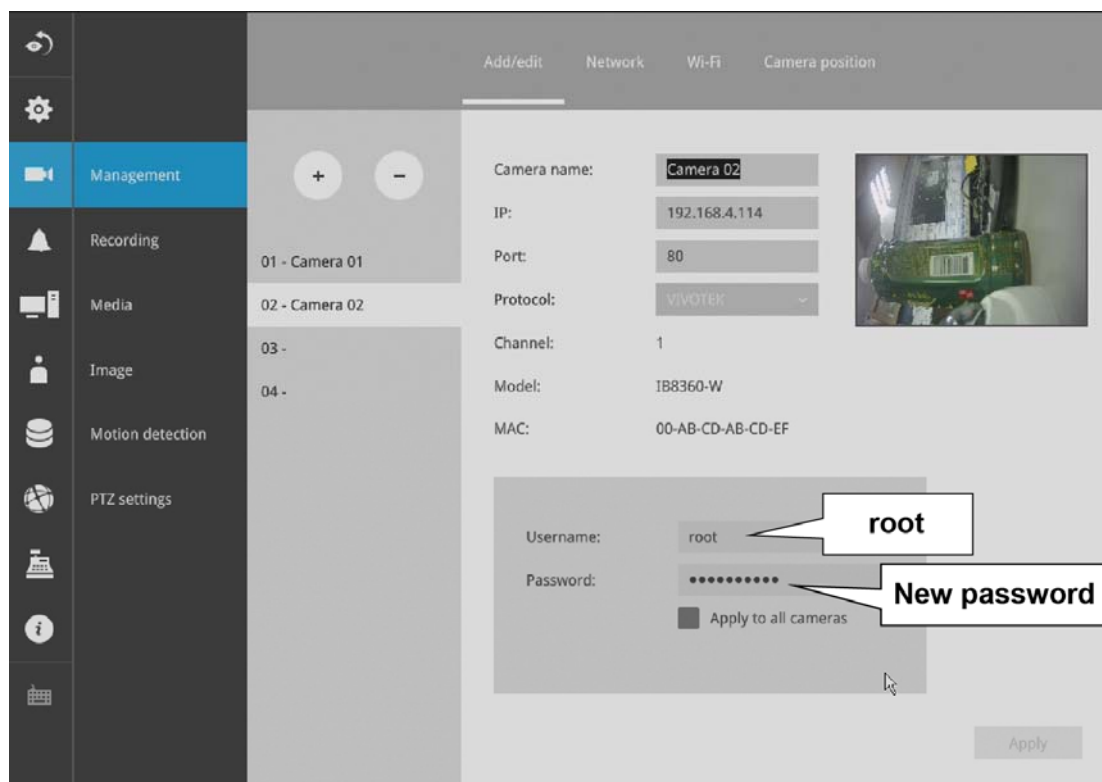
IMPORTANT:

If you are not connecting your wireless cameras using the WPS function, ready the following:

When the wireless NVR is operating in the AP mode, the default SSID and password is VVTK-XXXXXX/VVTK-XXXXXX. The six digits are the the last six digits of the MAC address on the NVR's product label.

For example,
MAC: 00:02:D1:60:4B:BF; SSID/PASSWORD: VVTK-604BBF/VVTK-604BBF

It is highly recommended to change the default password to that of your preference.
See **Settings - Network - Connection mode** for wireless network configuration.
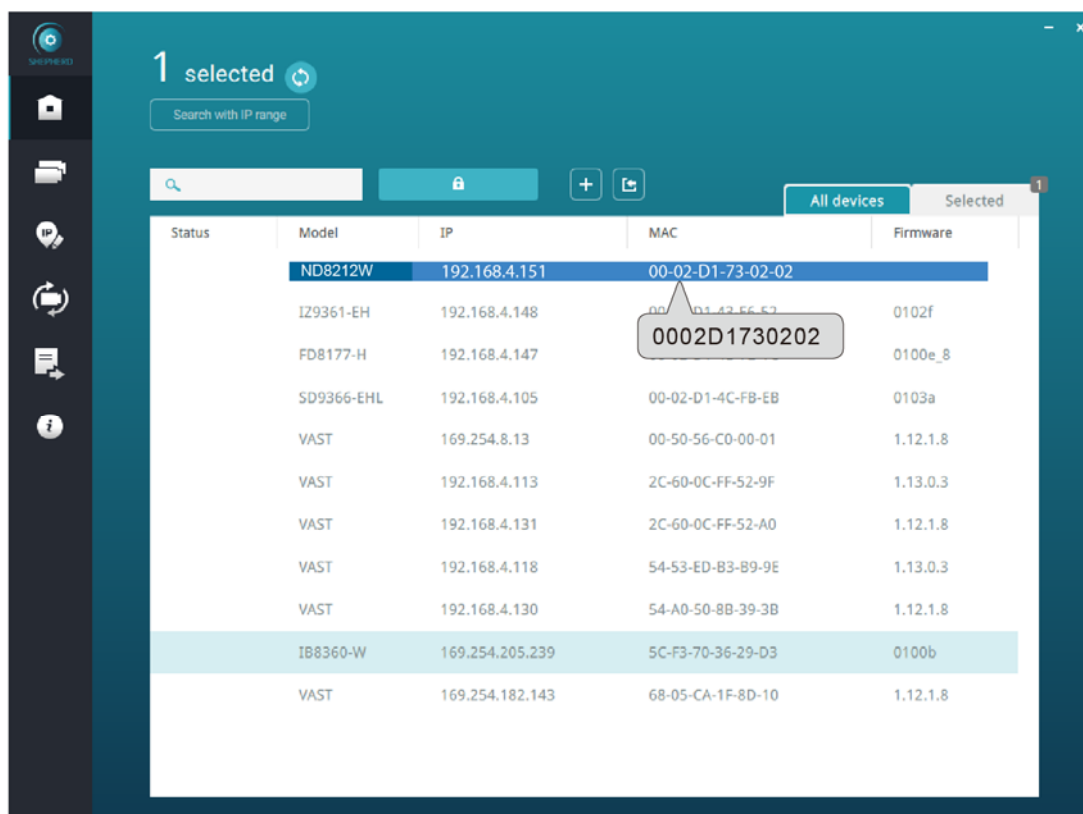
Initial Configuration - via a Web Console (Optional)

IMPORTANT:
If you already configured the system using an Ethernet web console, please skip the Auto Setup steps when you connect the HDMI cable. **You may accidentally format your storage volumes!**

1. Connect the power cord to start the NVR. Wait for the system status LED to light green.
2. From a management computer, download and execute the **Shepherd** utility software. Follow the onscreen instructions to complete the installation.


3. Start the Shepherd utility. The Shepherd utility will discover the NVR located in the same subnet.

4. Double-click on the ND8312 or ND8212W entry to start a web session with the NVR system.

5. If you have configured a user name and password on the local console, use them to log in. Ideally, the initial configuration is performed via the local console. Expand the menu on the right of the Login button. Select and click on the **Settings** button to begin your configuration.
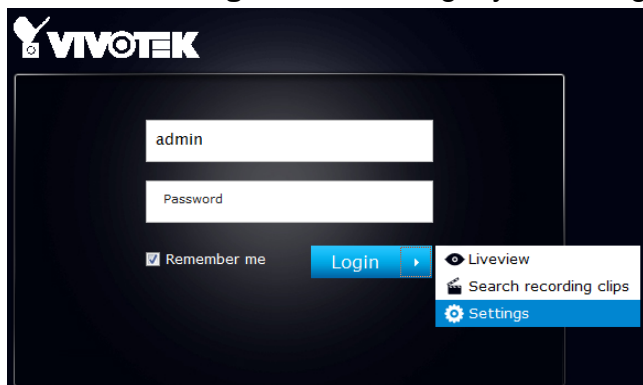
You can select the display language from the lower left corner of the screen.
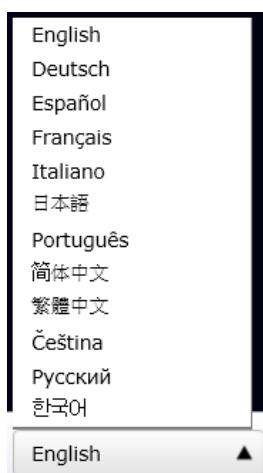
6. On the **Settings** page, click on **Storage** > **Volume** to access your storage volume configuration.
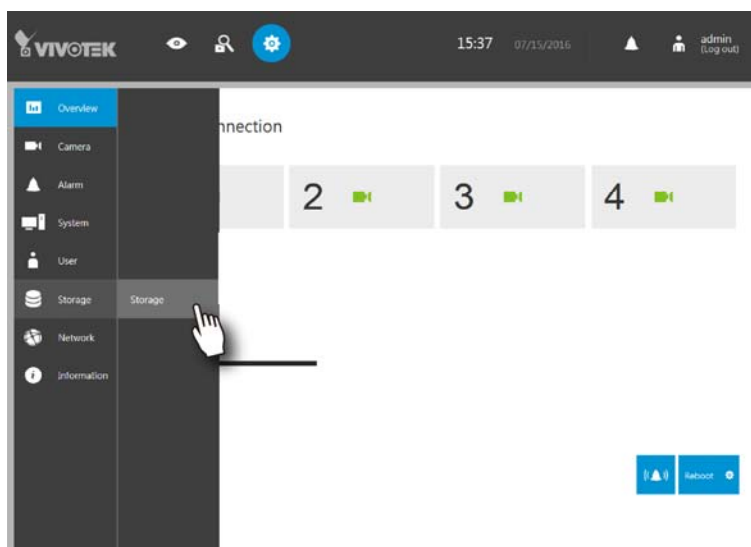
7. On the **Storage** settings page, check if your hard drive is present and

identified by your system. Click on the **Add Volume** button.

If you have let the setup wizard create single a disk volume, you can manually delete them and then create new volumes. Note that previous recordings will be erased.
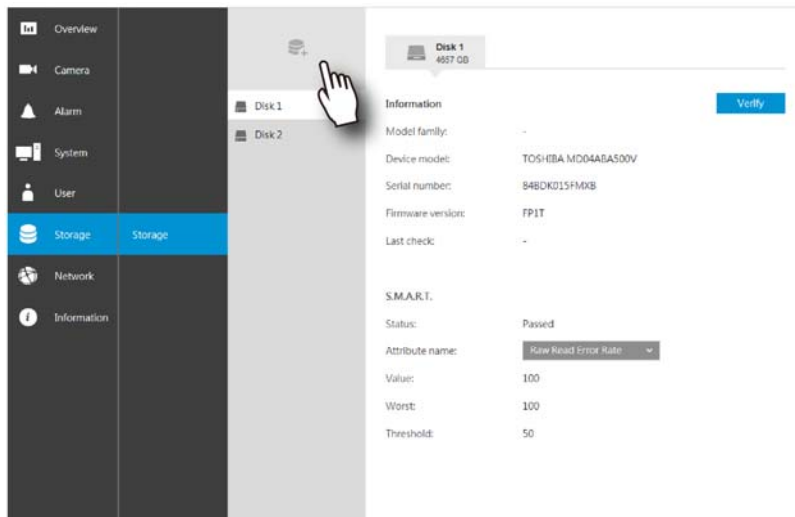
8. Refer to the later discussions for the rest of the configuration procedure.

LED Indicators

ND8312

ND8212W

ND8312

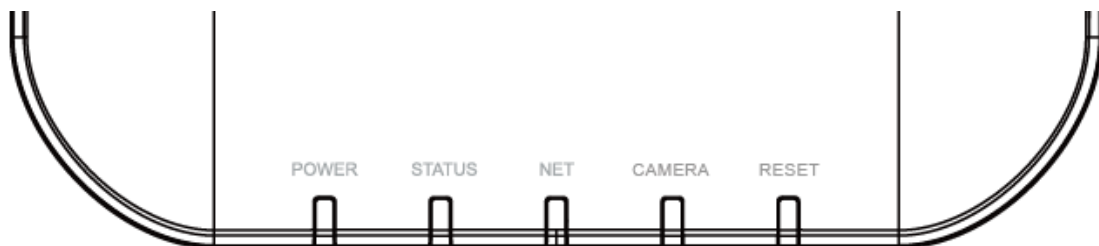| Name	Behavior		Definitions
1. Power	1	OFF	Powered down.
	2	Solid Green	Device is up and running.
2. Status	1	Green solid	System is ready.
	2	Blinking Red every 1 second	Firmware or device pack is being updated.
	3	Solid Red	* Disk errors detected via S.M.A.R.T. * Hard disk is full. * Configured disk drive is missing (the buzzer will be sounded until it is manually disabled.)
3. NET	1	OFF	The Ethernet port is disconnected.
	2	Orange blinking	Data is being transmitted and received.
4. Camera	1	Solid Green	All configured cameras have been connected.
	2	Solid Red	One or more configued cameras is missing.
	3	OFF	No camera is connected.
5. Reset	1	Blinking Blue	Reset is taking place.
	2	OFF	Normal status.

ND8212W

Name	Behavior		Definitions
1. Power	1	OFF	Powered down.
	2	Solid Green	Device is up and running.
2. Status	1	Green solid	System is ready.
	2	Blinking Red every 1 second	Firmware or device pack is being updated.
	3	Solid Red	* Disk errors detected via S.M.A.R.T. * Hard disk is full.

|			* Configured disk drive is missing (the buzzer will be sounded until it is manually disabled.)
3. NET	1	OFF	The Ethernet port is disconnected.
	2	Orange blinking	Data is being transmitted and received.
4. Wi-Fi	1	Solid Green	Working in the AP mode.
	2	Solid Orange	Working in the Station mode, and is connected to an AP.
	3	Blinking Orange every 0.2 second	Working in the Station mode, and failed to connect to an AP.
	4	OFF	Wi-Fi is off.
5. WPS	1	Blinking Blue	WPS is searching for nearby devices.
	2	OFF	WPS is not functioning.

Power Up and Power Down

To power up and power down,
On the initial configuration:

Connect the power adapter between the system and power outlet. To power up after a power-down, re-connect the DC connector.

After the initial connection,

Press the software power down button on the management session to power down. the system should start flushing the cached contents in system memory and gracefully shut down.
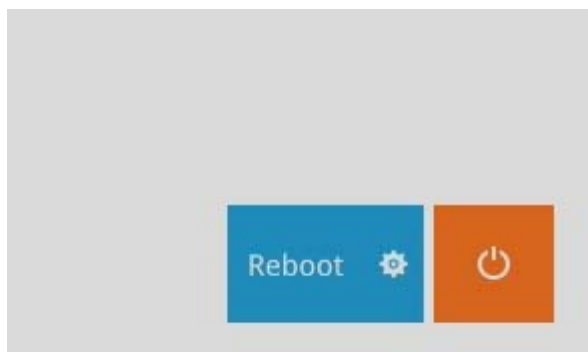
WARNING:

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, and VIVOTEK disclaims responsibilities of data loss or recovery.
2. Always power off the system using the software power button. 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.
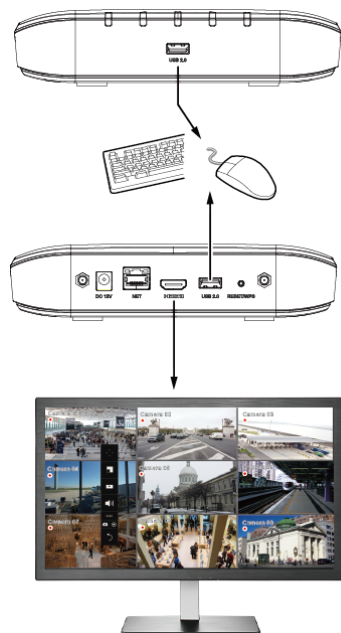
NOTE:

If system buzzer is sounded, move your mouse cursor to reveal the main screen portal, and then click on the **Stop buzzer** button.
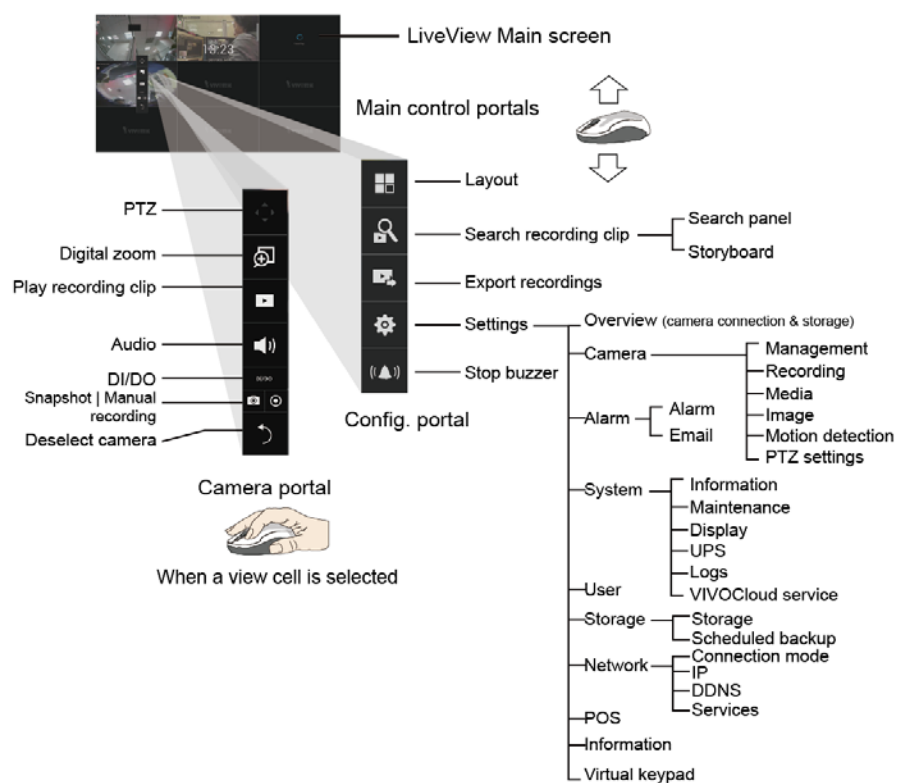
Serious system faults, such as a missing volume, can trigger the system buzzer. Verify the cause of system fault and turn off the buzzer.
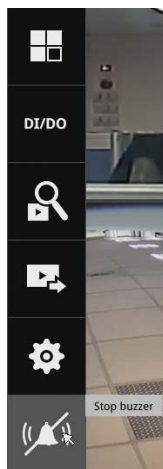
Introduction to the Local Console Interface

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

IMPORTANT:

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

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 46.

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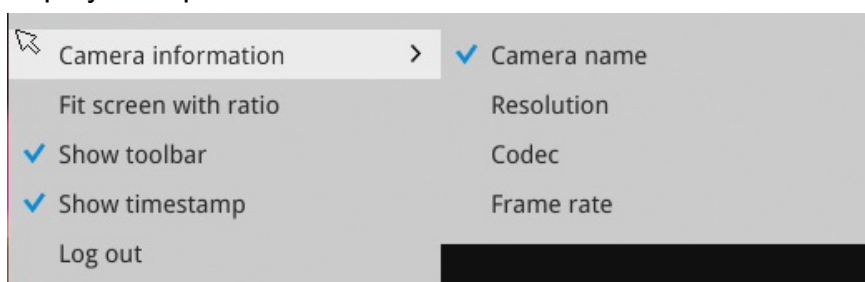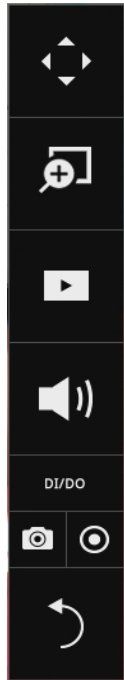

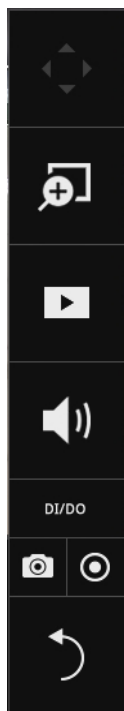### 2. How to access the Camera Portal?

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
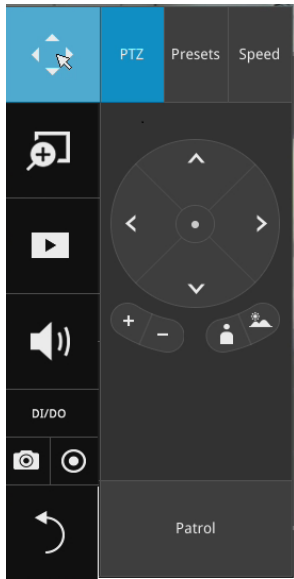

Tips:

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

3. How to retrieve and access recorded videos?

3-1. One is to access the video clips taken within 1 hour. 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**.
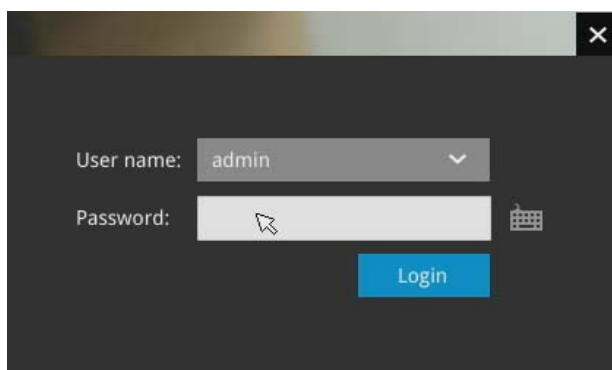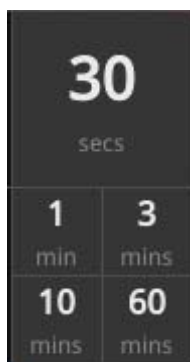
The **Playback** window will prompt, and a playback begins from the point in time you selected, e.g., 30 seconds ago. This function allows you to quickly review what has just happened.
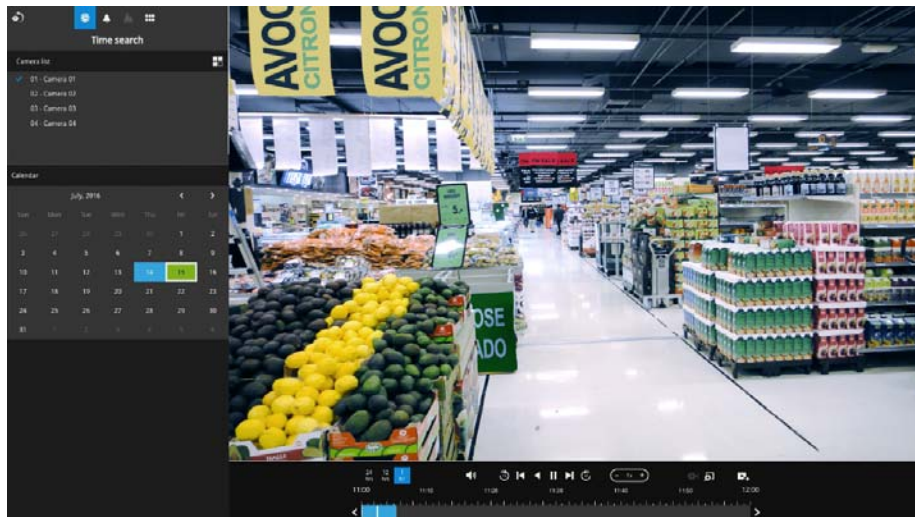
3-2. Another way to access past recorded videos is to open the **Search recording clips** window. Move your mouse cursor to display the **Configura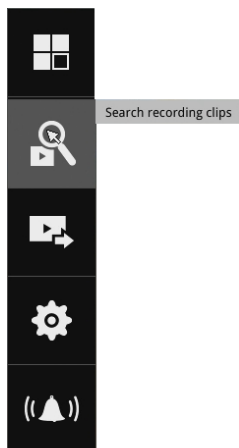tion Portal** (without selecting any view cell). Click on the Search recording clips button. Please refer to page 47 for more information about the search functions.

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.
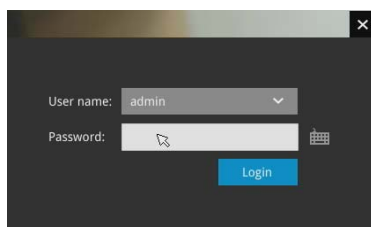
4. How to retrieve system alarm?

Please refer to page 84 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.

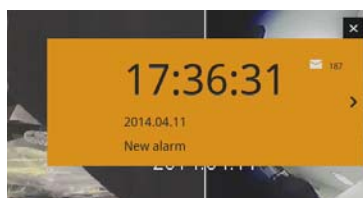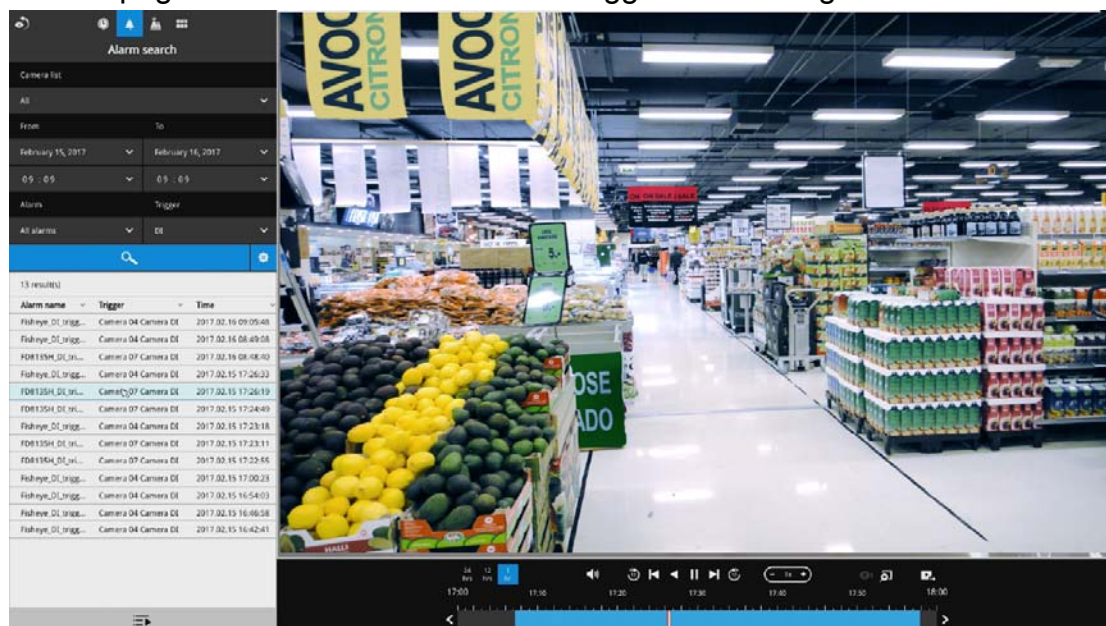Use the **>** arrow button to browse through the alarm messages.

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.

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. The same will occur if you connect some newer VIVOTEK 9xxx series H.265 models. You will then need to change the CH1 and CH2

video streams to H.264.
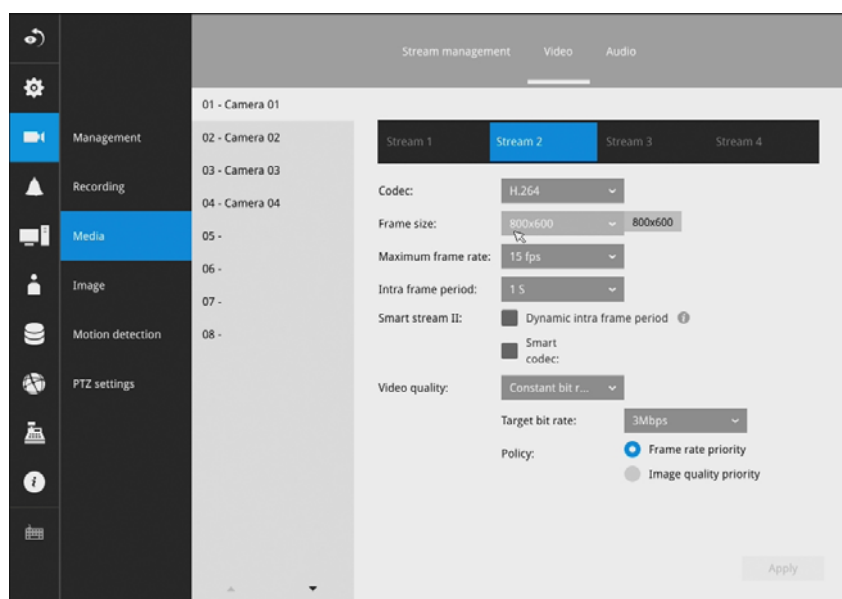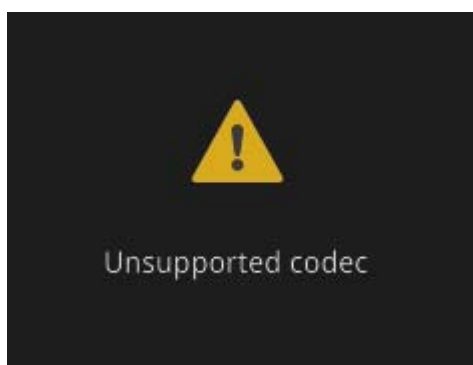
6. How do I move to another layout page?
Move your cursor to the right hand side of your screen. The page turner
buttons will appear as shown below.

For example, if you have 8 cameras placed on 2 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:

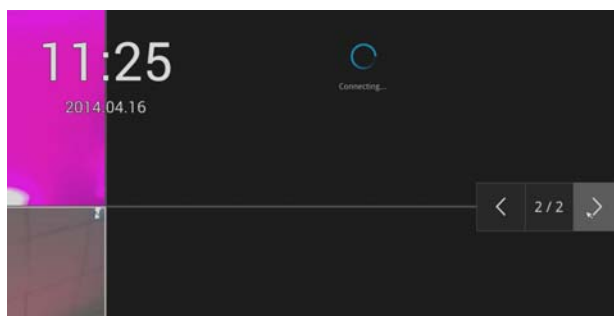1. **Live view**: if no management activities occur for 5 seconds, the tool bars disappear from screen. When in the idle mode, mouse cursor and tool bars will disappear. Moving the mouse cursor will re-activate the screen.
2. **Settings** page: If left unattended for 10 minutes, system will automatically 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 a Camera View Cell
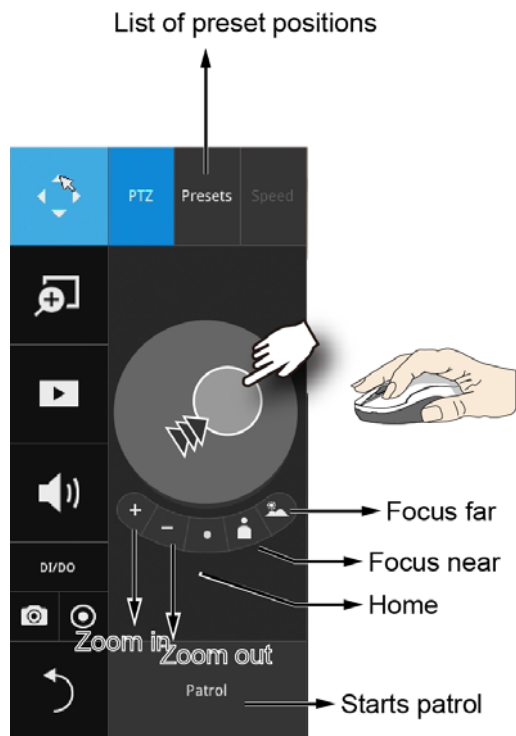
The following apply when a camera view cell is selected.

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:

List of preset positions

Focus far

Focus near

Home

Zoom in Zoom out

Patrol → Starts patrol

1. **PTZ** control: Click and drag the nudget in the center towards the direction you wish to move to.
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 nugget away from the center, the faster the lens moves. This works like speed control.

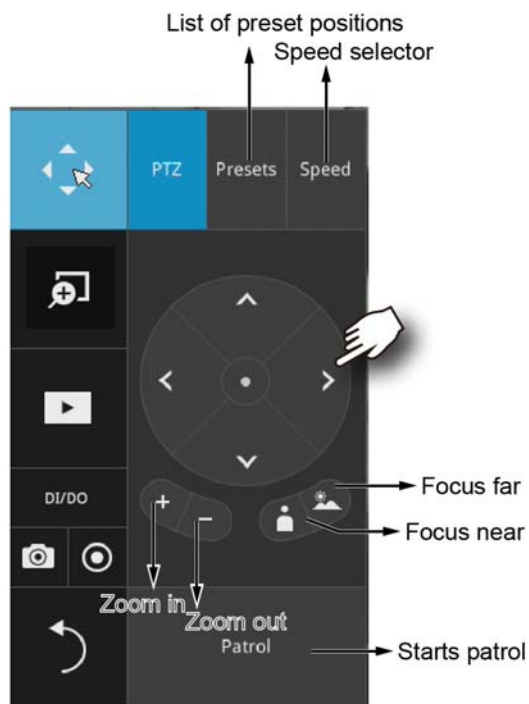Below is the PTZ panel that appears with ordinary PTZ cameras

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. The PiP and PTZ buttons will then be disabled for a fisheye camera.

This portal appears with a fisheye camera. The PiP and PTZ buttons will then be disabled for a fisheye camera.

2-2-2. Digital Zoom Panel

Digital zoom is a function that allows an operator to zoom in or zoom out on a live video.

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 clicks and drags.
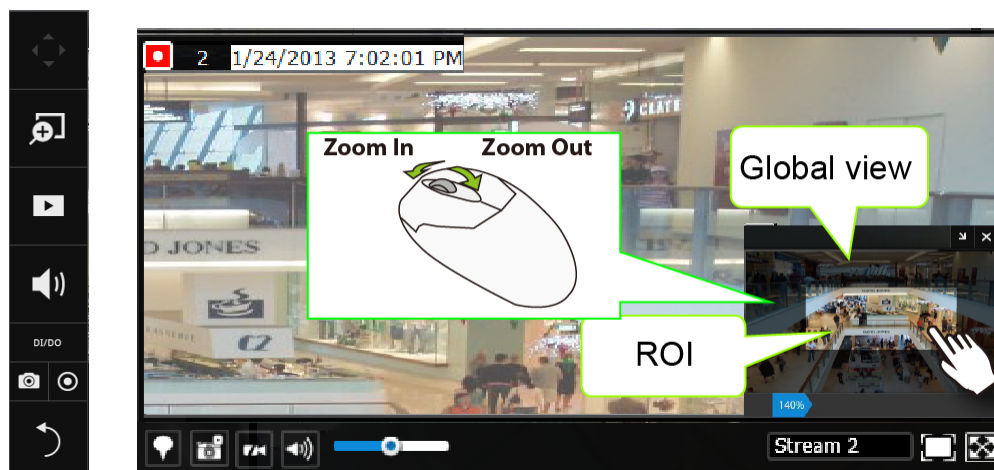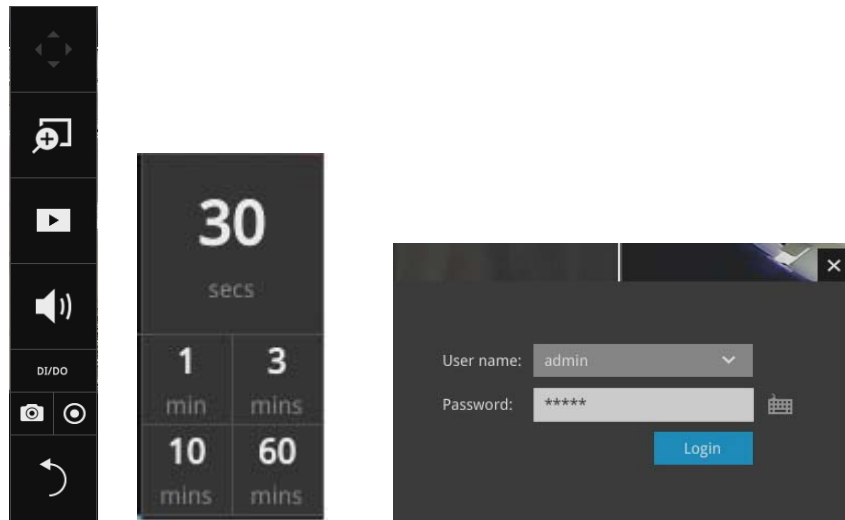

Note that not every camera supports the PiP function.

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.
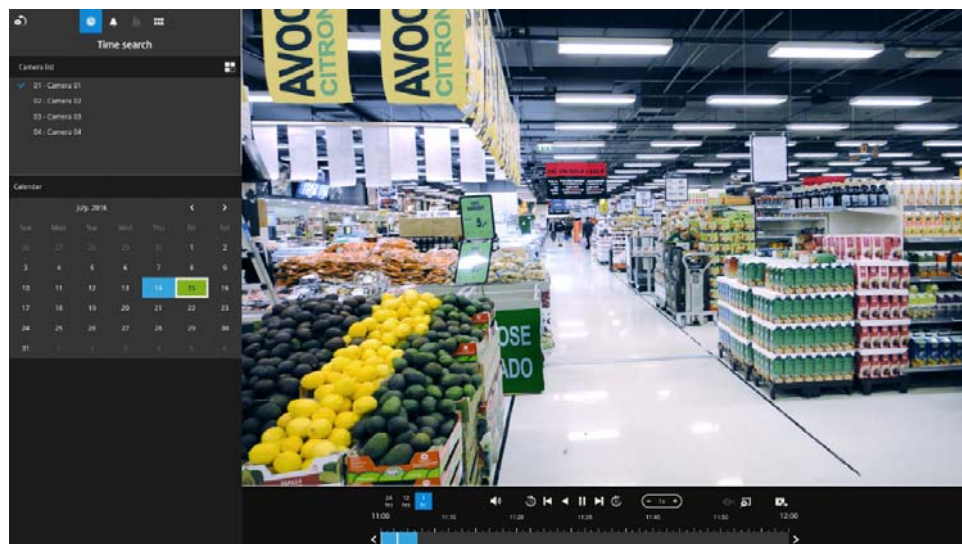
2-2-4. DI/DO

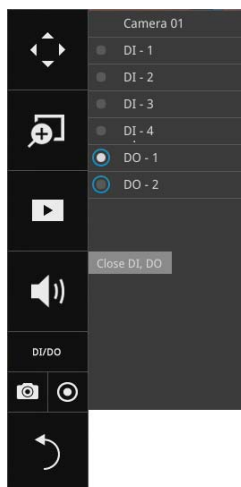The DI/DO panel provides a glimpse of all DI and DO signal statuses from the connected cameras. You can manually trigger a digital output by clicking on its indicators.

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.

IMMPORTANT:
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.
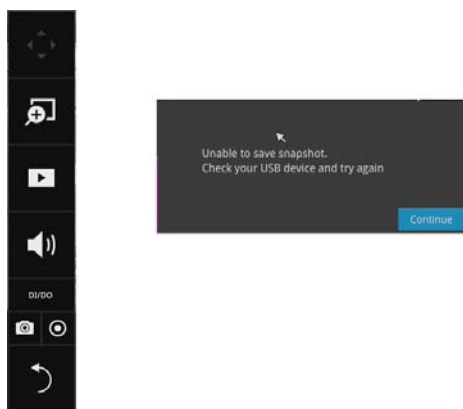
2-2-6. Right-click Commands

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 monitor 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 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 tool bar**: You can hide the tool bars by deselecting this option.

5. **Show timestamp**: You can hide the time stamp bars by deselecting this option.

6. **Log in**: Log in to enable system configuration.

Camera information   ＞ ✔ Camera name
✔ Auto adaptive stream   Resolution
   Fit screen with ratio   Codec
                                            Frame rate
✔ Show toolbar
✔ Show timestamp
   Log out