
















































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



































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


























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


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
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Wisenet WAVE User Manual

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Wisenet WAVE is a group of software applications, the primary purpose of which is to view, store and manage video from surveillance cameras. Wisenet WAVE uses client-server architecture – client and server applications are used for different purposes and can run on different computers.

The server application is primarily used to get and record videos from cameras; store and manage video archive; track and react on certain events.

Client applications are used to view live or recorded videos and manage servers and cameras.

Server

 Server icon

"Server" in this manual can refer to either the server application (also call the Media Server) or the computer on which the Media Server application is installed.

Servers can:

1. Receive video-stream from cameras
2. Manage cameras settings
3. Record video from cameras to internal or external storage
4. Process and analyze video – for example, detect motion
5. Manage users database and users access level
6. Track certain events and react on them
7. Work with different hardware devices – NVRs, I/O modules, door locks, and so on.

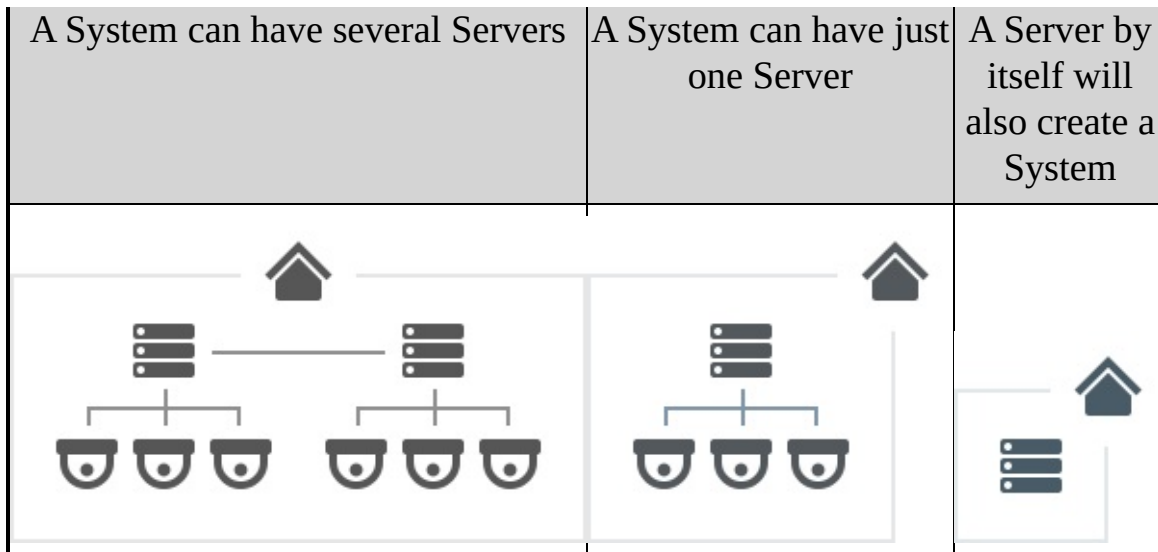
System

 System icon

 Camera icon

Many servers can work together if there are several locations with cameras, or if the total number of cameras is too large to process with just one computer, or in order to improve system stability, or in order to improve system stability. The agglomeration of all connected servers, cameras and other devices is a System.





If there is only one server, there is little difference between the server and the System, and they can be considered equivalent. However, with more servers in a System the differences will become significant.

All servers in a System are equal and each of them has all the information about all cameras, users, and settings in the System. Video archive, however, is not shared. Recorded video is stored only on the server to which a camera is connected. Therefore, if you replace one server in the System with a new one (e.g. for an upgrade or repair), all System settings will be retained but the video archive recorded on the old server is not.

Clients



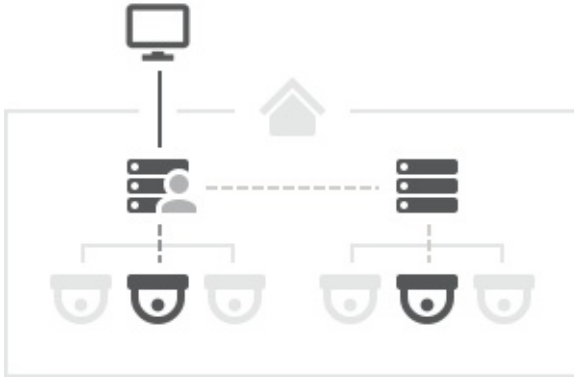
Client icon



Current Server icon - indicates server to which you are currently connected (with small user in bottom right corner)

Client applications can connect to servers, and can show live or recorded video from cameras in the System. Clients are also used to manage the System, server, and cameras settings.

A client can be connected to different servers, but only to one at a time. However, any number of clients can be connected to one server at any time. If the client is connected to a single server in the System, it has access to the entire System through this server – to all other servers and cameras, system settings, and camera settings.



Desktop Client

The most powerful of the applications. Works on Windows, MacOS and Ubuntu Linux.

1. Can be used to connect to any server
2. Can playback live and recorded video, and local video files
3. Can playback up to 64 videos at once
4. Can control cameras – PTZ, 2-way-audio, I/O ports
5. Can display web pages in the built-in browser
6. Can be used to manage cameras, system, and server settings
7. Can be used to view event and user behaviour logs

Mobile Client

Works on Android and iOS

1. Can be used to connect to any server
2. Can playback live and recorded video
3. Can control cameras – PTZ, 2-way-audio

Web Client

Also called "Web Admin". Can be opened in any modern web browser.

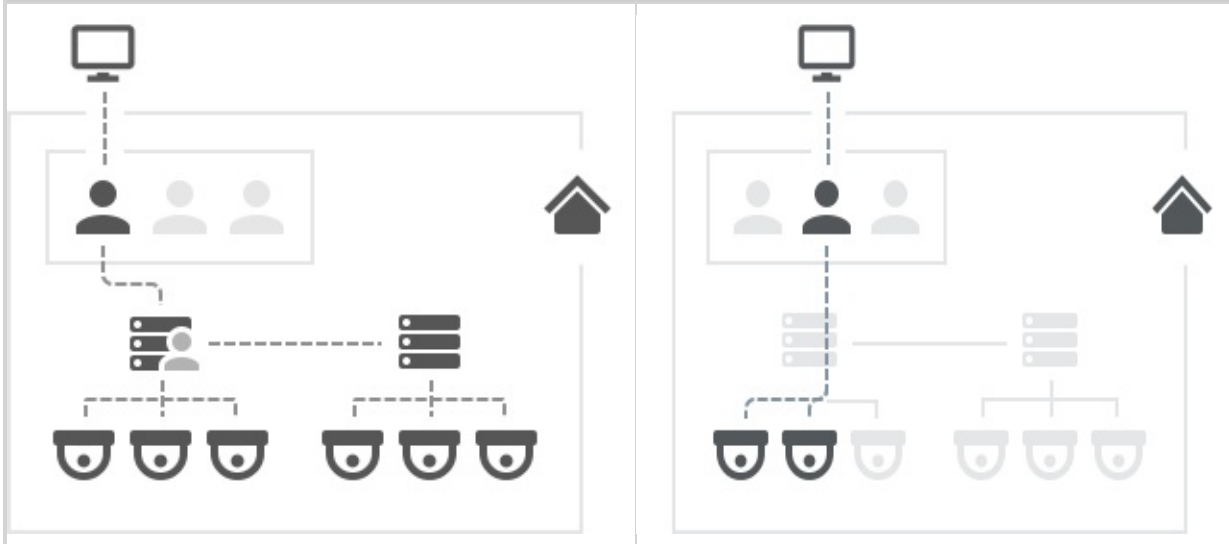
1. Belongs to a specific server.
2. Can playback live and recorded video
3. Can be used to manage a very limited number of system and server settings

Users

Every system has an admin user account with **owner** rights – only this account can grant administrator rights to other users. An **administrator** can specify every parameter of a new user - name, password, email, etc., and manage these parameters in the future. Users can be added to or deleted from the System by the owner or administrators. To log in to a system you must be authorized as a

user. Every System has a list of user accounts that can access it, and each user may have different access rights within the System.

Some users have access to everything in the System and can edit or manage its settings. Other users only have access to a few settings or none at all, and can see only certain cameras.



User with accounts having limited access rights may not be able to see certain servers or change their settings, but can use other servers to log in to the System and watch video. The term user can mean the same thing as the term account, or it can refer to a physical person. In the second case, the user can have multiple accounts – to access different systems, or several accounts with different access rights for a single system. "User Roles" are used to assign the same set of access rights to multiple users.

WAVE Sync

An important part of Wisenet WAVE is WAVE Sync. It is a cloud service, hosted in the Internet and extending functionality of the Wisenet WAVE Systems.

↻ cloud icon

In addition to the default functionality, WAVE Sync also gives the ability to:

1. Log in to multiple systems with a single account
2. Connect to servers through the internet which don't have an external IP address
3. Add users to your Systems via an email invite

To access cloud features, a System must be connected to the cloud – which

makes it a **cloud System** (as opposed to a **local System**).

Cloud accounts

To interact with WAVE Sync you have to create a **Cloud account**. With it, you can:

1. Log in to cloud systems in the same way as with regular user account
2. Log in to the Cloud in desktop and mobile clients
3. Log in to a **Cloud portal**
4. Connect your Systems to WAVE Sync
5. Restore a password using your email address

Users with Cloud accounts are also referred to as **Cloud users**. Users with regular accounts are referred to as **Local users**, and their accounts, accordingly, as **Local accounts**.

Local accounts belong to the System, and cannot be moved elsewhere or used in the different services.

Cloud accounts do not belong to any system, so system administrators are not able to create a new account – they can just add an account to their system, and grant some rights to this account. To do that they specify only the account itself – all other parameters, such as name and password, the cloud account's owner defines himself.

With a Cloud Account you can log in to WAVE Sync from the desktop and mobile clients.



Users 1–5 are local accounts; they exist only in the System databases and are managed by System administrators. User 6 is a Cloud account; it is the same for both systems, and is managed on the Cloud Portal by the Cloud account owner. The System database has information about this account but does not

manage it.

Cloud Portal

Cloud accounts can be created on the Cloud Portal – a web service which is independent of any system and available to everybody.

On the Cloud Portal you can see all your Cloud Systems, view video, and edit some of the settings.

You can log in to all Systems associated with your Cloud account from the client Welcome Screens.

Connecting a System to WAVE Sync

To connect a System to WAVE Sync, you must log in to the System using the owner's account. In the WAVE Sync tab of the System Administration dialog, specify a Cloud account the System will be associated with. This account will also get owner's access permissions and be displayed in the interface as System owner.

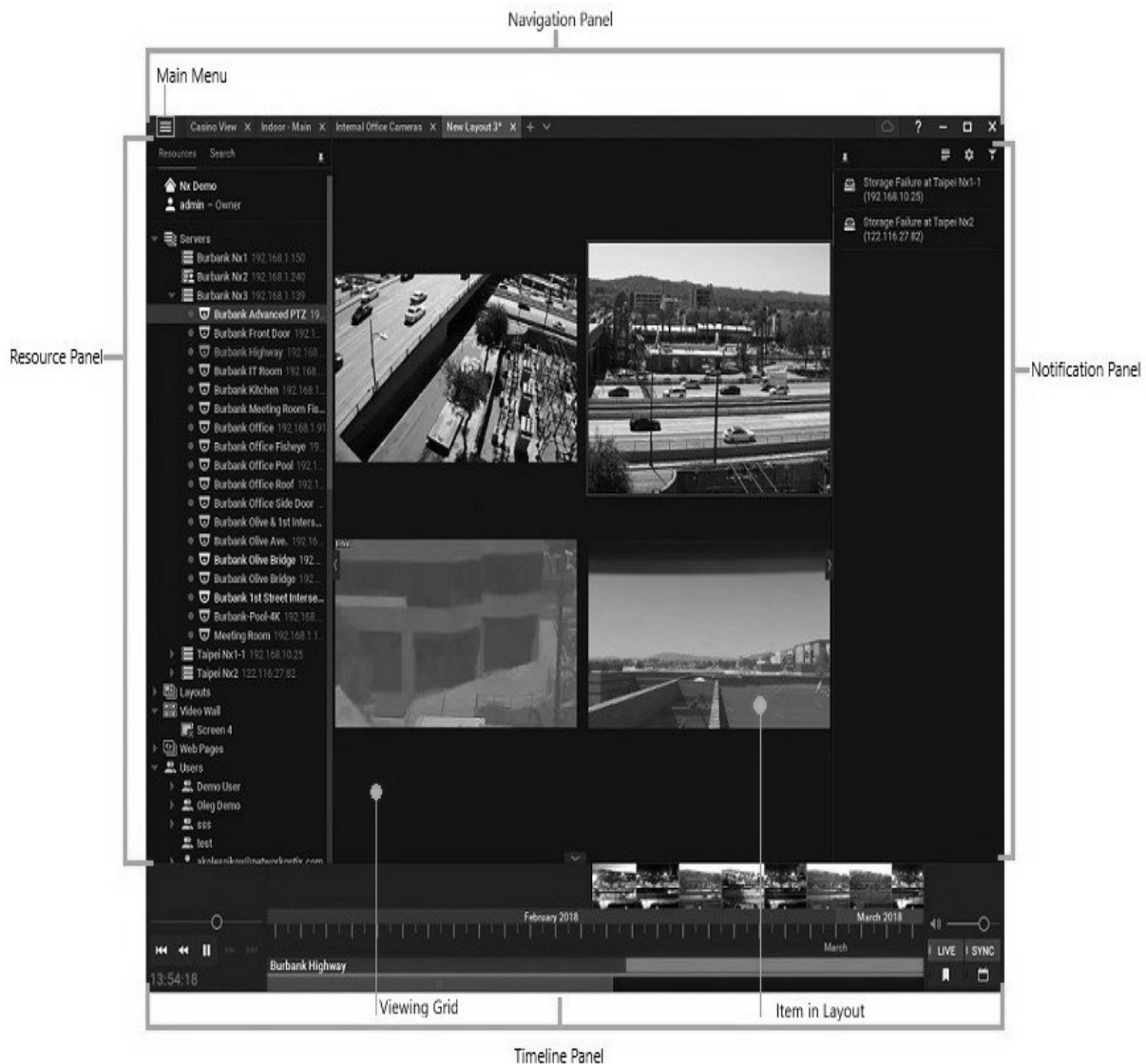
After a System is connected to WAVE Sync, it has access to all Cloud features, and can be disconnected from WAVE Sync at any time. After being disconnected, a System becomes a local System again. The Cloud owner and all other Cloud users will be deleted, but other settings and video archive will not be affected.

Navigation: [Working with Wisenet WAVE](#) >

Wisenet WAVE User Interface



Wisenet WAVE user interface includes the following main areas.



Viewing Grid for Layouts


The central **Viewing Grid** can display up to 24 (for x86 architecture) or 64 (for x64 architecture) individual **Items** – live camera streams, recorded video files, websites, etc.

An arrangement of items in the viewing grid is called a **Layout**, which can be named and saved. Multiple layouts can be open at once, each displayed in a

separate **tab**.

Panels

Sliding panels on each side of the viewing grid provide management and display tools. These panels can be shown or hidden, individually or all at once, and pinned in position.

[Navigation Panel](#) (top) – provides access to the **Main Menu** ; tabs for each layout; shortcuts to the WAVE Sync Client and the help system; and standard window sizing controls.

[Playback Panel](#) (bottom) – controls playback of local videos and live streams

[Resource Panel](#) (left) – the **Resource Tree** displays all servers, **devices** (cameras, analog encoders, DVRs/NVRs, IO Modules), layouts, Showreels, web pages, other Systems, and local files (video and image files) available to the current user. The [Search](#) pane speeds location of available resources.

[Notification Panel](#) (right) – displays notifications of System and custom events and alerts.

Context Menus

Each interface element has a **Context Menu** that provides shortcuts to key actions related to that element. Throughout this help System you will find instructions to use these context menus to access necessary tools. **Right-click** on an interface element to open its context menu.

Keyboard Shortcut

A set of [keyboard shortcuts](#) speeds access and operation.

Navigation: [Working with Wisenet WAVE](#) >

Launching Wisenet WAVE in Compatibility Mode



Compatibility mode lets you launch a compatible version of the client application in order to connect to a server running a different version of Wisenet WAVE. The client downloads another version of itself to match the server version using the same algorithm as auto-update.

This would be necessary, for instance, when Wisenet WAVE is installed at multiple sites (home, work, etc.) and only one installation has been upgraded to the current version. In that particular case, the System will have different versions and one client should connect to another System (client at home connects to System at work). Systems of different versions are highlighted in red in the login dialog and in yellow on the Welcome Screen.

When a client is connected to a server, all component versions are checked and a warning will open if the component versions differ from one another. A message will open specifying the version for the client and server, and prompting you to restart in compatibility mode. Click **Restart** to connect to the server.

In some instances, it may be necessary to download additional files for the compatibility pack. Once the download is complete, the client should be restarted.

⚠ IMPORTANT: The best practice is to have the same product version installed on all System components. If some of the components (server or client) in a multi-server System have different versions installed there may be operational issues.

See [Upgrading Wisenet WAVE](#) for more information.

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Connecting to a Specific Server

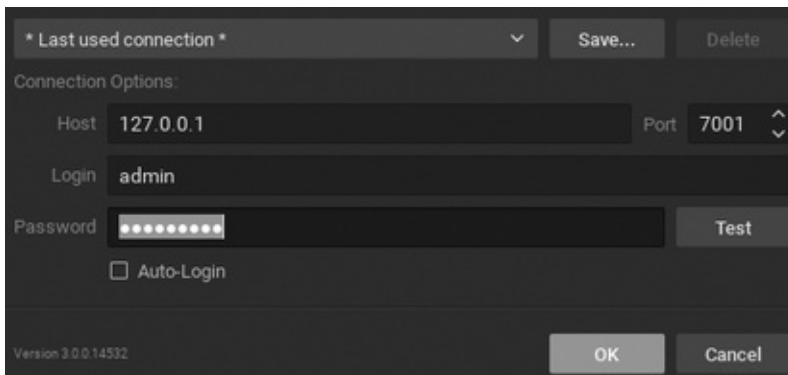


If the client is not connected to a server, a user can only access **Local Files** (see “[Playing Local Video Files in Wisenet WAVE](#)”).

To connect to a specific server

Use the *Connect to Server* dialog to connect to a specific server, login using a different user name, or enter new server coordinates or login credentials. If the operation is canceled, the current user will still be connected to server.

Open **Main Menu** and choose **Connect to (Another) Server** to open the connection dialog shown below.



The easiest way to connect is to use one of the auto-discovered servers. The default **Last Used Connection** is recommended.

To use a different predefined connection, click on the **Last Used Connection** drop-down list. Saved sessions are listed first, then auto-discovered servers by System name - server IP address in alphabetic order. Note that a server may have several network interfaces. In that case, one will be chosen at random to display in the drop-down list. Also, Wisenet WAVE automatically detects product version and will list a server in red if it is using a different version than the client. In the case of a multi-server environment, if several servers with the same System name are discovered it is possible to connect to any one of them.

To enter connection details manually

The following values are required:

Host – IP Address or address of the computer server is installed on (`localhost` or `127.0.0.1` for All-in-One installation).

Port – IP Port for access to server (`7001` by default).

Login and **Password** to connect to server. If connecting for the first time, use

"**admin**" as the login name. Use the same password that was set up during the initial installation.


Test – Press to check connectivity to a server. The following may cause connection errors:

- Server is not available
- Specified IP Address is incorrect or inaccessible
- Specified port is incorrect
- Server is stopped
- Login and/or password are incorrect
- Server and client are incompatible with each other because they are running different Wisenet WAVE versions. In this case compatibility mode will be suggested.
- Server and client are incompatible with each other because of different customizations.

Auto-Login – Check this option to save login credentials. When the client is launched again, it will connect to the server automatically using the pre-established login and password combination.

To save and restore connection details

- To save a set of connection details, press **Save**. In the *Save connection as* dialog that opens, enter or change the connection name and if desired check the **Save password** option. Click *OK* to add it to the drop-down list, or you can *Cancel* the operation.
- To delete details of a stored connection, select it from the drop-down list, click **Delete**, then click *Delete* or *Cancel* in the confirmation dialog that follows.
- If the last connection was not properly saved, the software will use connection data from the previous launch (* *Last Used Connection* *).

 **Note:** Passwords are not stored in saved connection details unless the **Save password** option is enabled.

To log out

Go to **Main Menu** and choose **Disconnect from Server** (shortcut **Ctrl+Shift+D**)

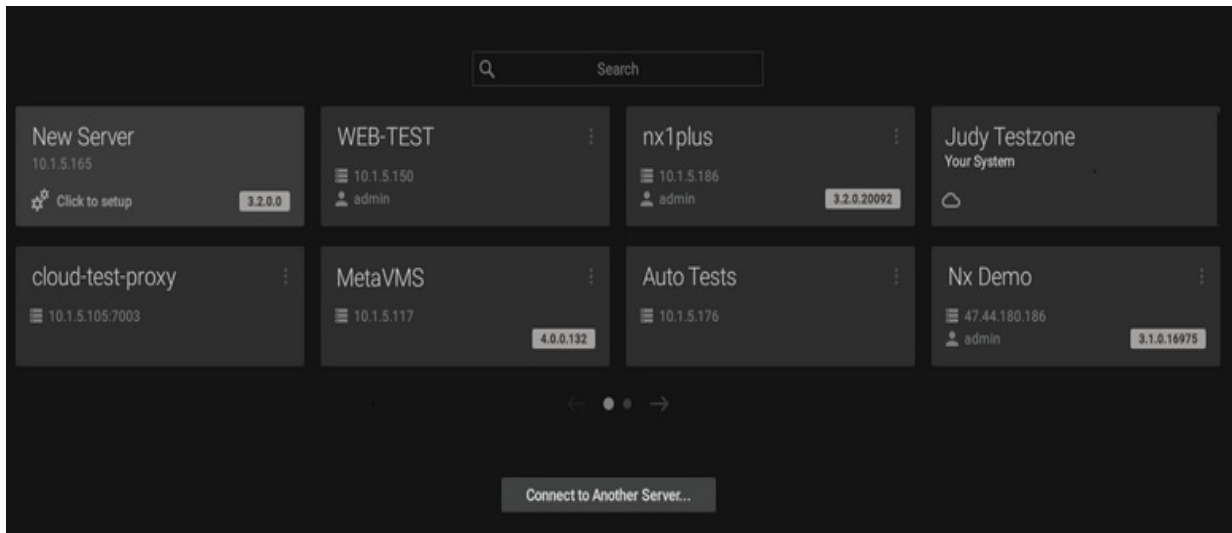
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Connecting to System from the Welcome Screen



When Wisenet WAVE Client is first launched, the Wisenet WAVE **Welcome Screen** (shown below) automatically detects and displays the Systems in your local networks and Systems that have been recently accessed. Local Systems can be accessed with a username and password. If a user is logged into WAVE Sync (see "[Logging in to WAVE Sync](#)"), Cloud Systems are also displayed. No login is required to open WAVE Sync portal.

Up to eight System tiles are displayed on the Welcome Screen, with a new page opening for each group of eight. When more than one page is open, you will see navigation arrows below the System tiles, with a dot that indicates the position of the current page. To search for a specific System, use the search bar above the tiles. Systems that are unavailable at the moment are grayed out and may be deleted from the display.



The Client can connect to Systems running different version of Wisenet WAVE. The product version is displayed in a yellow block on the lower right corner of the System tile if it is not the same version as the Client. If a System is incompatible with the Client, the block will be red. See "[Launching Wisenet WAVE in Compatibility Mode](#)" for information on resolving client/System version discrepancies.

⚠ IMPORTANT: Compatible hardware supports Safe Mode booting. The hardware boots up in Safe Mode if something has happened during a

previous boot. In this case it is possible to connect to a server, but it is not possible to perform any configuration.

To connect to a System

Click on the tile for the desired System. If it is compatible with the client a connection dialog will open.

- Enter a login and password.
- Optionally, check **Save password** so in the future clicking on the tile will connect directly to the System using the saved credentials.
- Optionally, check **Auto-login** to bypass the Welcome Screen in the future and instead connect directly to the System when Wisenet WAVE launches.
- Click **Connect**.

To edit or hide a System connection

For local Systems that are online, a context menu is available that lets you edit or hide the System tile. Right-click on a tile or click on the three dots in the upper-right corner to open this menu.

Edit expands the tile to the connection dialog without logging to the System. This is useful, for example, if you need to log in using a different account or server address, but a password is saved or auto-login is in enabled. Fields that can be edited will display a pencil icon when the cursor hovers over them. Select from the available options in the pulldown menu for the IP address and **Login** fields and choose your desired settings for **Save password** or **Auto-login**.

Hide simply moves the System tile to the end of the display queue (last tile on last page) when a System is online. (For an offline System, an "X" button appears on the System tile. Clicking this X button removes the System completely - the tile won't appear on the Welcome Screen again unless the System is online.)

Working Offline

Even when you are not connected to a System, the Welcome Screen main menu provides the following:

- *Connect to server* – lets you connect to a specific server using its IP address. See "[Connecting to a Specific Server](#)".
- *Browse Local Files* – use the Welcome Screen as a media player. See "[Playing Local Video Files in Wisenet WAVE](#)".

- *New* – launches a Welcome Screen in a new window.
- *Start Screen Recording* – toggles screen recording of an entire window. See "[Screen Recording \(Windows Only\)](#)".
- *Local Settings* – opens the Local Settings dialog where you can choose language, display time and other global setting. See "[Customizing Look and Feel of Wisenet WAVE](#)".
- *About* – displays important System and network configuration information. See "[Collecting Additional Information](#)".
- *Exit* – closes the window (shortcut **Alt+F4**)

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Initial System Configuration



When Wisenet WAVE is installed, some initial configuration is required. A new installation will be displayed as "**New Server**" on the Welcome Screen. Remember that a sufficient number of licenses must be obtained and activated (see "[Wisenet WAVE Licenses](#)").

Click **Click to setup** to connect without login credentials. The setup wizard that opens provides two options, **Setup New System** or **Add to Existing System**.

Setup New System – specify a System name and owner password. The following advanced settings are also available:

- Device setting optimization (see "[Preventing Wisenet WAVE from Changing Camera Streaming Settings](#)")
- Device auto discovery (see "[Automatic Device Discovery](#)")
- Usage statistics and crash reports logging (see "[Sending Anonymous Usage and Crash Statistics](#)")

Add to Existing System – if a System contains multiple servers (see "[Configuring Multi-Server Environment](#)"), specify:


- System URL – this value can be auto-discovered. If it is not, the URL format is <http://<host>:<port>>, where <host> is the name or IP address of the server and <port> is the server port (usually 7001)
- Login and password for the existing System

Whether it is a new System or the server is connecting to an existing one, the following settings will be required:

- **Storage** on each server must be configured (see "[Configuring Server and NAS Storage](#)").
- **Devices** must be properly set up (see "[Device Management \(Cameras, Encoders and I/O Modules\)](#)").
- **Recording** settings must be established (see "[Setting up Recording Schedule](#)").

Once storage, device, and recording configuration is complete it is possible to define the following:

- **User Roles** and authorities (see "[Users and User Roles](#)")
- **Layout** configuration (see "[Layout Management](#)")

 **Note:** All servers in a given System have the same "localsystemID" value. This parameter cannot be viewed or edited, it is required for internal processing when servers are merged. If you select "Setup New System," the localSystemId is assigned during initial configuration. If you select "Add to Existing System," the localSystemId is taken from the existing System.

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Connecting to a Server

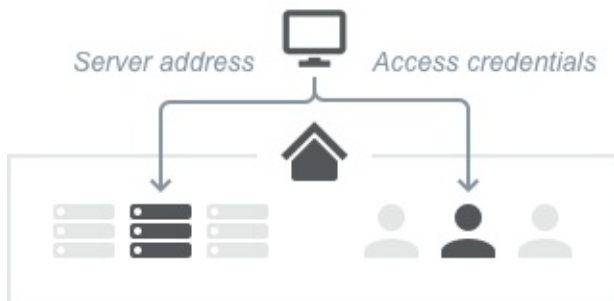


Because available functionality does not depend on which server you are connected to, sometimes the term "log in to a System" is used interchangeably with "connect to a server". In fact, to establish connection with the server you must do both – connect to the server using its address and then log in to the System using your individual access credentials.

In order to gain access to devices, a user must be connected to a **System**. A System consists of one or more servers.

Connecting to a known server

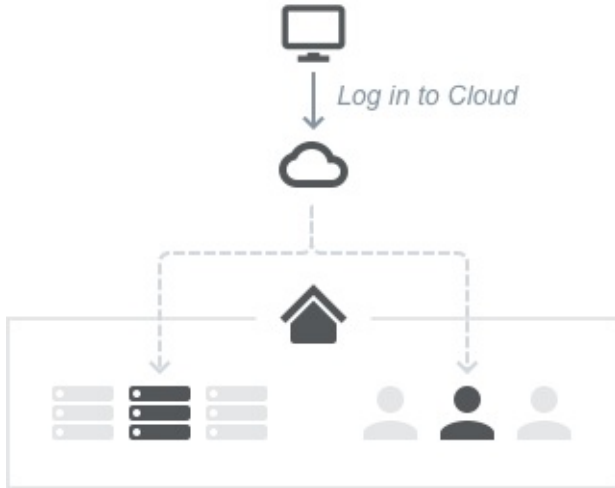
To connect to a server, you must specify the server IP address, your account login and password, and the server port. In desktop and mobile clients, the server address is entered into a designated field. In the web client, you enter the server IP address in the address line of the browser, and then a login and password in a subsequent dialog.



Both Cloud and local accounts can be used to connect to a server in this way. In rare cases, Cloud accounts may not work if the System you are connecting to doesn't have connection to the internet and you never logged in with this account to this System before. Local accounts should always work.

Connecting after you have logged into the Cloud

Another way to connect to a server, if it belongs to a System which is connected to WAVE Sync, is to log in to WAVE Sync in the client. After that, if you are not currently connected to a server, you will see a list of all your Cloud systems, and be able to log in to any of them by simply clicking on the associated icon. Your Cloud account will be used to log in, and because you are already logged in to the client with that account, you will not have to enter your access credentials again.



The server to which you will be connected will be determined automatically based on the network configuration. If you are logged in to the Cloud in the client you still can connect to a known server by entering its address and the appropriate credentials.

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Connecting System to WAVE Sync



Once logged in to WAVE Sync, a user gains access to all servers that are connected to WAVE Sync . See "[Connecting to System from the Welcome Screen](#)".

The following operations are possible:

- Login to any System without entering credentials
- Share access to WAVE Sync
- Share Systems with users and create custom user Roles

To connect a System to WAVE Sync

1. Open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) and go to the **WAVE Sync** tab.
2. Click **Create WAVE Sync Account** to open a registration form in the WAVE Sync portal.
3. Click **Connect System to WAVE Sync** and log in to WAVE Sync.

Once connected, the System will be displayed in the WAVE Sync portal and will be accessible without a log in. Sharing can be done from within the WAVE Sync portal.

To disconnect a System from WAVE Sync

1. Open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) and go to the WAVE Sync tab
2. Click **Disconnect System from WAVE Sync Account**.

⚠ IMPORTANT: Note that disconnecting will cause all users a System is shared with to lose their access.


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Logging in to WAVE Sync



The cloud icon  in the [Navigation Panel](#) opens a web page where you can login or logout of WAVE Sync or create a WAVE Sync account.

To login to WAVE Sync from the desktop client

1. Click the  icon in the Navigation Panel.
2. Enter your email and WAVE Sync password, then click on the **Log In** button.

Once connected, your email address will be displayed next to the cloud icon, and you can click on it to open the WAVE Sync portal, log out from WAVE Sync, or change your Cloud account settings.

Note that you can connect to a server with the WAVE Sync login even if the internet connection is temporarily unavailable.

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Connecting to Wisenet WAVE via Mobile Client



Wisenet WAVE **Mobile Client** provides the following features:

- View live streams from cameras
- Search through recorded archive
- PTZ camera control
- Fish-eye camera dewarping
- Two-way audio
- Soft triggers

The mobile client is available for Android and iOS platforms. Two versions of the mobile client are available:

- New Mobile client – Compatible with Wisenet WAVE versions 2.5 and higher. Requires iOS 8.1+ or Android 4.1+. Provides a much better user experience and enhanced interface.
- Old Mobile client – Compatible with any version of Wisenet WAVE, supported for this reason.

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Connecting to Wisenet WAVE Web Client





Wisenet WAVE **Web Client** provides the following features:

- view live streams from cameras
- search through recorded archives

To open the Web Client

1. Open server's web interface and log in using your standard login and password credentials.
2. Go to the **View** tab to select and view servers and devices.

The Web Client can be opened on mobile devices as well. See "[Connecting to Wisenet WAVE via Mobile Client](#)".

 **Note:** If a System contains multiple servers, the web interface will control the server to which the client is connected (as indicated by the  icon in the Resource Tree).

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Opening and Closing Wisenet WAVE Desktop Client



To open the latest version of Wisenet WAVE Desktop Client

Click on the Wisenet WAVE shortcut icon on your PC or mobile device interface to launch the [Welcome Screen](#).

If for some reason you need to use an executable file, the applauncher.exe executable is recommended as it launches the newest installed version of the client. In addition, if another executable is used, it is possible that client restart will not work during auto-updates, and restart to compatibility mode and interface language changes may be disabled.

Note that if your client version has been auto-updated there will be other executable files in other folder locations than the following default initial installation locations.

Windows

- From desktop: click on the Wisenet WAVE shortcut icon
- From Start Menu: go to **Start** → **Programs** → **Hanwha** → **Wisenet WAVE**
- From the installation folder: click on the executable file. The default location is `C:\Program Files\Hanwha\Wisenet WAVE\Client\
<VERSION>\hanwha Launcher.exe`

On Windows only it is also possible to automatically launch Wisenet WAVE when a computer starts up:

1. Go to **Main Menu** → **Local Settings** → **General** tab
2. Check **Run Application when PC boots up**
3. Click *Apply* to accept changes, *OK* to save changes and close the dialog, or *Cancel* to discard changes.

Linux

- Click on Wisenet WAVE shortcut icon
- From the installation folder:
`/opt/wave/client/<VERSION>/bin/applauncher`

MAC

- Use the Wisenet WAVE shortcut icon located in Applications or Launchpad

- From the installation folder: `/Applications/Wisenet WAVE.app/Contents/MacOS/applauncher`

To close Wisenet WAVE Desktop Client

- Click on the "X" button in the top right corner
- Go to **Main Menu** → **Exit** (shortcut **Alt+F4**)

🔴 **IMPORTANT:** In order to display video and graphics properly, it is important to have the most current video drivers installed. If current video drivers are not installed, a warning will display prompting you to update your installation.

Launching in Configuration Mode

The Wisenet WAVE client detects PC system configuration automatically. If the CPU and/or graphics adapter are insufficient to render all graphics, the client will launch in **configuration mode**. This mode restricts functionality as follows to limit CPU load and graphics usage:




- Only one video can be viewed at a time
- Notifications are disabled in the client
- Movement of interface elements is disabled

Navigation: [Working with Wisenet WAVE](#) > [Wisenet WAVE User Interface](#) >

Navigation Panel



The **Navigation Panel** provides access to the most important System tools and features, as well as the layout tabs. Like all panels, it can be shown and hidden. The Navigation Panel contains the following controls:

-  **Main Menu** – use to configure fundamental behavior such as [System Administration](#), [Users and User Roles](#), Local Settings, etc.
- **Layout Tabs** – all open tabs are displayed and can be navigated through
-  **Cloud Connect Button** – connects to WAVE Sync. This button indicates the current WAVE Sync connection status and allows you to connect/disconnect to WAVE Sync and open the WAVE Sync Portal.
-  **Help Button** – Invokes this help System
- Standard window sizing buttons – Minimize, Maximize, Exit

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Showing and Hiding Panels



Panels in the user interface can be shown or hidden, individually, or all at once. Use the ">" arrow buttons at the perimeter of the viewing grid to show or hide individual panel display.

Press **F11** to hide all Panels and expand the viewing grid content to maximize the Wisenet WAVE screen. Press **F11** again to show all Panels. (Note however that the product window remains maximized).

You can also use [Fullscreen Mode](#) to simultaneously hide all four sliding panels and expand display of a single Item to fill the entire layout.

Pinning a Panel

Additionally, the side panels can be pinned or unpinned using the pin icon in the upper right corner of the panel.

- When **Pinned**, panel display is "sticky". When a panel is shown or hidden, it remains that way until you explicitly use the ">" arrow to change it. A pinned panel will not reopen automatically when the panel is hidden manually (*i.e.* the pin works to keep the panel hidden as well as open).
- When **Unpinned**, panel display is hidden. If you hover the cursor over the ">" arrow it will open for a few seconds, but it will only remain open if you click inside it.

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Expanding Items to Fullscreen Mode



Fullscreen mode simultaneously expands display of a single Item to fill the entire layout, and hides all four sliding panels. If you expand an item to Fullscreen mode, only recorded fragments related to the selected Item are visible on the Timeline.

To toggle Fullscreen mode on or off, use one of the following:

- **Double-click** or press **Enter** on an Item in layout
- Open an item's context menu and select **Maximize Item** to expand or **Restore Item** to return the full layout and panel display

 **Note:** You can use [Tours](#) to loop through Fullscreen display of each item in the active layout.

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Zooming Layout



Click anywhere on the layout background and use the "+" (in) and "-" (out) buttons to zoom the entire layout, or use the mouse wheel to zoom the layout in and out, centered on the cursor location.

Fit in View

Fit In View scales the Viewing Grid so that all items in a Layout are visible. It is a convenient way to restore a layout you have zoomed or moved.

Double-click on the layout background or **Right-click** on the context menu and select **Fit in View**.

Fit In View is performed automatically when you change to **Fullscreen Mode** (see "[Expanding Items to Fullscreen Mode](#)").

Navigation: [Working with Wisenet WAVE](#) > [Wisenet WAVE User Interface](#) > [Viewing Grid](#) >

Changing Cell Aspect Ratio



Cameras provide video in a variety of aspect ratio formats. To populate layouts efficiently, Wisenet WAVE attempts to match the default aspect ratio of an Item window to the aspect ratio of its contents.

The Viewing Grid adjusts to the aspect ratio of the first item added. To manually change the aspect ratio of a layout, right-click anywhere on the Viewing Grid, and use **Change Cell Aspect Ratio** from the context menu to select from the available options (**4:3**, **16:9**, **1:1**, **3:4**, or **9:16**).

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Viewing Grid



The **Viewing Grid** is the empty background of cells into which **items** (devices, Showreels, web pages, local files, etc.) are placed to create a **Layout**.

Viewing Grid cells are only visible when you move or resize objects in the layout. Green cells indicate where an item can be placed, red cells indicate where it will not be placed.

The Viewing Grid has a default cell aspect ratio of 16:9, currently the most common aspect ratio of cameras on the market. The cell aspect ratio can be set using **Change Cell Aspect Ratio** from the from the Viewing Grid context menu.

Note that the cell aspect ratio adapts to the first item placed in layout. This is important to consider when designing your layout. Each item added to a layout will display in its native aspect ratio, but no matter what the aspect ratio of subsequent items placed, the cell aspect ratio is determined by the first item placed in layout.

The Viewing Grid has a setting for the spacing between cells (*none, small, medium, or large*) which is useful when you need to make a layout more compact. Access this control from the Viewing Grid context menu choose **Change Cell Spacing**.

There is also a setting for the default display resolution (*auto, low, high*), controlled from the Viewing Grid context menu -> **Change Resolution**.

⚠ IMPORTANT: The Viewing Grid adjusts to the aspect ratio of the first item added to a layout.

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Customizing Look and Feel of Wisenet WAVE



Use **Main Menu** -> **Local Settings** -> **Look and Feel** to set the following global display characteristics:

- **Language** – select your preferred display language from the pull-down menu. You must restart Wisenet WAVE for this change to take effect.
- **Time Mode** – select *Server Time* or *Client Time* as the display time that will apply to recorded footage, the Timeline, and timestamps in Event Logs, Audit Trail and Bookmarks. See "[Timeline](#)".
- **Show additional info in tree** – check this box to include the IP address of devices and servers, and the User Role of individual users in the Resource Tree display.
- **Tour cycle** – sets the time, in seconds, that each item in a [Tour](#) will be displayed.
- **Background Image** – click this button to add an image (typically a logo) that will display on the viewing grid beneath all layouts. Once an image is selected, you can use this button to toggle it on and off.
 1. Click *Browse...* to select an image file
 2. Set the display *Mode* to *Stretch*, *Fit*, or *Crop*
 3. Set the *Intensity* level from 0% (completely transparent) to 100% (completely opaque)

Click *OK* when done or *Cancel* to discard changes. If your changes require a restart, you will be prompted to *Restart Now*, *Restart Later*, or *Cancel*.

 **Note:** The viewing grid background is different than the backgrounds that can be applied to a single layout (see "[Adding a Background to Layout](#)").

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Maximizing the Wisenet WAVE Display



The recommended display for Wisenet WAVE is a maximized window. Use one of the following to maximize the application window:

- Click the standard maximize window ("Go to Fullscreen") button in the Navigation Panel
- **Double-click** on the Navigation Panel to toggle between a maximized or scaled window
- Press **Alt+Enter** to toggle between a maximized or scaled window
- Press **F11** to simultaneously maximize the current layout and hide all side panels. (Pressing **F11** again will reopen the panels, but Wisenet WAVE will remain maximized.)

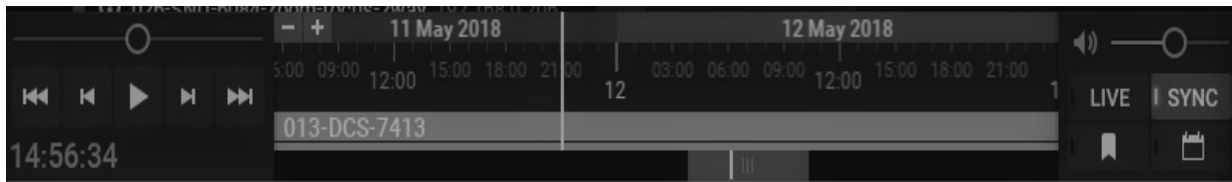
Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Viewing Archive and Live Display](#) >

Navigating with the Timeline



On the Timeline, green indicates recorded segments and dark gray indicates unrecorded segments. It is only possible to navigate through recorded segments. The scrollbar will skip unrecorded segments and jump to the next available recorded segment.

- Press **▶** to play
 - Press **⏸** to pause
 - Press **Space** to toggle between play and pause
- To skip to the next recorded segment
- Press **⏭** or **Ctrl+Right Arrow** to skip forward
 - Press **⏮** or **Ctrl+Left Arrow** to skip backwards



To search through archive

- Click on any desired position on the Timeline
- Drag the scrollbar to the desired position

To scale the Timeline

- Zoom in or out using the mouse wheel
- Double-click on the position scrollbar to fully zoom out to one month
- Use the **+** and **-** scale buttons at the left

To select a time segment on the Timeline

- Click-and-drag on the green recording indicator
- Right-click on the Timeline to open the context menu and choose **Mark Selection Start** (shortcut **[**), then **Mark Selection End** (shortcut **]**) at a later point.
- Click-and-drag the white line of the position indicator.

The selection will be highlighted with a blue block. You can click-and-drag the edges of the segment to adjust its length. Once a segment is selected, you can also use the context menu to **Clear Selection**, **Zoom to Selection**, or **Add Bookmark**.

Controlling playback speed

Fast Forward or **Rewind** buttons:

Press  or **Ctrl+Right Arrow** to increase speed

Press  or **Ctrl+Left Arrow** to decrease speed

Available speeds on play are -16x, -8x, -4x, -2x, 1x, 2x, 4x, 8x, 16x

Available speeds on pause: -2x, -1x, -0.5x, -0.25x, 0x, 0.25x, 0.5x, 1x, 2x

The **Speed Slider** provides another way to move through the playback speed increments, where all the way to the left is the slowest speed and all the way to the right is the fastest speed.


Click on speed slider to change speed temporarily and then revert to 1x during play or 0x when paused. This is helpful for previewing images that bracket the current position.

Drag speed slider or use mouse wheel to set speed to one of the preset increments.

If you press a rewind button while in **Live** mode, the mode will switch to **Archive** playback. If you press fast forward while viewing archive, camera(s) will switch to **Live** mode if the current time is reached.

Previous/Next Frame (during **Pause** only):

Press  or **Ctrl+Right Arrow** to skip to the next frame

Press  or **Ctrl+Left Arrow** to skip to the previous frame

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Wisenet WAVE provides powerful and easy playback controls that let you quickly find, or Bookmark, a video segment, perform forensic analysis, capture screenshots, export video, and other related actions. This section provides a detailed description of the following operations:

- [Navigating through Archive and Live Display](#)
- [Searching through Archive](#)
- [Using Bookmarks](#)
- [Playing Local Video Files in Wisenet WAVE](#)
- [Using 2-Way Audio](#)
- [Exporting](#)
- [Taking Screenshots](#)
- [Adjusting Volume](#)
- [Tours](#) – cycles through all items in a given layout
- [Showreel \(Tour Cycle\)](#) – cycles through all layouts open in the current session
- [Viewing Archive from Deleted Cameras](#)

Wisenet WAVE provides viewing and playback of the following content:

- **Cameras** – live and archived footage
- **I/O Modules** – sound can be recorded from an I/O module with a microphone connected, and played live or from archive
- **Local files** – saved video and image files (see "[Playing Local Video Files in Wisenet WAVE](#)")

(Some operations described in this section may require certain advanced permissions. See "[Introducing User Roles](#)" for details.)

Controlling Live Playback Quality

If you are experiencing image stuttering during live playback, or there is too much time between actual action and displayed action in Live view, it may be necessary to adjust the buffer size (see "[Configuring Live Buffer Size](#)") or streaming resolution (see "[CPU and Bandwidth Saving during Playback](#)").

Navigation: [Working with Wisenet WAVE](#) > [Video Wall Mode](#) >

Pushing Operator's Screen on Video Wall



Wisenet WAVE provides the ability to push Operator's screen to Video Wall. This is done from **Video Wall Controller**:

1. Open Video Wall on Video Wall Controller by dragging the desired Video Wall from the Resource Tree onto the layout, or by right-clicking on the desired Video Wall in the Resource Tree and choosing *Open Video Wall*.
2. Right-click on the desired Screen and choose *Push my Screen*. Everything displayed on the operator's desktop will be sent to the Video Wall screen, including sound.
3. To stop the broadcast, locate the desired Screen in the Resource Tree or on Video Wall Layout, right-click and choose *Detach Layout*.

Navigation: [Working with Wisenet WAVE](#) >

Video Wall Mode



Video Wall mode lets you use a session of the Wisenet WAVE Desktop Client to remotely (via a LAN, WAN, or internet connection) control display on other monitors in your System. This feature is only available on Windows.

A special Video Wall License is required (see "[Wisenet WAVE Licenses](#)"). Each license allows Video Wall control from one Client session and Video Wall display on up to two monitors (so, for example, 4 licenses allow you to display Video Wall on 8 monitors and control it from 4 Clients, concurrently).

 **Note:** To be able to configure and control a video wall, a user must be assigned the related permission.

Video Wall Architecture

A **Video Wall Server** is the computer that hosts the main database of a **Video Wall Cluster**. Video Wall displays can be connected to this server and it can act as the **Video Wall Processor** as well. All computers that are part of the Video Wall Cluster (clients and controllers) should be located in the same network.

The **Video Wall Processor** is the computer that Video Wall displays are connected to. Depending on its configuration it can handle one or several displays. There is not a limit to the number of Video Wall Processors that can be combined in a Video Wall Cluster.

A **Video Wall Controller** is any computer that can connect to a Video Wall and control it. It can even be a laptop; the only requirement is that the video adapter should support OpenGL > 2.0.

In order to operate Video Wall properly, Wisenet WAVE should be installed on every computer in the Video Wall Cluster:

- Video Wall Server: Full installation.
- Video Wall Processor(s): Client only installation.
- Video Wall Controller(s): Client only installation.

If all Video Wall components are installed on one computer, choose Full installation.

Initial Video Wall configuration is performed in several steps:

- [Configuring a Video Wall Display](#)

- [Switching to Video Wall Mode](#)
- [Controlling Video Wall Displays](#)

You can also [Delete a Video Wall or it's Elements](#), or [Push an Operator's Screen to a Video Wall](#).

The number of displays available to any single computer is limited by the number of video outputs it has. To extend Video Wall it is necessary to add additional computers and combine them with the Video Wall Cluster. See "[Configuring Video Wall on Several Computers](#)".

Navigation: [Working with Wisenet WAVE](#) >

Backing up and Restoring Wisenet WAVE Database



You can create a backup of the System database of System settings, user rights and settings, and device configurations, which can be restored in case of failure. If a user creates the backup in the Client, the file is saved as a *.db file. Wisenet WAVE creates a database backup automatically when the product version is updated and when Systems are merged (see "[Merging Servers with Another System](#)"). If the backup is created automatically, the file is saved as a *.backup file.

The System database does not include archives, server data, or local settings.

The default database backup location is

C:\Windows\System32\config\systemprofile\AppData\Local\Hanwha\H Media Server on Windows and /opt/hanwha/mediaserver/var on Linux.

⚠ IMPORTANT: It is best to backup and restore the database on the same computer.

To back up Wisenet WAVE database

1. Go to **Main Menu -> System Administration**.
2. In the *Backup and Restore* section, click **Create Backup**.
3. In the dialog that opens, choose a location on the local file system, enter a file name for the backup, then click **Save**.

To restore Wisenet WAVE settings from backup

1. Go to **Main Menu -> System Administration -> General**.
2. In the *Backup and Restore* section, click **Restore from Backup**.
3. In the dialog that opens, find the desired database backup file (*.db), then click **Open**.
4. Click **OK** in the confirmation dialog to restore the database.


Servers will restart automatically when the System is restored from backup. It will

⚠ IMPORTANT: It may be necessary to restart servers and Wisenet WAVE clients after restoring a database.


Navigation: [Working with Wisenet WAVE](#) > [Layout Management](#) > [Image Display Controls](#) >

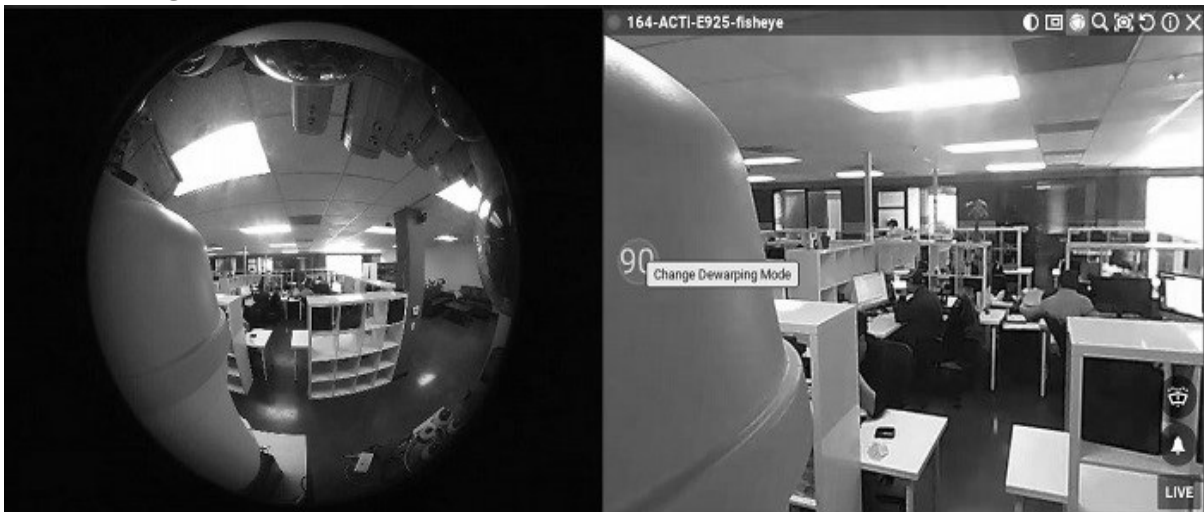
Dewarping Fish-Eye Cameras




If configured, as indicated by the presence of the dewarping  icon in layout, a fish-eye camera image can be dewarped and will also have PTZ controls available. See "[Configuring Fish-Eye Cameras](#)".

To apply dewarping

1. Click the dewarping  icon to activate dewarping and enable the following controls:



2. Click the **Change Dewarping Mode** button in layout to show the image as a **90**, **180**, or **360** degree panoramic view, as indicated by the button. Note that 360 degree panoramic mode is not available to cameras that are configured as wall mounted.
3. Use PTZ controls as desired. See "[Controlling Pan, Tilt, and Zoom \(PTZ\)](#)".
4. Click  again to hide controls and disable dewarping.

Note that zoom windows created from a fish-eye image are dewarped automatically, but Wisenet WAVE generates screenshots and export files exactly as the image is displayed. It is possible, however, to apply dewarping to a screenshot after it is captured.

To dewarp a fish-eye screenshot

1. Right-click on the saved image to open the context menu and select **File Settings**.
2. Click on the **Fisheye Dewarping** button to enable (green) the distortion correction parameters.

3. Configure dewarping as described in "[Configuring Fish-Eye Cameras](#)".

Navigation: [Working with Wisenet WAVE](#) >



Layouts are a powerful and flexible way to view video data in Wisenet WAVE. A Layout can contain up to 24 items for x86 architecture or 64 items for x64 architecture – including camera streams, local video files, web pages, or images, which are not restricted in terms of location, size, or orientation.

Initially, a layout is created and configured by an Owner or Administrator. It can then be assigned to Viewers. Viewers can also create their own layouts based on the resources (devices, local files) available to them.

If running on a multi-machine System, changes to shared layouts are activated immediately on all machines. Refer to [“Opening and Closing Saved Layouts”](#) for more information.

The following layout controls are described in this section:

- [Tabs for Layout](#)
- [Creating and Assigning New Layouts](#)
- [Adding a Background to Layout](#)
- [Saving Layouts](#)
- [Opening and Closing Saved Layouts](#)
- [Locking Layouts](#)
- [Deleting Layouts](#)

See also ["Showing Cameras on Alarm Layout"](#)

Navigation: [Working with Wisenet WAVE](#) > [Users and User Roles](#) >

Audit Trail of User Actions



Wisenet WAVE tracks all user actions and records them to a log called the Audit Trail.

To view this log, open **System Administration** (shortcut **Ctrl+Alt+A**) -> **General** tab and click the **Audit Trail** button. There are two summary panels, Sessions and Devices, with a Details panel to the right.

The screenshot shows the Audit Trail interface with a search bar and filters. The 'Sessions' panel is active, displaying a list of sessions with columns for Session begins, Session ends, Duration, User, IP, and Activity. The 'Details' panel is also visible, showing a detailed view of a session with columns for Date, Time, User, IP, Activity, and Description. The 'Activity' column in the Sessions panel includes a graph that shows the number of actions performed when a mouse hovers over the field.

Session begins	Session ends	Duration	User	IP	Activity
10/11/17 12:15 PM	10/11/17 12:15 PM	0m	admin	10.1.5.169	
10/10/17 10:48 AM	10/10/17 12:51 PM	2h 3m	admin	192.168.0.92	
10/10/17 10:43 AM			admin	10.1.5.169	
10/10/17 12:09 AM			admin	192.168.0.4	
10/10/17 12:09 AM			admin	192.168.0.220	
10/9/17 5:23 PM	10/9/17 5:23 PM	1m	admin	192.168.0.92	
10/9/17 4:50 PM			admin	192.168.0.191	
10/9/17 3:56 PM	10/9/17 5:17 PM	1h 26m	admin	192.168.0.92	
10/9/17 3:46 PM	10/9/17 3:50 PM	3m	admin	192.168.0.92	
10/9/17 3:46 PM	10/9/17 3:46 PM	0m	admin	192.168.0.92	
10/9/17 2:48 PM	10/9/17 3:45 PM	3h 4m	admin	192.168.0.92	
10/9/17 9:49 AM	Unsuccessful login		admin	192.168.0.82	
10/9/17 9:48 AM	Unsuccessful login		admin	192.168.0.82	

Date	Time	User	IP	Activity	Description
10/11/17	12:32 PM	admin	10.1.5.169	Watching live	10/11/17 12:32 ... Play
	12:16 PM	admin	10.1.5.134	Watching live	10/11/17 12:16 ... Play
	12:16 PM	admin	192.168.0.220	Watching live	10/11/17 12:15 ... Play
	12:16 PM	admin	192.168.0.4	Watching live	10/11/17 12:15 ... Play
	12:16 PM	admin	10.1.5.136	Watching live	10/11/17 12:15 ... Play
	12:15 PM	admin	10.1.5.169	Watching live	10/11/17 12:15 ... Play
	12:15 PM	admin	10.1.5.169	Login	Nx Witness/3.1.0.16127
10/11/17	7:00 AM	admin	192.168.0.5	Watching live	10/11/17 7:00 A... Play
	6:57 AM	admin	10.1.5.134	Watching live	10/11/17 6:57 A... Play
	6:47 AM	admin	10.1.5.134	Watching live	10/11/17 6:47 A... Play
	6:44 AM	admin	10.1.5.134	Watching live	10/11/17 6:44 A... Play
	6:39 AM	admin	192.168.0.5	Watching live	10/11/17 6:39 A... Play
	6:30 AM	admin	192.168.0.5	Watching live	10/11/17 6:30 A... Play

Sessions. A session is defined as the period between a user's log in and log out. The summary information displayed for each session is:

- *Session begins* and *Session ends*
- *Duration*
- *User ID*
- *IP address* of server user logged onto
- *Activity* graph indicating the number of actions performed when a mouse hovers over the field

Devices. A summary of the user actions such as devices viewed live and from archive, video exports, device modifications, server setting changes, user setting updates, etc.

Details. Select one or more records to view more detailed information in this panel. To select a record, click on it or use the checkboxes to the left. To select several records, use **Ctrl+click** or **Shift+click**. Use **Ctrl+A** or the **Select All** button to select all records. If no sessions are selected, all details will be displayed. The following detailed information is provided:

- *Date and Time* of action
 - *User* who performed the operation
 - *IP* address the user was logged in from
 - *Activity* – the action performed
 - *Description* – details of action performed
 - *Play* – allows you to view user actions directly. For example, you can select a camera and view exactly the footage that the user exported, or open a device that the user modified to see the current device settings.

Audit Trail Operations

Filter. Type a filter criteria in the *Search* field on the top. Select a desired time period using the From and To calendar fields.

Show/Hide actions by type. Use the checkboxes at the top to toggle display of specific action types.

Update data. Data may have changed since the log was opened. Use the **Refresh** to update the display.

Export. To export the log file, select the desired records and open the context menu to choose one of the following:

- **Copy Selection to Clipboard** – so data can be pasted to another program (ex. Microsoft Excel or Google Docs).
- **Export Selection to File** – exports data as an **html** or **csv** file.

Disabling Audit Trail recording

The Audit Trail is enabled by default. To disable it, uncheck the **Enable audit Trail** checkbox on the **System Administration** (shortcut **Ctrl+Alt+A**) -> **General** tab.

Navigation: [Working with Wisenet WAVE](#) >

Users and User Roles



This section describes how to create, modify, disable or delete users, and how to work with User Roles.

Wisenet WAVE provides certain predefined **User Roles** that have preset permissions: **Owner**, **Administrator**, **Viewer**, **Advanced Viewers**, and **Live Viewer**, as described in "[Predefined User Roles](#)". You can also create custom user roles and assign individual users a custom set of permission, as described in "[Roles Management](#)".

To simplify user and User Roles management it is possible to import users from a preexisting corporate network directory (LDAP). After the import users will be able to login to Wisenet WAVE using their corporate domain user name and password. See "[Adding Users from LDAP Server](#)" for details.

Finally, it is possible to track the actions that users perform in the System. See "[Viewing Users' Actions Log \(Audit Trail\)](#)" for details.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Write to Log



Writes a record to the event log when an event occurs.

By default, all events mentioned in rules are written to the log. However, if all notifications are turned off, you can use this **Write to Log** action for a specific event.

Basic Parameters

None

Advanced Parameters

Interval of action: no more than once per certain amount of time (to reduce the number of events), or instant.

May be caused by

All events

Why Action may work incorrectly

Event is not configured properly

Interval of action is too long, try "instant" instead

Navigation: [Working with Wisenet WAVE](#) >



An **Event Rule** is an **Event-Action** pair – when an **Event** is detected, the related **Action** is triggered.

An event rule is a one-to-one definition: a given event can have just one action. However, you create as many event rules as you need. For example, you can define an event that detects motion on a camera with the action "send an email", and a second event that detects motion on a camera with the action "create a bookmark".

User events are custom defined for a wide variety of conditions, using the available events and actions.

System-generated events exist for notification of critical storage and connection issues; a user cannot configure them or delete them.

Default Events are preconfigured events that run in background whenever Wisenet WAVE is open. Default events are triggered by System-level circumstances such as storage failure, license issues, device disconnection, etc.

Event Indicators in Layout

Due to their importance, or simply to make an event noticeable in a dense layout, certain events provide built-in visual indication when triggered. For critical events – storage failure or storage not configured, server failure or conflict, device disconnected, etc. – the indicator is a set of red outlines that radiate from the perimeter of the related item. For other, less critical events – motion on camera, input signal on device – a set of green outlines will radiate from the perimeter of an item. The server monitor also provides a similar visual indicator when a server issue is detected.

Event Logging

System events are automatically recorded in the System Event Log (see "[Viewing Events Log](#)"). All other events must have an explicit rule to "[Write to Log](#)".

Turning Rules On or Off

Using the Event Rule List – Once a rule is defined, it can be turned on or off using a checkbox in the Event Rules list. Turning a rule off means the event will not be detected and the corresponding action will not be

performed.

Using the Schedule – For any rule, detection of the event can be turned on or off in increments of one hour using a weekly calendar (see "[Event Scheduling](#)".)

Using Global Notification – Notification of a rule occurrence can be turned on or off System-wide (see "[Global Notification Settings](#)"). The rule is still on, but notifications are not sent when it triggers.

Resetting All Rules to Default

Rule configurations can be returned to their default settings. From **Main Menu** -> **System Administration** (shortcut **Ctrl+Alt+A**) -> **Event Rules**, click on **Restore all Rules to Default** then click **Reset** to accept changes.

❗ IMPORTANT: All user-defined rules are discarded when you restore rules to default.

To Create a Rule

See "[Using the Event Rules List](#)" and "[Using the Event Rules Form](#)".

To Delete a Rule

Right-click on a single rule in the list and choose **Delete** from the context menu, or use the **Delete** button at the top of the dialog.

❗ IMPORTANT: There is no confirmation prompt before a rule is deleted!

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) > [Working With Expert Device Settings](#) >

Assigning Logical ID



The Wisenet WAVE server API provides a mapping that lets you assign a 1 to 3 digit **Logical ID** that can be used instead of the much longer **Camera Id** displayed in **Camera Settings -> Advanced**.

The Logical ID simplifies device identification when integrating with third-party systems, and is necessary in environments with input devices that are not capable of entering the full camera ID. The Logical ID can be used in API calls (including getting RTSP streams etc) to address cameras.

To assign a Logical ID

1. Open the context menu for a camera and go to **Camera Settings -> Expert**.
2. Enter a number in the **Logical Id** field.

If you are integrating with a system that is already using 1 to 3 digit identifiers, use the **Generate** button to discover and display the smallest number that is not already in use.

To remove a Logical ID

Press the **Reset** button. This sets the Logical ID to zero, which the API equates to having no Logical ID.

Navigation: [Working with Wisenet WAVE](#) >

Device Management (Cameras, Encoders and I/O Modules)



The following types of devices are supported in Wisenet WAVE:

- Cameras
- Encoders and DVRs
- I/O Modules
- NVRs

! **IMPORTANT:** Most device parameters can only be configured by a user with Administrator or higher permission level. See "[Users and User Roles](#)".

The following settings are required for a device to be able to record:

- **Recording schedule** See "[Setting up Recording Schedule](#)".
- **Authentication** (if the default password has been changed for the device). See "[Configuring Device Authentication](#)".

This section describes the following functions related to devices:

- [Viewing Full Device List](#)
- [Adding Devices \(Cameras, Encoders and I/O Modules\)](#)
- [Working with NVRs](#)
- [Sharing Parameters on Multiple Devices](#)
- [Moving a Device to a New Server](#)
- [Deleting Devices](#)

Navigation: [Working with Wisenet WAVE](#) > [Configuring Multi-Server Environment](#) >

Time Synchronization in a Multi-Server Environment



Wisenet WAVE provides a time synchronization mechanism that sets System Time to synchronize either with the Internet or from a manually-specified Time server that all other servers will synchronize to. By default Wisenet WAVE tries to synchronize time across all servers, even when no Internet connection is available. At times it may be necessary to configure the time settings manually.

To do so open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) and go to the **Time Synchronization** tab.

The current System Time is displayed at the top. Below, a list shows the servers currently online, and the current date, timezone, time and offset from System time for each server.

- To synchronize System Time with the Internet, check the **Sync time with the Internet** box.

To specify a **Time Server**, uncheck the **Sync time with the Internet** box and click the toggle button to the left of the server you want to set as master, then click *Apply* or *OK*.

Navigation: [Working with Wisenet WAVE](#) >

Configuring Multi-Server Environment



Wisenet WAVE allows many servers to work together in one or more Systems for complete scalability. This section describes how to manage multi-server environments to maintain maximum System reliability and performance:

- [Moving One Server to a Different System](#)
- [Merging Servers with Another System](#)
- [Detaching a Server](#)
- [Configuring Failover](#)
- [Configuring Routing within Multi-Server Environment](#)
- [Configuring Time Synchronization within Multi-Server Environment](#)

Navigation: [Working with Wisenet WAVE](#) > [Configuring Server Settings](#) >

Using a Server's Web Interface



Wisenet WAVE provides a simple and convenient way to control servers remotely through the server's web interface.

To access a server's web interface from a browser

1. Enter an address of the format: <http://<ip>:<port>>, where
 - **<ip>** – IP address of server (the current computer should be able to connect to this server)
 - **<port>** – network port of server (default 7001).
2. Enter login and password.

A server web page may be inaccessible because it is located on a different network than the server.

To access a server's web interface from the Wisenet WAVE client

1. Right-click on a server and choose **Server Settings** from the context menu.
 2. Click on the **Server Web Page** link on the bottom left of the dialog.
- You can also choose **Server Web Page** directly from the server's context menu.

The web interface provides the following

Settings - Server

- Reset server to default configuration; detach or restart server; change port or admin password.

Settings - System

- Rename System; merge two Systems; connect to WAVE Sync.

View

- See all connected servers and devices.

Information

- View server data: version, architecture, IP address, storage locations, health monitoring, server logs.

For Developers

- Send feedback; run the Generic Events Generator (see "[Generic Event](#)"); use the APIs and SDK documentation.

Help

- Contact product support; run the storage and network requirement

calculator.

Navigation: [Working with Wisenet WAVE](#) >

Configuring Server Settings



In addition to the settings that are entered during initial configuration, Administrators can also view and edit these other server parameters. See the following topics for basic information concerning Wisenet WAVE storage behavior:

- [Archive Retention](#)
- [Archive Indexing](#)
- [Archive Backup](#)

To configure server parameters, select the desired server in the Resource Tree, open its context menu, and choose **Server Settings**.

In the *General* tab

- *Name* – server can be renamed here or in the Resource Tree
- *IP Address* – cannot be changed. (IP address display in the Resource Tree can be turned on or off using the [Show additional info in tree](#) flag)
- *Port* – this value is display only but can be changed from the web client
- *Ping* – initiates a server status check. If server is not responding, this can help check availability of the computer on which the server is hosted
- *Failover* – setup and turn failover on or off (see "[Configuring Failover](#)"). At least 2 servers are required.
- *Server Web Page* – provides a convenient link to the server web page

In the *Storage Management* tab

- *Storage Locations* - add and configure main, external and backup storage locations. See "[Configuring Server and NAS Storage](#)"
- *Backup Archive* – see "[Configuring Backup and Redundant Storage](#)"
- *Reindex Archive* or *Reindex Backup* – restores recorded footage if it is moved. See "[Reindexing Archives](#)".

In the *Storage Analytics* tab

- To view detailed storage statistics, see "[Analyzing and Predicting Storage Usage](#)".

Navigation: [Working with Wisenet WAVE](#) >

Configuring Mail Server for Email Notifications



An email server must be configured for the System to be able to send emails (see "[Mail Notifications](#)"). Wisenet WAVE can automatically provide server settings for certain email carriers, in which case you can enter just basic information using the simple entry form. If your email carrier is not recognized (warning message "*No preset found. Use 'Advanced' option*"), you will need to enter the required settings manually using the Advanced entry form.

Simple outgoing email settings

Outgoing Email Settings

Advanced settings... Test

Email: chuckchen@uzben.ch

Password: ●●●●●●●●

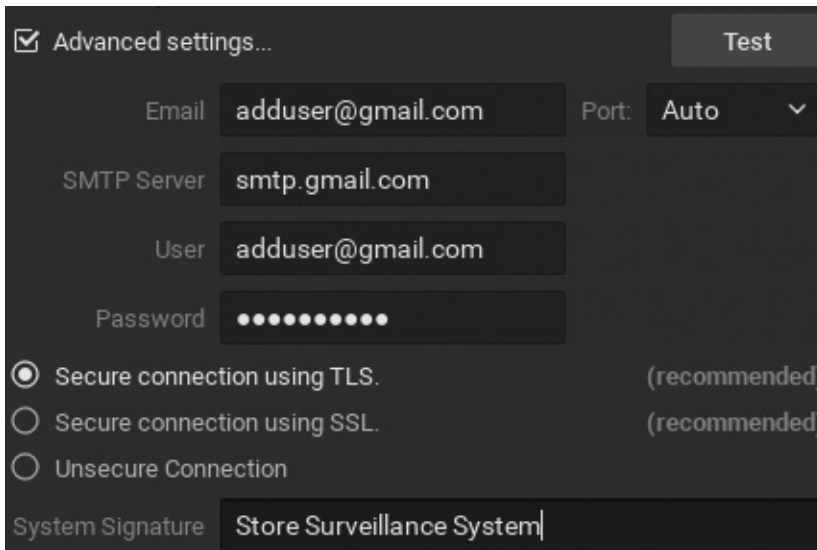
System Signature: Enter a short System description here.

Support Signature: http://support.networkoptix.com

1. Open **Main Menu** -> **System Administration** (shortcut **Ctrl+Alt+A**) -> **Email** tab.
2. If advanced settings (see below) are properly configured you can simply enter the following:
 - **Email** – email address to use for outgoing mail
 - **Password** – password for the outgoing email account
 - **System Signature** – user defined System description that will identify the System in outbound emails
 - **Support Signature** – support website for the Wisenet WAVE installation
3. Click the **Test** button to confirm all settings are valid. If the test fails, use the Advanced form to configure the server manually (see below). Possible failure results:
 - "Cannot test such parameters" – the domain name is not supported
 - "No preset found" – email and/or password is invalid
4. If the test is successful, press *OK* or *Apply* to accept or *Cancel* to discard

entries.

Advanced outgoing email settings



1. Check **Advanced settings** in **Main Menu** -> **System Administration** (shortcut **Ctrl+Alt+A**) -> **Email** tab.


2. Enter the following:

- **Email** – email address to use for outgoing mail
- **SMTP Server** – email server address
- **User** – email of person entering the information
- **Password** – password for user email account
- **System Signature** – user defined System description that will identify the System in outbound emails
- **Support Signature** – support website for the Wisenet WAVE installation
- **Port** – SMTP port. Choose *Auto*, *25*, *465*, or *587*
- **Connection type** – choose *Secure connection using TLS*, *Secure connection using SSL*, or *Unsecure connection*

3. Click the **Test** button to confirm all settings are valid. If the test fails:

- Try a different connection type
- Try a different SMTP port

5. If the test is successful, press *OK* or *Apply* to accept or *Cancel* to discard entries.

 **Note:** Even when Advanced settings are properly configured and emails are working as desired, the simple entry form may display an error.

Navigation: [Working with Wisenet WAVE](#) >

System-Wide Configurations



Main Menu → **System Administration** (shortcut **Ctrl+Alt+A**) is where you create the events Wisenet WAVE will track, and monitor current user, device and licenses status.

The dialog contains the following tabs:

General

- **Event Rules** – invokes the dialog when events and corresponding actions can be configured.
- **Event Log** – opens the list of events that occurred .
- **Device List** – opens the list of devices in the System.
- **Audit Trail** – opens the list of users' actions. Can be enabled and disabled.
- **Health Monitoring** – opens a graphic display of CPU, RAM and disk drive usage.
- **Bookmarks** – opens the Bookmark log.
- System setting checkboxes for the following:
 - Automatic device discovery**
 - Enable audit trail**
 - Sending anonymous usage and crash statistics**
 - Allow system to optimize device settings**
- **Backup and Restore** – creates a backup database of local settings

Licenses – use this tab to manage licenses and activation.

Email – use this tab to configure an outgoing email settings.

Updates – tools to manage versions and updates.

Users – shows all users and roles defined on the System.

Routing Management – shows System servers and their IP addresses.

Time Synchronization – lets you choose or synchronize server time.

WAVE Sync – use this tab to create or connect to a Cloud account

Navigation: [Working with Wisenet WAVE](#) >

Main Menu



The *Main Menu* is where fundamental Wisenet WAVE client behavior is configured, such as server connections, display characteristics, and the permissions granted to categories of users.

Click on the Main Menu button  in the upper left corner of the Navigation Panel to access the following:

- **Connect to (Another) Server** (shortcut **Ctrl+Shift+C**) – see "[Connecting to System from the Welcome Screen](#)".
- **Disconnect from Server** (shortcut **Ctrl+Shift+D**)
- **New**
 - Tab* – creates a new empty tab in the Tab Navigator (see "[Tabs for Layout](#)").
 - Window* – opens a new window of Wisenet WAVE (see "[Working with Multiple Wisenet WAVE Windows](#)").
 - User* – creates a new user (see "[Users and User Roles](#)").
 - Video Wall* – creates new Video Wall (see "[Video Wall Management](#)").
 - Web Page* – creates a new layout item for a web page (see "[Using Wisenet WAVE as Web Browser](#)").
 - Showreel* – creates a new tab containing a Showreel layout (see "[Showreel \(Tour Cycle\)](#)")

Open

- File(s)* and *Folder* commands open and play back selected local video files or all video files in a folder, respectively (see "[Playing Local Video Files in Wisenet WAVE](#)")
- Web Client* – opens a web browser to an Wisenet WAVE Web Client login dialog (see "[Connecting to Wisenet WAVE Web Client](#)")
- **Start/Stop Screen Recording** (shortcut **Alt+R**) – toggles screen recording of an entire window (see "[Screen Recording \(Windows Only\)](#)")
- **System Administration** (shortcut **Ctrl+Alt+A**) – opens a tabbed dialog for System-related settings (see "[System-Wide Configurations](#)")
- **User Management** – opens a dialog for managing individual users and defining roles for user groups (see "[User and Role Management](#)")
- **Local Settings** – opens a dialog for local client settings (see "[Customizing](#)")

[Look and Feel of Wisenet WAVE"\)](#)

- **Audit Trail** – opens a log that displays all user sessions, actions, and device activity (see "[Viewing User's Actions Log \(Audit Trail\)](#)")
- **Bookmark Log** (shortcut **Ctrl+B**)– opens a log where you can view, search and manage Bookmarks (see "[Searching Bookmarks](#)")
- **Merge Systems** – allows for merging of multi-server Systems (see "[Configuring Multi-Server Environment](#)")
- **About** (shortcut **F1**)– displays product version, hardware, and driver information (see "[Collecting Additional Information](#)")
- **Exit** (shortcut **Alt+F4**) – closes Wisenet WAVE client session

Navigation: [Working with Wisenet WAVE](#) > [Wisenet WAVE Licenses](#) >

Expired and Invalid License Keys



Under some circumstances, a license may become invalid. For instance, when a server is removed from the System or goes offline, the licenses tied to the hardware ID of that server will become invalid. When the server is back online or reconnected to the System, the licenses will be active again without configuration.

However, if a server change results in a hardware ID update, all licenses tied to the previous hardware ID will become invalid and can only be activated on the new hardware ID by contacting support at <http://wavevms.com/support>. If a hardware change is planned, the best approach is to contact support prior to the update so licenses can be intentionally deactivated before the hardware change, while they are still active and valid, and reactivated once the new hardware ID is established.

 **Note:** A trial license cannot be deactivated nor reactivated once it expires.

To deactivate a license

Users can deactivate and move a license a maximum of 3 times. The operation must be performed from the Desktop Client and requires an active Internet connection in order to execute. Trial licenses cannot be deactivated.

1. Go to **Licenses** tab in **System Administration**.
2. Select a license, click **Deactivate** and confirm the action in the dialog that opens.
3. Enter your name, email address, and select the reason for deactivation from drop-down list to confirm and explain the action.

It will now be possible to activate this license key on another computer.

To remove a license

If you are absolutely certain a license is no longer needed, it is possible to remove it. Only invalid (red) licenses can be removed.

1. Go to **Licenses** tab in **System Administration**.
2. Select the license you want to remove and click the **Remove** button.

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Video from any camera in Wisenet WAVE can be viewed live without a license, and there are no device count restrictions. However, a license is required to record video from a device. One license provides one **channel**, which is the ability to record an IP video stream from an IP camera, an RTSP stream, or an HTTP link; therefore you need one recording channel per camera.

Several types of license are available, including professional, edge (for ARM servers), encoder, and the others discussed below.

A **trial license** is a "time license" which expires after a certain length of time. I/O Modules require a specific type of license; see "[Setting Up I/O Modules](#)".

A specific type of license is also required for Video Walls. Each license allows you to control a Video Wall from a single computer (one session) or to extend the Video Wall to 2 displays. For instance, 4 licenses allow for control from 4 clients concurrently and Video Wall display on 8 monitors; see "[Video Wall Management](#)".

A specific license "**Bridge**" license may be required to view video streams from **NVRs**. See "[Working with NVRs](#)".

Licenses and hardware ID

Every Wisenet WAVE license, when activated, is locked to the **hardware ID** of the computing device upon which it is installed. The hardware ID is a unique 34-digit identifier generated when the server is installed on a Windows, Ubuntu Linux, or ARM device. The hardware ID is based on a combination of the following server software and hardware:

- BIOS
- Motherboard
- RAM
- Network Card (NIC)

After installing Wisenet WAVE on a server, any modification in the software or hardware items above will result in a change to the hardware ID and invalidation of licenses attached to that device (see "[Expired and Invalid License Keys](#)").

To determine hardware ID

1. In the Wisenet WAVE Desktop client (mobile or web clients do not have the ability to located licensing information), open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**).
2. Go to the **License** tab.
3. Select a license attached to the server for which you want to see the hardware ID.
4. Click the **Details** button.
5. The License Details dialog that opens will display the *License Type*, *License Key*, *Hardware ID*, and the number of active streams allowed on that device.
6. To copy the license information press the **Copy to Clipboard** button.

The following sections describe how to obtain, activate, and deactivate licenses:

- [Obtaining and Activating Licenses](#)
- [Expired and Invalid License Keys](#)

Navigation: [Working with Wisenet WAVE](#) > [Wisenet WAVE User Interface](#) >

Keyboard Shortcuts



These keyboard shortcuts are for Windows and Ubuntu Linux, but most will also work for Mac OS by replacing "Ctrl" with "Command" key.

Shortcut	Command
Ctrl+Left	Previous Frame
Ctrl+Right	Next Frame
Z	Jump To Start of Segment
X	Jump To Next Segment
Ctrl+Up arrow	Volume Up
Ctrl+Down arrow	Volume Down
M	Toggle Mute
L	Jump to Live
S	Toggle Sync
Enter	Maximize Item
Alt+I	Show Info
Alt+G	Start Smart Search
Alt+C	Check File Signature
Alt+S	Take Snapshot
Alt+J	Adjust Video
F2	Rename Resource
Alt+T	Toggle Showreel Mode
Ctrl+W	Close Layout
Ctrl+Tab	Switch Layout (similar to using tab in a browser)
Alt+R	Toggle Screen Recording

Esc	Close Current Dialog
Alt+Enter	Fullscreen
Ctrl+Alt+A	Open System Administration Dialog
Ctrl+B	Open Bookmarks Search
Ctrl+E	Open Alarm/Event Rules Dialog
F1	About Wisenet WAVE
Alt+F4	Exit
[Start Time Selection (on Timeline over recorded segment)
]	End Time Selection (on Timeline if time selection has been started)

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Getting Context Help



Wisenet WAVE includes a context-sensitive help system.

To launch the help system, click on the **Help** button "?" in the Navigation Panel, then click on the desired interface element. This manual will open in a web browser to the topic most relevant to the element you clicked on.

You can also use the **F1** button to open the *About Wisenet WAVE* dialog, which displays important System and network configuration information (see ["Collecting Additional Information"](#)).

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Working with Multiple Wisenet WAVE Windows



It is possible to open multiple Wisenet WAVE windows in a multi-monitor environment.

To open a new window, click on **Main Menu** → **New** → **Window** (shortcut **Ctrl+N**). You can select Items from the Resource Tree or Viewing Grid and drag them to the new window. (Only **Administrators** can add Items to a predefined Layout.)

You can also select an item and open it directly in a new window:

1. Select desired Items in the Resource Tree or on the viewing grid
2. Select **Open in New Window** from the context menu

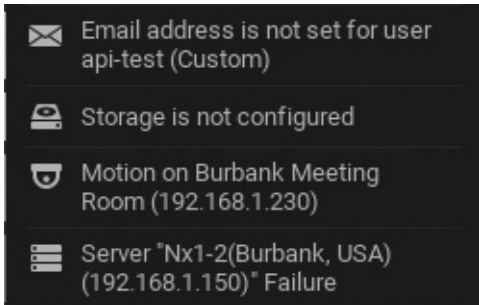
The Video Wall feature provides further control of multiple displays and broadcast capability (see "[Video Wall Management](#)").

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Notification Panel



Wisenet WAVE provides a powerful mechanism for notifying users of System and user-defined events. When an event occurs, a color-coded alert flashes in the **Notification panel**.



- **System messages** and **important notifications** – Red indicates something is not properly configured and should be fixed.
- **Warnings** – Orange indicates a critical event (device disconnected, server failure, etc).
- **Notifications** – Green indicates non-critical events (motion, input signal, etc).

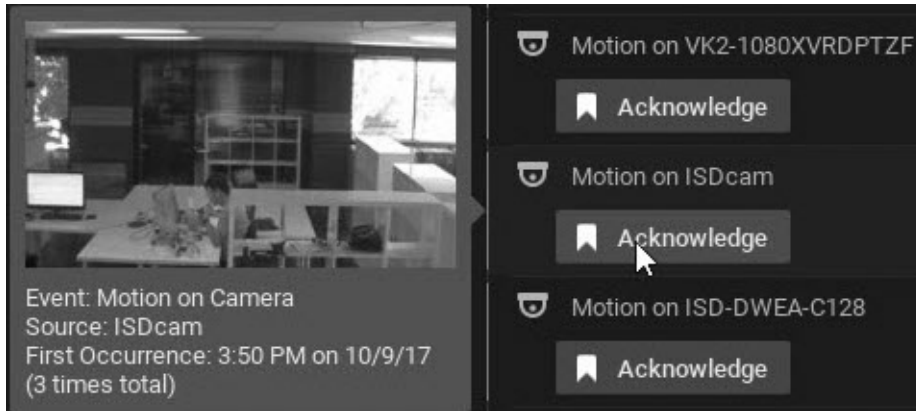
There are also 3 shortcut buttons in the upper-right corner of the Notification Panel:

- ☰ **Event Log** (shortcut **Ctrl+L**) – opens the [Event Log](#)
- ⚙ **Event Rules** (shortcut **Ctrl+E**) – opens the [Event Rules](#) dialog
- ▼ **Filter** – opens the Local Settings dialog to the global [Notification](#) tab

Responding to a Notification

Some notifications display temporarily, then vanish. You can hover over a notification and click on the "X" in the top right corner to close it. However, notifications that require acknowledgment cannot be closed until the required action is complete.

To obtain additional information, hover the mouse cursor over a notification. A thumbnail will open displaying information according to the notification type. For example, Motion Detection and Input Signal on Device notifications display a frame from the camera the event occurred, with related data.



When you click on a notification related to a System message, you will see additional information, and a corresponding action will be performed. For example, when you click on a "Network Issue on Device" notification, it displays the last frame received from the device and opens the Device Settings dialog.

Click on a notification to open the dialog where the underlying issue can be addressed

- Motion or Input on Camera – opens the camera in a new tab
- Device IP Conflict – opens the device's web page in a browser
- Device Network Issue – opens the Device Settings dialog
- Server Failure or Storage Issue – opens the Server Settings dialog
- Email Issue – opens the Email Server Settings or User dialog
- License Issue – opens the License Form
- Server Conflict – no action
- Generic Event – if event has a camera attached, opens the camera in a new tab. If no camera is attached, no action

Acknowledging a notification

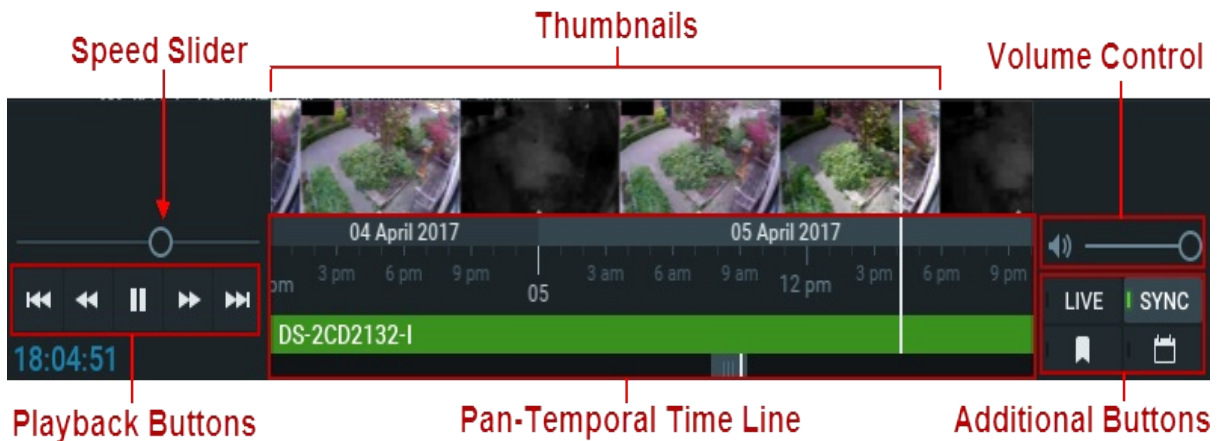
If a notification is set with the "[Force Acknowledgment](#)" parameter, the recipient should respond by clicking the button beneath the notification. Acknowledgments are considered important so they display in red. Once acknowledgement is complete, a corresponding Bookmark is created.

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Playback Panel



The **Playback Panel** provides smooth archive playback, extensive search capabilities, local file playback, and seamless transition from live to archived footage.



The Playback Panel contains the following controls:

- **Playback Buttons** – used to start and stop playback and control playback speed.
- **Speed Slider** – also sets playback speed of selected Item(s).
- **Timeline** – represents the archived data for selected Item(s). The **Timeline** can be expanded by dragging the upper edge upward to reveal image **Thumbnails**.
- **Volume Control** – adjusts audio volume of client application.
- **Additional Buttons:**
 - **LIVE** – switches selected camera(s) to live playback mode (green bar on this button indicates live status). See "[Navigating through Archive and Live Display](#)".
 - **SYNC** – performs time synchronization of all cameras displayed on the current layout. See "[Navigating through Several Cameras Synchronously](#)".
 -  – use to show/hide calendar for navigating through archives. See "[Using Calendar](#)".
 -  – use to show/hide Bookmarks that mark important or saved time segments. See "[Using Bookmarks](#)".

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Search



Wisenet WAVE provides a fast, powerful and flexible search engine that quickly locates System resources.

To perform a search

Click on **Search** tab in the Resource Panel. Type any three consecutive characters from a resource **name**, **MAC** or **IP** into the box to activate a search. Search results appear in the search pane immediately as characters are entered, and are automatically added to the current layout. Results will be removed from layout as characters are removed from the search box.

 **Note:** If the search return a large number of results only the first 24 results will be displayed for x86 architecture (or 64 results for x64 architecture).

To filter search results

- Specify the resource type in the pulldown menu: *Any Type*, *Video Files*, *Image Files* or *Live Cameras*.
- Use special symbols to combine several search criteria:
 - “+” – to add a new criteria to the search. Example, “out” + “100” will select all results containing “out” or “100” in file description.
 - “\” – to avoid files containing certain characters. Example, “out \hdtv” will select all results containing “out”, but not “hdtv”.

For instance, the search string "254 + 00-" will yield cameras, recorders and local files that contain "00-" or "254", cameras and recorders that contain "00-" in their MAC addresses, and cameras and recorders that contain "254" in their IP addresses.

 **Note:** It is not possible to rename resources in the Search tab.

To configure a layout using a search

1. Create a new layout (see [Creating and Assigning New Layouts.](#))
2. Enter keywords into the Search box. The search results will appear on the viewing grid automatically.
3. By adding or deleting keywords from the search box, the items on the viewing grid will vary.
4. Remember to save your configured layout.

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Resource Panel



The **Resource Panel** contains the **Resource Tree** and a **Search** pane for resource items. The Resource panel can be resized by dragging its right edge to or away from the Viewing Grid.

Resource Tree



The Resource Tree is what you use to display, search and manage available resources within the application. You can toggle display of the IP addresses of servers and devices in the **Look and Feel** dialog for global display settings. What is shown in the Resource Tree depends on the user's permission level (see "**Introducing User Roles**"). For example, a Viewer will see only layouts, devices, web pages, and local files in their Resource Tree.

Resources that are placed in the active layout are highlighted in the Resource Tree list. Resources that are selected in the current layout are indicated in blue in the Resource Tree.




The following controls can be used in the Resource Tree

- **Expanding/collapsing** a tree node (shortcut + and - keys or > and < keys)
- **Scrolling**
- **Multi-Selection** using select plus **Shift** to select multiple items or **Ctrl** to select/deselect multiple items sequentially
- **Drag-and-drop** to organize and configure resources in the tree.
- **Renaming** a resource using a **click** on the name to make it editable (shortcut **F2**) or **Right-click** -> **Rename**. (Some items can only be renamed by an Administrator. Local files can be renamed by any user.)
- **Searching**


For Administrators, the following is displayed

 – **Servers** lists the servers registered in the System.  **Note:** A server can have several network interfaces, so different IP addresses may be displayed for the same server.

Server icons indicate the following statuses:

-  Client is connected to this server
-  Server is offline
-  Server is incompatible with Client (see "**Upgrading Wisenet**")

[WAVE](#)").

 Server is unauthorized. In this very rare situation, the password for the user Admin does not coincide with other servers so this server is not able connect to the System. To fix this issue, go to *Server Settings*, restore to factory defaults and then reconnect to the System (see "[Using a Server's Web Interface](#)").

Devices Each server shows a list of the attached devices. When a mouse cursor hovers over a device icon in the Resource Tree, a thumbnail of a frame taken by that device will open. Devices attached to a server can include:



 **Cameras**


 **I/O Modules**

 **Multi-Channel Cameras**

 **Recorders**

Device icons indicate the following statuses:

 or  – Device is offline (see "[Diagnosing Offline Devices](#)")

 or  – Device is unauthorized (see "[Configuring Device's Authentication](#)")


Icons to the left of a device name indicate the following:


● – Device is currently in recording mode


○ – Device is configured for recording but is not recording at the moment

! – Device is experiencing network issues (see "[Device Disconnection/Malfunction](#)" or "[Working Around Device Issues \(Expert Settings\)](#)")

 – **Layouts** Contains resources (devices and local files). Owned by users and displayed under each user.

 – **Shared Layouts** are layouts created by an administrator and made available to a User Role or other set of users


 – **Locked Layouts** are layouts that cannot be changed (see "[Locking Layouts](#)")


 – **Showreels** cycle display through a sequence of layouts (see "[Showreel \(Tour Cycle\)](#)")

 – **Web Pages** show the viewing cells containing a web page (see "[Using](#)

[Wisenet WAVE as Web Browser](#)").

 – **Users** see [Users and User Roles](#)

 **Video Walls** control multiple displays remotely (see "[Video Wall Management](#)")

 – **Other Systems** shows servers in local network that belong to different Systems, and the available Cloud Systems (see "[Configuring Multi-Server Environment](#)").

 – **Local Files** displays the following:

- **Local Video files**
- **Exported Video Files** (see "[Exporting](#)")
- **Exported Multi-Video Files** (see "[Multi-Video Export](#)")
- **Screen Recordings** (see "[Screen Recording](#)")
- **Images**
- **Screenshots** (see "[Taking Screenshots](#)")

Navigation: [Working with Wisenet WAVE](#) > [Users and User Roles](#) >

Predefined User Roles



There are five predefined user roles in Wisenet WAVE:

- **Owner** (uses "admin" login). This user has unlimited System privileges and cannot be deleted. Can create and modify Administrators, and can merge Systems and link or unlink to WAVE Sync accounts.
- **Administrator**. In addition to Advanced Viewer permissions, this user has full control of System configuration, but cannot change any Owner settings, cannot delete or change their own role, and cannot create or edit other Administrators. Only an Owner or Administrator can define locked layouts.
- **Advanced Viewer**. In addition to Viewer permissions, can also see and run PTZ positions and PTZ Tours, use 2-way audio, operate I/O Module buttons, create and edit Bookmarks, and view the Event Log.
- **Viewer**. In addition to Live Viewer permissions, can view and export archive and Bookmarks, and trigger a screen recording.
- **Live Viewer**. These users can view live videos in specific layouts to which they have been assigned access. They can also view all I/O Modules, view all web pages, and monitor the health status of all servers.
- All users can change their own password and by default have access to all cameras.

	PERMANENT	CREATE/ MODIFY ADMINS	CREATE/ MODIFY USERS	MANAGE SERVERS	VIDEO WALL	CAM SETTINGS	IN: (P 2WA TRIG
--	-----------	-----------------------------	----------------------------	-------------------	---------------	-----------------	--------------------------

Owner	√	√	√	√	√	√	
Administrator			√	√	√	√	
Adv. Viewer							
Viewer							
Live Viewer							

Typically, the Owner or Administrator creates and configures layouts for the various viewer levels. Viewers log into Wisenet WAVE and can only work with the layouts and devices they have been assigned.

It is also possible to create **Custom Roles** so that specific permissions can be assigned to an individual or a group of user. See "[Roles Management](#)" for details.

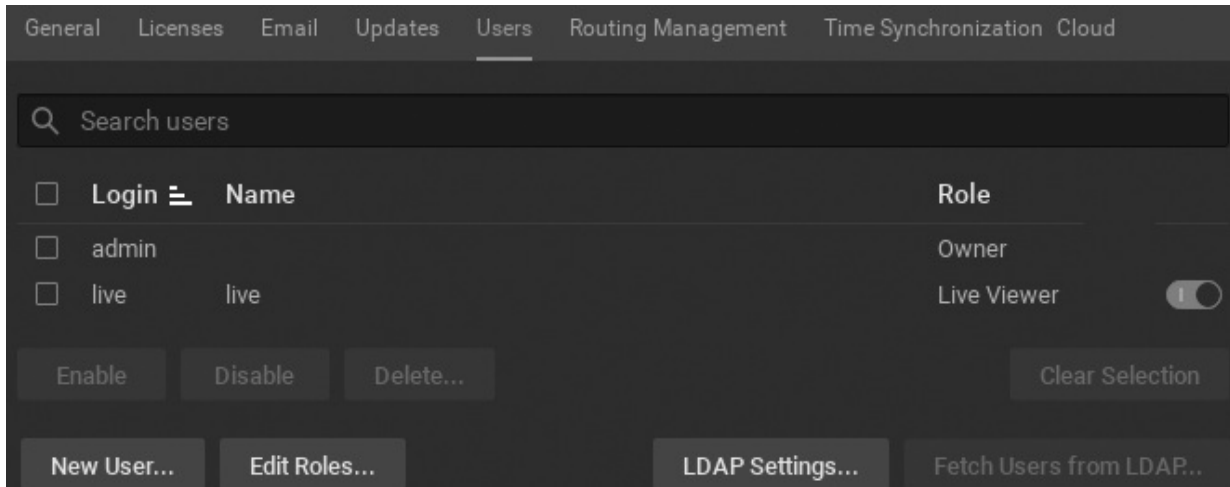
❗ IMPORTANT: Because permission assignments are so flexible, any given action or resource may not be available to a given user or User Role. Many of the features and functions described in this manual will only be available to users with the appropriate permission level.

Navigation: [Working with Wisenet WAVE](#) > [Users and User Roles](#) >

User Management



The *Users* tab in **System Administration** lists all users defined on a System and indicates whether or not they are enabled.



The following information is displayed for each user:

- *Login*
- *Name*
- *Role*
- *LDAP* – indicates if user was imported from LDAP (see "[Adding Users from LDAP Server](#)")
- *Enabled* – indicates if user is currently enabled

The following operations available:

- **Sorting users.** Each of the columns can be sorted in ascending or descending alphabetical order.
- **Filtering users.** Type any characters in the *Search users* field to display only the users having the entered characters in one of their column fields.

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Creating a New User



1. Use one of the following methods to open the **New User** dialog for local users:

- Open **Main Menu** and choose **New** → **User**
- Open **Main Menu**, click on **User Management**, then click the **New User** button
- **Right-click** on **Users** in the Resource Tree and choose **New User**
- From **System Administration**, go to the **Users** tab then click the **New User** button

2. In the *New User* dialog, enter the following user information:

- **Login** – enter a log in ID for the user.
- **Password** and **Confirm Password** – enter a password for the user
❗ **IMPORTANT:** login and password are case sensitive
- **Name** – enter the user's name
- **Email** – enter the address that will be used for Email notifications. If this is not set, the user will not be able to receive "[Mail Notifications](#)" from the System.
- **Role** – select a User Role from the menu. Predefined and custom roles will be included. To assign special permissions, click the Edit Roles button (see "[Roles Management](#)").

3. Click *OK* to complete creation of the new user or *Cancel* to exit without saving.

 **Note:** All users can reset their own password.

New Cloud Users

If the System is connected to WAVE Sync, the new user dialog for a "Cloud" user looks like this:

User Information

User Type ? Cloud ▼

Email


Role Live Viewer ▼ Edit Roles...

Can view live video from all cameras.

Enabled OK Cancel

- Enter the user's email address and click *OK*. The System will send the user an email.
- If the user is not registered, they will get email notification that they have been granted access to the System and a registration link. If the user has already registered on the Cloud Portal, they will get an email letting them know that the System has been shared with them.
- As long as new user is not registered on the Cloud Portal, a warning will be shown in their User Settings:

User Information

 amatveeva+not-reg@networkoptix.com

Role Live Viewer ▼ Edit Roles...

Can view live video from all cameras.

This user has not yet signed up for Nx Cloud

Enabled OK Apply Cancel

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Send Email



Sends email to one or more users, or to additional addresses, when an event occurs. An **email server** must be configured for Wisenet WAVE to send emails (see "[Configuring Mail Server for Email Notifications](#)") and the users must have a valid email address in the Wisenet WAVE System (see "[Changing User Settings](#)").

Basic Parameters

Users the email should be sent to:

The screenshot shows a dark-themed dialog box titled "Send Email". At the top is a search field with a magnifying glass icon and the text "Search". Below this are two sections: "Roles" and "Users".

Role	Count	Selected
Owner	1 users	<input checked="" type="checkbox"/>
Administrator	0 users	<input checked="" type="checkbox"/>
Advanced Viewer	0 users	<input type="checkbox"/>
Viewer	0 users	<input type="checkbox"/>
Live Viewer	3 users	<input type="checkbox"/>

User	Role	Selected
abrub	Live Viewer	<input type="checkbox"/>
admin	Owner	<input type="checkbox"/>
chukchen	Live Viewer	<input type="checkbox"/>
qarlsun	Live Viewer	<input type="checkbox"/>

At the bottom of the dialog, there is a message: "User admin has invalid email address". Below the message is a toggle switch labeled "Show all users" (currently off), and two buttons: "OK" and "Cancel".

Use the **Search** field to filter names.

Advanced Parameters

Additional Recipients – additional email addresses to send notifications to. Separate multiple addresses with a semicolon (;) no spaces.

Action

Do Send email

to All Administrators, 1 additional

Interval of action : No more than once per 1 hrs

Additional Recipients: dyaydka@butilka.com Global Email Settings...

Interval of action – no more than once per a given amount of time, or instant.

Global Email Settings – click to configure Email Server parameters.

May be caused by

All events.

Why Action may work incorrectly

[Email Server is not Configured](#) – a notification is generated in this case. See "[Configuring Mail Server for Email Notifications](#)" for more details.

[Email is not Set for Users](#) – a notification is generated in this case.

Event is not configured properly.

Too long an interval of action is set.

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Available Actions



The reaction to an event is an **Action**. Each action has its own parameters. The common parameters **interval of action/instant** and **fixed duration** are described in "[Interval of Action](#)".

Refer to the particular action description for more information:

- [Bookmark](#)
- [Device Output](#)
- [Device Recording](#)
- [Do HTTP Request](#)
- [Execute PTZ Preset](#)
- [Panic Recording](#)
- [Play Sound](#)
- [Repeat Sound](#)
- [Send Email](#)
- [Show Notification](#)
- [Show on Alarm Layout](#)
- [Show Text Overlay](#)
- [Speak](#)
- [Write to Log](#)

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

System in Safe Mode (system)



Occurs when a System is in Safe Mode, in which case changes cannot be saved. The only available option is to activate a license. This is a System-generated event.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

Tracked Events



The trigger for an action is an **Event**. Each event has its own parameters. Most events can be defined with "[Event Scheduling](#)" to control the days and times event detection is enabled.

Refer to the particular event description for more information:

- [Analytics Event](#)
- [Archive Backup Finished](#)
- [Archive Integrity Check Failure](#)
- [Device Disconnection/Malfunction](#)
- [Device IP Conflict](#)
- [Email Address Not Set](#)
- [Email Not Set for Users](#)
- [Email Server is not Configured](#)
- [Error while Sending Email](#)
- [Generic Event](#)
- [Input Signal on Device](#)
- [Licenses Not Configured](#)
- [License Issue](#)
- [Motion on Camera](#)
- [Network Issue](#)
- [Rebuilding Archive Canceled](#)
- [Reindexing Archive Complete](#)
- [Remote Archive Synchronization](#)
- [Server Conflict](#)
- [Server Failure](#)
- [Server Started](#)
- [Soft Trigger](#)
- [Storage Failure](#)
- [Storage Not Configured](#)
- [System in Safe Mode](#)


Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

Viewing the Event Log



Each event that occurs in Wisenet WAVE is stored in the **Event Log**. Event logs make it easy to navigate through past activity and diagnose device or server issues.

To view the Event Log

- Open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) → *General* tab and click on the **Event Log** button
- Click on the Event Log icon  in the header of the Notification Panel

To sort the Event Log

Events are displayed in the following columns. You can click on any column header to sort the log in ascending or descending order:

- *Date/Time* – date and time the event occurred
- *Event* – the type of event
- *Source* – the resource that initiates the event: device (motion detection, input signal, etc) or server (storage failure, server failure, etc).
- *Action* – the action that is performed when the event occurs.
- *Target* – the Users or Devices that are recipient of the action.
- *Description* – any additional information. For motion detection events, the description includes a hyperlink that will open the device in a new layout and start playback of the event.

To filter the Event Log using the header menus

- **Start date** and **End date** – select a day in each of these calendar fields to show only events that occurred during a particular time period. Default display is the current day. Dates are shown in dd/mm/yyyy format.
- **Event** type – from the pulldown menu, select an event category (*Any Event, Any Device Issue, Any Server Issue, Analytics Event, Generic Event*), or specific type of event within those categories.
- **Device** type – display events occurring on a particular device only (applies to Motion, Input and Device Issues).
- **Action** – display only the events caused by a particular action.

Click the **Clear Filter** button to remove all filter conditions. Click the **Refresh** button to apply additional filter criteria to list that is already filtered.

To filter the Event Log using event fields

You can also use the context menu of a log field to filter the display according to that field's value. For example, if you **right-click** in the *Source* field of a specific event and choose **Filter Similar Rows**, only the events occurring on the same source will be displayed. Similarly, if several filter criteria are in effect, you can remove a single filter criteria by opening the context menu for the desired field (*Date/Time*, *Event*, *Source*, etc.) and choosing **Clear Filter** to display all values for that field.

To view the Event Log for a specific device or server

- Device – open the device context menu and select **Check {device type} Issues**
- Server – open the server context menu and select **Server Diagnostics**

Other Event Log actions

Context menus in the Event Log provide different functions, depending on the field (event, source, action, etc.) from which they are opened. The following functions are available from the context menu for all fields:

- **Select All** (shortcut **Ctrl+A**) – selects all entries in the log
- **Export Selection to File** – save the selected data to an HTML or CSV text file.
- **Copy Selection to clipboard**

Context menus in the *Source* field provide several additional functions, depending on the device.

You can drag the mouse or use **Ctrl+Click** or **Shift+Click** to select multiple and apply actions to multiple events.


Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

Global Notifications



Notification of a particular event type or System alert can be turned on or off globally. Note that the notification setting does not affect event detection or action execution, just whether or not notifications are sent to the Notification Panel.

To show or hide notifications of a particular type

1. Click on **Main Menu** and go to **Local Settings** → **Notifications** or click the  button on the Notifications panel (on the right)
2. Check **Show all notifications** so that all events will display in the Notification panel, or uncheck it to select individual notification types to display
3. Click *Apply* to accept, *OK* to save and close the dialog, or *Cancel* to discard changes

General Look and Feel Screen Recording Notifications Advanced

Show all notifications

Events

- Motion on Camera
- Input Signal on Camera
- Camera Disconnected
- Storage Failure
- Network Issue
- Camera IP Conflict
- Server Failure
- Server Conflict
- Server Started
- License Issue
- Archive backup finished
- Soft Trigger
- Generic Event

System Notifications

- Email address is not set
- No licenses
- Email server is not set
- Some users have not set their email addresses

OK

Apply


Cancel

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

Event Scheduling

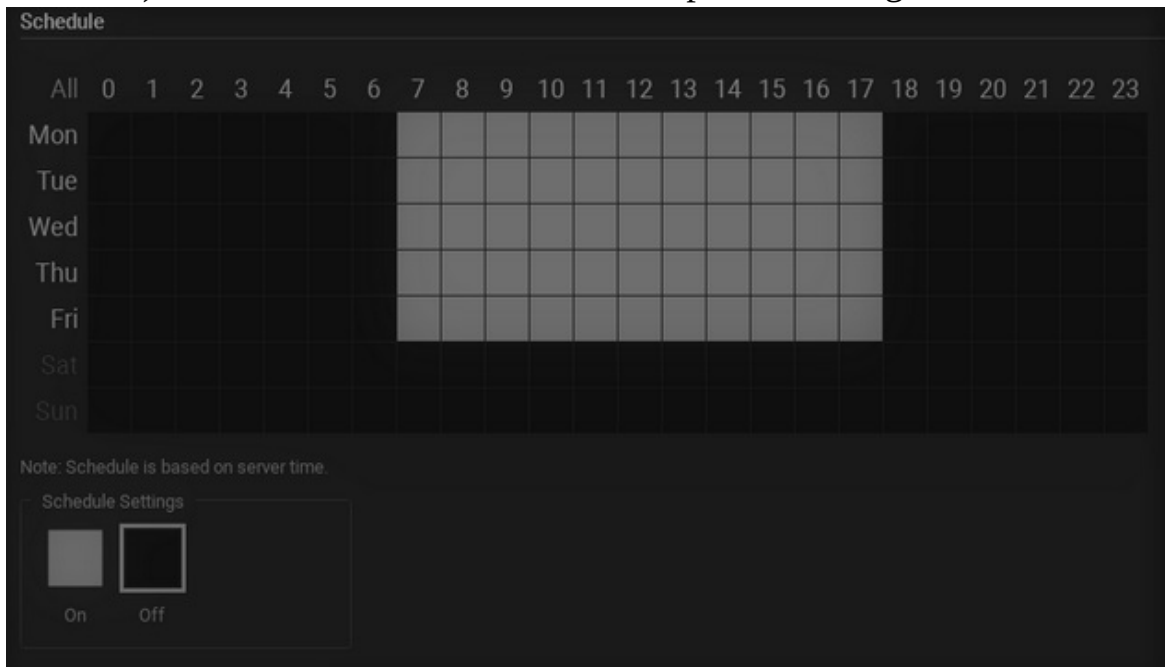


By default, event monitoring is active 24 hours a day, 7 days a week. If you only want to monitor for an event at certain times, you can assign it a schedule. Note that System-generated events cannot be placed on a schedule since they should always be on.

 **Note:** It is possible to disable a rule entirely by unchecking the **On** box in the Event Rules list.

To set a schedule for an event

1. When a event is editable (because it is new or it is selected in the Event Rules list), click on the **Schedule** button to open the dialog shown below.



Schedule

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
Mon																								
Tue																								
Wed																								
Thu																								
Fri																								
Sat																								
Sun																								

Note: Schedule is based on server time.

Schedule Settings

On Off

2. Click the **On** or **Off** button to determine monitoring behavior in specific 1-hour cells. The 0 column in this 24-hour calendar represents midnight - 1:00AM.
3. Click in a cell to apply the selected schedule setting to cells, or use these shortcuts to apply to multiple cells:
 - **Click-and-drag** to select multiple cells
 - Click the hour heading to select an entire column
 - Click the day of the week to select an entire row
 - Click **All** to select all cells

The above example shows an event that will be tracked on Monday - Friday 7AM to 6PM.

4. Click *OK* to accept or *Cancel* to discard changes.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

Selection Lists in Event Rules

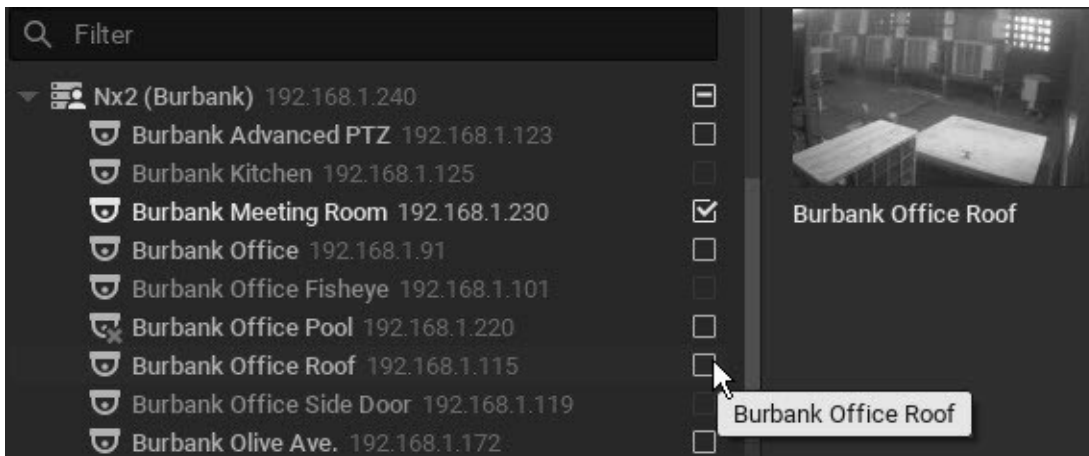


To Select Devices

For Events, choose the device(s) that will trigger the rule. If no devices are selected (shown as *<Any Device>*), the rule will apply to all devices.

For Actions, choose the device(s) that will respond to the event. At least one device must be selected for a rule to be valid.

- Drag-and-drop devices from the Resource Tree into the **At** field.
- Alternately, use the *Select Devices* dialog which lists all servers in the System, and all devices attached to them:



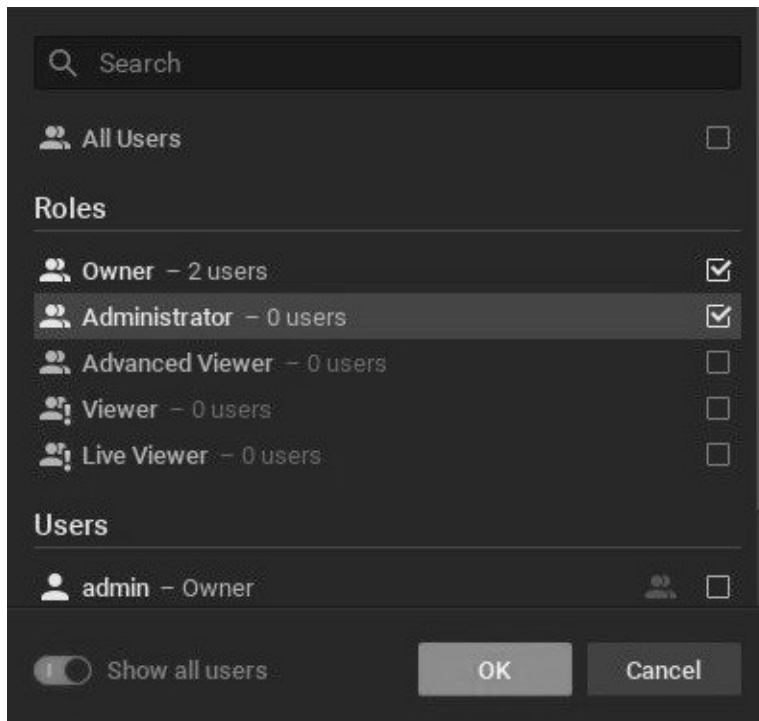
1. Click on the **At** field in the advanced settings form to open the *Select Devices* dialog.
2. Check the desired individual devices, or click a server's check box to select all devices on that server.
3. Optionally, use the **Filter** field to [search](#) for specific devices. All device parameter values (name, firmware, vendor, etc.) are searched. The results update immediately as characters are entered in the field.
4. Click *OK* to accept or *Cancel* to discard the selection.

To Select Users

For Events, choose the user(s) the event will be available to. At least one user must be selected for a rule to be valid.

For Actions, choose the user(s) who will be recipients of the action. At least one user must be selected for a rule to be valid.

- Use the *Select Users* dialog to select one or more users:



1. Click on the **To** field (alternately labeled *For*, *Available to*, *Play to users*, or *Speak to users*) in the advanced settings form to open the *Select Users* dialog.
2. Check one or more User Roles, or check **All users** to open a list of all individuals active in the System.
3. To see individual user names, enable **Show all users** (green) and check the desired individuals.
4. Use the **Search** field to locate user names or roles that contain the characters entered. Filter results refresh as characters are entered.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

Using the Event Rules Form



The form opens in the lower half of the *Event Rules* dialog when you select a rule in the list or when you click the **Add** button. Often it includes parameters that are not available in the *Event Rules* list.

Adding an Event Rule from the Form


1. Click the **Add** button (or **right-click** on an existing rule in the list and click **New** in the context menu). The form will open and a new line for the rule is added to the list.
2. Select the **Event** to be monitored and the **Action** to execute when that event occurs. Each requires one or more of these parameters:

For Events

- **When** – click on this field in the form (or the **Event** field in the list) to select from the menu of events.
- **Starts** or **Stops** – see below.
- **Device(s)** – click on the **At** field in the form (or double-click on the **Source** field in the list) to select one or more devices.

For Actions

- **Do** – click on this field in the form (or the **Action** field in the list) to select from a menu of actions.
 - **Device(s)** – click on the **At** field in the form (or the **Target** field in the list) to select one or more devices that will execute the action. At least one device must be selected for a rule to be valid.
 - **User(s)** – click on the **To** field in the form (or the **Target** field in the list) to select one or more user roles as recipient of the action. At least one user must be selected for a rule to be valid.
 - **Schedule** – click on this button to open a calendar for "[Setting up Schedule for Tracking Events](#)".
 - **Comments** – enter any desired remarks.
 - **Interval of action** and **Fixed duration** – see below.
3. Click *OK* to apply changes and close the form.
Click *Apply* to accept changes and keep the dialog open.
Click *Cancel* to close the dialog. A confirmation dialog will prompt you to either *Apply* or *Discard* changes, or you can click *Cancel* to return to the Event Rules dialog.

 **Note:** If one or more rules are not correctly defined, you will get the error message "Some rules are not valid. Disable them?"

Click *Yes* to disable the invalid rules. Invalid rules will remain in the list but their *On* checkbox will not be checked.

Click *No* to allow invalid rules to be active (*On* checkbox will be checked and rule will be highlighted in red.)

4. In the Event Rule list, set or clear the **On** checkbox to enable or disable the rule.

 **IMPORTANT:** Make sure notification for the event type is turned on in [Global Notifications](#).

[Using Selection Lists in Event Rules](#)

Event rules use selection lists to choose devices and users. Selection and filtering behavior, described in the next topic, is consistent in both.

Continuous or Instant Events

Some events may be continuous, some can only be instant, and some may be either (generic or analytics events).

Continuous – Events that can occur continuously, such as an motion on a camera, require a state definition of either **Starts** or **Stops**.

Instant – Events that occur instantly, without duration, such as a device being disconnected or a server starting. For generic and analytics events, instant events are labeled **Occurs**.

Instant, Interval or Fixed Duration Actions

The following parameters are available for most actions, depending on their intended behavior.

Interval of Action – Check this box to limit the frequency with which an action will occur in response to an event. Enter an integer value (1 - 999) in the **No more than once per** field, and select a corresponding time increment (*sec, min, hrs, days*). This feature is useful, for instance, with an action like show notification where the triggering event may be continuous but it is only necessary to be notified periodically.

Instant – Uncheck this option so the action will execute every time the event occurs.

Fixed Duration – Check this option to specify how long an action will last, typically in response to a continuous event. Enter the duration, in seconds. Zero is not a valid entry, and depending on the action there may be an upper


limit to the duration.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

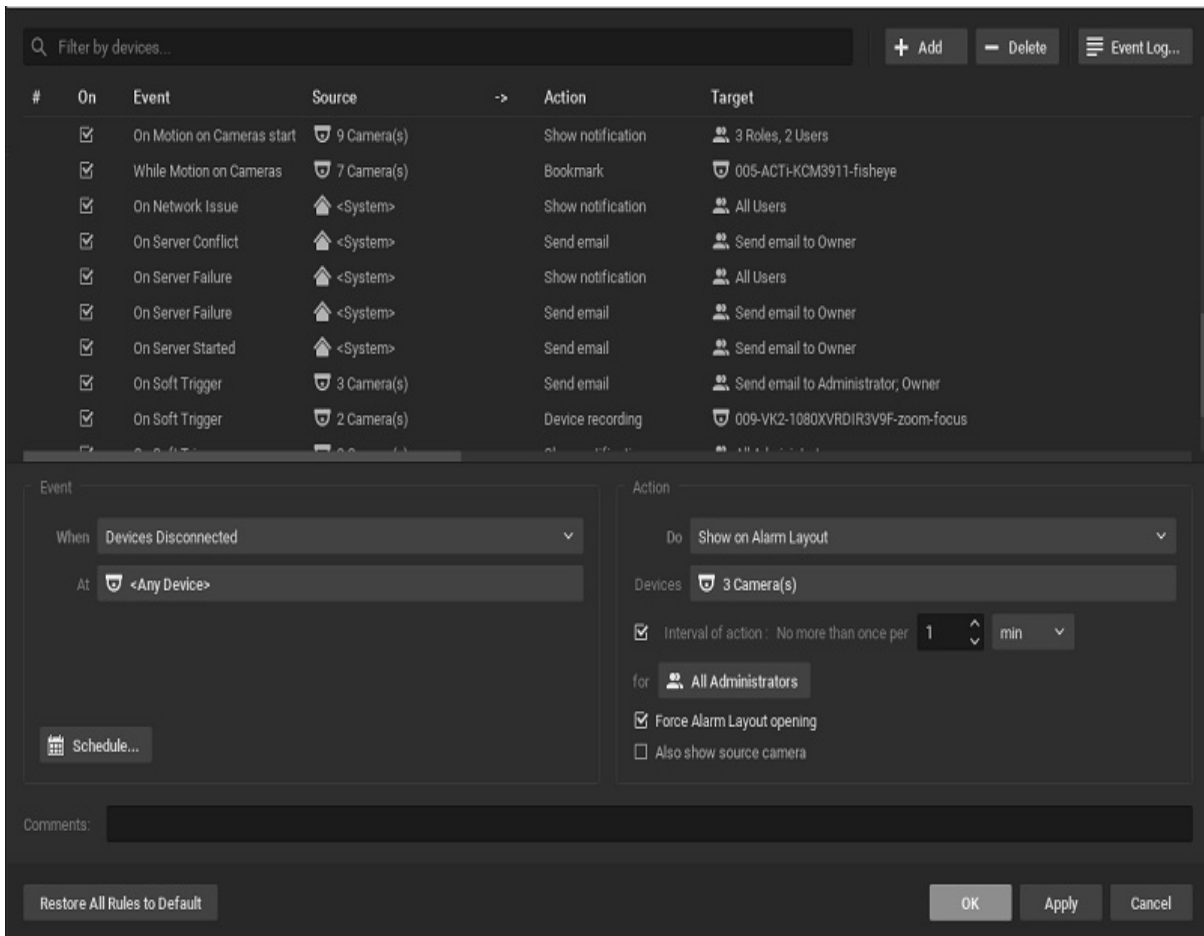
Using the Event Rules List



There are several ways to open the **Event Rules** dialog:

- Use the Event **Rules** icon  in the Notification Panel (shortcut **Ctrl+E**)
- Open System Administration (shortcut **Ctrl+Alt+A**) -> **General** tab and click the **Event Rules** button
- Use the device context menu and select **Device Rules** to list just the rules that apply to that specific device
- Click on the **Device Rules** button in the **Device Settings** dialog

Each row in the *Event Rules* list is a rule. A small dot in the left-most # column indicates that an event has unsaved changes.

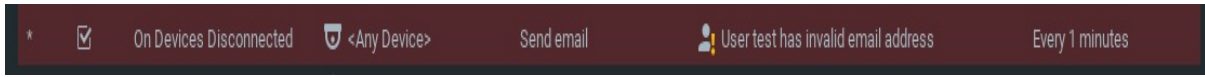


The screenshot shows the 'Event Rules List' dialog. At the top, there is a search bar 'Filter by devices...', '+ Add', '- Delete', and 'Event Log...' buttons. Below is a table with columns: #, On, Event, Source, Action, and Target. The table contains several rules, some with a small dot in the '#' column. Below the table is a configuration panel for a selected rule. The 'Event' section has 'When' set to 'Devices Disconnected' and 'At' set to '<Any Device>'. The 'Action' section has 'Do' set to 'Show on Alarm Layout', 'Devices' set to '3 Camera(s)', 'Interval of action' set to '1 min', and 'for' set to 'All Administrators'. There are checkboxes for 'Force Alarm Layout opening' and 'Also show source camera'. At the bottom, there is a 'Comments' field, a 'Restore All Rules to Default' button, and 'OK', 'Apply', and 'Cancel' buttons.

#	On	Event	Source	Action	Target
•	<input checked="" type="checkbox"/>	On Motion on Cameras start	9 Camera(s)	Show notification	3 Roles, 2 Users
	<input checked="" type="checkbox"/>	While Motion on Cameras	7 Camera(s)	Bookmark	005-ACT-KCM3911-fisheye
	<input checked="" type="checkbox"/>	On Network Issue	<System>	Show notification	All Users
	<input checked="" type="checkbox"/>	On Server Conflict	<System>	Send email	Send email to Owner
	<input checked="" type="checkbox"/>	On Server Failure	<System>	Show notification	All Users
	<input checked="" type="checkbox"/>	On Server Failure	<System>	Send email	Send email to Owner
	<input checked="" type="checkbox"/>	On Server Started	<System>	Send email	Send email to Owner
	<input checked="" type="checkbox"/>	On Soft Trigger	3 Camera(s)	Send email	Send email to Administrator, Owner
	<input checked="" type="checkbox"/>	On Soft Trigger	2 Camera(s)	Device recording	009-VK2-1080XVRD1R3V9F-zoom-focus

Invalid Rules

If a rule is not configured correctly, it will have a red background indicating it is invalid:



Filtering and Sorting the Event Rule List

You can click on each of the column headers to sort rules in ascending or descending order by the values in that column. The **Filter** field applies to devices (**Source** column) only. Filter results refresh as characters are entered, and will include rules that apply to multiple devices if any one of the devices matches the criteria. Rules that apply to *<Any Device>* will never be filtered out. To disable filtering, clear the field.

Editing Rules from the List

The Event Rules list provides basic editing functions. A click on any parameter in the list opens a pulldown menu where you can edit the parameter value for the selected rule. A right-click on any parameter opens a context menu where you can add a **New** rule, **Delete** the selected rule, or set a **Schedule** for the selected rule.

Editing Rules from the Advanced Settings Form

You can also configure rule parameters using the **advanced settings form** on the lower half of the dialog (see "[Using the Event Rules Form](#)").

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) >

Supported Events and Actions



The following events and actions are supported:

Events

User Events

- Analytics Event
- Generic Event (DEFAULT)
- Input Signal on Device
- Motion on Cameras
- Soft Trigger

Default Events

- Archive Backup Finished
- Devices Disconnected
- Devices IP Conflict
- License Issue
- Network Issue
- Server Conflict
- Server Failure
- Server Started
- Storage Failure

System-Generated Events

- Archive Integrity Check Failure
- Email Address Not Set
- Email Not Set for Users
- Email Server Not Configured
- Error while Sending Email
- Licenses not Configured
- Reindexing Archive Canceled
- Reindexing Archive Complete
- Remote Archive Synchronization

Actions:

- Bookmark
- Device Output
- Device Recording
- Do HTTP Request
- Execute PTZ Preset
- Panic Recording
- Play Sound
- Repeat Sound
- Send Email
- Show Notification
- Show on Alarm Layout
- Show Text Overlay
- Speak
- Write to Log

- [Storage not Configured](#)
- [System in Safe Mode](#)

Default Events

Default events are effective as soon as Wisenet WAVE is installed, and are automatically written to the [Event log](#). With the exceptions noted below, all default events trigger both global notifications and an email:

- [Show Notifications](#) to all users, every 30 seconds until issue is resolved.
- [Send Email](#) to System Owner.

(The exceptions are [Archive Backup Finished](#) and [Generic Event](#), which send notifications only, and [Server Started](#), which sends email only.)

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Analytics Event



Occurs when Wisenet WAVE server receives a special HTTP request from a device with built-in video analytics. If a camera has analytics enabled, Wisenet WAVE can render visual displays in layout for the various types of analytics data received. Event metadata is also captured, and can be searched, filtered, and further analyzed.


⚠ IMPORTANT: Analytics must be configured in the camera first in order to be detected by Wisenet WAVE.

For example, video analytics can detect when a vehicle has entered a certain area, zoom in on the license plate, and then perform license plate recognition. The corresponding event in Wisenet WAVE could render a bounding box of one color around the car, a bounding box of another color around the license plate, and trigger an email alert to security personnel.


Any number of video analytics devices can be connected the System, and for each device any number of video analytic types can be enabled. Visualizations are captured and displayed as a bounding box in a user-specified color for each event or as a point for objects with a coordinate but no size. Once defined, an analytics event can be searched and filtered by entity type (notifications, Bookmarks, events, motion, detected objects), by area as with motion search, by class or by attribute using unified text search of the Caption and Description fields, or by date interval. A counter shows the number of results that match the search criteria.

To configure an Analytics Event

1. Use the camera web page to confirm that analytics detection is properly configured and enabled in the device(s) you plan to use.
2. Open **Event Rules** and click the **Add** button to create a new rule.
3. Select **Analytics Event** from the **When** field.
4. Click on the **At** field to select the device(s) that will be generating the third party analytics for the rule. In the *Select Devices* list, cameras that do not support analytics are highlighted in red.

 **Note:** Analytics integration works with certain camera models only, and event types differ from camera to camera. A warning notification will open if one or more of the selected cameras does not support analytics.

5. Choose the **Event Type** that will trigger the rule.

 **Note:** Each device will have a different set of available triggers depending on the analytic capabilities provided by the manufacturer. Only those available for the selected devices will be listed.

6. Optionally, use the *Caption* and *Description* fields to enter or filter attributes or metadata provided by the analytics device. Entries in these fields should match the corresponding fields in the HTTP request and are case sensitive. If the field is empty, it will always be considered a match.

- **Caption** – optional class value used to identify object type.
- **Description** – optional attribute value used to distinguish objects within a class.

Advanced Parameters

Event Scheduling

Why Event may work incorrectly

Request is filtered out. Edit or clear the *Caption* and *Description* fields and trigger the event again.

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Archive Backup Finished (default)



Occurs when archive backup is complete. Does not occur if archive backup is set to perform in real time. See "[Configuring Backup and Redundant Storage](#)" for details. This is a default event.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

Backup is set to "real time".

There has been an [Archive Integrity Check Failure Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Archive Integrity Check Failure (system)



Occurs when archive files are removed, renamed, or otherwise manually changed and a user clicks on part of an archive that was removed. This event can also be triggered when a file has an incorrect timestamp, or if a file has been renamed. This is a System-generated event.

Users with owner or administrator privileges will receive a notification when attempting to view an altered archive. If you hover over the notification, the storage path where the problem was detected displays.

Why Event may work incorrectly


[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Devices Disconnected (default)



Occurs if a device is disconnected for whatever reason (network issue, device malfunction, etc.). This is a default event.

Devices are considered disconnected if no data is received for 10 seconds. If a device is experiencing network issues for over a minute, then  appears next to it in the Resource Tree. Once data is received from the device, the status is automatically changed back to Online.

Additional related events may occur that can help to investigate the issue:

- [Network Issue](#) – indicates the network is unable to transfer data between the device and server, potentially the reason a device goes offline.
- [Server Failure](#) – if a server is down, all hosted devices will appear offline.
- [Camera IP Conflict](#) – if another camera with the same IP address enters the network, one of these two cameras will go offline.
- [Server Conflict](#) – if a new server is connected to another server on the same network and pulls data from the same cameras, some cameras may drop offline because they are not able to provide several streams simultaneously.

Basic Parameters

At – click in this field to [select devices](#) to monitor, or use *<Any Device>* to monitor all devices.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

Too many devices are monitored, triggering too many events.

Devices being monitored are offline.

Action is not configured properly.

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Devices IP Conflict (default)



Occurs if another device with the same IP address has entered the network, resulting in one of the two devices going offline. A [Devices Disconnected](#) event is then generated. This is a default event.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Email Address Not Set (system)



Occurs when a logged-in user does not have an email address configured in the System and is therefore unable to receive [mail notifications](#). This is a System-generated event.

- **Viewer** is notified that their email address is not configured.
- **Administrator** is notified that a user does not have an email address specified.

If you click on the notification, the user's email settings dialog will open (see "[Changing User Settings](#)"). This notification will close automatically once the email address is set.

Email notifications cannot work if an [Email Server is not configured](#). In this case, an [Error while Sending Email](#) notification will display.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Email Not Set for Users (system)



Occurs to notify the Administrator when one or more users do not have an email address specified and are therefore unable to receive [mail notifications](#). This is a System-generated event.

When an Administrator receives notification that a particular user does not have an email address specified, they can click on the notification to open the [User Settings](#) dialog for that user. Once email for the user is set by an Administrator, the related notification will stop.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Email Server Not Configured (system)



Occurs if an email server is not configured. Displays a notification. This is a System-generated event.

If you click on the notification, the *System Administration* dialog opens to the *Email* tab where you can configure *Outgoing Email Settings*. See "[Configuring Mail Server for Email Notifications](#)".

This notification will hide automatically once the email server is configured.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Error While Sending Email (system)



Occurs when email notification fails. This is a System-generated event.

If you click on the notification, the *Mail Server* settings dialog will open (see "[Send Email](#)" for details).

This notification will hide automatically once email is configured.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.


Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Generic Event (default)



Occurs when the server receives an HTTP request from an external system such as an alarm system, access control device, or monitoring system. This is a default event.

Wisenet WAVE allows third-party systems and devices to send an HTTP string known as a "createEvent" API call. The CreateEvent request must follow the proper format in order to be read by the server, and the event fields in the rule must match the corresponding fields in the HTTP request to be acted upon. Full server API documentation can be accessed on any installed server from <http://<serveripaddress>:<servernetworkport>/static/api.xml>. See "[Using a Server's Web Interface](#)".

 **Note:** Values in the event field are case-sensitive, and an empty string functions as a wildcard, where any value is considered a match.


Basic Parameters

Each request contains the following fields:

- **Source**
- **Caption**
- **Description**
- **Metadata** – Used to pass a device identifier that will specify devices the event is limited to (cameras, I/O modules, etc). To obtain the device identifier:


Open the device context menu and click **Device Settings**. In the **Advanced** tab, the device identifier will be displayed as **Camera/Device Id**. The device identifier should be passed in the following format:

`{"cameraRefs": [{"<id>"}]}`. In HTML encoding it will look like this:
`{%22cameraRefs%22: [%22<id>%22]}`.

 **IMPORTANT:** It is necessary to specify a device if the generic event is linked to a notification, and the "Force Acknowledgment" option is required. In this case once the notification is acknowledged, the Bookmark will be created and linked to the specified device. See "[Show Notifications](#)" for details.

- **Occurs** – This is an optional field for the "State". If there is no "State" field in the HTTP request, the event is considered **instant**. If specified, the event is considered **continuous** and the rule requires a State=**Active** (Start) or

State=**Inactive** (Stop) attribute. If a Generic Event containing State=Active is received, the resulting action will continue until the server receives a Generic Event with the same parameters that contains State=Inactive.

 **Note:** If a continuous action such as "device recording" or "repeat sound" is bound to an instant Generic Event (one without a State field), the rule will not work. (See "[Configuring Event Rules](#)" for more information about continuous and instant events.)

Example

```
http://127.0.0.1:7001/api/createEvent?
source=%22Door%22&caption=%22Knock%20Knock%22&description=%22
{%22cameraRefs%22:[%22066fbf9c-2e11-a501-6e15-dfb0fb97c7cb%22]}
This HTTP request:
```

- Sends data to a server at IP Address 127.0.0.1 and Port 7001,
- Source – "Door"
- Caption – "Knock Knock"
- Description – "Visitor!"
- State – not used, so instant
- Device Identifier – 066fbf9c-2e11-a501-6e15-dfb0fb97c7cb.

Remember, fields in the Generic Event must match the corresponding HTTP request and are case-sensitive. For instance, for an event configured as Source "foo", Caption "bar", and Description "" (empty):

An HTTP request with the following data WILL trigger a Generic Event:

Source – "foo12345" (contains "foo")

Caption – "bartender" (contains "bar")

Description – (empty string means all values match)

An HTTP request with the following data will NOT trigger Generic Event:

Source – "Foo12345" (contains "Foo" instead of "foo")

Caption – "batender" (does not contain "bar")

Description – "Lorem ipsum dolor sit amet" (empty string means all values match).

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

HTTP request is not correctly written. Refer to the server API.

Request is filtered out. Try clearing all fields (Source, Caption, Description) and trigger the HTTP request again.

HTTP request is bound to a continuous type of action but does not contain the "State" field.

A device is not specified yet the event is linked to a notification and the "Force Acknowledgment" option is set.

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Input Signal on Device




Occurs if input signal is detected on one or more device(s). Wisenet WAVE can detect input signals on the following devices:

- ONVIF-compliant (input support via ONVIF may vary from device to device)
 - Axis cameras
- !** **IMPORTANT:** To detect input signals, input must be supported on the device.

Basic Parameters

When – a signal can be continuous, so the event must be defined as occurring when input "**Starts**" or "**Stops**".

At – device(s) the input signal is detected on. To specify devices see [Selection Lists in Event Rules](#). Choose *<Any Device>* to detect input signals on all devices supporting that input.

 **Note:** A warning notification will open if one or more of the selected cameras does not support this event. These cameras will be highlighted in red.

Advanced Parameters

Input ID – the I/O Module port to take signal from (see [Setting Up I/O Modules](#))

[Event Scheduling](#)

Why Event may work incorrectly

Too many devices are being monitored, causing too many events to occur.

Devices that are being monitored are offline.

Action is not configured properly.

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Licenses Not Configured (system)



Occurs if no licenses are activated. Displays a notification. This is a System-generated event.

If licenses are not configured it is not possible to record cameras or view analog cameras.

Click on the notification to open the license dialog. See "[Wisenet WAVE Licenses](#)".

The notification will hide automatically once at least one license is activated.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

License Issue (default)



Occurs when a trial license expires, or when the Server on which licenses are activated goes offline. This is a default event.

When there is a license issue, it is not possible to record camera streams or to view analog cameras. Once recording has stopped a License Issue event generates a notification. The notification will list the cameras that are not being recorded. If you click on the notification, the license dialog will automatically open (see "[Wisenet WAVE Licenses](#)").

When a Server goes offline, there is a 30-day failover period for the licenses that were in use, during which recording can continue. The Server must be restored or a new license must be activated during this grace period, or recording will stop on as many cameras as there are missing licenses.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >




Occurs if motion is detected on camera(s).

! **IMPORTANT:** recording must be enabled on the selected cameras for this rule to be functional. See "[Setting a Recording Schedule](#)" for instructions on enabling and configuring recording.

Basic Parameters

When – motion can be continuous so the event must be defined as occurring when motion "**Starts**" or "**Stops**". If no motion occurs for 3 seconds, the current motion event is considered stopped. When motion occurs again, a new motion event is generated.

At – device(s) on which motion detection will be enabled. To specify devices see [Selection Lists in Event Rules](#). Choose *<Any Device>* to detect motion on all devices.

 **Note:** A warning notification will open if one or more of the selected cameras does not support motion detection. These cameras will be highlighted in red.

Advanced Parameters

[Event Scheduling](#)

Why Event may not work correctly

Recording is disabled for camera(s) that are being monitored.

Motion Mask is not set properly. See "[Setting up Motion Mask and Motion Sensitivity](#)".

Too many cameras are monitored, triggering too many events to process.

Cameras that are monitored are offline.

Action is not configured properly.

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Network Issue (default)



Occurs if network is unable to transfer data between device and server and packet loss is detected. That may cause for frame rate to drop on device(s). If no frames are received from device for 10 seconds, device is considered offline. [Device Disconnection/Malfunction](#) event is then generated in this particular case. This is a default event.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Reindexing Archive Canceled (system)



Occurs if the archive reindexing operation is canceled before it completes. This is a System-generated event.

When a storage device or archive file is moved, renamed, or deleted, it is possible to restore access to the archive by rebuilding the index that maps physical storage locations for the System (see "[Reindexing Archives](#)").

If such reindexing is cancelled, the System automatically generates the warning notification "*Rebuilding archive index is canceled by user*". It is highly recommended that archive reindexing be restarted and allowed to complete, otherwise you may not be able to access some or all of your archived files.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Reindexing Archive Complete (system)



Occurs when the archive reindexing operation completes successfully. This is a System-generated event.

When a storage device or archive file is moved, renamed, or deleted, it is possible to restore access to the archive by rebuilding the index that maps physical storage locations for the System (see "[Reindexing Archives](#)").

When reindexing is complete, the System generates the notification "*Rebuilding archive index is complete*".

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Remote Archive Synchronization (system)



Occurs when remote archive synchronization from internal storage begins and when it is complete. Used for certain cameras that record directly to their own internal storage, in which case the camera's internal storage must be periodically downloaded to the Wisenet WAVE System servers. This is a System-generated event.

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Server Conflict (default)



Occurs if a new server is connected to another server on the same network and pulls data from the same devices. In this case, some devices may drop offline because they do not provide several streams simultaneously. This results in a [Device Disconnection/Malfunction](#) event. The notification message contains a list of the specific devices that are used by both servers. This is a default event.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Server Failure (default)



Occurs if a Server is down. Can be triggered by a hardware or software issue, or by manual or emergency shutdown. When a Server fails, all devices hosted that Server will go offline. This is a default event.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Server Started (default)



Occurs when any server registered in the System has started. This is a default event.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

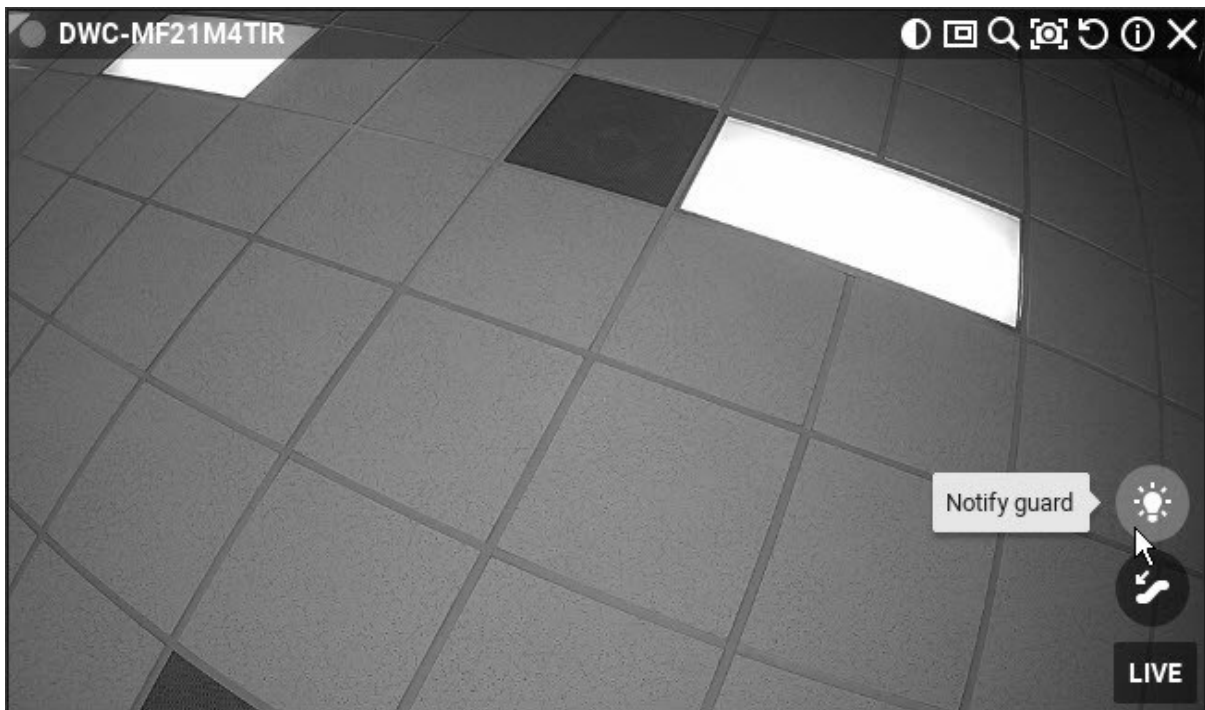
[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Soft Trigger



This event type adds a button to one or more devices in layout. When a user clicks on a soft trigger button, the associated action is triggered. The event can be instant (triggers when the button is clicked), or continuous (triggers as long as the button is held). Soft trigger buttons appear as a circular overlay in the lower-right region of an item, and will display the contents of the **Name** field when the mouse cursor is hovered over it.



For example, you can create soft trigger button to start and stop a Bookmark recording when an operator sees suspicious activity. Or, it could be a panic button that starts a siren when an emergency situation is detected.

In addition to making it possible for a user to initiate an action from layout, a soft trigger that has a "[Perform HTTP Request](#)" action makes it possible to integrate third-party systems and devices, and to bundle multiple actions within an event. For example, you can create a soft trigger with an HTTP request to a 3rd party device that initiates one or more of the actions the device is capable of, such as "if temperature that exceeds 110°F is detected, close door."

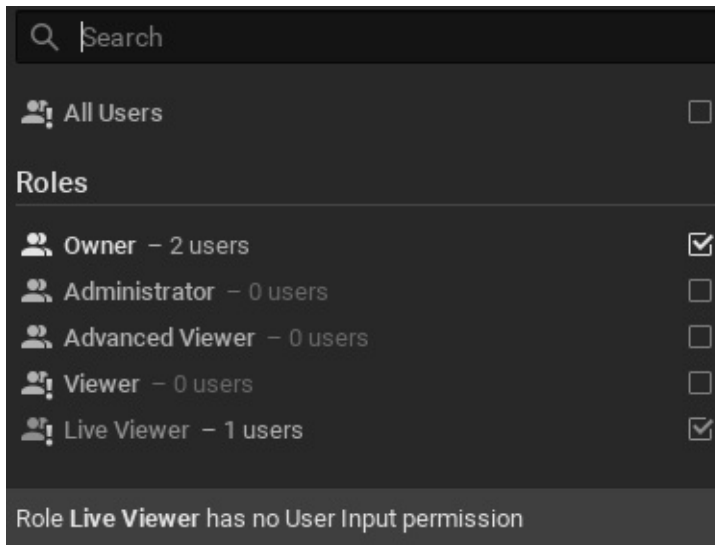
Basic Parameters

At – Click in this field to select the device(s) that will have the soft trigger

button. Note that if you choose *<Any Device>*, the button will be placed on offline devices as well.

Available to – Click in this field to select the users or User Roles that are allowed to use the trigger.

! IMPORTANT: To be able to trigger an event on a device, the user or user role must have input permission on the device. If they do not, the following warning appears:



Name – Enter a brief description of the event that will triggered. Contents of this field are displayed on layout when the mouse cursor hovers over the button.

Icon – Select from the menu of available icons.

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

Action is not configured properly.

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Storage Failure (default)



Occurs if the Server is unable to write data onto one or more storage device. This is a default event.

Storage failure may be caused by any of the following:

- **Hard disk malfunction.**
- **Insufficient rights.** The permission to write on disk or recorded folder may be restricted by the computer Administrator.
- **Hard disk is too slow.** Too many cameras are attempting to record simultaneously and the hard disk cannot respond quickly enough. It may be useful to add another hard disk drive.
- **Disk is full.** There is a required reserved space of approximately 10-30Gb for local storage or 50-100Gb for NAS devices. When available disk space reaches that threshold, the oldest data will be overwritten by new data. If available storage drops below this threshold, the server will write data to the disk but instantly erase it.
- **System Drive is Full.** Occurs when the partition on which the operating system is installed has less than the required amount of free space (5Gb for PCs or 1Gb for ARM devices). It is highly recommended that space be made available as soon as possible to avoid loss of data and system instability.
- **Archive Integrity Failed.** Each file in the archive contains a specific signature. If the archive is modified somehow (files changed, replaced, or corrupted) a notification is displayed. If you hover over the notification, the storage path where the problem was detected displays. You can obtain more information (ex. the exact file name) from the server log files (see "[Collecting Logs](#)").

Advanced Parameters

[Event Scheduling](#)

Why Event may work incorrectly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Tracked Events](#) >

Storage Not Configured (system)



Occurs if storage is not configured, or no storage device is selected (the recording flag may have been removed accidentally), so it is not possible to record. This is a System-generated event.

This event triggers a "Storage is not configured" notification. When you click on the notification, the storage configuration dialog will open. See "[Configuring Server and NAS Storage](#)". The notification closes automatically once storage is configured.

Advanced Parameters

[Event Scheduling](#)

Why Event may not work correctly

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Configuring Server Settings](#) >

Configuring Server and NAS Storage



Wisenet WAVE provides easy and flexible storage management controls. Each server can use an unlimited number of local and network storage paths. If more than one storage location is used, the Media Server will automatically balance consumption so free space is distributed between available resources.

Each local hard disk partition is considered a storage location. Network attached storage (**NAS**) and USB storage, if enabled, is also supported.

⚠ IMPORTANT: 10-30 GB of free space is always preserved on each storage location. For NAS storage, this amount may vary between 50 and 100 Gb depending on the storage size. If only one system partition (where OS is installed) is present, then Wisenet WAVE will use this partition for recording. If any other disk is added and an extended partition is created, then the system partition will be disabled for recording and Wisenet WAVE will record data to the extended partition(s).

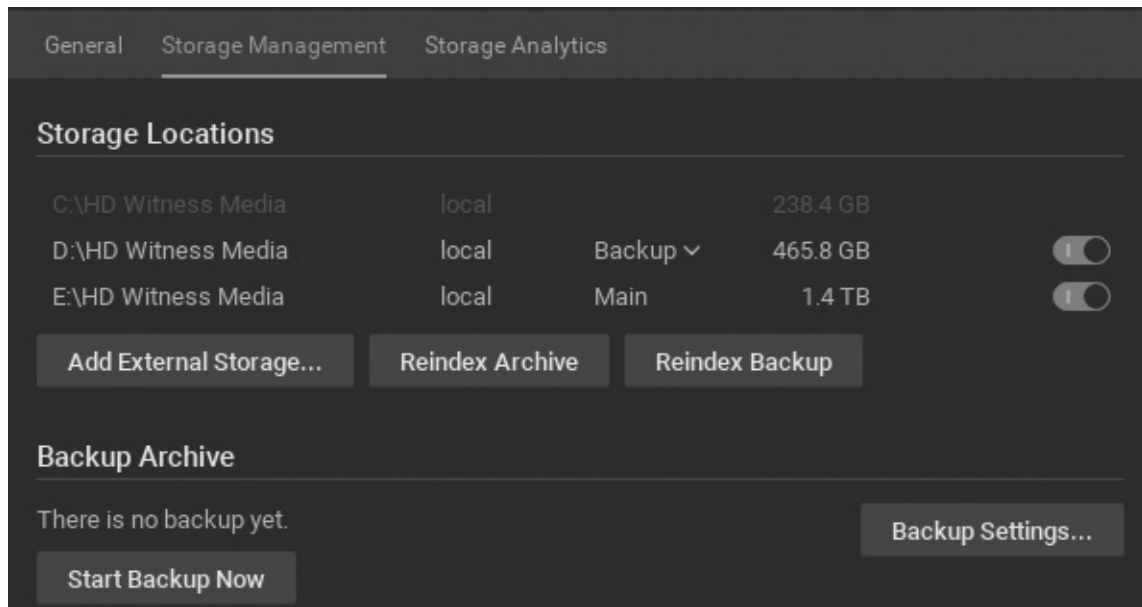
To configure server storage

 **Note:** USB storage is not enabled by default. Wisenet WAVE will show a warning when a user is attempting to record to a removable drive (USB).


1. Open the server's context menu and go to **Server Settings** -> **Storage Management** tab.

2. Wisenet WAVE discovers and displays local storage resources.


In the example shown below, the computer has 3 partitions. Disk E is the main storage partition and disk D is configured as backup. Disk C is not used because it is a system partition (where the operating system is installed) and there are two other storage locations in the list. The system disk drive is only used if it is the only storage location on a server *and* it is at least five times smaller than any other drive on the server.




3. Click on a storage location and use the button at the end of the row to toggle it on or off. There must always be at least one **Main** storage location. Once a main storage location is enabled, any other storage location can be set to **Main** or **Backup** as needed.

 **Note:** At least one drive must be set to **Backup** for archive backup to be possible.

4. Wisenet WAVE will check all storage locations for validity and confirm the ability to write to each. If a drive is not available or has insufficient space, a warning will display.
5. To configure backup storage, see "[Configuring Backup and Redundant Storage](#)".

 **Note:** Because some cameras record directly to their own internal storage, Wisenet WAVE must periodically download archive from the camera's internal storage to Wisenet WAVE System servers. See "[Remote Archive Synchronization](#)".

To add external storage

 **IMPORTANT:** Make sure NAS is available, and accessible through the network on which the computer server is installed.

1. Open the server's context menu and go to **Server Settings** -> **Storage Management** tab.
2. Click **Add External Storage**
3. Choose the desired option from the **Protocol** menu, and enter the storage path (**URL**), **Login**, and **Password** for the external storage device.

4. Click OK to accept the entries and add the new device to the list of storage locations.

5. Set the button at the end of the row to set as **Backup** or **Main**.

To find archive on a storage device

The storage structure on a partition is as follows:

`<drive>/Wisenet WAVE Media/$Resolution/$ID/$YYYY/$MM/$DD/$HH`

where:


- \$Resolution:
 - hi_quality – full resolution streams
 - lo_quality – low resolution streams
- \$ID – if reported, the MAC address of the recorded device, otherwise the Camera ID
- \$YYYY – year recorded
- \$MM – month recorded
- \$DD – day recorded
- \$HH – hour recorded

Navigation: [Working with Wisenet WAVE](#) > [Configuring Server Settings](#) >

Archive Backup



Some disks on a server can be designated as **backup storage**. They will store a copy of the archives recorded to the main storage on the same server.

 **Note:** Only archives from main storage of a given server will be backed up. If there is archive on some other server you want to backup, you should configure backup storage for that server as well.

Backup can be set up in two ways – **on demand** or **realtime**. On demand backup is activated either by command or according to a schedule, and will copy all existing archive from main storage to backup.



Because large amounts of data are being copied during backup, it is possible to set bandwidth limitations or to schedule regular backups at specific times, to minimize the negative impact of loading the network. On demand backup continues until all data on the main storage is backed up, and may take significant time, especially if many cameras are being recorded to the main storage.

If on demand backup fails at some point or is canceled, the archive already backed up remains on the backup storage. Just the remaining part of the archive will be backed if the backup process is restarted.

With realtime backup, only live streams that are being received from active cameras will be recorded to the backup storage. Archive that already exists on the main storage will not be backed up.



Outdated archive is deleted from backup drives in the same way as from main ones, but independently of the main storage. In other words, if the backup storage has higher capacity, the maximum archive age on it will also be greater.



The opposite is also true – if backup storage is smaller, archive age will be less.



In order to save storage space, a System can be configured to backup only archive from certain cameras or only certain streams. Camera recording is backed up only if the camera is selected in backup settings and backup storage is configured on the server that camera is currently connected to.

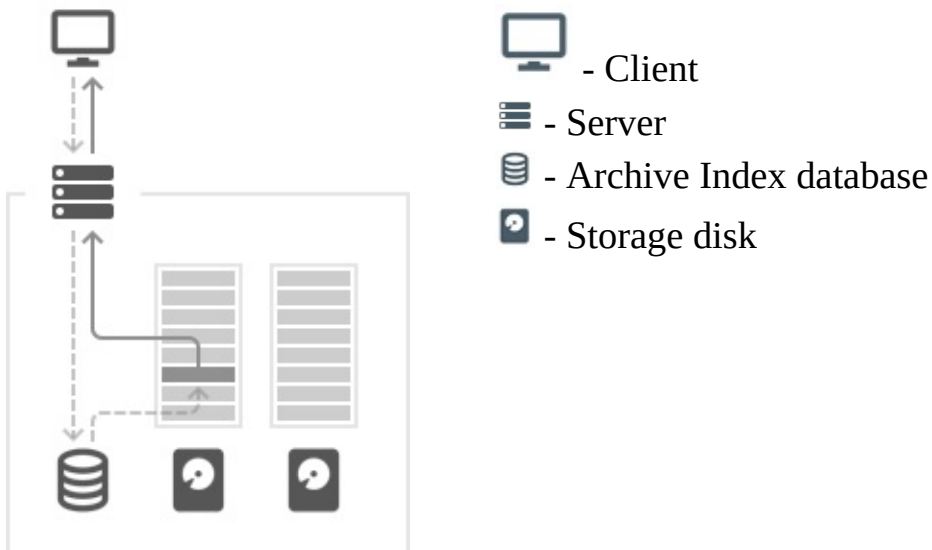
Navigation: [Working with Wisenet WAVE](#) > [Configuring Server Settings](#) >

Archive Indexing

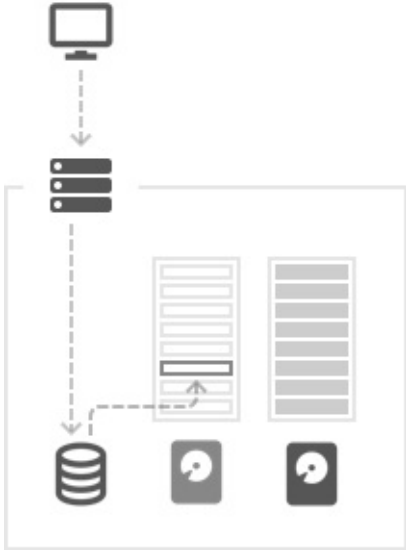


The **Archive index** is a special database that stores mapping information for video archive. This database includes which cameras are archived, for which times, and in which chunks exactly the archive is stored. (**Chunks** are the building blocks of video storage, see "[To find archive on a storage device](#)".)

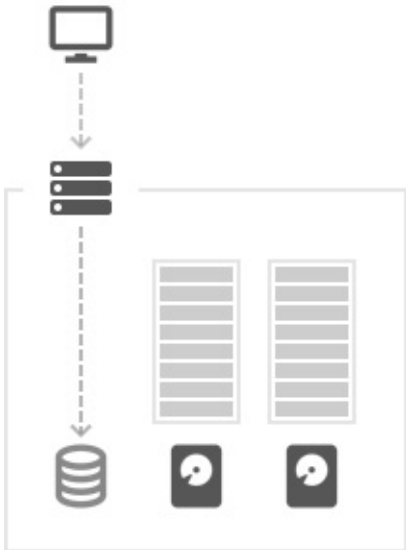
The client application pulls storage chunks to the Timeline based on the information in the archive index database. When you click on the Timeline to play a given recorded segment, the client sends the server a request for that video. The server checks the archive index to determine where video for that particular moment is stored – on which drive and in which exact chunks. The server reads that particular video and sends it to the client to display.



There can be situations when information in the archive index doesn't reflect the actual video archive. For example, if a disk has failed or been removed, the information about recordings which are supposed to be on that disk will still be in the archive index, but the server will not be able to read the disk.



Similarly, sometimes there is no information in the archive index about archive that does exist in storage. This can happen if a camera has been deleted from the System. Video recorded from that camera is kept, but information about it is deleted from the archive index.



These problem can be fixed by archive reindexing. During that process, the server will scan all recordings on all drives and update the archive index database with the current information. Archive reindexing is initiated from the Storage Management dialog for each server, and can be performed for main or backup storage locations. See "[Reindexing Archives](#)".

Navigation: [Working with Wisenet WAVE](#) > [Configuring Server Settings](#) >

Archive Retention



Video from a camera is always written to the server to which the camera is connected. Cameras can be moved between servers but the recorded video stays where it was and never moves with the camera. New video is written on the new server. Recorded video is called **archive**.

If a server has multiple drives, video archive is divided between them in order to improve reliability and balance the load on each drive. Nevertheless, even when different parts of the archive are stored on different drives or on different servers, video playback is seamless.

Not all free space on a drive can be used to record. Storage space occupied by data that is not from the VMS is never recorded on. In addition, a certain amount of the total capacity is **reserved space** that will not be used for recording. Numbers vary depending on the software version, server configuration; typically 10-30 Gb is reserved for local storage and 50-100 Gb is reserved for external storage.

Available Space

The remaining disk storage is considered **available space** – whether it is currently recorded on or is currently free space. Archive is recorded according to available space.

If there is no available space on a given storage device, the system will automatically delete outdated recordings in order to free space for new archive. By default the oldest archive is deleted first. However, there are two special properties a given camera can be granted that affect archive retention. One prevents archive from being deleted before a certain number of days has elapsed. The other requires that archive be deleted after a certain number of days has elapsed. These are the only cases in which the system will actively determine storage deletion.

Schematically, storage life cycle can be illustrated like this:



- New archive
- Outdated archive
- New archive recorded over outdated archive

Storing archive on multiple drives

Servers can have any number of storage devices. Recording to some can be disabled manually, or automatically when they are too small or are the main OS partition. USB drives are disabled by default, but can be enabled manually (though for ARM devices they can be enabled by default).

Enabled drives can be one of two types – **main** or **backup** type. Main storage is used to record archive, backup is used to store extra copies of some recordings. At any given moment, a drive can be assigned only one type, but because it is possible to change a drive's type, it is therefore possible to have different types of recording (main and backup) on one drive.

If there are multiple storage locations of the same type (main or backup) on a server, recorded archive will be split between them in proportion to their available space, as shown below:

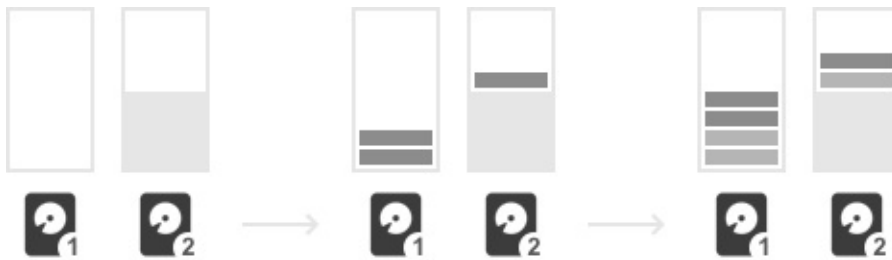


Note that when there are multiple storage locations of the same type on a server, recorded archive is distributed separately by type in proportion to the

available space for each type.

Write **bitrate** (the amount of data that is processed per unit of time) will correlate with the amount of free space – in the illustration above disk 1 will have a higher bitrate than the others.

Remember that the distribution of recorded data is dependent on the amount of available space, not free space. If you have two similar drives, but part of drive #2 is occupied by some other data, recording speed will be higher for the drive #1 because the amount of available space for this drive is higher. Also, because archive recorded by the System does not reduce the amount of available space, recording speed doesn't depend on how much available space is currently used.



For example, you have two similar drives, and both are already full. You add a third drive with the same amount of available space as the first two but completely empty. Distribution of recorded data is dependent on the amount of available space, so new recordings will be distributed evenly between all three drives. Even though there is plenty of free space on the third drive, outdated footage on the first two drives will be deleted to free up space for new recordings – archive must to be split evenly between all three drives because they have the same amount of the available space.



This is done to balance drive usage and to avoid the situation where all cameras are being written to one drive, which might not have enough speed to record such an amount of data.

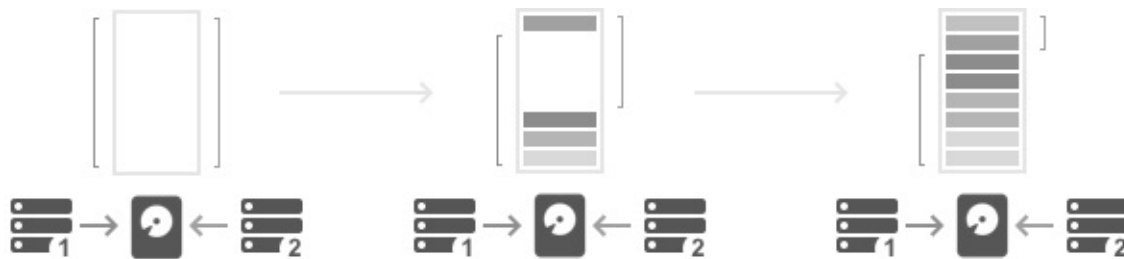
Servers sharing the same drive

It is possible to set up recording from multiple servers to the same drive. It is

recommended to split the drive to different partitions, and to attach separate partitions to every server.

Archive written by one server cannot be deleted by another. If you add one partition to multiple servers, they both will treat free space on that drive as available and will use it for recording. Data recorded by one server will be considered as “other data” by the other server, and will reduce the amount of available space.

If different servers have different recording speeds, it will lead to a situation where storage is divided unequally. After storage is filled with archive, each server will manage only the space that is occupied by its own data.



[- Available space for server 1

] - Available space for server 2

Navigation: [Troubleshooting and Contacting Support](#) >




Wisenet WAVE creates a database that stores an **index** which maps the relationship between archive filenames and the physical location of the archive on disk. When a storage device is moved, renamed, or deleted, or when an archive file is removed, renamed, has an incorrect timestamp, or is otherwise corrupted, this index will be broken. Reindexing restores the relationship between the database and storage device(s).

Similarly, if a camera is deleted, its archive remains but access to its footage is lost. To make such footage available again the archive must be reindexed. After the archive index is restored, the deleted camera will be displayed in the Resource Tree. It will be marked as offline but it is possible to navigate through its archive.

When an archive is damaged, users with owner or administrator access will receive a notification when attempting to view that archive. This notification indicates the storage path where the problem was detected, and will continue until the issue is corrected.

To reindex an archive

1. Right-click on a server in the Resource Tree, choose **Server Settings** and go to the **Storage Management** tab.
2. Click on **Reindex Archive** to restore the index for all Main storage locations. Click **Reindex Backup** restore the index for all Backup storage locations.
3. A message will open with the warning "**Hard disk load will increase significantly**". Depending on the size of the archive, reindexing can take up to several hours. The System can continue recording while the archive is being restored but performance may be affected.
4. Click *OK* to continue. When the window closes, reindexing will run in background. A progress bar will indicate status, and a message will indicate when reindexing is either complete, or has been canceled.

 **Note:** Reindexing can be canceled at any point. However, an incompletely indexed archive may be partially or entirely inaccessible. It is strongly recommended that the archive reindex process be completed. In this case the "[Reindexing Archive Canceled](#)" event is fired.

After the reindexing is complete, the "[Reindexing Archive Complete](#)" event

occurs.

(To protect against the possibility of complete loss or removal, archives can be saved to one or more backup storage locations. See "[Configuring Backup and Redundant Storage](#)".)

Navigation: »No topics above this level«

Troubleshooting and Contacting Support



Some issues can be resolved without support. For example:

- If a camera is not working properly, it can be diagnosed. See "[Diagnosing Offline Devices](#)".
- If an archive is lost, it can be restored. See "[Reindexing Archives](#)".

To contact support use: <http://wavevms.com/support>

When posting an issue, it is necessary to describe the problem as detailed as possible. It is useful to provide additional information such as log files, network configuration, etc. If possible please provide administrator login credentials as well.

To expedite investigation, it's best to [provide remote access](#). If remote access cannot be provided, it is helpful to complete the following steps to provide as much information as possible for a support ticket:

- [Recording an Issue](#)
- [Collecting Logs](#)
- [Collecting Additional Information](#)
- [Sending Anonymous Usage and Crash Statistics](#).

If the issue is related to a specific Camera compatibility, Support team will likely provide a specific build that should solve this particular problem. Then it will be necessary to upgrade System to this build. See "[Upgrading Wisenet WAVE](#)" for more information.

Navigation: [Working with Wisenet WAVE](#) >

Upgrading Wisenet WAVE



Wisenet WAVE provides a one-click upgrade for an entire System, including Systems on different platforms, locations and devices, without the need to physically login to the computers that Servers are installed on.

When a new version of Wisenet WAVE is released, a notification will open in the Client. You can click on the appropriate link to perform the upgrade, or you can disable future notifications of this type. If a new build is released to fix a particular issue, the support team may recommend that you upgrade to a particular version.

The upgrade process can take some time. Issues may occur during the upgrade process for a variety of reasons. The most common problem occurs when a Server goes offline or becomes inaccessible. In this case, try to repeat the upgrade.

! IMPORTANT: Ensure that all servers in the System are upgraded.

Online Upgrade

1. Open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) → **Updates** tab.
2. The number of the latest available version is displayed under the *Latest Available Update* menu.
 - To upgrade to the latest release, click the **Update System** button to start the update process.
 - To upgrade to a specific version, click the arrow on the *Latest Available Update* menu and choose **Specific Build**. In the dialog that opens, enter the build number and a password (this should be provided by support team), then click **Select Build** to start the update process.

Offline Upgrade

Sometimes for security reasons the Wisenet WAVE System does not have access to the Internet.

Offline Upgrade to the Latest Available Version

1. Open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) → **Updates** tab.
2. Click on **Download the Latest Version Update File** and choose **Copy Link to Clipboard**.

3. Save the link to an external drive so it can be transferred to a computer with Internet access.
4. Paste the copied link into a browser on a computer with Internet access and use it to download the update file.
5. Save the update file to an external drive, then copy it onto the Client PC that is in a private network.
6. On the offline Client PC, open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) → **Updates** tab.
7. Click the arrow on the *Latest Available Update* menu and choose **Browse for Update File Build**.
8. In the file browser that opens, navigate to the external drive where the update file is saved and open it to start the upgrade process.

Offline Upgrade to a Specific Build

1. Open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) → **Updates** tab.
2. Click the arrow on the Latest Available Update menu and choose **Specific Build**.
3. In the dialog that opens, enter the build number and a password (this should be provided by support team), then click **Select Build**.
4. In **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) → **Updates** tab, click on **Download Update File** and choose **Copy Link to Clipboard**.
3. Follow steps 4 through 8 from the above instructions.

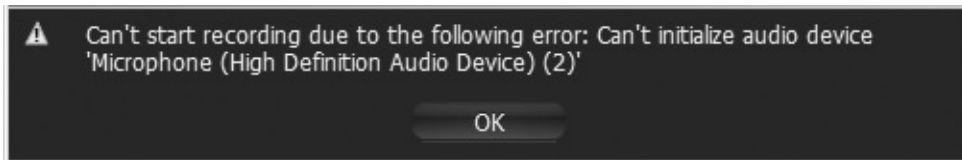
Navigation: [Working with Wisenet WAVE](#) > [Screen Recording](#) >

Performing Screen Recording



To record the entire Client screen, open Main Menu and select **Start Screen Recording** (shortcut **Alt+R**). Screen recording will begin in 3 seconds. To stop recording, open Main Menu and select **Stop Screen Recording** (or press **Alt+R**).

IMPORTANT: If audio parameters are setup incorrectly, Screen Recording will display the following error:



In this case it is necessary to do the following:

1. Set up audio card parameters in Windows, check and select default recording devices. Then try to record sound in Windows Recorder.
2. Set up Screen Recorder Parameters (see "[Setting up Screen Recording](#)").
3. Choose the desired file name and location and click *Save* (*Cancel* will close the dialog and data will not be saved):

File and folder operations are performed in the same manner as in Windows Explorer. As soon as the file is saved, it will be available in local files.


IMPORTANT: This resource will be available until the Client restarts. To make it available permanently, save the exported video to Wisenet WAVE **Media Folder** (see "[Configuring Media Folders](#)") or create and save a layout containing the video.

Navigation: [Working with Wisenet WAVE](#) >

Screen Recording




This feature records whatever is displayed on screen and includes sound if it is present. This is especially useful for presentations. Available on Windows and Ubuntu Linux only.

 **Note:** Screen recording is disabled for users without export archive permission. See "[Introducing User Roles](#)" for details.

Screens can be recorded in the following formats:

- Video: **MPEG4 Part 2**
- Audio: Stereo (**Lame Audio Codec**)
- Container: **AVI**

 **IMPORTANT:** It is necessary to have a powerful processor and video adapter to capture a screen recording. See configuration recommendations in the installation guide.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

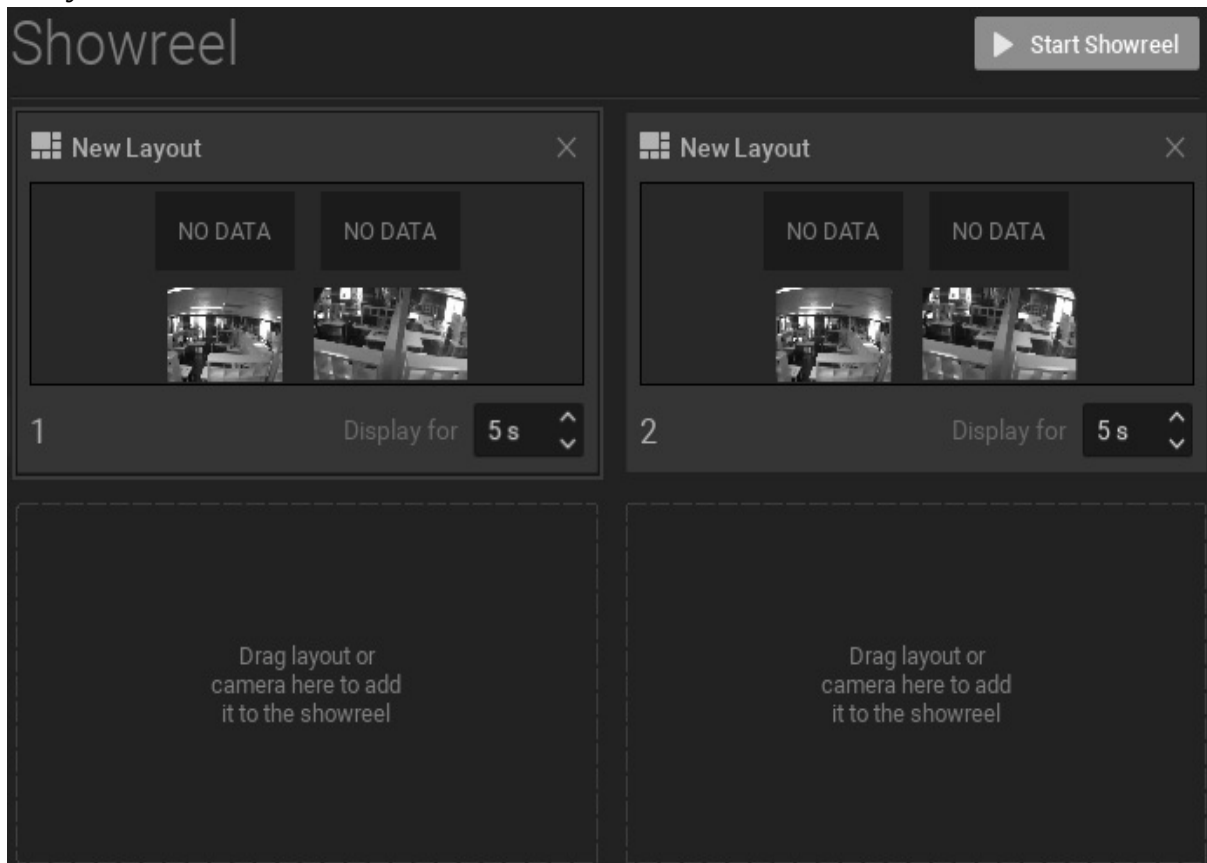
Showreel (Tour Cycle)



In addition to [Tours](#), which cycle in Fullscreen mode through display of open Items in a layout, Wisenet WAVE lets you create a **Showreel** that cycles in Fullscreen mode through entire layouts.

To configure a Showreel

1. Open Main Menu and select **New -> Showreel** to open the Showreel layout.



2. Drag any of the following resources into the Showreel cells:

- Layout(s) from Resource Tree
- Individual Resources (Cameras, Local Files, other Devices, Web Pages) from Resource Tree
- Servers (monitoring item will be displayed) from Resource Tree
- External video files or folders containing video files (right-click in an empty cell to open the Showreel context menu and choose **Open -> File(s)** or **Open -> Folder**)

3. Click-and-drag cells to set the display order by repositioning them in the

layout. (Order is left to right, top to bottom.) Click the **X** in the upper right corner to remove a cell.

4. Use the scrolling *Display for* field to set the display time, in seconds (1 to 99), for each cell.
5. If you do not want the Showreel to cycle automatically, open the context menu and check **Settings -> Switch with Hotkeys**. Once the Showreel is started, it can only be cycled manually using the right arrow key (>) to go forward and the left arrow key (<) to go backwards. For automatic continuous cycling, check **Settings -> Switch on timer**.

To Display a Showreel

1. To start a Showreel, click the **Start Showreel** button in the upper-right corner of the showreel layout, or open the context menu and choose **Start Showreel** (shortcut **Alt+T**). To stop a Showreel, press **Esc**.
 2. Once a Showreel is running, whether automatically or manually, you can use the right and left arrow keys to move through the cycle.
- Showreels are displayed in the Resource Tree and can be opened, deleted, renamed or started from there using the context menu.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >



If several Items are open in the viewing grid , you can start a **Tour** to cycle through Fullscreen display of each item, like a slide show.

To start a tour, open the Viewing Grid context menu and select **Start Tour** (shortcut **Alt+T**). To stop a Tour, press any key.

To set how long each Item is displayed in a Tour

1. Open **Main Menu** and select **Local Settings**
2. In the **Look and Feel** tab, use **Tour Cycle** to specify the desired duration (in seconds).

It is also possible to cycle through entire tabs - see "[Showreel \(Tour Cycle\)](#)".


Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Adjusting Volume



The Wisenet WAVE volume level affects these System actions: [Speak](#), [Play Sound](#), and [Repeat Sound](#).

To adjust playback volume, use one of the following:

- Click-and-drag the **Volume Slider** to the right of the Timeline
- Use a **Mouse Wheel** by clicking on the slider
- Use **Ctrl+Up** or **Ctrl+Down**
- Click the speaker icon  (shortcut **M**) to mute or unmute.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Taking Screenshots



Wisenet WAVE has a built-in **Screenshot** feature that simplifies still image capture of streaming device and local video files to **PNG** or **JPG** output formats. If image enhancement and/or dewarping were applied to the exported source, they will be retained while rendering the screenshot.

To take a screenshot from a video

1. Select the desired item in layout.
2. Scroll in Timeline to the desired position (see "[Navigating through Archive and Live](#)").
3. Click the *Screenshot* button



Screenshot

.

4. In the *Save As* dialog that opens:
 - Chose a directory location
 - Enter a *File name*, or use the default file name, which is the device name appended with a timestamp
 - Select a file type (JPEG or PNG) from the pulldown menu
 - To include the playback time, select a timestamp location from the pulldown menu, or select *No Timestamp*.
 - Click *Save* or *Cancel*.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Exporting](#) >

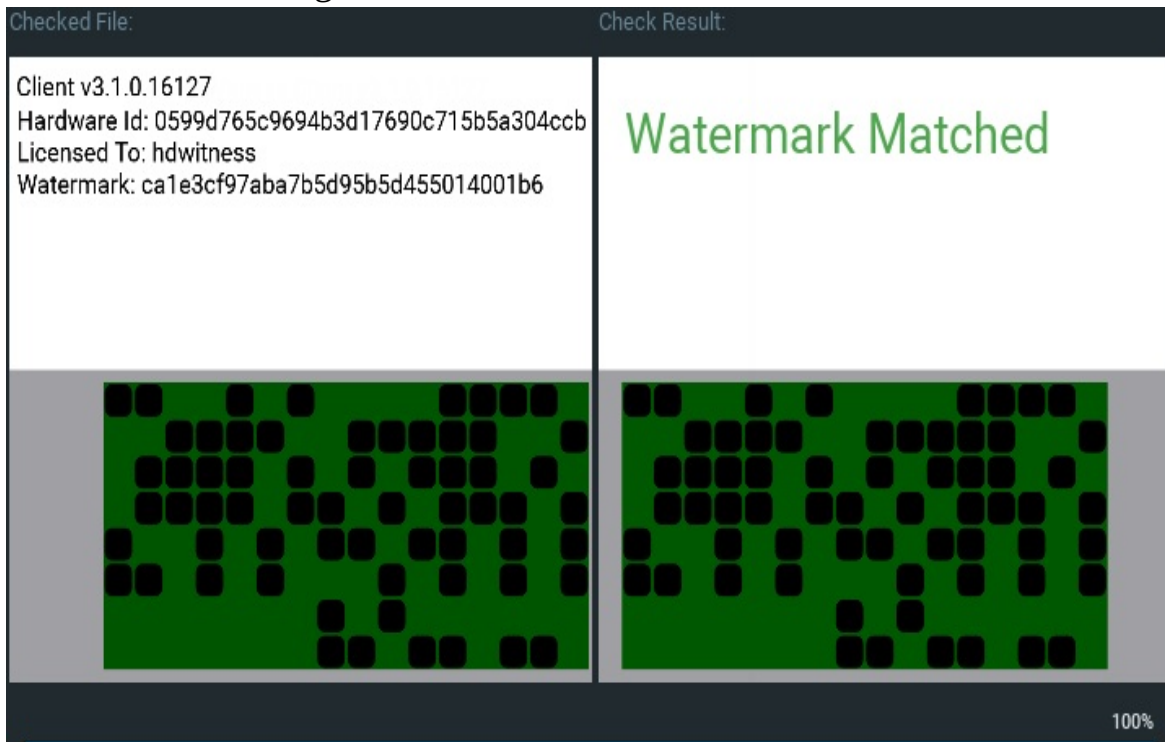
Checking the Validity of Exported Videos



Watermark allows users to check for validity of footage to determine whether or not any modifications were ever performed to the native footage. Any videos exported by Wisenet WAVE (either single camera or Multi-Videos) can be checked for validity.

To check the validity of exported videos:

1. Bring the desired video onto the layout
2. Open the context menu and select **Check File Watermark** (shortcut **Alt+C**)
3. If the file is in its original state, the check will succeed:



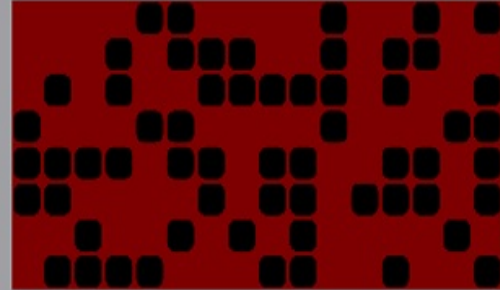
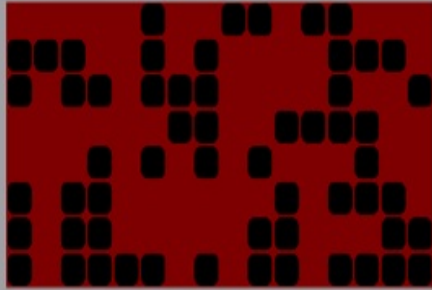
4. If any modifications took place, the check will fail:

Checked File:

Check Result:

Client v3.1.0.16127
Hardware Id: 0599d765c9694b3d17690c715b5a304ccb
Licensed To: hdwitness
Watermark: ca1e3cf97aba7b5d95b5d455014001b6


Invalid watermark



Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >



Wisenet WAVE provides powerful and flexible export capabilities. It is possible to export from a single device or Bookmark, and to export multiple videos simultaneously for synchronous playback. Options are also available to add a timestamp, logo, image processing filters, and similar metadata. Export is performed in background, so it is possible to continue working with Wisenet WAVE until it completes.

 **Note:** Export is only available to users with the appropriate permissions. Export archive permission is required for any export operation. See "[Introducing User Roles](#)" for details.

Export options include:

- [Single Camera Export](#) – Exports archive from a single camera.
- [Multi-Video Export](#) – Exports in a proprietary format for playback using WAVE Mobile, or as executable bundle that can be viewed on any Windows computer.
- [Export Bookmark](#) – Exports a Bookmark.
- [Rapid Review Export](#) – Exports video in fast-forward mode for rapid review. Video must be at least 10 seconds long for this option to be available.
- [Checking the Validity of Exported Videos](#) – determines if any modifications were performed to exported footage.
 - **IMPORTANT:** Files produced with the **x64** version of software will only be viewable on Windows **x64**; however, **x86** files can be viewed on any architecture.

The following file formats are supported for single camera exports

- **MKV** – Matroska (**.mkv**) is a more advanced format that may not be supported on some devices (ex: home media players). It does not restrict video and audio content. (Single camera only.)
- **AVI** – Audio video interleave (**.avi**) is more widely used, but the codec remains intact (H264). To view exported videos in other players may require additional codecs. Additionally, some codecs are not allowed in **AVI** format. A warning message will appear. (Single camera only.)
- **MP4** – MPEG-4 Part 14 (**.mp4**) is another advanced format, but also may not be played back on some devices (ex: home media players). It does not

restrict video and audio content. (Single camera only.)

- **NOV** – Network Optix x64 Media file (**.nov**), a proprietary format. Can be opened by Wisenet WAVE client only.
- **EXE** – a platform dependent (x86 or x64) executable bundle. Can be opened without Wisenet WAVE installed on the computer. Can be edited once exported. The **EXE** format is used for distributing videos to the users who do not have any codecs or media players installed. When the executable is opened, the client launches and plays the exported video. Motion detection and data processing in the recorded segments is retained in the export.

The following file formats are supported for multivideo exports (see above for explanation)

- **NOV**
- **EXE**
- **NOV (Read-Only)** – Cannot be edited after export.
- **EXE (Read-Only)** – Cannot be edited after export.

If a long period of time is selected for export, the following warning message will appear: *You are about to export a long video. It may require over a gigabyte of HDD space and take several minutes to complete.* As soon as export is finished, the video will be available under Local Files in the Resource Tree.

❗ IMPORTANT: An exported video will only be available until the client restarts. To make it available permanently, save the exported video to the Wisenet WAVE **Media Folder** (see “[Configuring Media Folders](#)”). Alternately, you can create and save a layout that contains the exported video(s). See "[Viewing Exported Video](#)" for more information.

To export a video segment

1. Select the desired item(s) in layout.
2. Use the Timeline to select the desired video segment. (See instructions for how to select a time segment in "[Timeline](#)".)
3. **Right-click** on the selected time segment to open the context menu and choose **Export Video**.

Optional filters and overlays are available for **.mkv**, **.avi**, and **.mp4** export formats. Note that if more than one option is selected, they will be layered on top of each other.

The following optional filters and overlays are available

 **Note: Including filters or overlay options requires transcoding, which will increase CPU usage and export time significantly.**

- **Apply Filters** – Check this box to apply image filters from the source recording (for example, [Image Enhancement](#), [Forcing Aspect Ratio](#), [Camera Orientation](#), [Dewarping](#)) to the exported video.
- **Timestamp** – Adds a timestamp to the upper left corner in Long (day of week, date, month, and year, hour:minute:seconds and UTC differential) or Short (dd/mm/yyyy hh:mm), ISO8601, or RFC2822 format. Font Size is also adjustable.
- **Image** – Browse for an image, often a logo, to add to the upper left corner. There are sliders for **Opacity** and **Size**.
- **Text** – Adds the text of your choice to the upper left corner. You can set the **Width** of the text field and the **Font Size**.
- **Rapid Review** – Exports video at higher playback speed than the original recording. See "[Rapid Review Export](#)".

4. Click **Export**. A status dialog will display export progress as a percentage. Clicking **Stop Export** will cancel the operation so that no exported data is saved.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Using 2-Way Audio



Wisenet WAVE allows playing sound directly on devices (Cameras or I/O Modules). It can be initiated manually or automatically.

Currently this feature is supported on the following devices:

- ONVIF compliant
- Axis with firmware 5.x or higher
- Sony SNC-CX600
- full Digital Watchdog camera line
- All Hanwha cameras.

If the device supports 2-way audio, the following button appears:



First, it is necessary to configure audio source: go to the General tab and choose First Source and Second Source. Audio will get mixed from both devices. The best practice is to select master from the sound card as primary and microphone as secondary. In this case, both sounds from Wisenet WAVE (i.e. video clips) and microphone will be recorded simultaneously.

To manually say something on camera press the button and hold while speaking. It is necessary to have a microphone connected and set up. Use spectrum analyzer check the level while the button is pressed and hold:



When the button is released, the transmission is over.

It is possible to play sound or say a text on a device when an event occurs. See



"Play Sound, Repeat Sound, and Speak" topics for more details.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Playing Local Video Files in Wisenet WAVE](#) >


Timeline Navigation for Local Files



Navigation through **Local Files** is very similar to navigation through the **Camera** archive, except:

- Items are not synchronized, therefore **Sync** is always disabled)
- Files are not live, therefore **Live** is always disabled
- **Timeline** does not display colored markers for recorded or motion regions
-  and  buttons jump to the beginning or end of a file

All other operations (seek, play, pause, ff/rew, etc.) are described in details in "[Navigating through Archive and Live](#)".

 **Note:** If a layout contains both cameras and local files, the cameras are played back synchronously, but the local files play back independently.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Playing Local Video Files in Wisenet WAVE



Wisenet WAVE can play back almost any video file, with most major codecs and containers supported.

- [Local File Structure in Resource Tree](#)
- [Configuring Media Folders](#)
- [Opening Local Files Outside of Media Folders](#)
- [Timeline Navigation for Local Files.](#)

All Local file operations described in this section are available when you are connected to a System. If you are not connected to a System, you can still browse and view local files, as follows:

To play local files from the Wisenet WAVE Welcome Screen

1. Go to **Main Menu** and select **Browse Local Files**.
2. The Wisenet WAVE interface opens to a blank new layout, with all local files found in the default media folder displayed in the Resource Tree.
3. You can now add files, arrange items, add new layouts, and use the Timeline. Note however that these layouts cannot be saved.
4. To toggle back to the System connection page, go to **Main Menu** and select **Show Welcome Screen**.

5.1 sound stream playback

Video files that have a 5.1 sound stream require a special setting in order to play back on stereo speakers

1. Go to **Main Menu** -> **Local Settings** -> **Advanced** tab and check **Downmix Audio from 5.1 to 2.1**.
2. Click **Apply** to save changes, **OK** to save changes and close the dialog, or **Cancel** to discard changes
3. You will need to restart the Wisenet WAVE client for this change to take effect

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Preview Search



This feature helps to search through data in large archives by breaking the selected time range into smaller time increments and displaying these increments as separate items. Preview search can be used iteratively until the desired event is located.

For instance, a one month period will be broken down into ten 3-day segments, the 3-day segments will be broken down into nine 8-hour periods, the 8-hour segments into eight 1-hour periods, and so on. It may take three to five iterations to locate an event within an initial period of several months.

To perform Preview Search

1. Select the desired camera in layout. (To make viewing easier, zoom in on the Timeline using a mouse wheel.)
2. Select the region to export on the timeline:
 - Use **Right-click-and-drag**
 - Open the context menu on the Timeline and click **Mark Selection Start** (shortcut **[**), then choose and end point and click **Mark Selection End** (shortcut **]**)
 - You can adjust the region by dragging edges or delete it from the context menu using Clear Selection
3. Invoke the context menu and choose *Preview Search*.
A new tab will open containing several items showing archive from the selected **Camera** in different periods.



If you click on **Items**, the selection on **Timeline** will display the particular period in archive related to the selected **Item**.

If the selection does not contain archive data this feature is not available.

4. Locate the period of time the desired event took place and select appropriate **Tab**.
5. Repeat steps **1-3** on the desired **Item** on Preview Search Tab to further refine the search.

It is also possible to perform the following actions in Preview Search Tab:

- [Navigate through archive](#)
- [Thumbnail Navigation](#)
- [Smart Motion Search](#)
- [Calendar Search](#)
- [Tours](#)
- [Screenshot](#)
- [Export](#)


Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Using Bookmarks](#) >

Deleting Bookmarks



User-created Bookmarks can be deleted individually from the Timeline, or in multiples from the *Bookmark Log* dialog. System-created Bookmarks cannot be deleted.

To delete a Bookmark using the Timeline

- Hover the mouse cursor over the Bookmark to open its dialog and click 
- Right-click on the Bookmark and choose **Remove Bookmark**

To delete a Bookmark using the Bookmark Log


1. Open Main Menu and choose *Bookmark Log* (shortcut **Ctrl+B**)
2. Select the desired Bookmarks (use mouse drag or **Ctrl+Click** or **Ctrl+Shift** to select multiple rows), open the context menu, and choose **Remove bookmarks**

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Using Bookmarks



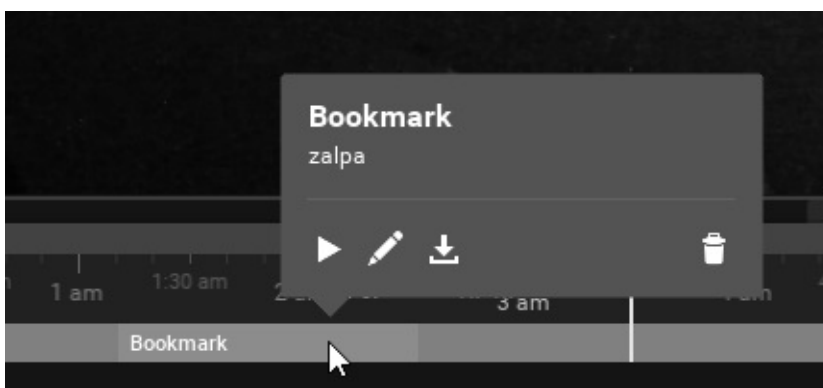
A **Bookmark** is footage in archive that is marked to make it easy to find. Bookmarks provide a convenient way to search for specific footage in the archive (see "[Searching Bookmarks](#)").

Once a Bookmark is created, it displays as a blue segment on the time scale. When the cursor hovers over it, a control dialog opens. Note that Bookmarks are only visible when the Show Bookmarks button  in the Timeline is enabled (green bar on icon). If several items are open in a layout, Bookmarks will display only for the device that is selected.

Bookmarks can be created manually on the Timeline (see "[Creating Bookmarks Manually](#)"), or they can be created automatically as the action of an event rule (see "[Create Bookmark](#)"). The action of completing an acknowledgment in response to a notification also generates a Bookmark on the triggering event.




The name, description and tag properties of Bookmarks are searchable and editable, and can be exported and saved individually, or with the archive of the camera (see "[Exporting Bookmarks](#)"). When archived footage is deleted, associated Bookmarks are deleted as well. You can also manually delete individual Bookmarks (see "[Deleting Bookmarks](#)").

To play a Bookmark, **double-click** a single record in the Bookmark Log, invoke the context menu and choose **Open in New Tab**, or right-click on the Bookmark in Timeline and click the play icon. The corresponding Bookmark will open in a new layout.



Use the Bookmark control dialog on the Timeline to perform the following:

-  – plays the Bookmark from the beginning

-  – opens the *Bookmark* dialog for editing
-  – opens the *Export Video* dialog. See "[Exporting Bookmarks](#)".
-  – deletes the Bookmark

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Advanced Archive Search Tools](#) >

Viewing Archive from Deleted Cameras



When a camera is been deleted from the System, access to its footage is lost. To make such footage available again you the index that maps the System to physical storage location must be restored – see "[Restoring Archives](#)".

After the archive is restored, the deleted camera will be displayed in the Resource Tree. Though it will be marked offline it is possible to navigate through its archive.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Advanced Archive Search Tools



Wisenet WAVE provides many features that make archive search faster, more convenient, and fully intuitive. Since an archive may contain a significant volume of video data (taken over several months), it is crucial to minimize the time a user spends searching for a particular event.

The following search methods are available:

- **Calendar** – Timeline can be zoomed to a selected date (see "[Using Calendar](#)").
- **Smart Motion Search** – selects a region on video, refines the archive, and highlight fragments that include motion. See "[Performing Smart Motion Search](#)".
- **Thumbnail Navigation** – small previews are displayed on top of the Timeline to help locate a particular image or event. See "[Using Thumbnails for Better Navigation](#)".
- **Preview Search** – select a region and allow for the application to provide videos that represent a time period based on time stamps. See "[Preview Search](#)".
- **Bookmarks** – select a segment of footage from a single Camera and give it a name, description and assign tags. See "[Using Bookmarks](#)".

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Viewing Archive and Live Display](#) >

Synchronizing Playback

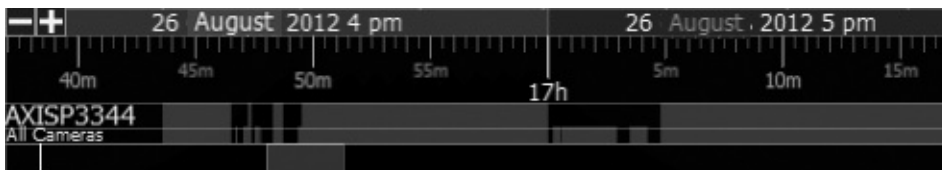


Wisenet WAVE provides a powerful engine that enables users to navigate through multiple cameras: if several cameras are displayed at the same time, they can be synchronized.



If a user performs a search, fast forward, rewind or search by frame each camera will be synchronized. If no recording took place over a certain period of time, **NO DATA** will display on the camera view.

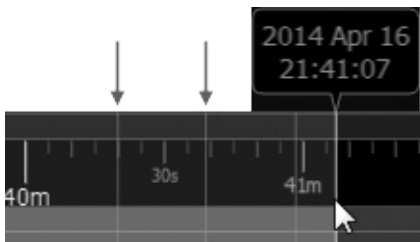
Recorded fragments are displayed on the **Timeline** in two rows:



- The upper row displays fragments for **Camera** selected on the viewing grid
- The lower row – for all **Cameras** displayed on the viewing grid

It is possible to disable synchronization (press **SYNC** button). If no **Item** is selected, the selection will move to the previously selected item, which will become the only item affected by playback controls (seek, speed etc).

Thus, if **Synchronization** is disabled, it is possible to seek each camera in a different position. In this case Timeline displays positions for all camera played back (see blue markers on the picture):



If **a camera is selected** on the viewing grid and enables synchronization again, all other cameras will synchronize time and speed with the selected camera.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Viewing Archive and Live Display




The Timeline provides a convenient way to navigate through live and archived footage. It can be set to display local or server time (see "[Customizing Look and Feel of Wisenet WAVE](#)"). Note that the [Export](#) and [Preview Search](#) features depend on this time settings as well. Timeline shows archive for a single selected camera in the upper wide bar, and combined archive for all cameras in layout cameras in the lower narrow bar.

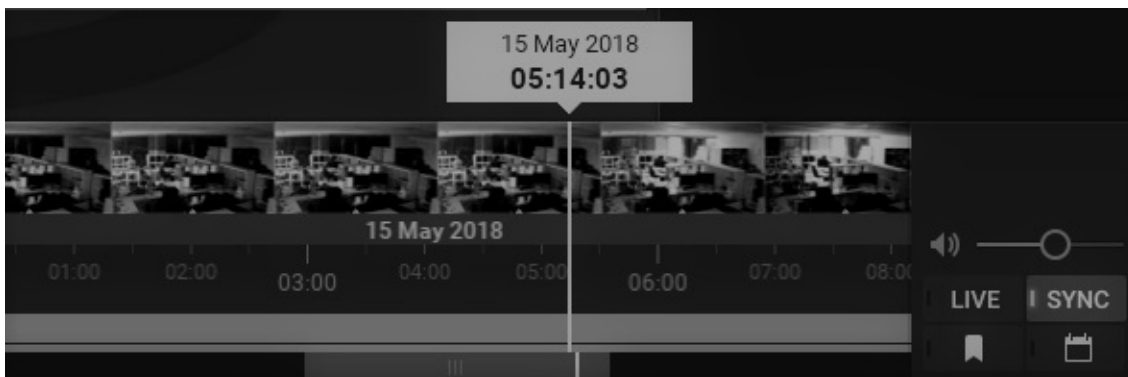
! IMPORTANT: It is not possible to navigate through the last minute of archive (this increment is represented in stripes on the Timeline).

By default, all cameras display a live images when first opened. It is only possible to navigate through recorded fragments. If the Timeline position indicator is placed in a moment with no recording, it will jump to the next available recorded fragment.

- Click the **LIVE** button (shortcut **L**) or move the position scrollbar all the way to the right to view live images.
- Click the **SYNC** button to synchronize all items in layout to the same date and time, whether live or archive.

 **Note:** When SYNC is enabled, the speed slider and LIVE button apply to all items in layout. When SYNC is off, the speed slider and LIVE button apply only to the selected item.

Main sections of the Timeline (see "[Navigating with the Timeline](#)" for more details)



Position indicator – When you click on the Timeline, that position is indicated by a white marker with a box showing the exact date and time. The marker remains until you click somewhere else on the Timeline. The marker

remains in the scrollbar area as well, so you can tell where you are in relation to the indicator.

Day/date display – can be scaled from increments of 100ms to 1 month.

Recorded segment indicator – The timeline has color indicators as follows:

Black – indicates no recorded footage


Green – indicates recorded segments

Blue – indicates a Bookmark. See "[Using Bookmarks](#)".

Red – indicates regions where motion has been detected, if Smart Search is active. See "[Performing Smart Search](#)".

Scrollbar – Use this gray button to quickly move backwards and forwards along the Timeline. Note that the scrollbar scales with the Timeline.

Thumbnails – Click-and-drag the top of the Timeline to open thumbnails of the currently selected item. See "[Using Thumbnails for Better Navigation](#)".

 **Note:** All users are allowed to view cameras live. However, to view archive footage a viewer must have the appropriate permissions.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >



Wisenet WAVE can be used to display web pages in the layout. This can be useful, for instance, for modifying camera parameters on an external web page, or to open an external system such as Access Control or Analytics while also performing surveillance monitoring.

To create a new web page

1. Go to **Main Menu** and choose **New -> Web Page**, or right-click on the **Web Pages** icon in the Resource Tree and select **New Web Page**.
2. In the dialog that opens, enter a **Name** for the page, and the complete desired **URL** (including https://www.)

The new web page will launch in the current layout and be added to the Resource Tree.

In a web page item, the *Info* button (shortcut **Alt+I**) functions as a toggle to show or hide the URL as a transparent overlay in the bottom left corner of the cell. You can use **Edit** from the item's context menu to change the name or URL.

It is also possible to view video on a web page if you have a codec pack (for instance, K-Lite codec pack) installed on the PC where the client is running.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

Configuring Live Buffer Size



On some cameras, live playback may stutter, or there may be a time significant delay between actual actions and the action shown on Live view. For a better viewing experience it may be helpful to adjust the live buffer size from the default of 600ms.

To do so, open **Main Menu**, choose **Local Settings** -> **Advanced**, then adjust the **Maximum Live Buffer Length** to the smallest possible value that does not cause issues with live view on all cameras.

- Larger buffer makes playback smoother, but increases the delay between real time and the live display
- Smaller buffer decreases the delay but can cause stutters on playback

See also "[Double Buffering](#)" and "[Disabling Blur for Intel HD Graphics](#)".

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) >

CPU and Bandwidth Saving During Playback



Wisenet WAVE architecture provides significant CPU and network bandwidth savings by acquiring multiple streams from a single camera: **High Resolution** (regular) and **Low Resolution** (approximately 10 times less bandwidth).

Automatic resolution switching

If there is not enough bandwidth between the client and server to display the high resolution stream while viewing a camera, the camera is automatically switched to low resolution mode. See "[Dual Stream Recording Specifics](#)". This switching will occur when there is insufficient CPU to display many videos simultaneously (for example, running over 20 full high resolution videos at the same time or fast forwarding multiple high definition videos at the x16 speed).

Setting layout resolution manually

It is possible to choose resolution for a layout manually. **Right-click** on the layout background, choose **Resolution**, then select **Low** or **High**. The change is applied at once, but only to the current session. The default setting is **Auto**. The **Custom** setting indicates that one or more items in the layout are playing back at a different resolution than the others. This can occur when the resolution setting for a specific item has been set manually. See "[Setting Item Resolution](#)".

It is also possible to force motion detection to a specific stream; see "[Forcing Motion Detection to a Specific Stream](#)". This will affect server performance as well as software decoding of the stream.

Auto pausing video playback

Wisenet WAVE also offers significant bandwidth savings with the option to automatically pause video playback due to inactivity after a certain period of time. To set this option, open Main Menu, go to Local Settings -> General and check Auto Pause Video, then set the desired time interval.

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) >

Recording Modes



The **recording schedule** is where you define when and at what quality a device will be recorded. The recording schedule is always based on server time.

You must have an active Wisenet WAVE license to record device streams. If there are insufficient licenses, you will be warned that the license limit is exceeded. If this is the case, your recording schedule settings will be saved, but recording will be disabled.

Audio can be recorded as well as image if the device has (or is connected to) a microphone, and the "Enable Audio" checkbox in **Device Settings -> General -> Audio** is checked. It is also possible set a recording schedule for I/O Modules (see "[Setting Up I/O Modules](#)").

The recording schedule provides the following modes, which can be applied in 1 hour blocks:

Record Always – Always records.

Motion Only – Recording will start if motion occurs. Requires that the camera support hardware or software motion detection.

Motion + Lo-Res – by default, a camera is set to record at low resolution unless motion occurs, at which point it automatically switches to recording at high resolution. High resolution recording requires dual streaming. To use this recording mode, make sure the camera supports dual-streaming. If it does not, the following warning will be displayed: "*Dual-Streaming and Motion Detection is not available for this camera.*" See [Dual Stream Requirement](#) section below.

Do Not Record – never records.

When recording is configured, devices are marked with a small red circle in the Resource Tree:

- – indicates camera is recording
- – indicates a recording schedule is established but the camera is not recording at the moment. A license is still being used even though the device is not recording at the moment.

Dual Stream Requirement

The secondary stream is used for recording and also used for motion detection

and to save bandwidth and CPU during playback (see "[CPU and Bandwidth Saving during Playback](#)"). If dual-streaming is supported, the System tries to set second stream settings to low quality as follows:

- 2 to 7 FPS
- 320p to 480p (some cameras may set secondary stream resolution up to 720p). If the primary stream is 480p or less, it can be used for software motion detection as well.

❗ IMPORTANT: FPS and Quality settings in the recording schedule dictate live stream viewing settings as well. For example, if the recording quality in the schedule is set to 4 frames per second and Low Quality, Wisenet WAVE will stream live using those settings even if the camera is capable of higher quality playback. However, when recording is turned off in the schedule, Wisenet WAVE will stream live at the maximum possible frames per second and quality.

Setting a motion detection region

You can control the image regions that will trigger a motion event, and how sensitive to motion those regions will be. See "[Setting up Motion Mask and Motion Sensitivity](#)".

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) > [Controlling Pan, Tilt, and Zoom \(PTZ\)](#) >

Setting Up PTZ Tours

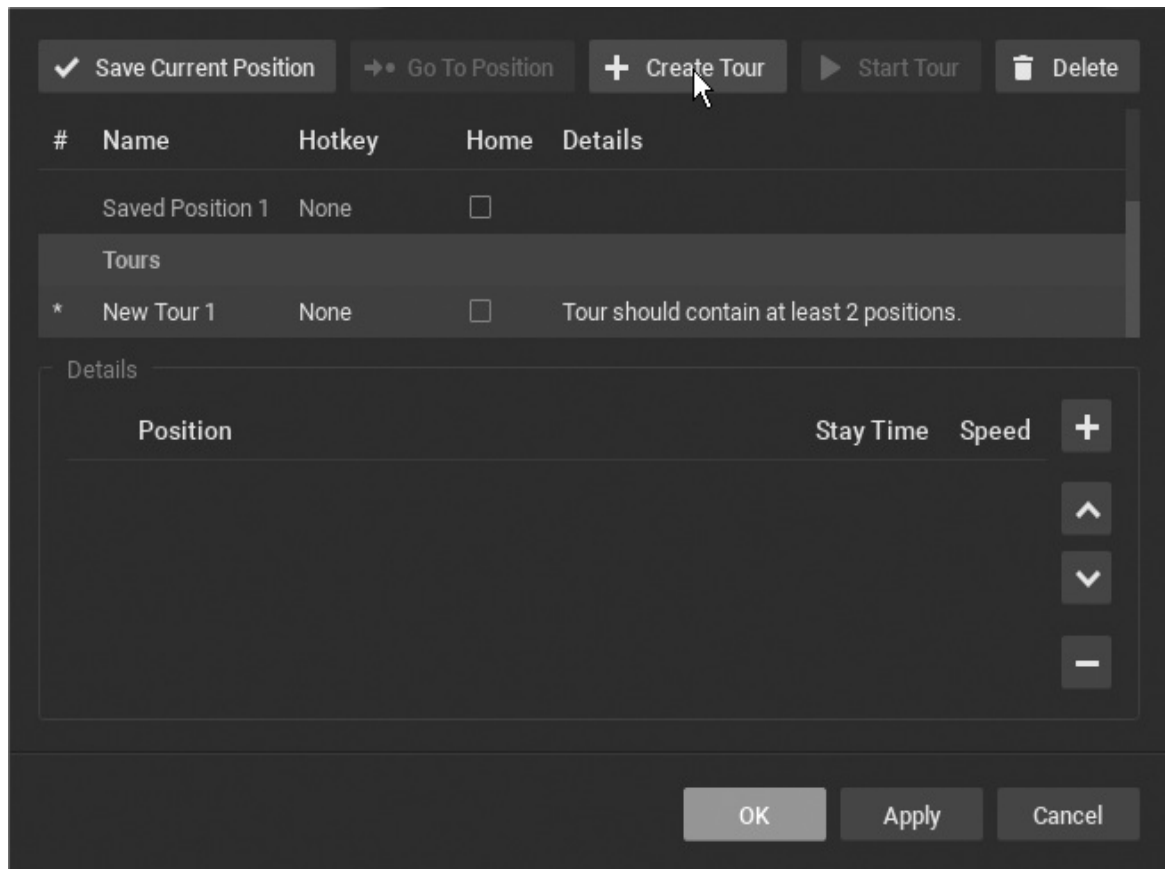


A **PTZ tour** is a sequence of saved PTZ positions. PTZ tours are useful for observing a broad field of coverage with a single camera. The following restrictions apply:

- Can only be applied to a PTZ or fish-eye camera
- Must contain at least two positions
- The same position should not be used consecutively or as both the first and last position. A warning will appear if a tour contains multiple instances of the same position. Instead, define and use slightly different or overlapping PTZ presets.

To create a PTZ tour

1. Right-click on the camera item in layout and select **PTZ -> Manage** from the context menu.



2. Make sure at least two positions are saved.
3. Click the **Create Tour** button. A *Tours* section will open at the end of the

position list, with a default name *New Tour <#>*.

4. In the *Details* form, click the + button to add the first position to the tour. Continue to click + until you have added all desired positions.
5. Each tour position can be edited as follows:
 - Click on the **Stay Time** field to select the display duration for a position
 - Click on the **Speed** field to set the speed of the move from one position to the next (menu)
 - Click on the **Position** field to select a different position (menu)
 - Use the up and down arrows at the right to change the order of a position in the tour
 - Click the + button to add a position
 - Click the - button to delete a position
4. Click *Apply* to save the tour then click the **Start Tour** button to test it.
5. Optionally, rename the tour using the list **Name** field or assign it a **Hotkey**.
6. Optionally, check the **Home** box. The home tour will be activated on a camera automatically if there is no active PTZ tour.
7. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

To start a PTZ tour

1. From the camera item in layout, open the context menu and select **PTZ**.
2. Select the desired tour from the list of saved tours (which is below the list of saved positions).
3. Alternately, open the context menu, select **PTZ -> Manage**, highlight the desired tour in the list and click on **Start Tour**.

To stop a PTZ tour

A PTZ tour cannot be toggled on and off, it must be replaced with a static PTZ position. Either enable PTZ controls on the camera item and choose a PTZ position manually or choose a saved PTZ position (select one from the context menu or use a hotkey).

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Controlling Pan, Tilt, and Zoom (PTZ)





To the extent supported by a given ONVIF camera model, Wisenet WAVE provides convenient PTZ controls when a camera is in Live mode and also on fish-eye cameras and screenshots.

For the most commonly-used camera models that support ONVIF Absolute Move, the following features are also available:

- [Saving and Restoring PTZ Positions](#)
- [Setting Up PTZ Tours](#)

When PTZ requirements are met and enabled, the PTZ icon  will display on the corresponding camera item.

 **Note:** Native PTZ camera presets (those that are configured on the camera web page) can be ignored in favor of Wisenet WAVE settings by checking the **Disable native presets, use system presets instead** box in the **Camera Settings -> Expert** tab.

Depending on the camera model, one of the following modes is available when you click on the PTZ icon .

Simple (Zoom only) – As shown in the image below, only the + and - buttons are available to zoom in and out.



Regular (Zoom and Point) – Use the + and - buttons to zoom in and out. When there is a center circle as shown below, you can use it to click-and-drag the center of the image to the desired position.



Extended (Zoom, Point and additional features) – Requires ONVIF Absolute Move support by the camera and custom product integration. Allows zooming, repositioning, and the following additional controls:



- **Click** anywhere in the field of view to re-center at that position.
- **Left-click-and-drag** and draw a zoom rectangle that can be positioned until the mouse button is released.
- **Double-click** to zoom out all the way.

Once a PTZ position is set, press  again to hide PTZ controls.

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Configuring Minimum and Maximum Archive Storage



Wisenet WAVE provides the ability to set a maximum and minimum storage duration for the archive of any given camera, measured in the number of days from the current date going backwards in time.

Before you use a **Fixed Archive Length** setting, it is important to understand the impact it will have. The default **Auto** setting means that archived footage for a given camera is treated according to the standard algorithm - the oldest data is deleted first. No controls are placed on when or which archived footage is deleted.

The **Min. Days** and **Max. Days** fields assign priority to a given camera - high priority for Min. Days, low priority for Max. Days. If more than one camera is assigned high or low priority, storage results may not be predictable. Typically the *Min. Days* setting is used for environments with limited storage capacity and a few high-importance cameras, or when a regulation requires that certain footage be stored for a minimum number of days. **Max. Days** is typically used for environments where storage is limited and there is no need to store records beyond a certain age from certain cameras.

Min. Days

Min. Days sets a minimum archive length, in number of days from the current date, for which Wisenet WAVE gives highest priority to retention of records from a given camera over retention of records from any camera that has the default (*Auto*) archive setting.

For example, a **Min. Days** value of 120 for a given camera means Wisenet WAVE will attempt to preserve the past 120 days of records from that camera.

❗ IMPORTANT: Be careful when setting a minimum days value. If more than one camera is assigned a **Min. Days** value, those cameras will have the same priority level, in which case storage results cannot be entirely guaranteed for any of them. If there is insufficient storage space, in order to retain footage as specified with **Min. Days**, Wisenet WAVE will first delete records from cameras that do not have a minimum archive length set, and then will stop recording incoming signals from low and average priority cameras. If storage space is at capacity, no other camera streams will be

recorded.

Max. Days

Max. Days sets an archive duration after which records will not be saved for a given camera.

To configure storage duration


1. Go to the camera's context menu from the Resource Tree or layout and open **Camera Settings** -> **Recording** tab.
2. In the *Fixed Archive Length* section, uncheck the **Auto** checkbox.
3. Enter the number of days you want to preserve archive in *Min. Days*.
4. Enter the number of days after which archive will be automatically deleted from archive in **Max. Days**.
5. Click *Apply* to accept, *OK* to save and close the dialog, or *Cancel* to discard changes.


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Configuring Fish-Eye Cameras



Fish-eye lens capture a very large viewing area but also create a severely distorted image. Wisenet WAVE provides a powerful dewarping algorithm that can be applied to make a fish-eye image much easier to view. Applying the dewarping algorithm allows enables PTZ controls for a camera.

Dewarping requires that a camera first be configured to best apply the dewarping algorithm. Once dewarping is configured, you use the corresponding dewarping icon  when the camera is in layout to activate dewarp mode. See "[Dewarping Fish-Eye Cameras](#)" for details.

 **Note:** Keep the camera open in layout so you can see how the image changes as settings are adjusted.


1. Select the desired camera and open **Camera Settings** from the context menu.
2. In the **Fisheye** tab, click on the **Fisheye Dewarping** button to enable (green) the distortion correction parameters.



3. Indicate the mounting position of the camera – **Ceiling Mount, Wall Mount, or Floor/Table Mount** – to apply the proper dewarping

algorithm for the camera's orientation. Note that a Wall Mount setting allows for only a 180 degree panoramic view. The other 2 settings allow for a 360 degree panoramic view.

4. **Mount Angle Correction** - if needed, you can adjust the mounting angle by -30.0 to +30.0 degrees.
5. If necessary, position the blue calibration circle over the camera's field of view as accurately as possible. Click-and-drag to move the circle and use the mouse wheel to resize it.
6. Click **Auto Calibration** to apply the dewarping algorithm.
7. If needed, you can manually adjust the settings:
 - Use the **Size** slider to change the size of the blue circle. You can also use the mouse scroll button to resize it.
 - Use the **X Offset** and **Y Offset** sliders to change the position of the circle it horizontally or vertically. You can also click-and-drag it to the desired position.
 - Use the **Ellipticity** slider to adjust the shape of the lens (panamorph lens support).
8. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.


The dewarping  icon will now display on the camera item in layout to indicate that it is configured for dewarping mode and PTZ controls. See "[Dewarping Fish-Eye Cameras](#)".

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Setting Up Camera Orientation



Wisenet WAVE can adjust to proper orientation for devices that have been mounted upside down or rotated by 90 degrees.

 **Note:** This correction will require transcoding if exporting videos from a camera.

To specify device orientation


1. Open **Camera Settings** and go to the **General** tab.
2. In the **Image Control** section, click on **Auto** in the **Rotation** field to open the pulldown menu.
3. Select the desired rotation adjustment from the available options: *0 degrees, 90 degrees, 180 degrees, 270 degrees*. Select *Auto* to restore the original orientation.
4. Click on *Apply* or *OK* to save the setting.

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Forcing Aspect Ratio for Cameras



Occasionally, cameras will report an incorrect aspect ratio. If Wisenet WAVE cannot make an automatic correction you can do so manually.

 **Note:** This correction will require transcoding if videos are being exported from the camera.

To specify an aspect ratio

1. Open **Camera Settings** and go to the **General** tab.
2. In the **Image Control** section, click on **Auto** in the **Aspect Ratio** field to open the pulldown menu.
3. Select the desired aspect ratio from the available options: *1:1*, *4:3*, *16:9*.
Select *Auto* for Wisenet WAVE to determine the aspect ratio.
4. Click *Apply* or *OK* to save the setting.

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Sharing Parameters on Multiple Devices



To simplify the configuration process, you can apply the same parameters to multiple devices at once.

1. Select the desired devices from the Resource Tree or layout.
2. Open the device context menu and go to **Device Settings**. The following settings can be entered on multiple devices:
 - Login
 - Password
 - Aspect Ratio
 - Rotation
 - Recording Schedule
 - License Activation
 - Enable Audio
 - All Expert settings except Logical ID. See "[Working With Expert Device Settings](#)"
3. Enter the desired parameters.
4. Click *Apply* to accept, *OK* to save and close the dialog, or *Cancel* to discard changes.

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Configuring Device Authentication



All devices come with a predefined login and password combination. During the discovery process, Wisenet WAVE attempts to use the manufacturer's default credentials to access a device and acquire media streams. However, default login and passwords can vary between models or product lines, or may have been deliberately changed.


If Wisenet WAVE cannot access a device using the default authentication, the device is shown as **Unauthorized** (🔒) in the Resource Tree and the following message will appear when a user attempts to view a live stream:

UNAUTHORIZED Please check authentication information.

Some devices require setting a password if they are discovered using default credentials. In this case, the device is displayed within the Resource Tree but an "unauthorized" message will be displayed when attempts are made to view streams from such devices.

To enter authorization parameters

1. Open **Device Settings** -> **General**.
2. Enter **Login** and **Password** in the *Authentication* section and click *Apply* or *OK*. To discard changes, click *Cancel*.

 **Note:** It is possible to configure the same authentication credentials for several devices simultaneously. See [“Sharing Parameters on Multiple Devices”](#).

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Renaming Devices



When a device is discovered automatically, it is displayed in the Resource Tree as either "model" or "manufacturer + model". As a result, all cameras with the same make and model will have the same name. Only the IP address will differ, and display of the IP address optional (see "[Show additional info in tree](#)").

A device can be renamed for easier identification or any other reason, from the Resource Tree using the device context menu option **Rename** (shortcut **F2**), or from **Camera Settings** -> **General** using the **Name** field.

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Configuring Audio on a Device



Wisenet WAVE allows for audio recording from devices that are audio-enabled and have a microphone connected.

Open the device context menu and go to the **General** tab, then check the **Enable Audio** checkbox and click *Apply* or *OK* to accept the change.

It may also be useful to use the device's web page for further controls. See "[Configuring Proprietary Device Parameters](#)" for details.

You can configure audio for multiple devices at once. See "[Sharing Parameters on Multiple Devices](#)".

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Setting Up I/O Modules



Wisenet WAVE handles I/O devices as it does cameras, with some specific functionality adaptations. Like all other devices, I/O modules are discovered automatically or with the user's help and then displayed in the Resource Tree. However, to start working with an I/O Module it is necessary to obtain and configure an **I/O Module License** (otherwise the "Module is disabled" message will be displayed). After the license is activated, the module will be displayed with the available inputs and outputs.

Only Owners, Administrators, and custom users with "Edit camera settings" permission can configure I/O Modules. Owners, Administrators, Advanced Viewers, and custom users with "User Input" permission can view IO Module input and outputs in layout.

I/O modules require the following setup steps

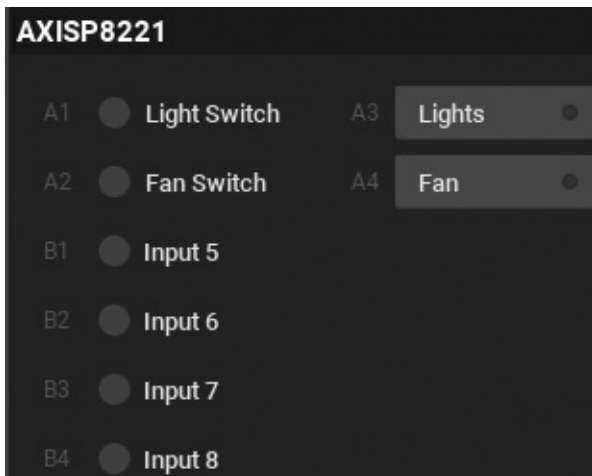
1. Right-click on the device in the Resource Tree and go to **I/O Module Settings**.
2. Go to the *I/O ports* tab and enter the following parameters:

#	Id	Type	Default state	Name	On click	Duration
1	A1	Input	Open circuit	Light Switch		
2	A2	Input	Open circuit	Fan Switch		
3	A3	Output	Open circuit	Lights	Toggle state	
4	A4	Output	Open circuit	Fan	Toggle state	
5	B1	Input	Open circuit	Input 5		
6	B2	Input	Open circuit	Input 6		
7	B3	Input	Open circuit	Input 7		
8	B4	Input	Open circuit	Input 8		

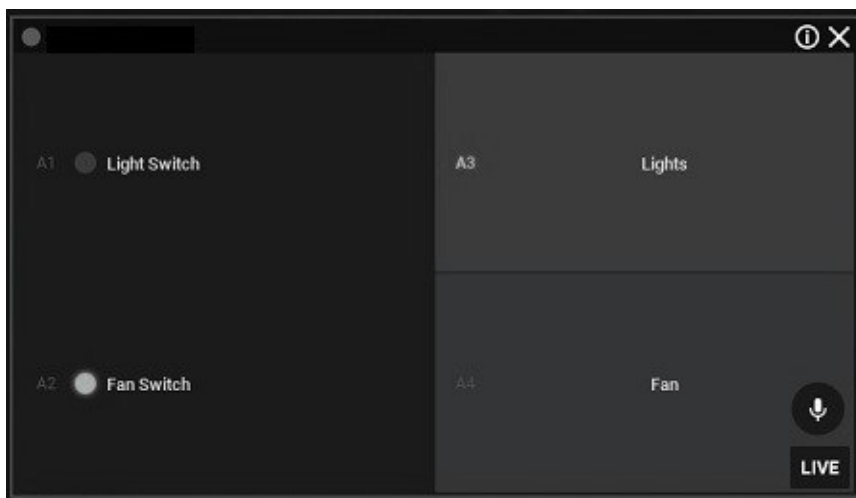
- **Type** – *Input* or *Output*
- **Default State** – *Open circuit* or *Grounded* (depending on I/O Module)
- **Name** of the port

- **On click** – select the desired action
- **Pulse time** (output only) – the length of time the signal will be generated (in milliseconds)

After the I/O module is configured, it will be displayed as shown below:



If you check the "Enable tile interface" checkbox, you will be able to operate the device's ports from the Wisenet WAVE interface. The left panel shows the ports currently in use, the right one is clickable.



The following actions can be performed with an I/O Module:

- **Record Audio from I/O Module** (if a microphone is connected). See "[Setting up Recording Schedule](#)" for details.
- **Playback Audio Archive Recorded from I/O Module** (if a microphone is connected). This is similar to viewing archive from cameras (see "[Navigating through Archive and Live](#)")
- **View Inputs State**. When the circuit is grounded, the appropriate sensor

turns green.

- **Trigger Output.** For this purpose click the corresponding button (A3 and A4 in the image above). The output signal is sent for the amount of time specified in the *Pulse Time* setting.
- **Create Rules** using the device's input and output ports as described in [Input Signal on Device](#) and [Device Output](#).

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Setting Up Analog Cameras



Typically, analog cameras are connected via analog recorders. Each recorder has a number of channels that indicates the number of analog cameras it can handle. If a recorder is plugged into the network, it can either be discovered automatically or added manually (see "[Adding Devices \(Cameras, Encoders and I/O Modules\)](#)").

The following types of analog cameras are supported:

- Analog cameras plugged into an encoder. These cameras behave like any other camera in the System. It is possible to have a [Recording Schedule](#) and [Motion Detection](#) configured for Encoder analog cameras.
- Analog cameras plugged into a recorder (DVR). These cameras are recorded somewhere else so Wisenet WAVE only pulls the desired stream from the recorder. It is not possible to configure a recording schedule or motion detection for recorder analog cameras.

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Obtaining Basic Device Information



Select a device, choose **Device Settings** from its context menu, and go to the **General** tab to view the following device information:

- Name
- Model
- Firmware
- Vendor
- IP address
- Web Page
- MAC address

Only the **Name** field is editable. The **Web Page** link launches the device web page in a browser, where you can view and edit all device parameters. You can press the **Ping** button to test the web page accessibility. (Depending on the device make and model, the device web page can also be launched and edited from within the Wisenet WAVE client (see "[Configuring Proprietary Device Parameters](#)").)

In **Device Settings**, go to the **Advanced** tab to see or copy:

- Camera ID
- Primary stream URL
- Secondary stream URL

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Deleting Devices




To delete a device:

1. Expand the server hosting the desired device in Resource Tree.
2. Find and select the device
3. **Right-click** for the context menu and choose **Delete** (or the **Del** button on a keyboard).
4. Click **Yes** to confirm.

If a camera is disconnected, its archived footage becomes unavailable.

However, it can be restored. See "[Viewing Archive from Deleted Cameras](#)".

 **Note:** If a device is online it will be auto-discovered again unless it was added manually. To avoid auto discovery, either unplug the device or disable [automatic device discovery](#).

If the device is back online, it will start working immediately and its recorded archive will be available. However, a user will need to reconfigure **Device** as its settings have been erased.

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Moving a Device to a New Server



If too many devices are used on the network, it may be helpful to set up an additional server for load balancing and redundancy purposes. If several servers are set up on the same network, it is possible to perform manual load-balancing.

⚠ IMPORTANT: When moving a device from one server to another, recording will be restarted automatically with all predefined parameters retained. Also, archive is seamlessly combined from all servers.

To move device(s) from one server to another:

1. Select the desired device(s) in Resource Tree
2. **Drag-and-drop** the selected devices to the desired server

⚠ IMPORTANT: In order to be able to see video from a relocated device on a new server, the device must be accessible to and discovered by the new server, otherwise it will be displayed as offline.

Devices can also be swapped automatically in the event of a server failure; see "[Configuring Failover](#)".

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Wisenet WAVE can work with a wide number of network video recorders (**NVRs**), however there are some special requirements:

- NVR requires a specific Bridge License to work (however a regular license will work as well). Each Bridge License allows viewing one channel from NVR.
- NVR cannot be detected automatically and must be added manually. See "[Adding Devices Manually](#)".
- Cameras should be connected to NVR and properly configured to display in Wisenet WAVE.

After an NVR is configured and added, its channels become visible and it is possible to navigate through its live and archive streams. Some restrictions apply:

- NVRs do not support asynchronous playback, so the SYNC button on the Timeline has no effect.
- Only three simultaneous connections per channel are supported for archive playback. This means only three Wisenet WAVE Client applications may request video from a certain channel. If an additional client tries to view archive from this channel, it will not be accessible.

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Adding Multicast, RTSP or HTTP Streams as Cameras



Some camera models are not fully compatible with ONVIF Profile S and therefore will not work properly in Wisenet WAVE. However, if such a camera can provide streams by RTSP, HTTP, or Multicast URL, it can still be viewed and recorded in Wisenet WAVE. Audio output over RTSP is also supported for devices that record audio.

ⓘ IMPORTANT: To add a camera stream you must verify that the particular camera model supports this option, and you must know the exact RTSP/HTTP/Multicast URL of the stream. This information can be found in the camera manual, on the camera web page, or by contacting the manufacturer.

To add the desired stream, follow the manual addition procedure described in "[Adding Devices Manually](#)", paste the RTSP or HTTP URL value (i.e. `rtsp://<camera IP>:554/hi_stream`) in the **Device Address** field.

- In the **Add Devices to {server name}** dialog, make sure **Subnet Scan** is unchecked.

Once added, the camera will be displayed in the Resource Tree and can be configured like any regular IP camera.

📖 Note: Only one stream can be added per camera, so dual-streaming benefits will not be available (see "[Dual Stream Recording Specifics](#)"). Also, if resolution is greater than 1024x768, software motion detection will not be available.

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Adding Devices (Cameras, Encoders and I/O Modules)



This section provides information on how to add various devices (cameras, encoders, I/O Modules) to the Wisenet WAVE resource list.

Choose one of the following methods:

- [Automatic Device Discovery](#)
- [Disabling Automatic Discovery](#)
- [Adding Devices Manually](#)
- [Adding Multicast, RTSP or HTTP Streams as Cameras](#)

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Viewing Full Device List



The **Devices List** lets you view and manage all devices registered in the Wisenet WAVE System.

To open the Device List

Open the **System Administration** dialog and select **Device List** (shortcut **Ctrl+M**).

Recording	Name	Vendor	Model	Firmware	IP/Name	MAC address	Server
Continuous	TestCameraLive		TestCameraLive		192.168.0.4	92-61-00-00-00-19	Server nx3-old (10.1.5.116)
Continuous	AVM542Bnetwork	AVM542B	networkcamera	1025-1017-1017-1011	192.168.0.217	00-0E-53-27-FE-98	Server BJER2U48T-PC (192
Continuous	DCS-2210	Dlink	DCS-2210		192.168.0.102	F0-7D-68-09-3F-05	Server BJER2U48T-PC (192
Continuous	TestCameraLive		TestCameraLive		192.168.0.4	92-61-00-00-00-57	Server nx3-old (10.1.5.116)
Continuous	TestCameraLive		TestCameraLive		192.168.0.4	92-61-00-00-00-69	Server nx3-old (10.1.5.116)
Continuous	DWC-MB950TIR	DIGITAL WATCHDOG	DWC-MB950TIR	1.1.6	192.168.0.24	00-19-6C-F0-02-7E	Server BJER2U48T-PC (192
Continuous	vimicroNVT	ZXDZHZ	0. 0	IPC_3.3.ISP.S30.MT9P1	192.168.0.73	00-00-00-00-00-00	Server BJER2U48T-PC (192

Add Device...

Data in each of the columns can be sorted in ascending or descending order.

- *Recording* – current recording state of the device (Not recording, Continuous, Motion only, Motion + Lo-Res). See "[Setting up Recording Schedule](#)".
- *Name* – Device name
- *Vendor* – Device manufacturer/maker. When interacting with a 3rd party device via ONVIF protocol, *Onvif Device* is displayed.
- *Model* of the device
- *Firmware* – the current firmware version
- *IP/Name* – device IP address
- *MAC Address* – device MAC address. If it is not possible to determine the MAC address, a unique identifier is shown (i.e. `urn_uuid_207f19b2-d5a6-407f-8fec-6265a311058b`)

- *Server* – Server hosting the device

The following tools are available to manage the Device List:

- **Sort data** – Click on a column header to sort
- **Filter data** – the filter field applies to all data in the list and results refresh as characters are entered. For example, if you type "VI", the list will be filtered to show all devices having those characters, in any of their parameters (name, vendor, model, etc.). To disable filtering, clear the field.
- **Select data** – To select multiple rows use Ctrl+Click or Shift+Click. Use Ctrl+A to select all devices.
- **Open device(s)** – Select the desired devices, open the context menu and choose *Open*, *Open in New Tab*, or *Open in New Window*.
- **Rename Devices** – Select a device, open the context menu and choose *Rename*.
- **Check Device Issues** - Opens the [Event Log](#) for the selected device.
- **Delete** – disconnects the selected device(s) for the server host.
- **Change settings** – Select the desired device(s), open the context menu and choose **Device Settings**.
- **Export data to an external file** – Select the desired **Devices**, open the context menu and choose *Export Selected to File*. Select file name and format. HTML and CSV text file are supported.
- **Copy one or several rows to clipboard** – Select the desired rows, open context menu and choose *Copy Selection to Clipboard*. The data can be pasted into any text editor or Microsoft Excel.

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Automatic Device Discovery



As soon as a server is started and connected to a System, it automatically performs device discovery in its network for devices that are accessible via broadcast. Once a device is discovered, it is displayed in the Resource Tree.

 **Note:** For Axis cameras only, if the "People Counter" function is enabled automatic discovery will not work in Wisenet WAVE software.

If a device does not transmit media data, it is marked as offline. If a server is offline, all devices the server is hosting are automatically switched to the offline status.

Once a device is discovered, Wisenet WAVE tries to configure the following settings on camera: the best possible image settings for the main video stream (resolution and frames per second) and optimal ones for the secondary stream (low resolution, 2 to 7 frames per second). To disable this feature, see "[Preventing Wisenet WAVE from Changing Camera Streaming Settings](#)".

Some devices require setting a password once accessed for the first time. In this case they are displayed within Resource Tree, however the corresponding message will be displayed when trying to view streams from such devices.

If a device was deleted (see "[Deleting Devices](#)") and connected again, it will be re-discovered. See "[Disabling Automatic Discovery](#)" to disable this feature.

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Disabling Automatic Discovery



Once a device is discovered, the only way to delete it is to disconnect it from the network (see "[Deleting Devices](#)"). If the device is plugged back in, it will be re-discovered.

To disable automatic device discovery


1. Open **Main Menu** -> **System Administration** (shortcut **Ctrl+Alt+A**) -> **General** tab
 2. Uncheck **Enable devices and servers auto discovery** in the *System Settings* section
 3. When finished, press *OK* to apply or *Cancel* to discard changes
- ⚠ IMPORTANT:** Once auto-discovery is disabled, new devices and servers will no longer be auto-discovered, they will have to be added manually.

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Adding Devices \(Cameras, Encoders and I/O Modules\)](#) >

Adding Devices Manually



If a device is not accessible via broadcast, for instance if it is located in a different network or can only be accessed via internet, it will not be discovered automatically. In this case Wisenet WAVE provides an ability to add a device manually. It is also possible to add several devices simultaneously by scanning a range of IP addresses. Wisenet WAVE also allows adding devices by IP Address, Host Name, or generic RTSP/HTTP link (advanced). See "[Adding Multicast, RTSP or HTTP Streams as Cameras](#)".

 **Note:** For Axis cameras only, if the "People Counter" function is enabled neither automatic or manual discovery will work in Wisenet WAVE software.

To add one or more devices

1. **Right-click** on the server in Resource Tree to open its context menu.
2. Choose **Add Device(s)**.
3. In the dialog that opens (shown below), choose one of the following:
 - To add a single device: enter either the IP address, Host Name the device can be resolved on, or an RTSP link for the device in the **Device Address** field. Hover the mouse cursor over this field to see some syntax examples.
 - To add several devices at once: check the **Subnet Scan** box and enter the desired **Start IP** and **End IP** values. (By default, addresses 0-255 of the same subnet are suggested so the entire specified network will be scanned.)

Server BJER2U48T-PC 192.168.0.191

Device Address IP, hostname, RTSP link... Login

Examples:

- 192.168.1.15
- www.example.com:8080
- http://example.com:7090/image.jpg
- rtsp://example.com:554/video
- udp://239.250.5.5:1234

Subnet Scan Password

Discovery Port Auto Auto

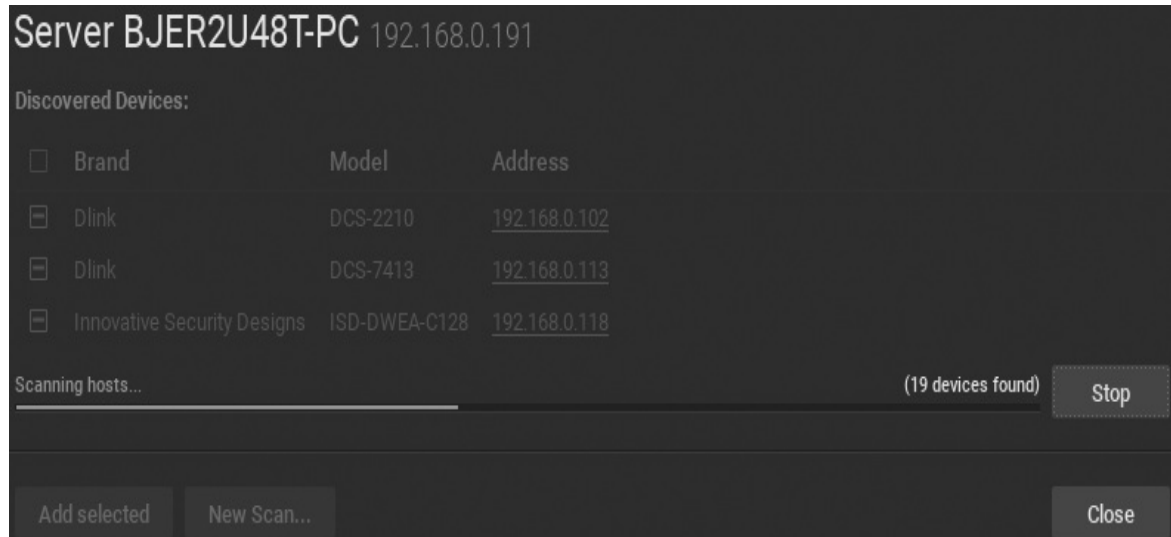
Scan Close

4. If the device requires, specify authentication parameters in the **Login** and **Password** fields.

Some devices may be discovered without specifying credentials, but often it is necessary to specify at least the default login and password.

Other devices may not require credentials for discovery but will require credentials when they are accessed for the first time. In this case, they will be displayed in the Resource Tree, but you will be prompted to enter credentials in order to view streams from these devices.

5. If needed, specify a **Discovery Port**. The default **Auto** setting is recommended. Most devices are discovered on port 80.
6. Press **Scan** to initiate the search. This can take some time, especially when an IP range is being scanned.
7. If devices are not located, you can click **New Scan** to return to the *Add devices* dialog. If devices are located they will be displayed in IP address order.



If a device is already registered, whether manually or automatically, it will display in the list but cannot be selected for addition. "All devices already added" message appears in this case.

8. Select the desired devices and click **Add selected**. The selected device will be added to Resource Tree.

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) > [Working With Expert Device Settings](#) >

Preventing Wisenet WAVE from Changing Camera Streaming Settings



When Wisenet WAVE discovers a camera, it captures the manufacturer's preset image quality settings and streaming configuration, then adjusts these settings to optimize the device for the client System.

Manufacturer settings are also changed when a recording schedule is defined (FPS, quality, and bitrate only - see "[Setting up Recording Schedule](#)"), and when changes are made to video stream configuration in the Camera Settings Advanced tab (see "[Configuring Camera Streams](#)".) A user with appropriate permissions can further customize image and stream settings for individual cameras (see "[Configuring Proprietary Device Parameters](#)").

In some cases, it may be preferable to keep the native settings exactly as provided. For instance, you may want to maintain preexisting FPS, bitrate, and resolution settings when connecting Wisenet WAVE to another VMS system. Or, on occasion the ONVIF implementation for a given camera diverges from the standard enough to make it preferable or even necessary to keep the native settings.

It is possible to prevent the internal optimization that Wisenet WAVE performs and use native stream and profile settings instead.

❗ IMPORTANT: Do not change image quality settings unless you are absolutely sure of the likely impact on system performance.

To disable automatic optimization for a single camera

1. Open **Camera Settings** and go to the **Expert** tab.
2. Check **Keep camera stream and profile settings**.
3. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Note that enabling this setting means Wisenet WAVE can record using native settings only. Frames per second and image quality settings in the Recording Schedule will be ignored (see "[Modifying Recording Schedule](#)").

It is also possible to manually adjust the bitrate calculation for a device ("[Adjusting Average Bitrate on Device](#)") and to set secondary stream parameters manually ("[Adjusting Secondary Stream Quality](#)"). For cameras that require manual configuration, you can also change all desired image settings (FPS, quality, and resolution) for high quality and low quality streams

on the camera web page.

To keep native PTZ settings

Note that native PTZ camera presets for a specific camera can be ignored in favor of Wisenet WAVE settings by checking the **Disable native presets, use system presets instead** box from the context menu **Camera Settings** -> **Expert** tab.

To disable automatic optimization for all cameras

1. Open **Main Menu** and go to **System Administration** -> **General** tab.
2. Uncheck the **Allow System to optimize device settings** flag.
3. Click *OK* or *Apply* to keep changes or *Cancel* to discard changes.
4. For each camera, go to its web page and set desired image settings.

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) >



Wisenet WAVE provides expert settings that can resolve some issues on the device side.

⚠ IMPORTANT: Do not change these settings unless you are absolutely sure of their potential impact on your System performance. **Improper configuration may lead to serious System malfunction!**

- [Preventing Wisenet WAVE from Changing Camera Streaming Settings](#)
- [Setting Up Camera Transport Protocol](#)
- [Adjusting Average Bitrate](#)
- [Forcing Motion Detection to a Specific Stream](#)
- [Disabling Recording of a Specific Stream](#)
- [Disabling a Secondary Stream](#)
- [Assigning Logical ID](#)
- [Controlling Pan, Tilt, and Zoom \(PTZ\)](#)

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) > [Working With Advanced Device Settings](#) >

Configuring Device Using Web Page




For ONVIF-compliant cameras, Wisenet WAVE provides direct access to a device web page from within the client.

There are two ways to access a device web page. For all devices, there is a link in the general device settings. In addition, for the most widely-used cameras, Wisenet WAVE is able to pull proprietary device parameters such as authorization, network settings, and display controls into the client where they can be configured directly.

From the General tab

1. Select a camera and open the **Camera Settings** -> **General** tab.
2. If the device requires authentication, enter camera credentials in the **Authentication** section. See "[Configuring Device Authentication](#)". (A user must have "Edit camera settings" permission to perform this function.)
3. Click on the **Web Page** link. The browser will open device's web page. From here you can control settings such as display size, JPEG refresh rate, PTZ and focus speed, etc.

 **Note:** A web page may be inaccessible because it is located on a different network. To check device accessibility, press the **Ping** button prior to opening the web page.

From the Advanced tab

1. Select a camera and open the **Camera Settings** -> **Advanced** tab.
2. If the device supports it, there will be a **Web** tab in this dialog.
3. When you click on the Web tab, the device's web page will open within the tab.
4. Enter authentication parameters if required.

System

Basic Configuration

Live View

Video & Image

Audio

Event

Dome Configuration

System

Information

Security

Date & Time

Network

Basic

DDNS

RTP

UPnP

QoS

NAT

Zeroconf

Bonjour

Network - DDNS

Internet DDNS (Dynamic Domain Name Service)

Enable DDNS

* Note

Please remember you have to configure at least primary DNS server in DNS configuration settings to use Dynamic DNS.

- DDNS Server:

- Registered host:

- User name:

- Password:

- Confirm password:

- Maximum time interval:

Register local network IP address

Registered IP address :

Save

Reset



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Wisenet WAVE provides advanced controls so you can view and configure manufacturer parameters such as video stream configuration, image or audio settings, authorization and network configurations from the client software.

This section describes the following features:

- [Configuring Proprietary Device Parameters](#)
- [Configuring Camera Streams](#)
- [Resetting Camera](#)
- [Configuring Device Using Web Page](#)

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) >

Setting Up Motion Detection




For devices that support dual-streaming, the Wisenet WAVE server automatically analyzes the secondary stream to detect motion. (The secondary stream is used by default, but if the primary stream is 480p or less, it may be used for motion detection instead.) Such **software motion detection** provides much better and more flexible motion detection than other types, and makes it possible to establish very precisely controlled regions of motion detection, with a range of sensitivity levels. It is also possible to define a **motion mask** where motion detection is completely disabled.

Wisenet WAVE also provides motion detection indicators. This feature is especially useful for highlighting motion that humans tend to filter out - trees moving in the wind, the motion of shadows, changes in light level - that cameras do not.

! **IMPORTANT:** If the secondary stream is high-resolution, motion decoding may consume most or all of the server CPU. See "[Forcing Motion Detection to a Specific Stream](#)" to adjust for this issue.

For cameras that perform in-device motion detection, Wisenet WAVE does not implement software motion detection. With such **hardware motion detection**, a motion mask may be applied, but no other sensitivity levels. In some cases it may be possible to use the **Camera Settings** -> **Advanced** tab to configure additional parameters (see "[Configuring Proprietary Device Parameters](#)").

 **Note:** Arecont Vision devices are set to hardware detection mode automatically.

To configure motion detection

1. Open **Camera Settings** and go to the **Motion** tab.

! **IMPORTANT:** Cells in the motion detection grid are briefly highlighted in red when motion is detected. The brighter these red indicators, the higher the level of motion.

2. Click the **Motion Detection** button to enable detection (green) for the device.

3. Click on a number in the **Sensitivity** section, where **0** is no sensitivity to motion (**motion mask**), **1** is minimal sensitivity, and **9** is maximum sensitivity.

4. The motion detection grid is 42 x 32 cells. Use the following to apply the

selected sensitivity to cells:

- **Click and Drag** to select a rectangular area
- **Click** within an area to fill it

5. The sensitivity level remains active until a new one is selected. Continue to select and apply sensitivity levels as desired. If necessary, you can use **Reset** to return the entire field to the default level of 5.

6. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

For example



The above image contains the following motion detection regions:

- Grey (un-numbered) is motion mask
- Blue (1) has very low sensitivity to motion
- Green (5) will capture motion with moderate sensitivity (5 is the default setting)
- Orange (7) will be highly sensitive to motion, red (9) offers the maximum sensitivity

You can also see some of the red indicators on the left side of the image.

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) > [Recording Modes](#) >

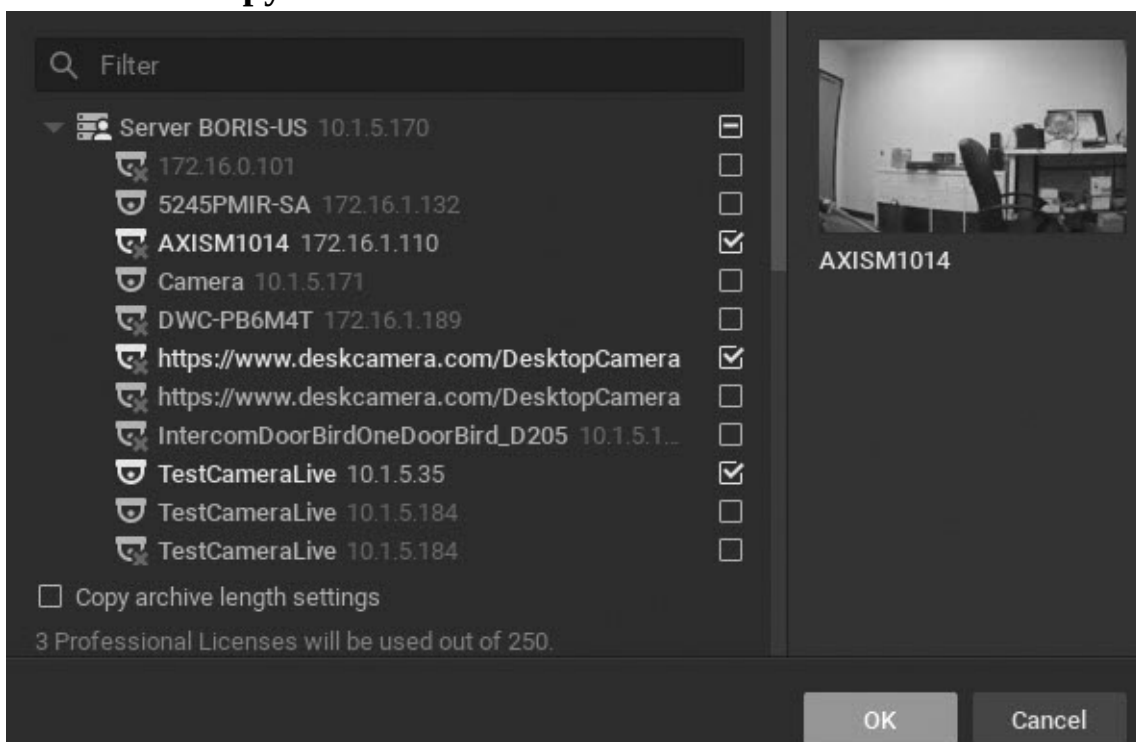
Copying a Recording Schedule




Once a recording schedule is configured on one camera, the settings can be copied to a different one. This is especially convenient, for instance, when a new camera is plugged in a System.

To copy a Recording Schedule

1. Open the context menu for the camera that has the schedule that should be copied and choose **Camera Settings -> Recording**.
2. Click on the **Copy Schedule** button.



3. In the *Select Devices* dialog that opens, check the cameras the schedule should be copied to. Check a server to copy the schedule to all cameras on that server. To filter the search, use the **Filter** box (see "[Search](#)"). You can hover the mouse cursor over a camera name to see a thumbnail of the camera's image. If desired, you can also copy the archive length settings (see "[Configuring Minimum and Maximum Archive Storage](#)") by checking **Copy archive length settings**.

 **Note:** A license is required for each camera the recording schedule is copied to. A dynamic message will indicate how many licenses are needed and how many are available. See "[Wisenet WAVE Licenses](#)" for details.

4. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) > [Recording Modes](#) >

Setting a Recording Schedule



Use the 24 hour recording schedule calendar to define, in 1 hour blocks, when a device will be recorded. Remember that the image quality settings in the recording schedule dictate live stream view settings as well.

Note that if recording is not enabled, motion detection will only be active when the camera is being viewed in a layout.

To set a Recording Schedule

1. Select the desired camera(s) in the Resource Tree or in layout.
2. Choose **Camera Settings** in the context menu and go to the **Recording** tab.
 - ❗ **IMPORTANT:** If the server and client are in different time zones, the schedule displays server time.
3. Click the **Recording** button at the upper-left to enable recording.

Note that the total number of licenses available and the number of licenses used is displayed below this button. If the number of available licenses is insufficient, you can click the **Activate License** button and proceed with activation.
4. If desired, set the frames-per-second (**FPS**) rate and **Quality** (*Low, Medium, High, or Best*) that will apply to the device(s). When available for the devices selected, you can also set the **Bitrate** by clicking on *More Settings*.
 - ❗ **IMPORTANT:** If changes to streamed settings are prohibited, these image quality settings are ignored. See "[Preventing Wisenet WAVE from Changing Camera Streaming Settings](#)".
5. Check the **Show Quality** and **Show FPS** boxes to display the respective values in the recording schedule calendar.
6. If desired, adjust the length of time that will be added to the recording before (**Pre-recording**) and after (**Post-Recording**) motion is detected.
7. If desired, use the *Fixed Archive Length* fields to assign high or low priority to the camera (see "[Configuring Minimum and Maximum Archive Storage](#)"). It is usually best to leave **Min. Days** and **Max. Days** set to **Auto**.
8. Once all parameters are set, select the desired Recording Mode – *Record Always, Motion Only, Motion + Lo-Res, or Do Not Record*. See "[Recording](#)

[Modes](#)".

9. A blue outline around the button indicates the active recording mode. Click in calendar blocks to apply a recording mode. You can also:

- **Click-and-drag** to select multiple time blocks
- Click on the hour number to select an entire column
- Click on the name of the day to select an entire row
- Click **All** at the top left corner to select an entire week
- Use **Alt+click** to copy a recording mode

10 Repeat steps 8 and 9 as desired to schedule other recording modes.

11 If **Motion Recording** is used, it is possible to set regions that will trigger a motion event and how sensitive to motion the regions will be. See "[Setting up Motion Mask and Motion Sensitivity](#)".

12 Click *Apply* or *OK* when finished, or *Cancel* to discard changes.

Example

General **Recording** I/O ports Motion Fisheye Advanced Expert

Recording Activate License...

128 Time Licenses are used out of 500.

Recording Schedule (based on server time)

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
Mon	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	6/Lo	6/Lo	6/Lo	6/Lo
Tue	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	6/Lo	6/Lo	6/Lo	6/Lo
Wed	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	6/Lo	6/Lo	6/Lo	6/Lo
Thu	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	6/Lo	6/Lo	6/Lo	6/Lo
Fri	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	6/Lo	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	15/Hi	6/Lo	6/Lo	6/Lo	6/Lo
Sat	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me
Sun	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me	15/Me

Schedule Settings ?

FPS **6** ^ v

Quality **Low** ? v

Show Quality

Show FPS

More Settings

Record Always Motion Only Motion + Lo-Res Do Not Record

Panic Mode: Off

Fixed Archive Length ?

Min. Days **1** ^ v Auto

Max. Days **30** ^ v Auto

Motion Recording

Pre-Recording **9 s** ^ v

Post-Recording **5 s** ^ v

Copying Schedule Copy Schedule...

This example uses the following settings:

- Weekdays 7:00 AM-7:59 PM – Record Always, 15 FPS, High quality
- Weekdays 8:00 PM-6:59 AM – Motion + Lo-Res, 6 FPS, Low quality
- Weekends – Motion Only, 15 FPS, Medium quality

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Forcing Motion Detection to a Specific Stream



Wisenet WAVE performs motion detection on the server side by analyzing and decoding the secondary stream from a camera, which is usually a low resolution stream while the primary stream is high-resolution.

Occasionally, a camera will report its configuration incorrectly and swap the primary and secondary streams. If this occurs and the secondary stream is high-resolution, motion detection processing will create a very high CPU load.

To correct this, it is possible to force motion detection on to a specific stream.

1. Open the **Camera Settings** -> **Expert** tab.
2. Check **Force motion detection for stream** and select **Primary** or **Secondary**.
3. Click *Apply*, *OK* or *Cancel*.

⚠ IMPORTANT: Adjusting these settings may seriously affect server performance!

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Adjusting Average Bitrate




Some camera models do not yield the best setting when Wisenet WAVE tries to configure a target bitrate, resulting in poor image quality. If this is the case you can adjust the bitrate calculation for the device manually.

⚠ IMPORTANT! This setting will significantly increase bitrate. Use only if the picture quality is noticeably poor.

To adjust bitrate

1. Open the **Camera Settings** -> **Expert** tab.
2. Check **Calculate bitrate per GOP** instead of **bitrate per second**.
3. Click *Apply*, *OK* or *Cancel*.

 **Note:** This setting is ignored when "**Keep camera streams and profiles settings**" is checked. See [Preventing Wisenet WAVE from Changing Camera Streaming Settings](#)".

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Setting Camera Transport Protocol



By default, Wisenet WAVE automatically determines which RTP media streaming protocol to use for a camera: **UDP** (faster, but less reliable) or **TCP** (more reliable, but slower). However, sometimes a camera may have issues streaming via the automatically selected protocol. If that is the case, you can manually set the RTP protocol as follows.

⚠ IMPORTANT: Do not change these settings unless you are absolutely sure of their potential impact on your system performance.

1. Use the camera's context menu to open **Camera Settings** -> **Expert**.
2. In the **RTP Transport** menu select **TCP** or **UDP**.
3. Click *Apply*, *OK* or *Cancel*.

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Disabling Recording of a Specific Stream



In some circumstances you may want to disable recording of the primary or secondary stream.

For instance, it may make sense to disable recording of the primary stream to save storage space and instead set the recording type to "Motion Only" and "Low" quality. Or, if the secondary stream bitrate is too high, it may make sense to disable recording so that the Wisenet WAVE server still performs motion detection but it will not be recorded.

To disable recording of a specific stream


1. Open the **Camera Settings** -> **Expert** tab.
2. Check **Do not archive primary stream** or **Do not archive secondary stream**.
3. Click *Apply*, *OK* or *Cancel*.

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Disabling a Secondary Stream




It is possible to disable the secondary stream entirely. This may be necessary, for example, for very old cameras where the secondary stream has motion detection but does not support H.264 Codec. In this case it is helpful to reduce the demand on storage space by disabling the secondary stream so it is not recorded.

 **Note:** If the resolution of the primary stream is more than 1024 x 768, software motion detection will be disabled. If the primary stream resolution is less than 1024 x 768, motion detection can be performed there.

To completely disable a secondary stream

1. Open the **Camera Settings** -> **Expert** tab.
2. Check **Disable secondary stream**.
3. Click *Apply*, *OK* or *Cancel*.

 **IMPORTANT:** This setting is ignored when "**Keep camera stream and profile settings**" is checked. See "[Preventing Wisenet WAVE from Changing Camera Streaming Settings](#)".


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Configuring Proprietary Device Parameters



For all cameras, Wisenet WAVE captures and displays the unique camera ID, RTSP URLs for primary and secondary streams, and a link to the device web page in the **Camera Settings** -> **General** tab. See [Configuring Device Using Web Page](#).

For ONVIF-compliant cameras, Wisenet WAVE also provides editable fields for stream, image quality, version, and related parameters in the **Settings** pane of the **Camera Settings** -> **Advanced** dialog. For the most commonly-used cameras, a **Web** pane in the same tab opens the device's web page where you can configure other proprietary device parameters such as in-camera events, security controls, and network settings.

 **Note:** If no settings are displayed, the device is not ONVIF-compliant and cannot support custom configuration.

To edit proprietary device settings

1. Open **Camera Settings** and go to the **Advanced** tab.
2. Use the **Settings** section to configure image quality parameters. Available controls are determined by the specific camera model. Settings are grouped by **Category**:
 - **Video Streams Configuration** – use to control **Codec** and **Resolution** for the primary stream and in addition **Bitrate** and **FPS** for the secondary stream. These values can be separately **Reset to Defaults** for each stream.
 - **Imaging** – use to adjust **Exposure** and **Extra Settings** (such as line frequency), if available for the camera.
 - **Audio** – typically includes audio-in sensitivity and audio-out volume.
 - **Maintenance** – use to perform various levels of camera reboot. See "[Resetting Camera](#)".
3. Use the **Web** section to adjust manufacturer proprietary settings. Note that the device may require authentication.

Camera ID 6e832a81-1561-6469-fe57-778d2a5e08d4 Copy

Primary Stream rtsp://192.168.0.74:554/1/stream1/Profile1 Copy

Secondary Stream rtsp://192.168.0.74:554/1/stream2/Profile2 Copy

Category

Video Streams Configuration

Primary

Secondary

Imaging

Focus

Maintenance

Imaging

Brightness 1

Color Saturation 1

Contrast 1

Ir Cut Filter Mode On

Sharpness 1

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Configuring Camera Streams



Wisenet WAVE's architecture provides significant CPU and network bandwidth savings by acquiring multiple streams from a single camera: **High Resolution** (regular) and **Low Resolution** (approximately one tenth the bandwidth). The second stream is always decoded by the server and is the default stream for software motion detection. High resolution streams are displayed when network & CPU load are within normal range and under specific conditions (when an item is larger than 172 pixel in layout, when an item is pulled into fullscreen display). Low resolution streams are displayed when image quality is of limited importance (items smaller than 172 pixels, during fast forward or fast rewind playback) and when high resolution processing compromises display quality (frames are delayed or dropped during decoding, too many streams are open in a given layout, etc.).

The default quality of the each stream is set automatically, but can be overridden. It is possible to set stream parameters manually, for example, when you need to lower bandwidth and CPU usage in order to accommodate more than the recommended number of cameras in a live display. Note that using a manual stream setting will affect other image quality controls. You may also need to adjust frames per second, bitrate, resolution, and storage settings as a result. Please review these topics to understand how these settings are interrelated:

- [Configuring Proprietary Device Parameters](#)
- [Configuring Device Using Web Page](#)
- [Forcing Motion Detection to a Specific Stream](#)
- [Disabling Recording of a Specific Stream](#)
- [Disabling a Secondary Stream](#)
- [Preventing Wisenet WAVE from Changing Camera Streaming Settings](#)
- [Adjusting Average Bitrate on Device](#)


⚠ IMPORTANT: Higher resolution of the second stream provides for a much better look and feel (especially on larger monitors), but can significantly increase CPU load on the server. It is not recommended to change these settings.

To adjust the quality of the second stream

1. Open the **Camera Settings** -> **Advanced** tab.

2. In the **Settings** pane, click the arrow to the left of the **Video Streams Configuration** category and choose **Primary** or **Secondary**.
3. Select the desired values for the following settings:
 - Codec** – choose from the options available in the menu
 - Resolution** – choose from the options available in the menu
 - Bitrate** – for secondary streams (see also "[Adjusting Average Bitrate on Device](#)").
 - FPS** – for secondary streams
4. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

You can use the **Restore to Defaults** button to discard any manual adjustments to Wisenet WAVE settings and return to native presets.


 **Note:** Manual adjustments are ignored if Wisenet WAVE is configured to [prevent camera streaming settings](#) from being changed. In addition, it is possible to [disable the secondary stream entirely](#).

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Resetting Camera



Wisenet WAVE allows for cameras to be reset to factory defaults.

 **Note:** These settings are available for ONVIF-compliant cameras only.

1. Open **Camera Settings** and select **Advanced**.
2. Click on **Maintenance** under **Settings**. (If the Settings list is empty, the camera is not ONVIF-compliant.)
3. Click on one of the following:
 - **System Reboot** – reboots the camera and saves settings.
 - **Soft Factory Reset** – reboots the camera and restores all settings related to the image but not the IP address.
 - **Hard Factory Reset** – reboots the camera and restores all settings (Network, Authorization, IP address, etc).

 **IMPORTANT:** The reboot is performed instantly once selected.

It is also possible to reboot a camera from its web page. See "[Configuring Proprietary Device Parameters](#)".

Navigation: [Working with Wisenet WAVE](#) > [Configuring Multi-Server Environment](#) >

Configuring Failover



Wisenet WAVE can automatically manage failover in a multi-server environment. If a server goes down, all devices are transferred and the client is reconnected to other server(s). The archive playback will remain seamless but there may be a 30 second gap in recording during the transfer.

Failover should be configured on all servers so that, for instance, if a System contains server A and server B, server A is configured to take over devices from server B and server B is configured to take over devices from server A.

! IMPORTANT: To be able to do failover, both servers should be able to access devices.

To configure Failover:

1. Find **server B** in Resource Tree, open context menu and choose *Server Settings*.
2. Click *Enable Failover*.
3. Enter the number of **Devices** the server can handle.
4. Click OK. Now If **server A** goes down, all devices will be transferred to server B.
5. To make **server A** handle the devices from server B, make the same on **server A**.

! IMPORTANT: To be able to do failover, server should be able to handle twice the number of devices.

It is possible to set up **Failover Priorities**. This means if a camera is more important, it can be failed over first. There are the following priorities:

- High – these cameras will be failed over at first.
- Medium and Low – these cameras will be failed over only if there is a server to host them.
- Never – these cameras won't be failed over.


1. To configure Failover priorities find any server in Resource Tree, open the context menu and choose *Server Settings*.
2. Click *Failover Priority*. The list of servers and cameras will be displayed.
3. Select cameras and click a button on the bottom to set the desired Priority.
4. Repeat this for all cameras that should be prioritized.
5. Click *OK* to apply changes.

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Detaching a Server




This action can be useful if it is necessary to isolate a server from the current System. This operation is rarely performed.

 **Note:** If licenses have been previously activated on the server being detached, will be disabled with the error "Server not found."

To detach Server from System using Server's Web Interface

1. Log in to web interface of server that should be detached from the current System.
2. Open the **Settings** tab and click **Detach from the system**.
3. Enter the server password and confirm the action.

 **IMPORTANT:** All WAVE Sync users including the Cloud System owner will be deleted when a server is unlinked from the Cloud System. Only the local Owner and local users will remain.

It is also possible to detach a server from a System by restoring the server's factory defaults:

1. Log in to web interface of the server to be detached.
2. Go to the **Settings** tab and click **Restore Factory Defaults**.
3. Enter the Server password and confirm the action.

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Deleting a Server



In some instances, it may be necessary to delete a server from the System.

A server can only be deleted when it is offline. To delete a server, locate it in the Resource Tree, **right-click** to open the context menu and select **Delete**.

ⓘ IMPORTANT: All devices that are hosted on a deleted server will be deleted as well. Recorded data will remain in the server's storage.

A server will automatically discover all devices and start operating once it is back online, and archives from previously attached cameras will remain available. However, storage settings and device configurations are not saved and will have to be re-entered.

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Merging Servers with Another System



It is possible to merge two Systems unless they are Cloud Systems, or to merge a non-Cloud System to a Cloud System. This is useful, for example, if System A contains several servers and you want to join all of them to System B, or to join remote server(s) to a current System.

❗ **IMPORTANT:** Note that this is a directional operation - it is not possible to merge a Cloud System to a non-Cloud Systems, or to merge two Cloud Systems.

To merge Systems

1. Launch Wisenet WAVE Client and connect to any server in system A.
2. Right-click on **System**, invoke context menu and choose **Merge Systems**.
3. Enter server URL (any server of System B or remote server). Use the drop-down menu to find Systems in the local network. For a remote server, type **http://<ip>:<port>**, where:
 - **<ip>** – IP address of server (the current computer should be able to connect to this server)
 - **<port>** – network port of server (default 7001).
4. Enter **Password** to System B (or to remote server) and click **Find System**.
5. Select the system that the others will merge into:
 - System A – System B will be merged to System A
 - System B – System A will be merged to System B
6. Click **Merge with <System Name>**.


Wisenet WAVE creates a database backup automatically before merging Systems. See "[Backing up and Restoring Wisenet WAVE Database](#)".

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Moving One Server to a Different System



Use this action to move a single server to a different System in the same local network.

 **Note:** If it is necessary to join several servers in a different System to the current one, this method is not an option. Also, this method won't work if the server that should be connected is outside the local network. For these cases use "[Merging Servers with Another System](#)".

Using the Client to join a Server

1. Expand  *Other Systems* in the Resource Tree and locate the destination System.
2. Expand the desired System and locate the server to connect to the current System.
3. Open the context menu of the server you want to move and choose **Merge to Currently Connected System**.
4. Enter the admin password of the destination System.

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Configuring Routing within Multi-Server Environment



Wisenet WAVE provides a built-in automatic routing mechanism that enables users to seamlessly work with large sites as a single cluster. However there may be custom network configurations that require custom routing settings. Sometimes servers have several IP addresses (public and private) and it may be necessary to allow or restrict traffic flow for some of them. For instance, a server can have a public IP address connected to the Internet via 100 Mbit network and a local NIC with local IP address (1Gbit). If it is not necessary to provide public access to this server, it may be useful to restrict traffic flow through the public IP.

Initially Wisenet WAVE tries to discover all available IP addresses of servers including public ones. However it is not possible in some network environments.

To add, enable, and disable routing, open **Main Menu** → **System Administration (Ctrl+Alt+A)** and go to the **Routing Management** tab.

The left pane displays a list of all connected servers. Click on a server in this list to show all available interfaces on the right side of the dialog.

- To add an address manually, click the **Add** button and enter a URL using the format `http://<ip>:<port>`:
 - **<ip>** – the desired IP address or DSN name of server
 - **<port>** – network port server is listening on (default **7001**)
- To allow/deny traffic via a specific network interface, click the toggle button for that connection.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Device Output




Generates output on a device when an event occurs, starts, or stops.

! IMPORTANT: Output must be supported on the selected devices.

Basic Parameters

At – device(s) on which output will be triggered. To specify devices see [Selection Lists in Event Rules](#). At least one device must be selected.

 **Note:** A warning notification will open if one or more of the selected devices does not have an output relay. These devices will be highlighted in red.

Advanced Parameters

Output ID – the I/O Module port ID to route signal to (see "[Setting Up I/O Modules](#)".)

May be caused by

Any Event

[Motion on Camera](#), [Generic Event](#), [Analytics Event](#), [Soft Trigger](#), and [Input Signal on Device](#) – synchronous output. Output stops when motion or input stops.

Why Action may work incorrectly

Output is not supported on some devices.


Event is not configured properly.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Bookmark



Creates a Bookmark in the archive of one or more cameras when an event occurs.

 **Note:** Recording must be enabled on the selected cameras for Bookmarks to be saved.

A Bookmark is automatically named with this syntax: **<Event> on <Device>**.

Basic Parameters

At – camera(s) for which Bookmarks will be recorded. To specify cameras see "[Selection Lists in Event Rules](#)". At least one device must be selected.

Advanced Parameters

Fixed Duration – the duration of the Bookmark. Applies to continuous events only (those with *Starts* and *Stops* attributes). Can be unchecked for continuous events such as motion on camera, input signal on device, etc. If unchecked, the Bookmark will continue until the event ends.

Pre-Recording – If checked, use to specify an amount of time to include in the Bookmark before the event occurs.

Post-Recording – If checked, use to specify an amount of time to include in the Bookmark after the event occurs.

Tags – optional descriptors that can be added to help identify and search for Bookmarks.

May be caused by

All Events

[Notifications](#) with *Force Acknowledgment* enabled will create the Bookmark once acknowledgment is complete).

Why Action may work incorrectly

Recording is not enabled on a selected camera (see "[Setting a Recording Schedule](#)").

Event is not configured properly.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Show Notification



Sends a notification to the selected user(s). See "[Notification Panel](#)".

Basic Parameters

Users – select users who will see the notification

Advanced Parameters

Interval of action – Check this box to aggregate notifications to a given per a certain amount of time, to reduce the number of events. Uncheck so the action is instant and will occur whenever the event is triggered.

Force Acknowledgment – prompts the recipient to acknowledge the notification.

When "Force Acknowledgment" is checked, a notification will remain in the Notification Panel until the recipient responds by clicking the **Acknowledge** button. Hovering over the Acknowledge button opens a thumbnail that showing the device name and timestamp of the event. Clicking the Acknowledge button opens a Bookmark form:

The image shows a dark-themed user interface. On the left is a dialog box titled "Show Notification". It contains the following fields:

- Name:** A text field containing "Motion on TestCameraLive (192.168.0.4)".
- Description:** A large empty text area.
- Tags:** A text field containing the placeholder text "List of tags divided by commas".
- Popular tags:** A section for suggesting tags.
- Buttons:** "OK" and "Cancel" buttons at the bottom.

On the right is a notification panel. It displays a notification with a shield icon, the text "Motion on TestCameraLive (192.168.0.4)", and a button with a bookmark icon labeled "Acknowledge".

The **Name** field is pre-populated with an event description but may be edited. A **Description** is required, **Tags** are optional.

Click **OK** to close the notification and create the Bookmark.

May be caused by

All events

Why Action may work incorrectly

Some notifications are disabled.

Event is not configured properly.

Interval of action is too long. Reduce length or try instant.

[Global notification](#) for this event is disabled.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Show on Alarm Layout



Wisenet WAVE provides the ability to dynamically create **Alarm Layouts**. An alarm layout opens certain cameras when a specific event occurs, with a special "Alarm" title and icon.



For instance, a rule can be configured as follows: if motion occurs on cameras 1 or 2, open cameras 2, 3, and 4 in an Alarm Layout.

Basic Parameters

Camera(s) to show on Alarm Layout. To specify:

1. Click on *Select at least one camera* in the desired row on the Alarm/Event Rules form (see "[Events Rules](#)"). The following form will appear:

The screenshot shows the 'Action' configuration form for 'Show text overlay'. The 'at' field is set to 'Select at least one camera'. The 'Display text for' field is set to 5 seconds. A list of cameras is shown on the right, with 'ACTI-E12A' selected. A preview window shows a camera feed labeled 'ACTI-E12A'.

Camera ID	IP Address	Selected
10115DN	192.168.0.56	<input type="checkbox"/>
12366DN	192.168.0.49	<input type="checkbox"/>
20185DN	192.168.0.42	<input checked="" type="checkbox"/>
40185DN	192.168.0.124	<input type="checkbox"/>
ACTI-E12A	192.168.0.20	<input checked="" type="checkbox"/>
ACTI-E13	192.168.0.101	<input type="checkbox"/>
ACTI-E52	192.168.0.226	<input type="checkbox"/>
ACTI-E91	192.168.0.129	<input type="checkbox"/>
ACTI-E924	192.168.0.243	<input type="checkbox"/>
ACTI-E925	192.168.0.159	<input type="checkbox"/>
ACTI-KCM3911	192.168.0.194	<input type="checkbox"/>
ACTI-KCM5311	192.168.0.121	<input type="checkbox"/>
ACTI-KCM5611	192.168.0.123	<input type="checkbox"/>
ACTI-KCM7211	192.168.0.125	<input type="checkbox"/>

2. Check the cameras to display, then click *OK* (*Cancel* will discard changes).

To select all cameras on a specific server, check the corresponding box. To filter search, use the *Filter* box. Filter criteria is the same as [search](#) criteria. It is possible to drag-and-drop the selected cameras from Resource Tree onto the action's advanced settings form.

Advanced Parameters

Interval of action – no more than once per certain amount of time (to reduce the amount of events), or instant.

Users to show alarm to – it is possible to show the Alarm Layout to only certain users. If several events are configured to show different cameras on alarm layout for the same user, the corresponding cameras will be added upon the Event occurrence. If several Events are configured to show different cameras on alarm layout for different users, each user will see the separate Alarm Layout.

Force Alarm Layout opening – if checked, when Event occurs Alarm Layout will show up immediately. If not, the Alarm Layout will be created, but the user will still be watching the current layout and will be able to switch to Alarm Layout.

Also show source camera – available only if Event is bound to cameras. If checked, when Event occurs Alarm Layout will contain camera that created Event. For instance, if Rule is set up to show cameras 2 and 3 and if motion occurs on Camera 1, Alarm Layout will contain Cameras 1, 2 and 3. If unchecked, it will contain only Cameras 2 and 3.

May be caused by

All events.

Why Action may work incorrectly

Alarm Layout is not showing to a certain user

Event is not configured properly. See the Event description for details

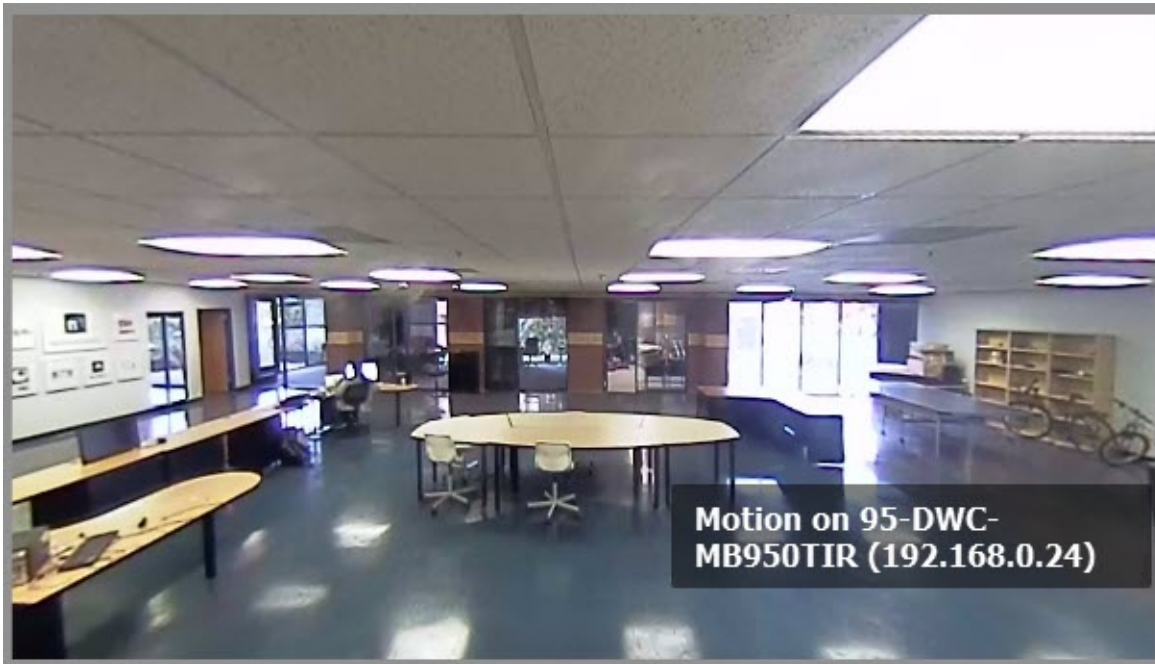
Too long interval of action is set. Try "instant".

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Show Text Overlay



Displays text overlay on specific cameras when an event occurs, as shown below:



Basic Parameters

Camera(s) to display text overlay on. To specify:

1. Click on *Select at least one camera* in the desired row on the Alarm/Event Rules form (see "[Events Rules](#)").
2. Check the cameras to display, then click *OK* (*Cancel* will discard changes).

To select all cameras on a specific **server**, check the corresponding box. To filter search, use the *Filter* box. Filter criteria is the same as [search](#) criteria. It is possible to **Drag-and-drop** the selected cameras from Resource Tree onto the **Action's** advanced settings form.

Advanced Parameters

Also show on source camera – available only if the event is bound to cameras. If checked, when event occurs text will be displayed on the source camera too. For instance, if Rule is set up to show Cameras 2 and 3 and event occurs on Camera 1, text will display on all 3 cameras. If unchecked, it will display only on cameras 2 and 3.

Display text for ... Seconds – If checked, the text will be visible for the specified amount of time. Can be unchecked for the following continuous events: [Motion on Camera](#), [Input Signal on Device](#), [Generic Event](#). If unchecked, text will be displayed until the event stops. For instance, text will be displayed while the motion is going on on a specific camera.

Use custom text – if not specified, the event description will be used as a text.

May be caused by

All Events.

Why Action may work incorrectly

Event is not configured properly. See the **Event** description for details.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Speak



Pronounces specific text when an event occurs.

Basic Parameters

Action

Do: Speak

at: Select camera

Interval of action: No more than once per 1 min

Speak to users: All Administrators

Speak the following: TEST

Volume: [Slider] Test...

Speak the following – Text to pronounce.

At – Camera to pronounce the text on. Camera should support [2-Way Audio](#).

Speak to users– If checked, the text will be pronounced to the selected users in the Client application.

⚠ IMPORTANT: Either *Speak to users* should be checked or at least one camera should be selected for 2-way audio, otherwise the rule will be invalid.

Advanced Parameters

Interval of action: no more than once per certain amount of time (to reduce the amount of events), or instant.

May be caused by

All Events.

Why Action may work incorrectly

Event is not configured properly. See event description for details.

Sound is muted. Open any item in layout and check if the sound is muted.

Volume settings are applied globally. See "[Adjusting Volume](#)"

Too long interval of action is set. Try "instant".

Either *Play to user* should be checked or camera for 2-way audio should be selected.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Device Recording



Starts recording on selected cameras when event occurs.

Action

Do: Camera recording

at: ⚠ Select at least one camera

Interval of action: No more than once per 1 min

Quality: Best 0 FPS Post-Recording: 0s

Fixed duration: 5 seconds

Basic Parameters

At – devices to record. To specify cameras see [Selection Lists in Event Rules](#). At least one device must be selected.

1. Click on the **at** field to open the *Select Devices* dialog.
2. Optionally, use the filter field to locate cameras (see "[Search](#)".)
3. Check specific cameras to record or select all cameras on a server by checking the corresponding box. (It is also possible to drag-and-drop the selected cameras from the Resource Tree into this field.)
4. Click *OK* to accept or *Cancel* to discard changes.

⚠ IMPORTANT: At least one camera must be selected, and recording must be enabled on the selected cameras for this rule to be functional (see "[Setting a Recording Schedule](#)").

Interval of action – check to repeat no more than once per a given amount of time (to reduce the number of events), or uncheck for the action to be instant.

Advanced Parameters

- **Quality** – select the desired recording parameter for these options: *Lowest, Low, Medium, High, Best*.
- **FPS** – enter a frames per second value of up to 30. The camera's maximum FPS will be used if the FPS value entered exceeds the camera's capability. Select one of the following:
- **Post-recording** – for continuous events (those with *Starts* and *Stops*

attributes), you can enter the number of seconds that recording will continue after the triggering event.

or

- **Fixed duration** – records for a specified amount of time in seconds when the event occurs.

May be caused by

[Analytics Event](#)

[Generic Event](#)

[Input Signal on Device](#)

[Motion on Camera](#)

[Soft Trigger](#)

Why Action may work incorrectly

Recording is not enabled on camera.

Event is not configured properly.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Do HTTP Request



Sends an HTTP request to a targeted external device or system (floodlight switch, access control trigger, alarm system) which can then be used in those devices or systems to trigger additional actions. The request must follow the proper format in order to be read by the receiving device.

This action generates an HTTP GET, POST, PUT, or DELETE request in response to any event triggered in Wisenet WAVE. Together with the "[Generic Event](#)", which can receive an HTTP request as an event, you can create bidirectional API communication between Wisenet WAVE and other software systems.

For example, a manufacturer has a restricted area with an ACS card reader at the entry point and cameras that monitor the area surrounding the entry point. Wisenet WAVE has a standard rule to send a notification when abnormal duration motion is detected in the entry area. If someone tampers with the card reader in an unauthorized attempt to enter the restricted area, Wisenet WAVE triggers one action to notify the surveillance center that motion is detected in the area, and a second HTTP request action to the manufacturer's call center server, which in turn runs a security procedure to activate an alarm and generate a phone call to factory floor security personnel.

Example

```
http://123.12.8.1:7001/api.clickandcall.com/http/sendmsg?  
user=WitnessVMS&password=123456&api_id=3612726$MO=1&from-  
13234567890&to=18184493546$text=Visitor+is+outside+front+door.
```

This example sends an API request to the clickandcall system to send an SMS message to the phone number you specify. It could be coupled, for example, with a generic event that can trigger a 3rd party device to unlock the front door.

- sendmsg – Sends data to a server at IP Address 123.12.8.1 port 7001
- user and password – credentials required by the receiver to allow the request access to their system.
- api_id – required account number with receiving entity.
- from – phone number from which the message will be sent.
- to – phone number to which the message is sent.

- **text** – the message text, in this case "Visitor is outside front door".

Basic Parameters

- **Interval of action** – Check this box to aggregate the number of times the action will be triggered. Enter an integer and select a time interval from the menu (**seconds, minutes, hours, or days**). Uncheck to trigger the action every time the event occurs.
- **HTTP URL** – the HTTP link to the external system that will receive the request. Can also contain the request itself.
- **HTTP Content** – the body of the HTTP request, if needed.
- **Login and Password** – if required by the external system, enter credentials for authentication.
- **Content type** – enter the body of the request. Select from **Auto, text/plain, text/html, application/html, application/json, or application/xml** format according to the requirements of the receiving system. Auto selects the best format based on your entry.
- **Authentication type** – level of authentication required (**Auto** or **Basic**).
- **Request type** – type of request (**Auto, GET, POST, PUT** or **DELETE**).

Why Action may work incorrectly

Event is not configured properly.

HTTP request syntax is incorrect or does not meet receiver requirements.

External system requires authorization and no or incorrect credentials were specified.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Execute PTZ Preset



Activates a **PTZ Preset** on a specific camera (see "[Saving and Restoring PTZ Positions](#)"). PTZ Tours cannot be activated by an event.

⚠ IMPORTANT: At least one PTZ position must be defined on the selected camera for this action to be valid.

Basic Parameters

At – Select one camera on which to activate preset.

Advanced Parameters

Interval of action – check to limit the number of occurrences in a given amount of time, or uncheck for a single, instant action.

PTZ Preset – choose from the PTX presets defined for the selected camera. If no presets are configured, the menu will be empty.

May be caused by

All events.

Why Action may work incorrectly

Event is not configured properly.


Interval of action is too long, try "instant".

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Panic Recording



Triggers **Panic Recording mode** when event occurs. Panic Recording switches recording settings for all cameras to maximum FPS and highest possible quality.

 **Note:** If recording is not enabled for a camera, Panic Recording cannot be activated. See "[Setting a Recording Schedule](#)" for instructions on enabling and configuring recording.

Basic Parameters

Interval of action – check to repeat no more than once per a given amount of time (to reduce the number of events), or uncheck for the action to be instant.

Advanced Parameters

None

Why Action may work incorrectly

Event is not configured properly. See event description for details.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Play Sound



Plays a sound when event occurs.

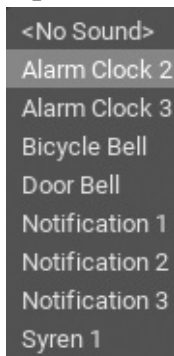
Basic Parameters

At – device to play the sound on. (The device should support 2-way audio, see "[Using 2-Way Audio](#)".)

Interval of action – check to repeat no more than once per a given amount of time (to reduce the number of events), or uncheck for the action to be instant.

Play to users – if checked, the sound will be played in the client application of the selected users.

(drop down menu) – select a sound from the available options:



! **IMPORTANT:** Either *Play to user* or a camera for 2-way audio ("*at*") must be enabled for this rule to be valid.

Advanced Parameters

Volume

Test

Manage – Click to open the *Notification Sounds* dialog where you can customize the library of available sounds by adding, renaming or deleting sounds.

• To **add** a sound:

1. Click Add... and select the desired audio file. WAV, MP3, OGG, and WMA formats are supported.
2. Use Clip sound up to to set the duration in seconds the audio file will be played.
3. Choose Custom Title to name the selected sound. If not specified, the file name will be used by default.

4. Click *OK* to add the sound or *Cancel* to discard changes.

- To **rename** the selected sound, click *Rename* and enter a new title.
- To **test** the chosen sample, click *Play*.
- To **delete** the selected sample, click *Delete*.
- Click *OK* to accept or *Cancel* to discard changes.

May be caused by

All events.

Why Action may work incorrectly

Event is not configured properly.

Sound is muted. Open any item in layout and check if the sound is muted.

Volume settings are applied globally. See "[Adjusting Volume](#)"

Too long interval of action is set. Try "instant".

Neither *Play to user* or camera for 2-way audio is checked.

Navigation: [Working with Wisenet WAVE](#) > [Events Rules](#) > [Available Actions](#) >

Repeat Sound



Plays a sound repeatedly when event occurs.

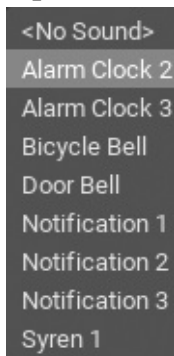
Basic Parameters

At – device to play the sound on. (The device should support 2-way audio, see "[Using 2-Way Audio](#)".)

Interval of action – check to repeat no more than once per a given amount of time (to reduce the number of events), or uncheck for the action to be instant.

Play to users – if checked, the sound will be played in the client application of the selected users. Those users are sent a special notification in the Notification Panel. Note that if the user closes the notification, the sound will stop playing even if event continues.

(drop down menu) – select a sound from the available options:



! **IMPORTANT:** Either *Play to user* or a camera for 2-way audio ("*at*") must be enabled for this rule to be valid.

Advanced Parameters

Volume

Test

Manage – Click to open the *Notification Sounds* dialog where you can customize the library of available sounds by adding, renaming or deleting sounds.

• To **add** a sound:

1. Click Add... and select the desired audio file. WAV, MP3, OGG, and WMA formats are supported.
2. Use Clip sound up to to set the duration in seconds the audio file will be played.

3. Choose Custom Title to name the selected sound. If not specified, the file name will be used by default.

4. Click *OK* to add the sound or *Cancel* to discard changes.

- To **rename** the selected sound, click *Rename* and enter a new title.
- To **test** the chosen sample, click *Play*.
- To **delete** the selected sample, click *Delete*.
- Click *OK* to accept or *Cancel* to discard changes.

May be caused by

[Analytics Event](#)

[Generic Event](#)

[Input Signal on Device](#)

[Motion on Camera](#)

[Soft Trigger](#)

Why Action may work incorrectly

Event is not configured properly.

Sound is muted. Open any item in layout and check if the sound is muted.

Volume settings are applied globally. See "[Adjusting Volume](#)"

Too long interval of action is set. Try "instant".

Neither *Play to user* or camera for 2-way audio is checked.

Navigation: [Working with Wisenet WAVE](#) > [Device Management \(Cameras, Encoders and I/O Modules\)](#) > [Setting Up Cameras and Devices](#) > [Controlling Pan, Tilt, and Zoom \(PTZ\)](#) >


Saving and Restoring PTZ Positions



It is possible to establish predefined PTZ positions that can be restored in just a few clicks or with hot key.

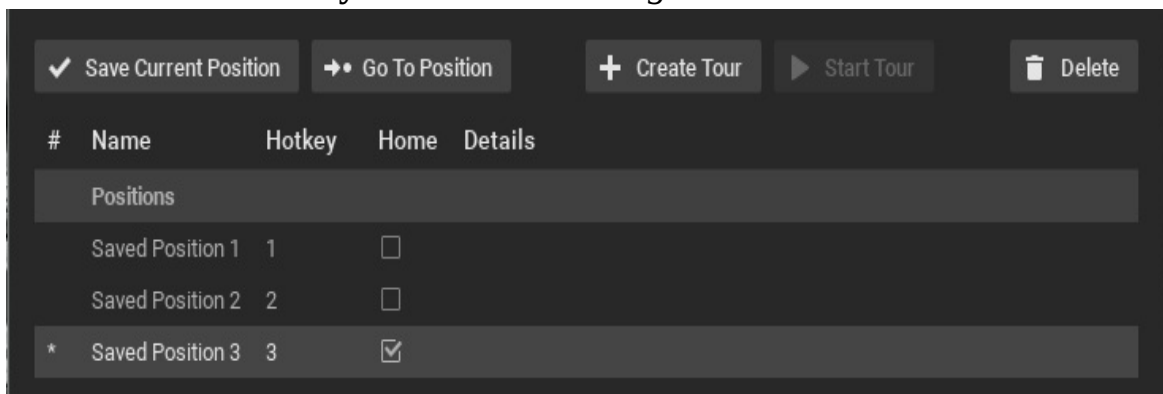
Once defined, a given PTZ preset can serve as the home position for a device, or several presets can be sequenced to create a PTZ tour. See "[Setting Up PTZ Tours](#)". There is also an "[Execute PTZ Preset](#)" action for event rules.


To save a PTZ position

1. Click on the PTZ icon  in layout and go to the desired position.
2. From the camera item in layout, open the context menu and select **PTZ -> Save Current Position**.
3. Enter a name or accept the default name.
4. Optionally, select a hot key for the position (**0-9**).

To edit a saved PTZ position

1. From the camera item in layout, open the context menu and select **PTZ -> Manage**. It is a good idea to move the *Manage PTZ* dialog so the camera item is clearly visible in layout.
2. The **Name** and **Hotkey** fields in the *Manage PTZ* list are editable fields.



3. If desired, click the **Home** checkbox to select the position the camera will return when the PTZ position is not changed for 2 minutes. (You can use the **Go To Position** button to preview a preset position.)
4. It is possible to add a new preset by clicking on the PTZ icon  in layout and clicking **Save Current Position** in the *Manage PTZ* dialog.
5. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

To restore a PTZ position


Open the camera context menu and choose **PTZ -> <position name>** or

press the related hot key (**0-9**). The active position will be indicated in the PTZ context menu.

To delete a PTZ position

1. Open the camera context menu and select **PTZ -> Manage**.

2. Select a desired preset and click **Delete**.

 **Note:** If a preset position is included in a PTZ tour, deleting it will make the tour invalid. The tour will remain in the list in the *Manage PTZ* dialog but will not be available from the PTZ context menu.

3. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

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Setting Item Resolution




It is possible to override the default image quality for a single item in layout to high- or low-resolution playback.

This is useful, for example, when you need to save CPU usage by the client (in which case you would force the playback setting to low-resolution), or to enhance image quality for a given item (in which case you would force the setting to high-resolution). Note that because this setting is saved for each item individually, it is possible to have the same device playing back at a different resolution in different layout items.

This setting overrides the setting for the entire layout (controlled using **Viewing Grid** context menu -> **Resolution**) and is saved when the layout is saved. However, [Fullscreen Mode](#) will always display an item using the highest possible image quality.

 **Note:** Image quality settings depend on the camera's secondary stream settings (see "[Adjusting Secondary Stream Quality](#)").

To specify item playback resolution

1. Right-click on the item in layout to open the context menu and choose Resolution.
2. The default is **Auto**. Select **High** or **Low**.
3. Click the information icon  or use the item context menu **Show Info** (shortcut **Alt+I**) to confirm the setting (see "[Image Display Controls](#)").

See "[Setting layout resolution manually](#)" as well.

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Arranging Item Display in Layout



Any video manipulation can be performed in the application to customize a layout:

- [Adding Items to a Layout](#)
- [Removing Items from a Layout](#)
- [Selecting Items in Layout](#)
- [Moving and Rearranging Items](#)
- [Resizing Items](#)
- [Rotating an Item](#)
- [Creating a Zoom Window](#)
- [Setting Item Resolution](#)

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Deleting Layouts



To delete a Layout from the Resource Tree

1. Find and select desired layout(s) in Resource Tree.
2. Invoke the context menu and choose **Delete** (shortcut **Del**).
3. If the layout is shared, click **Delete** again in the confirmation dialog.

The layout will be deleted from all Clients connected to the System.

 **Note:** [Locked Layouts](#) cannot be deleted!

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Locking Layouts



A layout can be locked so that no changes at all are permitted unless and until it is unlocked.

To lock a layout

1. Right-click on a Viewing Grid area of the layout you want to save and select **Layout Settings** in the context menu.
2. In the Layout Settings dialog, check **Layout is locked**.
3. Click *OK* to accept or *Cancel* to discard changes.

To unlock a layout

Follow the above directions but instead uncheck the *Layout is Locked* checkbox.

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Opening and Closing Saved Layouts




When a user logs into Wisenet WAVE, all saved layouts are listed in the Resource Tree.

To open an existing layout

- Drag-and-drop the layout from *Layouts* in the Resource Tree onto the viewing grid
- Right-click on the layout and choose **Open Layout** (or press **Enter**) from the context menu

You can use the same steps to select and open multiple layouts. Each layout will open in a separate tab. (A layout that is already open will not be reopened in a second tab.)

Sometimes an Alarm Layout may pop up if configured. See "[Showing Cameras on Alarm Layout](#)" for details.


 **Note:** After Wisenet WAVE is closed, all saved layouts opened in tabs will be restored when a user logs back in.

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Saving Layouts




A layout must be saved when to retain any changes. A layout remains local and will only be available during the current session unless it is saved. When a layout is successfully saved, it displays in the Resource Tree under *Layouts* and under a specific user name. Saved layouts that were open when a session closed will automatically open the next time a user logs in.

 **Note:** Saving a layout saves camera playback state, speed, position, and rotation in all items.

To save a layout

- Right-click on the tab name (in the Navigation Panel) or on the viewing grid.
- In the context menu that opens, select *Save Current Layout* (shortcut **Ctrl+S**) to save the current layout name (as shown in the tab header caption).
- Open the context menu on the viewing grid (on empty space) and select **Save Current Layout As** (shortcut **Ctrl+Alt+S**). layout will be saved as specified by user:
- Find the desired layout in Resource Tree, invoke the context menu and select *Save Layout*.

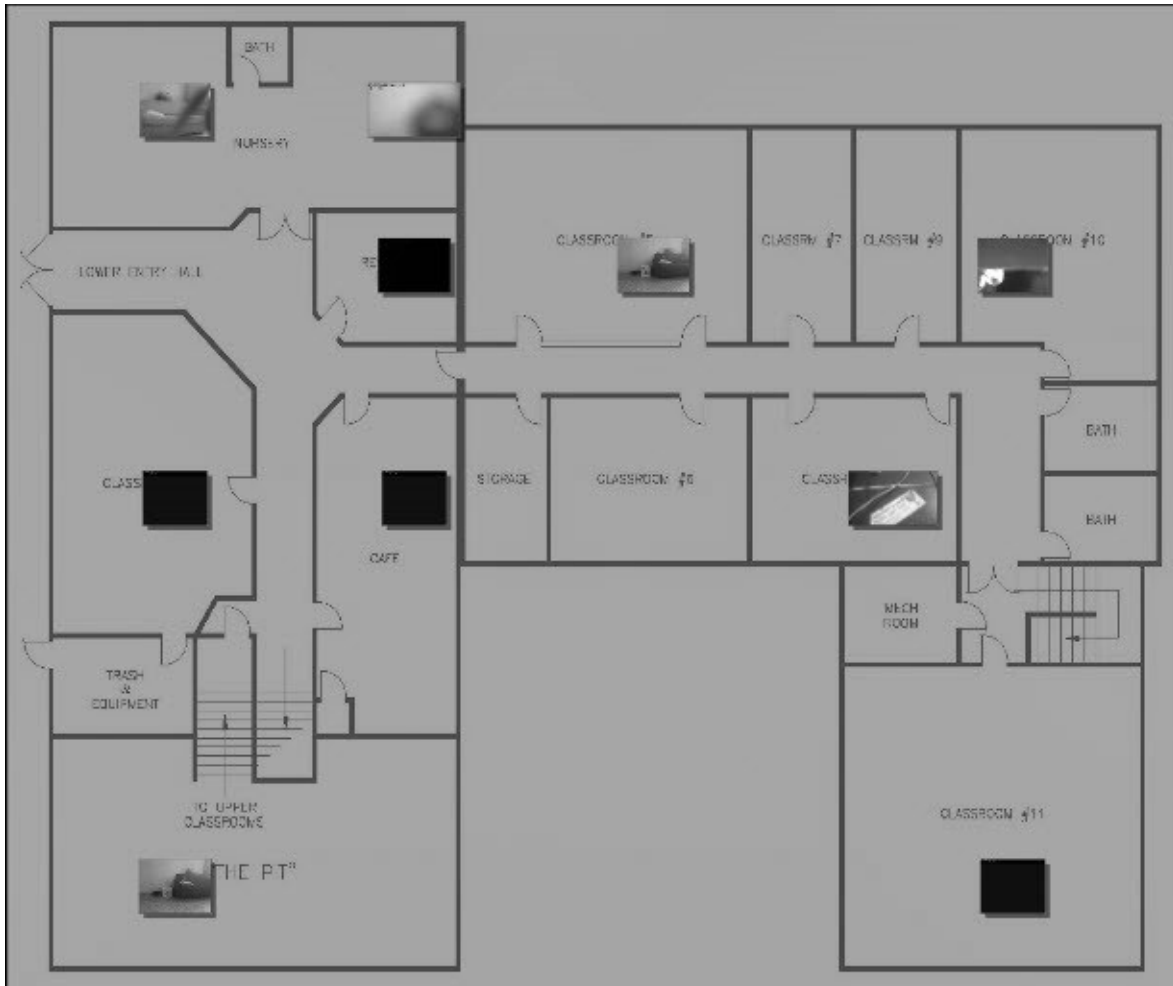
 **IMPORTANT:** Saved layout is activated immediately (if running on multi-machines, all saved changes to layout will reflect on all machines identically). Refer to “[Opening and Closing Saved Layouts](#)” for more information.

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Adding a Background to Layout

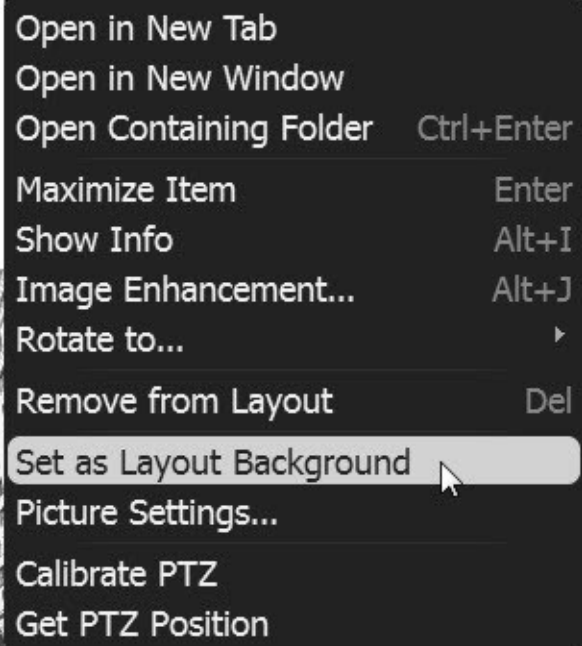


Wisenet WAVE offers an ability to change background for Layouts. A schematic map or a building plan can be chosen as the background behind cameras for easy camera location and information accessibility to users.



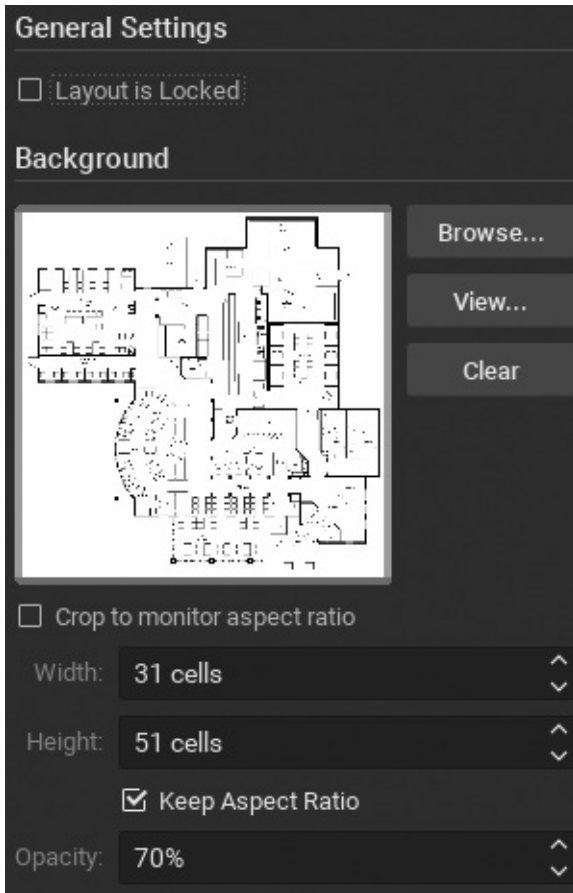
To set background for Layout (simple)

1. Open the desired picture in layout.
2. Right-click on the image to open the context menu and select *Set as Layout Background*:



To set background for Layout (advanced)

1. Expand **Users** to locate the desired **Layout** in Resource Tree.
2. Open the context menu (by clicking on any empty space within **Layout**) and select *Layout Settings...*



3. Click *Browse...* and select a desired image file to set as background.
4. Configure additional parameters:
 - **Crop to monitor aspect ratio** – if selected, then aspect ratio of the image will be adjusted according to the monitor. For instance, if monitor resolution is 1920x1080 (16:9) and image resolution is 1920x1200 (16:10), then the image will be cropped from both top and bottom.
 - **Width** and **Height** – image dimensions within cells. For instance, it is possible to place twenty items on a 5x4 layout.
 - **Opacity** of the image (in percent).
5. Click *OK* when finished. To discard changes, click *Cancel*.
6. Add, Remove, resize or move cameras on the background (see "[Arranging Item Display in Layout](#)").
7. [Lock Layout](#) if needed.
8. Make sure to [Save Layout](#).

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Creating and Assigning New Layouts



Initially, no layouts are configured in the System. A new layout can be created locally just for the session or saved for an entire System, and can be created for one or more specific users or for all users on a System. A new layout can be created and saved whether or not it contains any items. Layouts can also be assigned by User Role (see "[Roles Management](#)").

When you configure a new layout, an asterisk will automatically be added to the caption to indicate unsaved changes.

To create and save a new layout for a specific user

1. Open a new tab.
2. **Right-click** on a user name in Resource Tree and choose **New Layout** in the context menu.
3. In the *New Layout* dialog that opens, enter a layout name and click **OK**.
4. A new tab will open containing the new empty layout.
5. Add and configure items as desired.
6. Right-click on the viewing grid or on the tab name in the Navigation Panel to save the layout with content.

The new layout will display under the selected user's name in the Resource Tree for the current and future sessions. Playback state, speed, position, and rotation settings for all items are saved and will be applied when the layout is reopened.

To share a layout with other users

In the Resource Tree, drag-and-drop a layout name from one user to another. It will appear as a "Shared Layout" for the new user, and be added to the Layouts list for System Owners and Administrators where it can be assigned to custom users and User Roles from the *User Settings* dialog.

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Tabs for Layout



Each layout is displayed on a separate tab of the Viewing Grid. Tabs allow you to have multiple layouts open at once.

The display on initial System launch is an empty Viewing Grid with tab name “New Layout*”. An asterisk next to a layout name, both on tabs in the Navigation Panel and layout names in the Resource Tree, means the layout has unsaved changes. New tab names automatically increment by 1 (“New Layout 1”) until the user session ends.

When all layouts are closed, one blank tab will always display. If too many tabs are open to display at once in the Navigation Panel, use the "<" and ">" arrows to scroll left and right through the tabs.

To open a new tab

- **Right-click** on any tab in the Navigation Panel and select **New Tab** (shortcut **Ctrl+T**) from the context menu
- Go to **Main Menu** → **New** → **Tab**
- Click on the **+** icon to the right of the last tab in the Navigation Panel

To navigate to a tab

To navigate to a specific tab, click on the down arrow button (located to the right of the "+" button) in the Navigation Panel. The pulldown menu that opens lists the tabs that are currently open and your saved layouts.

- If you select a layout that is currently open, focus will shift to that tab
- If you select a layout that is not currently open, it will open in a new tab

To close a tab


- Click on the **X** icon next to the tab name
- **Right-click** on a tab to open the context menu and select **Close** (shortcut **Ctrl+W**)

To close all but the active tab

To close all tabs but the active one, open the tab's context menu and select **Close All but This**

To reposition a tab

Click-and-drag a tab name to change its position in the Navigation Panel.

 **Note:** If Alarm Monitoring is configured, an Alarm Layout will automatically open when the corresponding event occurs. See "[Showing Cameras on Alarm Layout](#)" for details.

Navigation: [Working with Wisenet WAVE](#) > [Users and User Roles](#) >

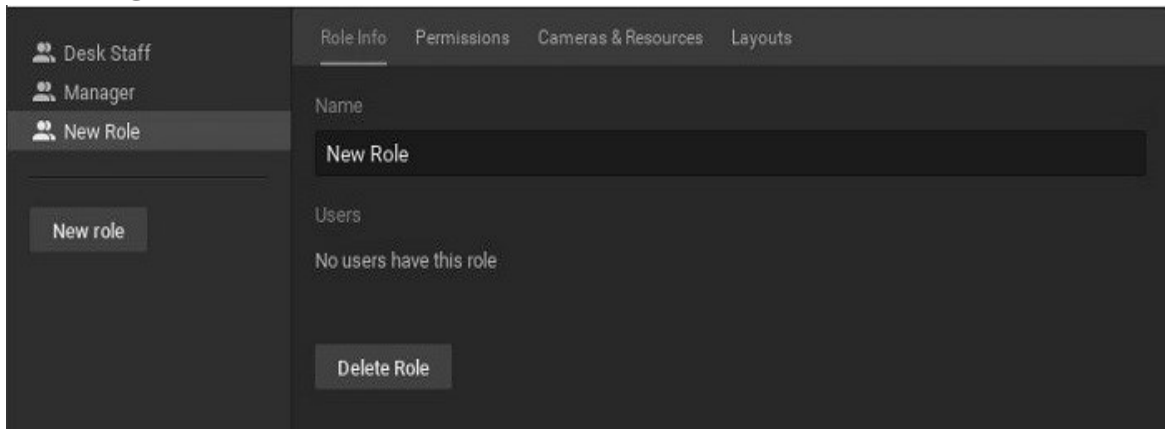
Roles Management




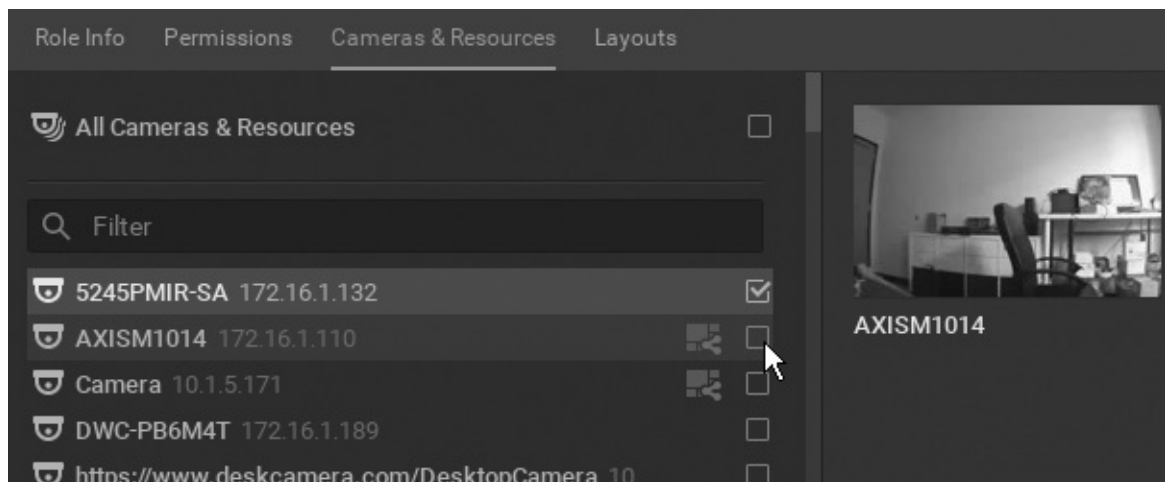
Once defined, a Role may be assigned to any number of users.

To create a new User Role

1. Open the **User Roles** dialog using one of these methods:
 - Open **Main Menu**, click on **User Management**, then click the **Edit Roles** button
 - **Right-click** on **Users** in the Resource Tree and choose **User Roles**
 - **Right-click** on a specific user in the Resource Tree and choose **User Settings**, then click the **Edit Roles** button




2. In the **Role Info** tab, click the **New role** button and enter a Role **Name**.
3. In the **Permissions** tab, check the actions the Role will be permitted to perform.
4. In the **Cameras & Resources** tab, select devices, web pages, tasks, etc. that will be available to users with this Role. Devices that have this icon  are available to a Role by default because layouts that contain these devices are accessible to this Role.



5. In the **Layouts** tab, select the layouts that will be available for Users with this Role. Note that giving access to a layout will give the Role access to all current and future devices used in that layout.
6. Click *Apply* to save changes and continue, *OK* to save changes and close the dialog or *Cancel* to reject changes.

To edit a User Role

1. Open the **User Roles** dialog as described above.
2. Select the desired User Role in the left-hand list.
3. In the **Permissions** tab, check the actions the Role will be permitted to perform.
4. In the **Cameras & Resources** tab, select the devices, web pages, tasks, etc. that will be available for users with this Role. Devices that have this icon  are available to a Role by default because layouts that contain these devices are accessible to this Role.
5. In the **Layouts** tab, select the layouts that will be available to users with this Role. Note that giving access to a layout will give the Role access to all current and future devices used in that layout.
6. Click *Apply* to save changes and continue, *OK* to save changes and close the dialog or *Cancel* to reject changes.

To delete a User Role

1. Open the **User Roles** dialog as described above.
2. Select the desired User Role in the left-hand list and click the Delete Role button.

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Changing User Settings




The following user settings can be modified, usually only by an Administrator or the System Owner:


- **Enabled** – a quick toggle for all users except Owner. A user cannot disable himself. See "[Disabling/Enabling Users](#)".
- **Login** – can be changed for all users except Owner. Viewers cannot change their own login.
- **Name** – can be changed for all users except Owner.
- **Email** – can be entered or changed for any user.
- **Password** – can be changed for all users except Owner. All users can change their own password.
- **Role** (Admin only) – access rights can be changed for any users except Owner. Also, User cannot change own Role.

To change user settings and Role

1. Open the **User Settings** dialog using one of these methods:

- Open **Main Menu**, click on **User Management**, then click on a specific user name in the *Users* tab
- Open **Main Menu**, click on **User Management**, then hover over a specific user name in the *Users* tab and click the edit icon 
- **Right-click** on a user in the Resource Tree and choose **User Settings**

2. Change the desired fields and click *OK* or *Cancel* to close the form.

 **IMPORTANT:** login and password are **case sensitive**.

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Disabling or Enabling a User



To prevent access to Wisenet WAVE it is possible to disable a user. Unlike deleting a user, this method preserves the user information in the database and can therefore be reversed. Also, the log of a disabled user's actions is retained (see "[Viewing Users' Actions Log \(Audit Trail\)](#)").

To disable a user

1. Open the **Users** tab using one of these methods:
 - Open **System Administration** and go to the **Users** tab.
 - Open **Main Menu and** click on **User Management** to open *System Administration* on the **Users** tab
 - Click on a specific user name in the *Users* tab
2. Hover over a user and click on the **Enable** button. Green indicates active, gray indicates disabled. (There is also a **Enabled** button in the User Settings dialog.)
3. To change the status of multiple users at once, check the box next to the desired users and use the **Enable** or **Disable** button below the user list.

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Deleting a User



Deleting a user removes them from the Wisenet WAVE database. Any user can be deleted except the Owner. A user cannot delete their own profile. Any layouts that are assigned only to a user being deleted will also be deleted.

! **IMPORTANT:** If "*Do not show this message again*" was checked in a previous instance of the Client, you will not be prompted to confirm a user deletion, and the action will be instant and permanent. To re-enable confirmations use the **Reset All Warnings** button in **Local Settings** -> **Advanced**.

To delete a user

1. Open **System Administration** -> **Users** tab.
2. Select the desired user(s) and click **Delete**. Alternately, select the desired user(s) in the Resource Tree, right-click to open the context menu, and choose **Delete**.

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Adding Users from LDAP Server



To simplify User and Roles Management in large corporate systems it is possible to import users from the corporate network directory (**LDAP**). The following LDAP servers are available:

- Microsoft Active Directory
- Open LDAP Server
- JumpCloud

Setting Up LDAP Integration

To be able to import users and allow them to connect to Wisenet WAVE, it is necessary to establish a connection between Wisenet WAVE and the corporate LDAP server. This integration should be performed by, or in cooperation with, the **Network (Domain) Administrator**.

1. Open [User Management](#) and click **LDAP Settings**.
2. Enter the following details (consult with your **Network (Domain) Administrator** if needed):

Server URL	ldap://ad.corp.hdw.mx
Admin DN	CN=Administrator,CN=Users,DC=corp,CD=hdw,CD=mx
Password	••••••••
Search Base	CN=Users,DC=corp,CD=hdw,CD=mx
Search Filter	Optional

⚠ IMPORTANT: Server URL should be a **Fully Qualified Domain Name** (not IP address). See https://en.wikipedia.org/wiki/Fully_qualified_domain_name for details. *Search Filter* is optional and is used to filter users on the server side (special LDAP syntax is used). The above example illustrates the most simple filter.

3. Click *Test*. If test is successful, the server will return the number of LDAP users found (*Search Filter* will be pre-applied).


Importing Users from LDAP Server

After LDAP integration is complete it is possible to import LDAP Users into

Wisenet WAVE. Imported users will be able to log in to Wisenet WAVE using their pre-existing domain usernames and passwords.

1. Open **System Administration** -> **Users** tab and click **Fetch Users from LDAP**. The list of LDAP Users found on the server will be displayed.
2. Select User(s) to be imported, using the *Search* filter if desired.
3. If needed, enable or disable LDAP Users (see "[Disabling/Enabling Users](#)") and assign the appropriate User Roles (see "[Changing User Settings](#)").

After an LDAP User is enabled, they will be able to log in to Wisenet WAVE using their domain username and password.

 **IMPORTANT:** If the LDAP server is not available, LDAP users will not be able to log in.

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Adding Items to a Layout



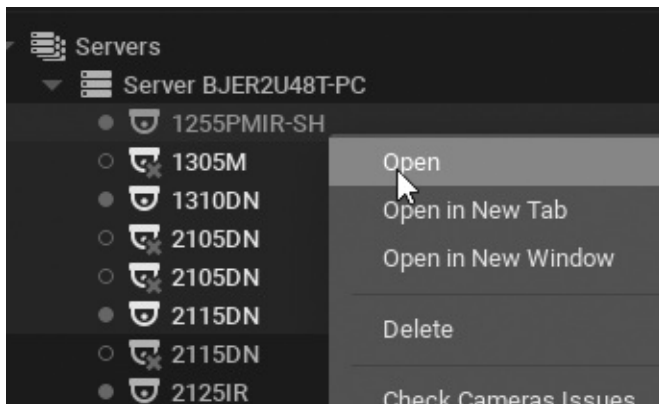
More than one item of any type (live cameras, local video, images, etc.) can be added to a layout at a time. (Wisenet WAVE allows 24 items to be displayed on x86 architecture and 64 items on x64 architecture.)

IMPORTANT: Viewers and user Roles with similar limitations on their authority cannot add items to a predefined layout. They can only open and add items to new tabs. Also, it is not possible to add cameras to a locked layout.

To add item(s) to layout, choose from one of the following:

- **Double-click** on the item in the Resource Tree
- **Right-click** in the Resource Tree to open the context menu and select **Open**
- **Drag-and-drop** from the Resource Tree into layout

Note that you can select and add multiple items in the Resource Tree using the **Ctrl** or **Shift** keys.



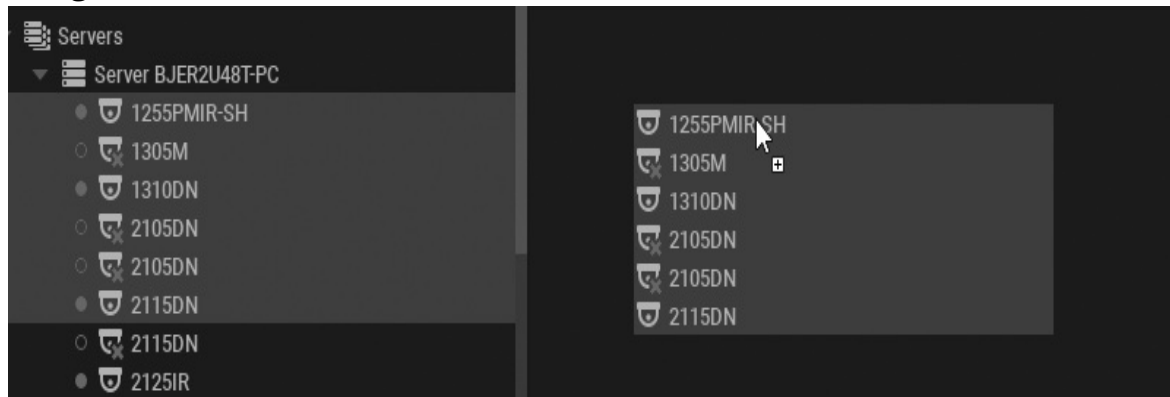
- Open **Local file(s)** or **Folder** – they will be added to the current layout (see [“Opening Local Files Outside of Media Folders”](#))

New items will scale to occupy the available space in layout. Wisenet WAVE adjusts the aspect ratio of viewing grid cells according to the aspect ratio of the items in layout to maximize use of display space. See ["Changing Cell Aspect Ratio"](#).

To open items directly into a new tab

- **Right-click** on the desired item(s) in the Resource Tree and select **Open in New Tab** in the context menu
- **Drag-and-drop** the selected item(s) from the Resource Tree and onto the

Navigation Panel header



! IMPORTANT: It may be difficult to locate and add each device manually. You can use the search pane to help locate items (see "[Search](#)").

To configure a layout using **Search**


1. Create a new layout (see "[Creating and Assigning New Layouts](#)".)
2. Enter keywords into the Search box. The search results will appear on the viewing grid automatically.
3. By adding or deleting keywords from the search box, the items on the viewing grid will vary.
4. Save the configured layout.

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Removing Items from a Layout




To remove Item(s) from a Layout:

1. Select desired item(s) in the layout
2. Click  to remove a single Item, or open the context menu and select *Remove from Layout* (shortcut **DEL**) to remove all selected Items

To remove Item(s) from Layout in Resource Tree:

1. Expand **Users** and locate the desired **Layout** in Resource Tree.
2. Select desired **Item(s)** under specified **Layout**.
3. Open the context menu and select *Remove from Layout* (shortcut **DEL**).
4. Confirm deletion by clicking *Yes*.

 **Note:** Grid cell aspect ratio will be adjusted automatically as per the existing item aspect ratio to occupy space in the layout. See "[Changing Cell Aspect Ratio](#)".

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Selecting Items in Layout



Click on an item to select it. The selected Item will expand in the layout. To bring it back to normal, click again. Once an item is selected you can use the arrow keys to scroll selected through all items in a given layout. Items can also be selected from the Resource Tree.

You can also select multiple items. Multiple selected items do not expand, instead they are outlined and given a colored overlay.

To select more than one Item

- **Click-and-drag** over items with a mouse to create a selection box.
- Use **Ctrl+Click** to toggle selection of successive items. **Click** on any one of multiple selected items to deselect all.
- Use **Ctrl+A** to select all items on a layout.



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Moving and Rearranging Items



The viewing grid consists of cells. Each cell may contain one **Item**. The default aspect ratio of a cell is **16:9** but it can be changed (see "[Changing Cell Aspect Ratio](#)").

In order to move an **Item**, **Click** on it and **Drag** it to a new position (grid cell borders are visible while in motion).

If the desired position is already occupied, **Items** will be swapped (if possible).



If swapping is not possible, the target cell will be marked red:



If bigger **Item** is being replaced by a smaller one, they will swap sizes as well as positions.

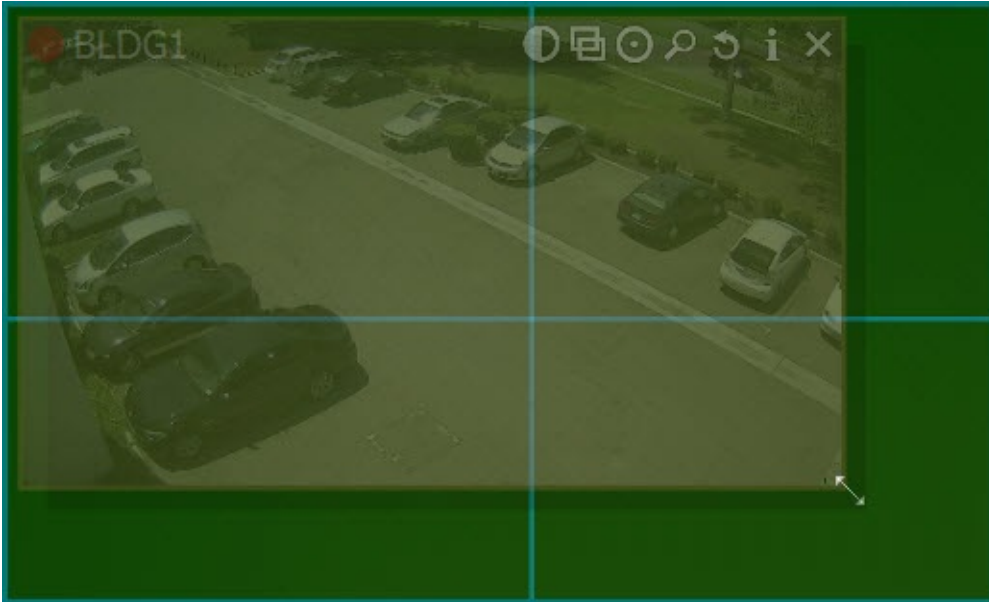
You can also use a right-click to move all Items in the Layout as one.

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Resizing Items



To resize an item, select an edge in layout and **click-and-drag** the mouse to resize it. If resizing is possible, the new cells are highlighted in green:



If resizing is not possible, the cells will appear red:



In this case the best practice is to move the entire viewing grid using a click-and-drag and then resize the Item to occupy the available space, or move the desired Item away from the other items then resize it to occupy the available space.


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Rotating an Item



There are several ways to rotate an item in layout. A red directional arrow will indicate that the item is in rotation mode.



- Press **Alt** + **click-and-drag** over an item. Release when the item is at the desired angle. You can use **Alt** + **Ctrl** + **click-and-drag** to limit rotation to increments of 30 degrees.
- Click and hold the **Rotate** button () , then use the mouse to rotate the item. Release when finished. Press **Ctrl** while holding the **e** button to limit rotation to increments of 30 degrees.
- It is also possible to use **Rotate to** in the item's context menu to choose from the options *0*, *90*, *180* or *270 degrees*.

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Creating a Zoom Window



With the **Zoom Window** feature in Wisenet WAVE , when you select a rectangular region in an Item's display, Wisenet WAVE instantly opens that selected region as a new item in the current layout. This lets you simultaneously view an entire device image and a zoomed-in detail. You can create as many zoom windows as you like from a given item, and these zoom window items will be saved in the layout. Zoom windows can be very helpful for viewing fish-eye camera output (see "[Dewarping Fish-Eye Cameras](#)").

The zoom window region on the source camera is persistent and editable. It can be resized in the source item by dragging a corner and it will dynamically adjust in the related zoom window, and it can be moved between cameras in a layout. When you close the item created by the zoom window, the zoom window region in the source item will be deleted.

To configure a zoom window:

1. Select a camera item.
2. Click on the **Create Zoom Window** icon , then drag a rectangle on the desired area. A new item will open in the current layout.
3. To close a zoom window, close the item it created.



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Opening Local Files Outside of Media Folders



To open Local Files that are outside the **Media Folders** and thus are not visible in the Resource Tree, use one of the following:

- **Drag-and-drop** a video file(s) or a folder from Windows Explorer to copy it into the Wisenet WAVE viewing grid
- Go to **Main Menu** and select **Open** → **File(s)** (shortcut **Ctrl+O**) then select the file(s) to be opened
- Go to **Main Menu** and choose **Open** → **Folder** then select a folder to be opened
- **Right-click** anywhere on the viewing grid to open the context menu, select **Open** → **Folder** then choose a folder

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Configuring Media Folders



When Wisenet WAVE starts, it automatically indexes local media folders in order to find and display local files in Resource Tree. By default, **the current user's video folder** (C:\Users\%User%\Videos) is configured as the media folder.

To configure unlimited number of media folders:

1. Open Main Menu and choose *Local Settings*.
2. Go to *General*.
3. To change the *Main Media Folder*, click *Browse* and choose the desired path.
4. Configure *Extra Media Folders*:

To add extra media folder click *Add...* and choose the desired path.

It is possible to perform standard file and folder operations in this form (similar to Windows Explorer).

To delete an extra media folder, select the folder from the list and click *Remove*.

5. Click *OK* when finished or *Cancel* to discard changes.

As soon as media folders are configured, Wisenet WAVE should be restarted. Then files from the specified media folders will be visible in the [Resource Tree](#) (under the *Local* node). It is possible to place such resources in layout. [Search](#) is also available for local files.

See also "[Opening Local Files Outside of Media Folders](#)".

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Local Files Structure in Resource Tree



All local files are displayed in Resource Tree under *Local Files*, which includes:

- Files that are located in **Wisenet WAVE Media Folders** (see “[Configuring Media Folders](#)”)
- Recently opened local files (see “[Opening Local Files Outside of Media Folders](#)”)
- Exported files (see “[Exporting](#)”)
- Screen Recordings (see “[Screen Recording](#)”)
- Screenshots (see “[Taking Screenshot](#)”).

Local files can be renamed from the Resource Tree. Open the context menu, choose **Rename** (shortcut **F2**), enter the desired file name, then press **Enter**.

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Image Display Controls









Item windows display basic device information and contain powerful built-in functions in the form of icons on the upper-right corner. The Information and icons shown depend on whether the item contains live or recorded video.

Information and icons for recorded display

The upper left corner displays the **file name**.




The following buttons are available for recorded items:

-  – [Image Enhancement](#)
-  – [Creating a Zoom Window](#)
-  – [Screenshot](#)
-  – [Rotate](#)
-  – [Information](#) (Displays additional information about the device settings.)
-  – [Close](#) (Removes the item from the current layout.)

The bottom right corner displays the following information and controls:

Current playback mode:

- **LIVE** – if watching a camera in live mode
- **Date/Time** – if watching archive or local file




 – 2-way audio button, displayed if watching a device with 2-way audio.

See "[Using 2-Way Audio](#)".





Additional buttons for [Soft Triggers](#) may also be visible for users on specific devices.

Information and icons for live stream display

If supported by a specific device, the following icons may be displayed in the upper right corner of a live streaming device in addition to those displayed for recorded playback:

-  – [Dewarping](#) for fish-eye camera
-  – [Pan, Tilt, and Zoom \(PTZ\) controls](#)
-  – [Smart Motion Search](#)

The upper left corner of a camera item displays:

- **Device Name**
- Icon for the current **Recording Mode** (Recording mode may vary depending on the device schedule, see "[Setting up Recording Schedule.](#)")
 -  – **Constant Recording** (green circle)
 -  – **Motion Recording** (red circle)
 -  – **Low Resolution** - always, **High Resolution** - only while in motion (red circle with green diagonal)
 -  – **Not Recording** (grey circle)




Additionally, these messages may appear for camera items

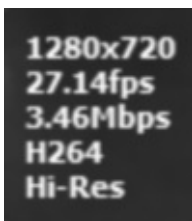
- **NO SIGNAL** – camera is offline. It is possible to diagnose the device in this case (see "[Diagnosing Offline Devices](#)").
- **NO DATA** – no recording was performed. No data available.
- **Loading** – awaiting data from server
- **Unauthorized** – incorrect/missing login or password

The following image information can be useful during camera setup and when monitoring streams or playback.

To view item image information in layout:

Click on the Information icon  located in the top right corner of the item. You can also select one or more items in layout (see "[Selecting Items in Layout](#)"), right-click on any selected item to open the context menu, and choose **Show Info** (shortcut **Alt+I**)

The bottom left corner of the item will display the following:



1280x720
27.14fps
3.46Mbps
H264
Hi-Res

- Current **Resolution** of the stream in pixels
- Current frames per second (**fps**) of the stream
- Current **Bitrate** of the stream
- Current stream **Codec** (for example, **H264** or **MJPEG**)
- Current **Stream Resolution** (if Dual-Streaming is enabled for the camera): **Hi-Res** or **Lo-Res**

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Image Enhancement



To enhance the image on darker items, Wisenet WAVE offers **Image Enhancement**. Not only can this feature be applied to cameras, it can also enhance local files and pictures as well (except for Screenshots taken within Wisenet WAVE).

To activate **Image Enhancement**, click on the  button located on the item:

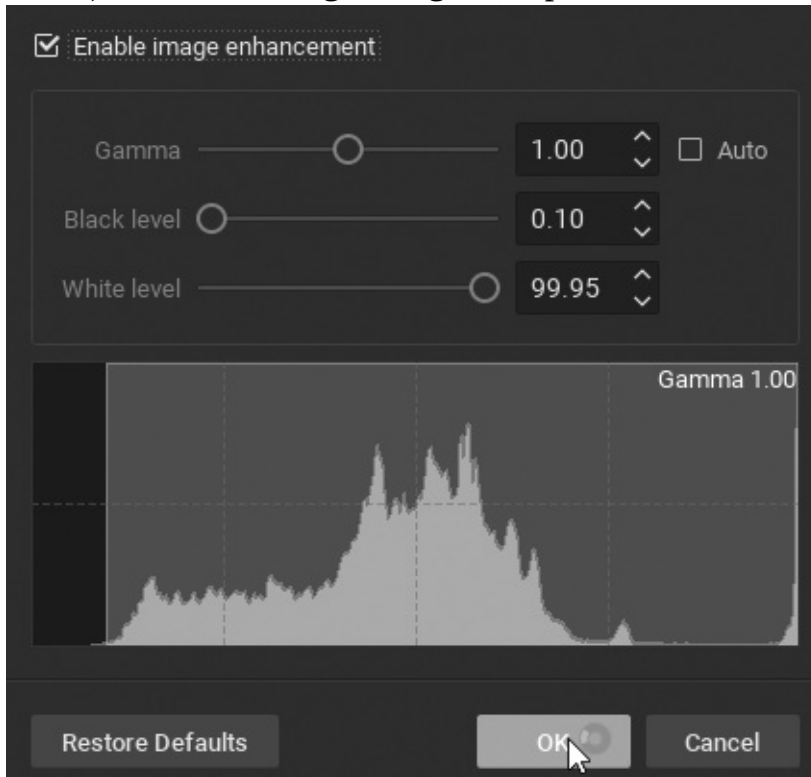


 **Note:** [Export](#) and [Taking Screenshots](#) features will depend on this setting as well: if dewarping is enabled, the screenshot will be dewarped automatically and the Export dialog will suggest this feature (can be disabled).

To adjust additional settings:

1. Invoke the context menu and select *Image Enhancement...* (shortcut

Alt+J). The following dialog will open:



2. Click *Enable enhancement* and configure desired parameters:

- *Gamma* – the lesser the value, the lighter the image will be. Set *Auto* for recommended values.
- *Black and White Levels* (information is located in the Histogram section). Refrain from cutting too much of left or right areas on the histogram – this will result in losing important graphical information.
- Click *Restore Defaults* to reset settings.

3. Click *Apply* or *OK* when finished. To discard changes, click *Cancel*.

 **Note:** In most cases, it is not necessary to perform any additional adjustments.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Advanced Archive Search Tools](#) >

Performing Smart Motion Search



Smart Motion Search enables user to perform fast and intuitive archived motion search by selecting a region on video and allow the application to automatically refine the archive, and highlight the fragments that contain motion.

To perform Smart Motion Search, select the desired region and Wisenet WAVE will display all fragments that contain motion throughout the archive (scanning through a yearly archive only takes a few seconds).

❗ **IMPORTANT: Smart Motion Search** in Wisenet WAVE assumes the selected camera supports motion detection. It is important to perform motion setup as well. See "[Setting up Motion Mask and Motion Sensitivity](#)".

To perform **Smart Motion Search**:

1. Open Motion Grid on the camera:

- use camera's **Quick Button** (📷)
- open the camera's context menu and choose *Motion Grid* (or select the camera and use the shortcut **Alt+G**)

The motion grid will appear:



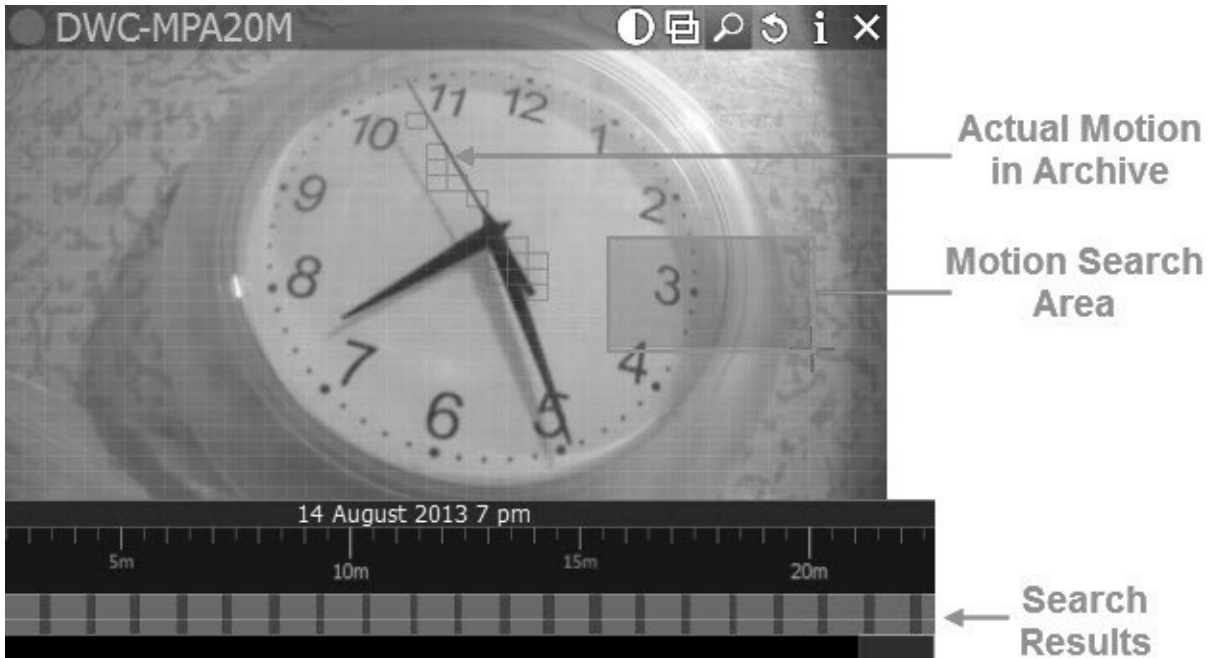
📷 **Note:** If red fragments appears in motion zones, motion detection is supported by camera.

2. Select the region the motion should be searched on (using the mouse):


- Hold **Shift+click-and-drag**
- **Ctrl+click-and-drag** to add another region
- **Click and Hold** or use the context menu (*Clear Motion Selection*) to clear all regions.

❗ **IMPORTANT:** Motion will not be visible and detected on a region marked as Motion Mask.

As soon as the region is selected, Timeline will be populated with red bars. Each bar indicates a recording period that contains motion.



⚠ IMPORTANT: Navigation in Timeline using the red fragments is only possible while Smart Motion Search is on.

To disable Smart Motion Search, clear all regions in the motion grid, disable by pressing the  button, or use the context menu option **Hide Motion Grid** (shortcut **Alt+G**).

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Using Calendar



This type of search helps the user to locate an event that took place on a particular date and time.

To perform a calendar search:

1. Open **Camera** that contains the archived event.
2. Press the calendar icon. Calendar will appear above Timeline. The dates that are displayed on **Timeline** are highlighted in green:

30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

It is possible to pin **Calendar** if needed

3. Select a desired date in **Calendar**. To select multiple dates, use **Ctrl**. **Timeline** zoom will automatically change to reflect the selected date(s) only. If the archive contains data outside the visible range, it will appear in shaded green:

30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

4. Select a desired hour in the upper part **Calendar**. To select multiple hours, use **Ctrl**. **Timeline** zoom will automatically adjust to display the selected hour(s) only.

06 August 2013						
12 am	1 am	2 am	3 am	4 am	5 am	
6 am	7 am	8 am	9 am	10 am	11 am	
12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	
6 pm	7 pm	8 pm	9 pm	10 pm	11 pm	
<div style="display: flex; justify-content: space-between;"> ← August 2013 → </div>						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Advanced Archive Search Tools](#) >

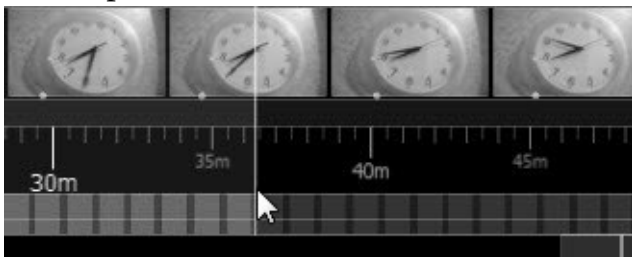
Using Thumbnails for Better Navigation



The thumbnail feature is a fast and convenient way to navigate through archive. Thumbnails are single snapshots taken from archived video footage that are displayed on the Timeline. This feature serves as another useful forensic tool for analyzing video.

To open Thumbnails:

1. Click on the desired Camera.
2. Drag upper edge of Timeline. The small previews called Thumbnails will show up:



If no Thumbnails are displayed, then there is no archive available for this particular Camera.

Thumbnails panel can be re-sized. To re-size, point a mouse cursor over Timeline, click and pull it up or down.

The white dots under the pictures point on the exact archive place where the shot has been taken. When clicking on Thumbnail, the current playback position will jump to the corresponding spot in the archive.

To close Thumbnails, pull Thumbnails Panel down.

See also "[Preview Search](#)".

Navigation: [Troubleshooting and Contacting Support](#) >

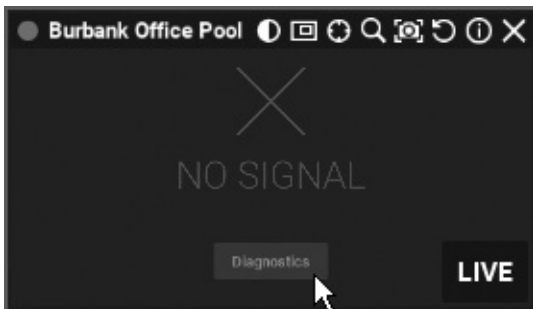
Diagnosing Offline Devices



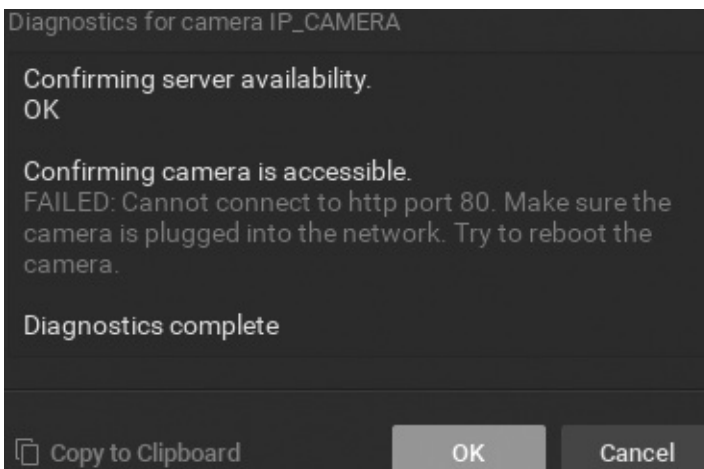
Sometimes cameras are displayed in Resource Tree, but are marked with unauthorized sign (✖). When opening such camera, it will display **NO SIGNAL**. Wisenet WAVE will then prompt the user to perform more thorough diagnostics.

IMPORTANT: Run diagnostics prior to contacting support.

Diagnostics can be invoked by pressing on the **Diagnostic** button on the item:



Once complete, reasons and recommended actions will be displayed:



Follow instructions to resolve the issue. If unsuccessful, contact support (see "[Troubleshooting and Contacting Support](#)"). Click *Copy to Clipboard* and paste the data into the message prior to sending it to support.

Navigation: [Troubleshooting and Contacting Support](#) >

Double Buffering



On some graphic cards, drivers may have problems with OpenGL drawing, resulting in very high or even 100% CPU load. In this case, the issue may be resolved by enabling **Double Buffering**.

To enable double buffering, open **Main Menu**, choose **Local Settings** (**Advanced** tab), then toggle **Double Buffering** and restart the Wisenet WAVE Client.

Navigation: [Troubleshooting and Contacting Support](#) >

Disabling Blur for Intel HD Graphics



In some situations the client application may work incorrectly on certain computers where an integrated Intel graphic chip (Intel HD Graphics) is installed. This may result in noticeable frames per second drop or incorrect video playback. In this case it may help to disable the blur effect in client settings.

To do so, choose **Local Settings (Advanced tab)**, then check **Disable blur**, and click *Apply* or *OK*. The Wisenet WAVE client must be restarted for this change to take effect.

⚠ IMPORTANT! Do not disable blur unless the graphic adapter is from Intel and you are experiencing graphic issues.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Using Bookmarks](#) >

Creating Bookmarks Manually




To create a Bookmark manually

1. Open the desired camera (it must have recorded footage)
2. Select the time span of the Bookmark on the Timeline:
 - **Click-and-drag** the time indicator line (not the block displaying the date and time but the vertical line below that) to mark a segment, which will be highlighted with a blue overlay.
 - Or, **click** on the desired start point, open the Timeline context menu, and select **Mark Selection Start** (shortcut **[**), then click on the desired end point and select **Mark Selection End** (shortcut **]**)
3. Once the time segment is defined, you can adjust it by clicking and dragging the edges of the blue block, or it can be deleted entirely using **Clear Selection** in the Timeline context menu.
4. **Right-click** in the blue highlighted area and select **Add Bookmark**
5. In the *Bookmark* dialog that opens, enter a **Name**, **Description** and if desired, one or more **Tags** separated by commas. (You can use a preexisting tag or create a new one. The most commonly used tags will be suggested.)
6. Click *OK* to accept or *Cancel* to close without saving.

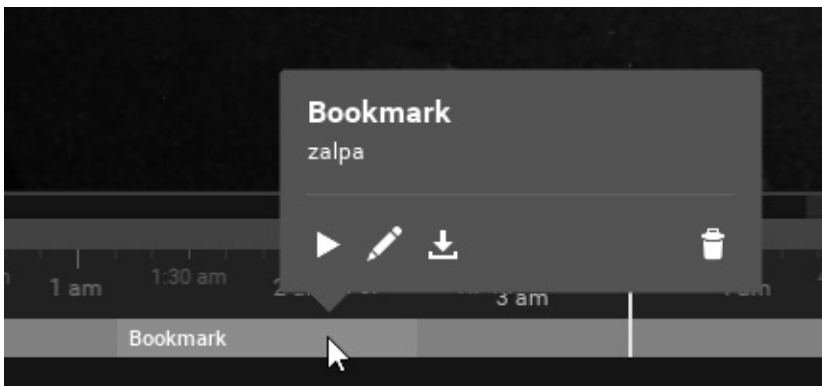
Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Using Bookmarks](#) >

Searching Bookmarks



Bookmarks are only visible when the **Show Bookmarks** button  in the Playback Panel is enabled. You can use the **Bookmark Log** to search for and edit Bookmarks.

Use **Main Menu** and select **Bookmark Log** (shortcut **Ctrl+B**) to open the *Bookmark Log*.



You can sort by any of the headers (*Name, Camera, Start time, etc.*).

Characters entered in the **Search** field will yield any Bookmarks containing those characters. Results can be cleared by clicking **Clear Filter**.

You can also filter the Bookmark list as follows:

- **Date** Click on the date fields to open calendar popups and filter by date
- **Devices** Click on **All Devices** to select from the available devices
- **Search** Text entered in this field searches for strings in the *Name, Description* and *Tags* fields. Returns up to 1000 results.

The *Bookmark Log* context menu lets you perform the following:

- **Open in New Tab:** opens a new layout tags and plays the highlighted Bookmark (shortcut **double-click**)
- **Edit Bookmark:** opens the *Bookmark* dialog where you can edit the *Name, Description* and *Tags* for the highlighted Bookmark
- **Export Bookmark:** Exports a video fragment related to a Bookmark as a video file. Enter a file name, format type, and timestamp option in the *Export Video As* dialog, then click *Save*
- **Remove Bookmarks:** deletes the selected Bookmark(s)

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Exporting Bookmarks



Bookmarks are saved to archive and the related video segments can be exported like any other single-camera videos.

To export a video segment related to a Bookmark

1. Open **Main Menu** and choose the **Bookmark Log** (shortcut **Ctrl+B**).
2. Use the filter and search tools to select the desired Bookmarks (see "[Searching Bookmarks](#)").
3. Open the context menu for a single Bookmark and click **Export Bookmark**.

Use the Export Video dialog. See "[Single Camera Export](#)" for details about formats and export specifics.

Navigation: [Working with Wisenet WAVE](#) > [Playback in Wisenet WAVE](#) > [Exporting](#) >

Single Camera Export



Wisenet WAVE supports video export of single device content and Bookmarks.

! **IMPORTANT:** An exported video will only be available until the client restarts. To make it available permanently, save the exported video to the Wisenet WAVE Media Folder (see “[Configuring Media Folders](#)”).

Alternately, you can create and save a layout that contains the exported video(s). See "[Viewing Exported Video](#)" for more information.

To export a video segment from a specific device

1. Select the desired item in layout
2. Select the desired region in Timeline and open the context menu open the Export dialog see "[Exporting](#)" for details.
3. Select **Single Camera** tab in the **Export Video** dialog and enter the following required parameters: **Folder**, **name**, and **file format**.
4. Click on the corresponding button to include options such as image filters.
5. Click **Export**.

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Multi-Video Export



With multi-video export it is possible to export video and audio from the archives of several cameras simultaneously (for instance, the last hour of recording from five different cameras). You can also export multiple local video files. However, it is not possible to mix both local videos files and cameras in a Multi-Video export.

The exported files are saved either in a proprietary format that can be played by Wisenet WAVE, or as an executable bundle that can be viewed on any Windows computer. The proprietary format has many benefits in comparison to standard single camera export. The exported multi-video layout can be navigated, manipulated, and searched like any other layout (see "[Navigating through several cameras synchronously](#)" and "[Smart Motion Search](#)"). It is even possible to perform Multi-Video Export on a multi-video export.

! **IMPORTANT:** An exported video will only be available until the client restarts. To make it available permanently, save the exported video to the Wisenet WAVE **Media Folder** (see "[Configuring Media Folders](#)").

To export multiple videos into one file

1. Select the desired item in layout and region in Timeline and open the Export dialog "see [Exporting](#) for details".
2. Click on the **Multi Video** tab and enter these required parameters: **Folder, name and file format.**
3. Optionally, you can check **Make read-only** to prevent the exported video from being edited.
4. Click **Export.**

If the selection contains empty archive on a given camera, it will be exported and no data will be shown when viewing the exported clip.

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Rapid Review Export



The **Rapid Review** feature lets you export video at a higher playback speed than the original recording. (Sometimes this is called "timelapse" mode). When you specify either the target speed or a target video length, the corresponding value and *Frames interval* will adjust accordingly.

Note that the source video must be at least 10 seconds long for this option to be available.

To apply Rapid Review Export


1. Select the desired device.
2. Select the timespan you want to export and use the context menu to open the **Export Video** dialog.
3. From the **Single Camera** tab click on the **Rapid Review** button. It may be necessary to select a different output format to enable the button.
4. Specify a value for each of the following. The **Initial video length** of the selected segment is displayed for reference.
 - Exported video length** – Enter a desired duration in seconds, where the shorter the exported video, the faster the playback speed will be. (Note that the possible values in this field are limited by the available speeds.)
 - Speed** – Set the speed increase from **10x** to **235x**.

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Viewing Exported Video



As soon as export is finished, the extracted video clip(s) will be available as **Local Files** on the Resource Tree. **AVI** and **MKV** files are shown as a single record, **EXE** and **NOV** file are contained in a folder. **EXE** files will display the exported time range in a new tab, single camera and Bookmarks are displayed as single item.

 **Note:** Start and end time points differ from a regular Local File – it is the start and end time of the exported fragment. When viewing video, the time will be displayed in the item's bottom right corner.

Viewing Exported Multi-Video

When an exported Multi-Video is opened, the following standard actions can be performed:

- [Arranging Item Display in Layout](#)
- [Tours](#)
- [Navigation through archive](#)
- [Thumbnail Navigation](#)
- [Preview Search](#)
- [Smart Motion Search](#)
- [Calendar Search](#)
- [Screenshots](#)
- [Single Camera Export](#)
- [Export \(incl. Multi-Video Export\)](#)
- [Checking the Validity of Exported Videos](#)

Any capabilities possible with devices can also be performed on Multi-Videos in Wisenet WAVE. For instance, if Multi-Video was exported from 10PM to 11PM and a new camera was added, it would be synchronized with other cameras and displayed in the same archive (10PM – 11PM). See "[Adding Items to a Layout](#)" and "[Removing Items from a Layout](#)".

Navigation: [Working with Wisenet WAVE](#) > [Screen Recording](#) >

Setting up Screen Recording



To set up Screen Recording

1. Open **Main Menu** and choose **Local Settings**.
2. Go to the **Screen Recording** tab to configure parameters:
 - **Temporary Folder** – the folder that stores temporary files. Files are stored during recording, then are copied to a specified folder to be saved.
❗ **IMPORTANT:** This folder should be accessible and writable.
 - **Screen** – if several monitors are installed, choose the desired one.
 - **Resolution** – select screen resolution. The lower the resolution, the higher the performance.
 - **Recording Quality** – select *Performance* for best performance. Select *Best* for best quality. Select *Average* to balance performance and quality.
 - **Disable Aero** – select this option to enhance performance. If this option is selected, once Screen Recording is in progress, Windows Aero will be turned off.
 - **Capture Cursor** – select this checkbox to include the mouse cursor during recording.
4. Click *OK* when done or *Cancel* to discard changes.

To select an audio source

1. Go to the *General* tab in **Main Menu**.
2. Select **First Source** and **Second Source**. Audio will be mixed from both devices. The best practice is to select master from the sound card as primary and microphone as secondary. In this case, both sounds from Wisenet WAVE (i.e. video clips) and microphone will be recorded simultaneously.

Navigation: [Troubleshooting and Contacting Support](#) >

Providing Remote Access



The best possible way to help investigate an issue is to provide remote access via one of the following applications:

- **Team Viewer** (<http://www.teamviewer.com>)
- **Citrix GoTo Meeting** (<https://www.citrix.com/products/gotomeeting/overview.html>)
- **VNC**: RealVNC (<https://www.realvnc.com/>), TightVNC (<http://www.tightvnc.com/>), UltraVNC (<http://www.uvnc.com/>)
- **RDP** (Windows Remote Desktop). Requires **Public IP**.

For Linux Mac it is possible to open SSH access. Requires **Public IP**.

Finally **Public IP** is necessary for the following investigations:

- Ability to connect remotely to the System and debug issue on the client side (server should be accessible via Internet)
- Camera issues investigations. For this purpose Camera should be accessible via Internet by **Public IP**.

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Recording an Issue



If it is not possible to provide remote access for security reasons, a supporting video clip can help understand and investigate the issue. To create a video clip:

1. Set up **Screen Recording**: select desired screen and microphone settings (see "[Setting up Screen Recording](#)").
2. Record a narrated (preferred) video explaining the issue (see "[Performing Screen Recording](#)").
3. Attach the video to the support ticket.

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Collecting Logs



The following logs must be provided as part of a support ticket:

- System Logs
- Server Logs
- Client Logs (Note that Client logs are disabled by default. To enable them, you will need to change a config file parameter, please contact .)

You can use **Local Settings -> Advanced -> Browse Logs** to open the directory where log files are saved.

To obtain System Logs

1. Open Event Log form (see "[Viewing Events Log](#)").
2. Choose **<Any Event>**, **<Any Camera>**, **<Write To Log>** filters.
3. Open the context menu and choose *Select All* (shortcut **Ctrl+A**).
4. Open the context menu and choose *Export Selection to File*.
5. Save the file and attach to the support ticket.

To obtain Server Logs

1. Right-click on the desired server , open the context menu and choose *Server Logs...* The log will open in a web browser.
2. Copy all text (**Ctrl+A**) and paste it into a new text file.
3. Repeat this for all servers (if necessary).
4. Save the file and attach to the support ticket.

To obtain Client Logs

- **Windows:** C:\Users\\AppData\Local\Hanwha\Hanwha Wisenet WAVE Client\log\
WAVELog
- **Linux:** /home/<Local User>/local/share/Hanwha/Hanwha Wisenet WAVE Client/log
- **Mac OS X:** /Users/<Local User>/Library/Application Support/Hanwha/Hanwha Wisenet WAVE Client/log/

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Collecting Additional Information



To display product version, hardware, and driver information, go to **Main Menu** and select **About** (shortcut **F1**).

The *About Wisenet WAVE* dialog displays:

- Version and platform information
- A list of external libraries used
- Graphical Processing Unit (GPU) information
- System servers
- Wisenet WAVE components and driver versions
- Customer Support contact information

This data is required by the support team and should be provided in addition to other pertinent details. (Similar information can be acquired with standard Windows tools such as **ipconfig**, but *About Wisenet WAVE* is a more direct and specific to the product.)

Navigation: [Troubleshooting and Contacting Support](#) >

Sending Anonymous Usage and Crash Statistics



Wisenet WAVE helps developers support and enhance the product by sending the following information anonymously:

- Events rules, with details on all settings
- Cameras with details like vendor, model, firmware, max fps, PTZ capabilities and so on
- Information about saved layouts and the cameras they contain
- License information (key, license type, camera count, expiration)
- Media server software information:
 - Version
 - About failover with max cameras
 - Status
 - SystemID
 - User access rights
- Features usage:
 - Button clicks for each camera widget button
 - Button clicks for each timeline button (sync, calendar, play/pause, etc)
 - Count of dialogs opened (per dialog) and opened tabs count
 - Preview search time and count
 - Percentage of time when the window is in fullscreen mode
 - Motion search time and count
 - Percentage of time when the window is active
- Total session time
- Internet network usage
- Client hardware information:
 - "openGLRenderer" (ex. GeForce GT 730/PCIe/SSE2)
 - "OpenGL vendor" (ex. NVIDIA Corporation)
 - "OpenGL version" (ex. 4.4.0 NVIDIA 331.113)

Statistics reports are sent once a month. This feature is enabled by default. To disable it:

1. Open System Administration and go to the **General** tab.

2. Clear the **Send anonymous usage and crash statistics to software developers** checkbox and click *OK*.

Navigation: »No topics above this level«



Administrator – a user that configures Wisenet WAVE.

Archive – video and audio data recorded from cameras.

Aspect Ratio (AR) – image dimensions shown as height:width. Most commonly used are: 4:3 and 16:9.

Bitrate – number of bytes per second. Used to measure video stream.

Client – the software used to connect to servers and view video streams.

Codec – video or audio compression.

Dual Streaming – enables a camera to provide two separate streams simultaneously, yielding bandwidth and processor savings on Client (see RADASS).

Export – allows to export a video footage from archive. Exported video can be viewed on any device.

FPS – Frames per Second. Used to measure video stream.

GPU – Graphic Processing Unit. The processor installed on the video card.

HTTP – Hyper Text Transfer Protocol. Some cameras use this protocol to stream video.

Item – video or image in layout.

Layout – saved video items and their position, size and orientation. Used to present surveillance information to Wisenet WAVE user.

Live – ability to view cameras live in real-time mode.

Motion Detection – indicates whether or not any motion occurred within a camera's viewing zone.

Motion Mask – the area in viewing zone that does not trigger motion detection.

Multi-Video Export – an ability to backup several videos in a proprietary format or executable bundle.

NVR – Network Video Recorder. An NVR is a software program that records video that is encoded and processed in-camera and streamed over a network to a storage device.

ONVIF – a unified protocol used for communication with cameras. See

<http://www.onvif.org/>.

OS – Operating System.

Owner – an initial user with full access to Wisenet WAVE (his login is **admin**). This user cannot be deleted.

Preview Search – breaks down a period of time into smaller video segments. Example: a month broken into ten 3-day periods displaying them as separate video segments. Eases search of large archives.

Private (cameras) Network – the network used to transmit data from cameras to server. It is not accessible from outside.

Public (Intranet) Network – the network used to connect to server from outside. May be used for either connecting server to server, or configuring server components. It may or may not be connected to the Internet.

Public IP – IP Address that can be accessed from the Internet.

PTZ – Pan, Tilt, Zoom (a camera must support PTZ for this feature to be valid).

Resources – cameras, servers, local video files, users and layouts.

RADASS – Resolution and Algorithmic Data Adaptive Scaling System. Enables dynamic switching of resolution to yield bandwidth savings and optimize processor load. Requires dual-streaming to be supported by the cameras used.

RTSP – Real Time Streaming Protocol. Some cameras use this protocol to stream video.

RTSP Port – the port used by server to process requests for media streams from Wisenet WAVE Client.

Server – the computer that Wisenet WAVE server is installed on.

Server Port – used by server to process requests for recorded fragments and video data from Wisenet WAVE Client.

Smart Motion Search – an ability to search by motion within the selected range. Wisenet WAVE will provide fragments with motion occurred in the specified region.

Sync – ability to play back several cameras simultaneously.

Thumbnails – small snapshots of recorded footage used in searching.

URL – Uniform Resource Locator is a specific character string that constitutes

a reference to an Internet/Intranet resource. Used to establish connection to server.

Viewer – a user with a limited access to Wisenet WAVE (not permitted to change configuration).

Watermark – used to check validity of exported files. If a file was modified or altered in any way, watermark will fail.

Navigation: [Working with Wisenet WAVE](#) > [Configuring Server Settings](#) >

Configuring Backup and Redundant Storage



Wisenet WAVE provides the ability to add redundant storage. This means that even if the server used for archive goes offline, the archive will still be available. This is especially useful in multi-server environments. The most common structure is to set servers to record and back up archive to a NAS device, or to each other.

There is also an internal archive integrity check so that if archive files are changed or removed, users who are actively viewing that archive will be notified. See "[Archive Integrity Check Failure](#)".

! IMPORTANT: To configure either backup or redundant storage it is necessary to define at least one main and one backup storage location as described in "[Configuring Server and NAS Storage](#)".

To configure redundant storage

1. Make sure each server is available and accessible through the network.
2. Create a shared folder on each server and make sure `\\server\shared` is accessible through the network.
3. Go to **Server Settings** and add all shared folders as NAS devices.
4. Set to **Backup** on each one added.
5. Repeat the above steps on all servers.
6. Setup backup parameters as described below.

With this structure, each server will back up footage to all other servers in the System. This will reduce the overall amount of stored footage but creates healthy redundancy.

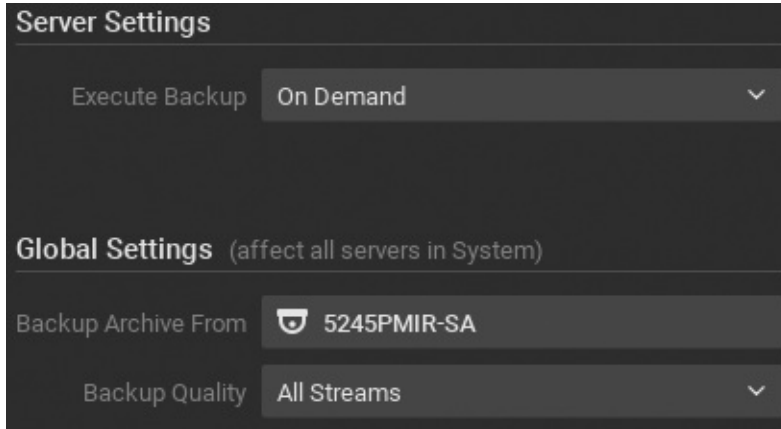
Note that each server backs up the archive for selected cameras, but if a camera is moved to a different server, backup will include only the portion archived when the camera was recorded on the previous server, not the entire archive.

To configure storage backup

Backup settings are defined in the **Server Settings -> Storage Management** tab. Note that these are System-level settings that affect all servers, and are saved even if a backup storage location is not defined or is not currently attached. Once backup storage is available they will be applied. A small alert displays under the *Backup Archive* section of **Server Settings -> Storage**

Management if you there is no backup storage drive or no camera have been selected.

1. In **Server Settings** -> **Storage Management**, click on the **Backup Settings** button to open the *Server Settings* dialog:



2. Click **Backup Archive From** to select cameras that will have their archive backed up. In the *Select Device to Backup* list that opens, you can check **Backup newly added devices** to discover and include devices that may be added to the System later. Click *OK* when you are finished selecting cameras.
3. Use the **Backup Quality** menu to select which streams to backup (*Hi-Res*, *Lo-Res*, or *All*) based on your available bandwidth.
4. **Execute Backup** provides several backup options:
 - **On Demand** – backup occurs only when **Start Backup Now** button in **Server Settings** -> **Storage Management** tab is pressed, and continues until all data is backed up or the operation is canceled. **Only previous data is backed up in this case.**
 - **Real-Time** – footage is written to main and backup location(s) immediately and simultaneously, so backup is performed immediately and continuously. If there is insufficient bandwidth to write to a network location, a warning displays. **Previous data is not backed up in this case.**
 - **By Schedule** – backup is performed on specific days of week, between specific start and finish hours, or *Until finished*. **Only previous data is backed up in this case.** Note that the footage will be backed up since the last time backup was finished (or since the very beginning if it is the first time backup occurs). If network bandwidth is insufficient, the backup may not be fully completed within the specified time frame. If this occurs, the date and time of the footage that was backed up will be clearly

indicated (*Archive backup complete until...*). There is an option to **Limit Bandwidth to** a certain Mbit/s. Note, however, that too tight a bandwidth constraint can cause the entire backup to fail.


When archive backup is finished, a corresponding notification event is triggered. See "[Archive Backup Finished](#)".

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Analyzing and Predicting Storage Usage



Due to differing bitrate streams, different cameras may require more or less storage space to save data for the same time interval. Wisenet WAVE uses a special algorithm to balance storage in order to keep the same amount of time stored for different cameras. Wisenet WAVE storage analytics help estimate and predict storage usage.

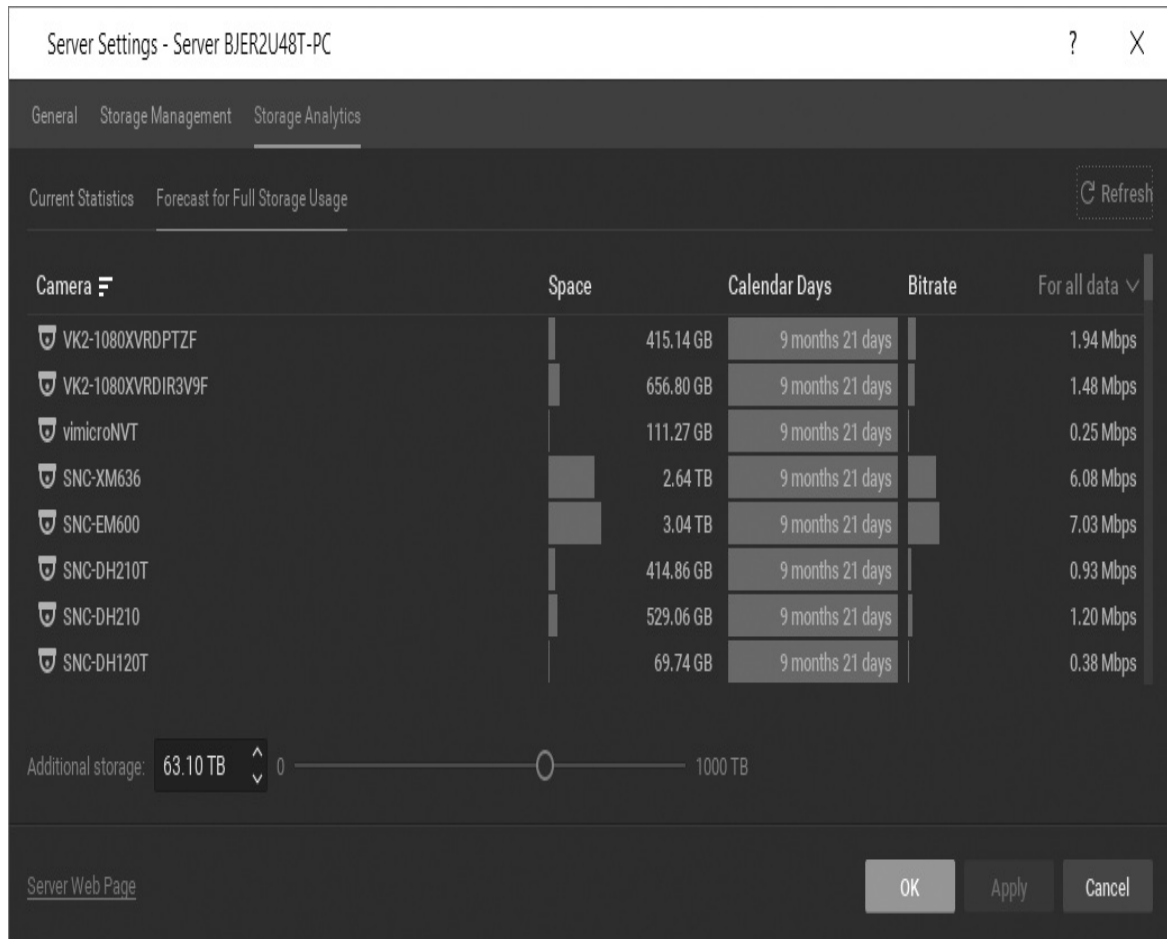
 **Note:** Administrators have the option of setting a minimum or maximum number of days that data is archived for any given camera. See "[Configuring Minimum and Maximum Archive Storage](#)".

Some common ways storage analysis can be used:

- Identify camera(s) that stream at extremely high bitrates
- Estimate amount of time that server can store data from a given device, in days and hours
- Understand the storage space that each camera consumes
- Predict the amount of time a server can store recording if additional storage is added.

To access Storage Statistics for a server:


1. Open **Server Settings** from the server context menu and go to the **Storage Analytics** tab. Data is displayed by server and then by individual camera.



- *Camera* – Camera name
- *Space* – the amount of storage currently consumed by recordings from this camera
- *Calendar Days* – the amount of recorded data that is available for this camera. Wisenet WAVE uses special algorithm to keep the same amount of time stored for different cameras. However a user can set minimum or maximum storage duration in days for individual cameras. See "[Configuring Maximum and Minimum Recording Time for Camera](#)".
- *Bitrate for (all data, hour, day etc)* – the average bitrate of the camera. It is possible to specify the amount of time the average bitrate is calculated for, by specifying it in the upper-right dropdown list (i.e last 5 minutes or last day).

To anticipate the storage capacity it is necessary to switch to the *Forecast for full storage(s)* tab and select the amount of storage to be added (in the screenshot shown 63.10 TB is considered to be added). The software will display the amount of time camera(s) can be recorded with the added capacity

(notice *Calendar Days* and *Space*).

 **Note:** The data may change after the form is opened. To update it click *Refresh*.

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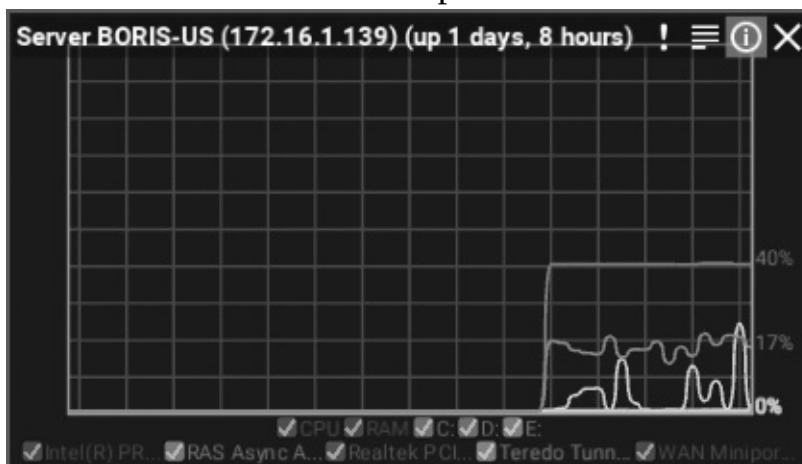
Monitoring Servers



Wisenet WAVE lets you view server processing usage in real-time, as a standard item that can be moved, resized, duplicated, etc.

To monitor server health

- Click-and-drag the server from the Resource Tree into a new or existing layout, or
- Open the server context menu and choose *Monitor*, *Monitor in New Tab*, or *Monitor in New Window* to open the chart shown below:



Only traces are displayed unless the cursor is hovered over the graph, which toggles display of the following:

- Server name and elapsed time since the server was last started
- CPU load
- RAM memory usage
- Hard disk partition usage (for example, *C:* and *D:*)
- Network interfaces usage
- Percentage of capability being used (on the right side)

Display can be controlled from the legend at the bottom. A trace can be enabled or disabled by checking the box next to its name, and when the mouse cursor is hovered over a name, the corresponding trace will be highlighted while all other traces will be grayed out.

Multiple servers can be monitored simultaneously. To quickly view the health of all available servers in a single layout, open **Main Menu**, choose **System Administration** (shortcut **Ctrl+Alt+A**), then click the **Health Monitoring**

icon.

The server monitor item provides a visual indicator if an aspect of server functions reaches a critical level.

Navigation: [Working with Wisenet WAVE](#) > [Wisenet WAVE Licenses](#) >

Obtaining and Activating Licenses



Wisenet WAVE comes with four trial licenses. A trial license is active for 30 days.

! IMPORTANT: Multi-Server System licenses are activated on the server to which the client is currently connected. If this server is offline, those licenses will be invalid until the server is back online. Note that licenses that are activated on different servers will be combined if the servers are merged into a single System.

To activate a trial license


1. Open **Main Menu** → **System Administration** (shortcut **Ctrl+Alt+A**) and go to the **Licenses** tab.
2. Click **Activate Trial License**.

 **Note:** You will be warned when a trial license is about to expire.

To get additional licenses, contact your local Wisenet WAVE reseller or Hanwha customer service using the following address:

<http://wavevms.com/support>.

To activate a license over the Internet

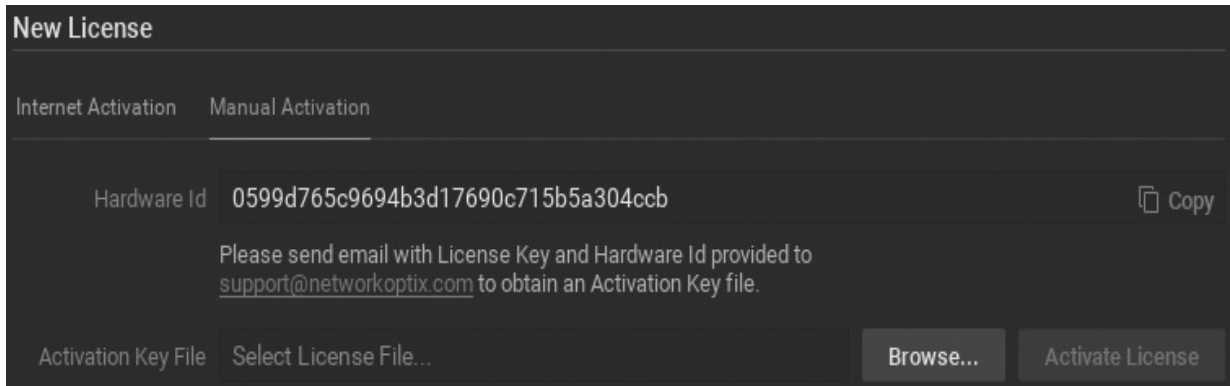
1. Note server the client is connected to (as indicated by the current server  icon in the Resource Tree), as the license key will be bound to it. If it is necessary to activate the license key on a different server, disconnect and connect to a desired one.
2. Select the **Licenses** tab in **System Administration**.
3. Go to the **Internet Activation** tab.
4. Enter or paste in the *License Key* value and click **Activate License**.

If Wisenet WAVE is not connected to the Internet, then licenses can be activated offline.

To activate a license (trial or commercial) offline

In situations where an Wisenet WAVE System is installed on a device that does not have Internet access, users will be required to perform an Offline (or Manual) license activation. Launch the Wisenet WAVE Client and connect to the server on which you wish to do an Offline (manual) Activation. The Wisenet WAVE Desktop Client is required - mobile or web clients do not have the ability to located licensing information.

1. Go to **Licenses** tab in **System Administration**.
2. Go to **Manual Activation** tab.





3. Press the **Copy to Clipboard** button to copy the hardware ID.
4. Email support@networkoptix.com to request an activation key, with the **Hardware ID** and **License Key** you received included.
5. As soon as you receive the activation key, import it to the target computer using the *Browse* button.

To export a list of license keys

It is possible to export a list of license keys to a CSV or HTML format file. It may be necessary, for instance, if re-activation is needed. To do so, click on *Export* (near the upper right corner) and select the target file.

Wisenet WAVE allows for license deactivation as well. See "[Expired and Invalid License Keys](#)".

 **Note:** When recording is enabled for a device, the license is considered in use even if the device is not currently recording (as indicated by the empty circle  icon to the left of device in the Resource Tree).

Insufficient licenses available

In an insufficient number of licenses is available to allow for a given camera to be recorded, the following warning will appear:

License limit exceeded (*X* of *Y* used). Your schedule will be saved, but will not take effect. *Enable Recording* flag will be disabled; however, all schedule settings will be saved.

Navigation: [Working with Wisenet WAVE](#) > [Video Wall Mode](#) >

Configuring a Video Wall Display



Use the Desktop Client running on what will be the display computer to complete the following steps.

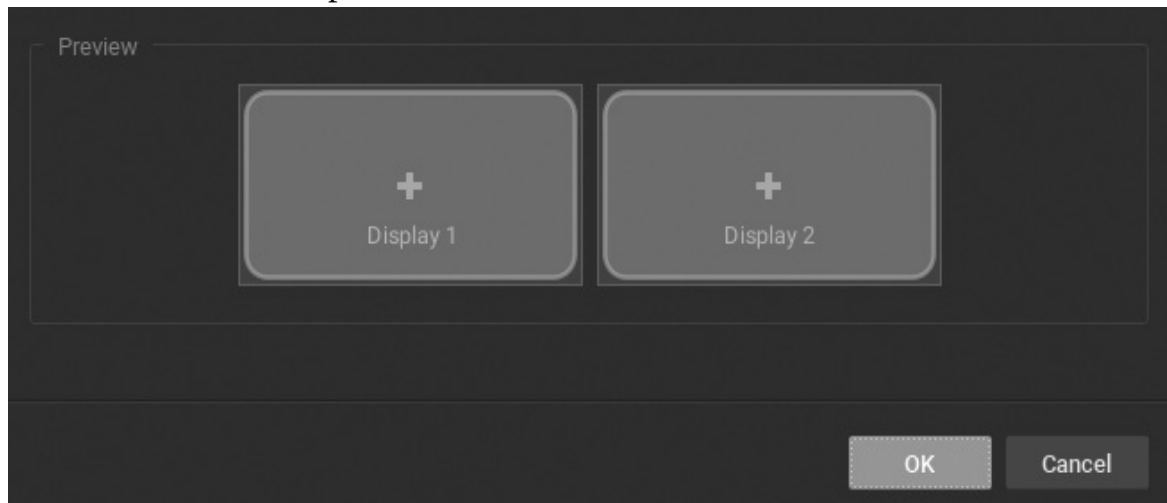
Create a new Video Wall

1. Open the **Main Menu** and choose **New** → **Video Wall**.
2. Enter a name for the Video Wall.
3. Click *OK* to save or *Cancel* to exit.
4. The newly created and named Video Wall will be added to the Resource Tee.

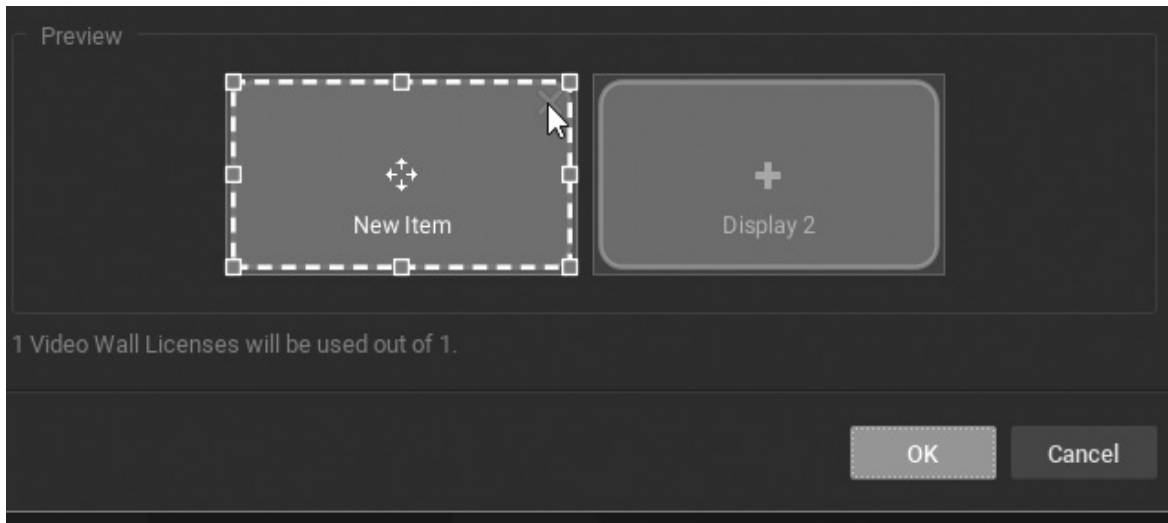
Configure Video Wall Layout

To make a computer display part of Video Wall it is necessary to perform the following settings **on that computer**:

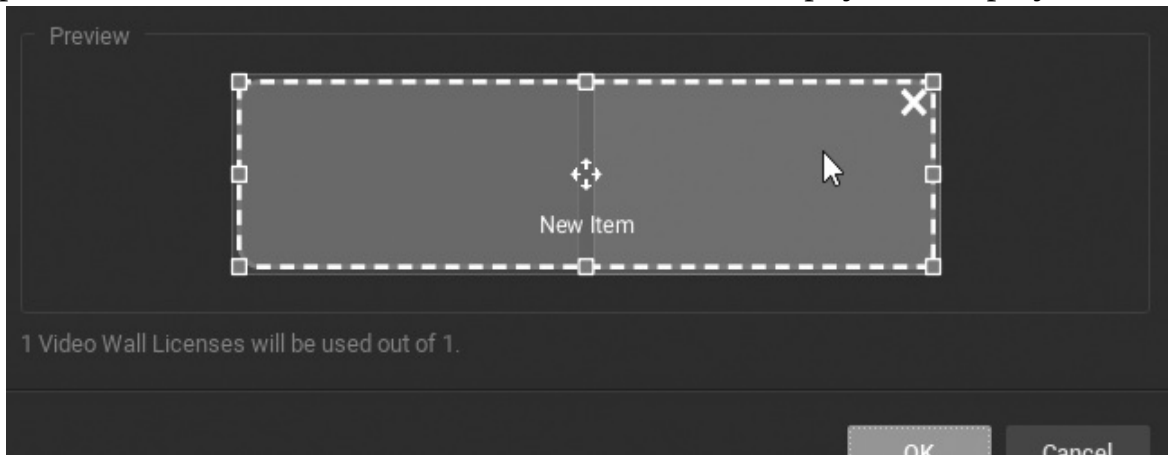
1. Right-click on the Video Wall in the Resource Tree and choose **Attach to Video Wall**.
2. Wisenet WAVE automatically detects, numbers, and previews the displays connected to the computer.



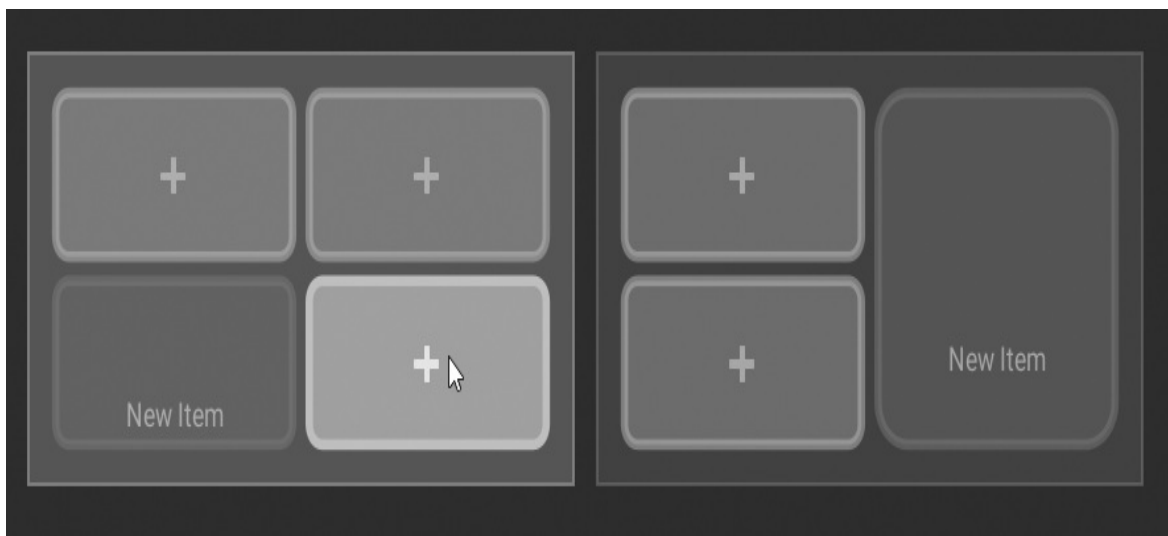
3. Click on an item in the dialog (it will change color and be retitled "New Item"). In this state you can drag the edges to resize the item, click-and-drag in the center to reposition it, or click on the "X" in the upper-right corner to remove the screen.



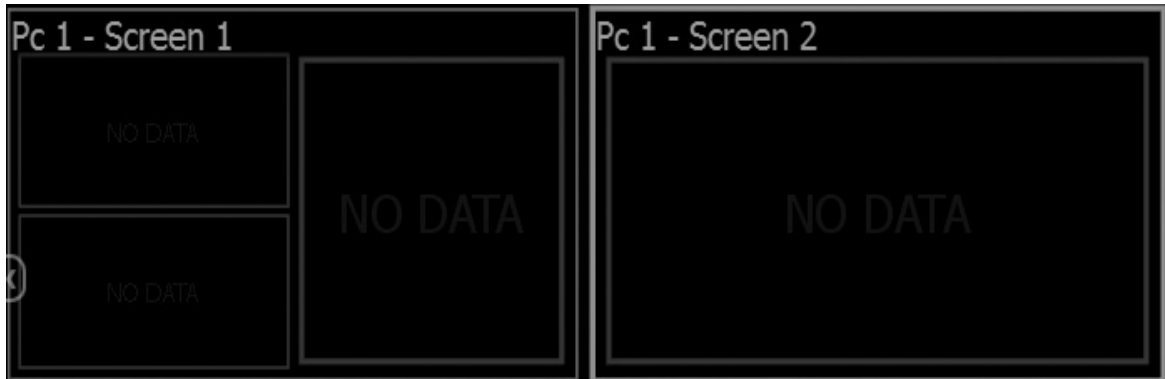
4. Typically, one Virtual screen represents one physical display. It is also possible to stretch one Virtual Screen across several physical displays:



Or, you can design one physical display that contains multiple Virtual Screens, in various combinations:



5. Once the screens are arranged as desired, click OK to save the configuration.



4. At this point you can drag-and-drop resources (devices, web pages, local files, etc.) from the Resource Tree into the Video Wall layout. It is possible to place a single device or an entire Layout into each Virtual Screen.



- To remove a resource from a Virtual Screen, right-click on it in the Video Wall layout and choose *Clear Screen*.
- To simplify the calibration process it is possible to add identification information of a resource the corresponding physical Display. To do so right-click on the desired Virtual Display and select *Identify*.

5. To save changes, right-click on the Video Wall in the Resource Tree and choose *Save Current Matrix*. The Matrix will be added to the Resource Tree under the current Video Wall, where you can right-click to rename it, load or delete it.
6. Right-click on the Video Wall in the Resource Tree and choose *Save Video Wall* (shortcut Ctrl+S).

To finalize configuration it is necessary to [Switch Video Wall Processor to Video Wall Mode](#). After a Video Wall has been started on the Video Wall Processor, the current configuration can also be changed on the Video Wall Controller. To restore a Video Wall view, expand the Video Wall in Resource Tree, right-click on a saved Matrix and choose *Load Matrix*.

To open Video Wall on a Video Wall Controller

- Drag Video Wall onto the layout
- Right-click on the desired Video Wall in Resource Tree and choose *Open Video Wall*.

Navigation: [Working with Wisenet WAVE](#) > [Video Wall Mode](#) >

Switching to Video Wall Mode



To control a Video Wall it is necessary to switch the Video Wall Processor to Video Wall Mode. **This should be done on Video Wall Processor.**

Usually Video Walls are controlled from a Video Wall Controller, and the computers the displays are connected to are easily accessible. So it is recommended to set up automatic switching to Video Wall Mode. To do so:

1. Right-click on **Video Wall** in Resource Tree and choose **Video Wall Settings**.
2. Click on **Launch video wall when Windows starts** and click *OK*. (This option is enabled by default.)

To switch to Video Wall Mode, right-click on **Video Wall** in the Resource Tree and choose *Switch to Video Wall Mode* and click *Yes* on the dialog window.

Several instances of the Client will be launched. The Client will be switched to Video Wall mode and will become inoperable. At this point it is possible to change settings and control the Video Wall from the Video Wall Controller.

To switch back from Video Wall to standard mode it is necessary to close all Client instances (shortcut **Alt+F4**) and relaunch the Client once more. In this case, operator won't be able to control displays connected to this Video Wall Processor and the corresponding screens will be displayed in the Resource Tree as offline.

Navigation: [Working with Wisenet WAVE](#) > [Video Wall Mode](#) >

Configuring Video Wall on Several Computers



To increase the number of Video Wall displays you must to add additional Video Wall processors.

To add a Video Wall Processor

1. Run the Desktop Client on the PC that should be added to the current Video Wall. Physical displays should be connected to this machine.
2. Right-click on desired Video Wall in the Resource Tree and choose *Attach to Video Wall*.
3. Repeat all steps described in "[Configuring a Video Wall Display](#)".
4. Switch to Video Wall Mode (see "[Switching to Video Wall Mode](#)").
5. Repeat the steps above on each Video Wall Processor.

Video Wall mode will be extended and will include displays connected to the newly attached Video Wall Processors.

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Deleting a Video Wall or Elements



To Delete a Video Wall, right-click on it in the Resource Tree and choose *Delete*, then click *Delete* in the confirmation dialog. This action will delete all Screens and configurations related to this Video Wall, and will stop the Video Wall on every single Video Wall Processor.

The following Video Wall elements can be deleted

- **Screen.** Right-click on a screen in the Resource Tree and choose *Delete*, then click *Delete* in the confirmation dialog. This results in stopping the Video Wall in the corresponding physical Display.
- **Matrix.** Right-click on a matrix in the Resource Tree and choose *Delete*, then click *Delete* in the confirmation dialog to delete a saved configuration.

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Controlling Video Wall Displays



Users with sufficient rights can change the layouts that are placed on a Video Wall.


As soon as a Video Wall Display is opened on the Video Wall Controller, the user can control it like any other layout - it is possible to change the layout, navigate through archive, perform searches, etc. All changes made on the Video Wall Controller are immediately displayed on the Video Wall itself.

It is also possible to push the Video Wall Controller desktop view to Video Wall. See "[Pushing Operator's Screen on Video Wall](#)".

To control Video Wall

1. Use one of the following to open Video Wall on the Video Wall Controller:

- Drag Video Wall onto the layout
- Right-click on desired Video Wall in Resource Tree and choose *Open Video Wall(s)*.

 **Note:** It is not possible to open videos in this Layout.

2. Double-click on the desired Video Wall Screen to enter control mode. The layout of this screen will be opened and you will be able to perform any necessary operations:

- [Adding Items to a Layout](#)
- [Removing Items from a Layout](#)
- [Arranging Item Display in Layout](#)
- [Selecting Items in Layout](#)
- [Moving and Swapping Items in Layout](#)
- [Resizing Items](#)
- [Cell Spacing](#)
- [Changing Cell Aspect Ratio](#)
- [Creating a Zoom Window](#)
- [Working with Multiple Wisenet WAVE Windows](#)
- [Navigating through Archive and Live](#)
- [Pushing Operator's Screen on Video Wall](#).

All changes will be reflected **immediately** on the corresponding Video Wall Display.

Navigation: [Working with Wisenet WAVE](#) > [Wisenet WAVE User Interface](#) > [Viewing Grid](#) >

Cell Spacing



This feature is used to change the spacing between items in layout so they can be closer together or further apart.

For example, four individual single-sensor cameras that together form a 180 degree panoramic view would best be displayed without any space between cells.

To adjust the distance between items, open the Viewing Grid context menu and select **Change Cell Spacing**, or use **Ctrl+Mouse Wheel** on the viewing grid. Options are *None*, *Small*, *Medium*, or *Large*.