LUXRIOT EVO
User Guide

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Luxriot EVO Monitor User Guide

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Luxriot EVO Monitor User Guide

1   Interface Overview

Luxriot Monitor is a dedicated interface for viewing live and recorded contents of connected Luxriot servers; it also includes advanced features such as video and snapshot export, alert monitoring, PTZ and digital PTZ control, among others.

We recommend that end users and CCTV station operators become acquainted with this document in order to understand application interface and work out some personal usage strategies.
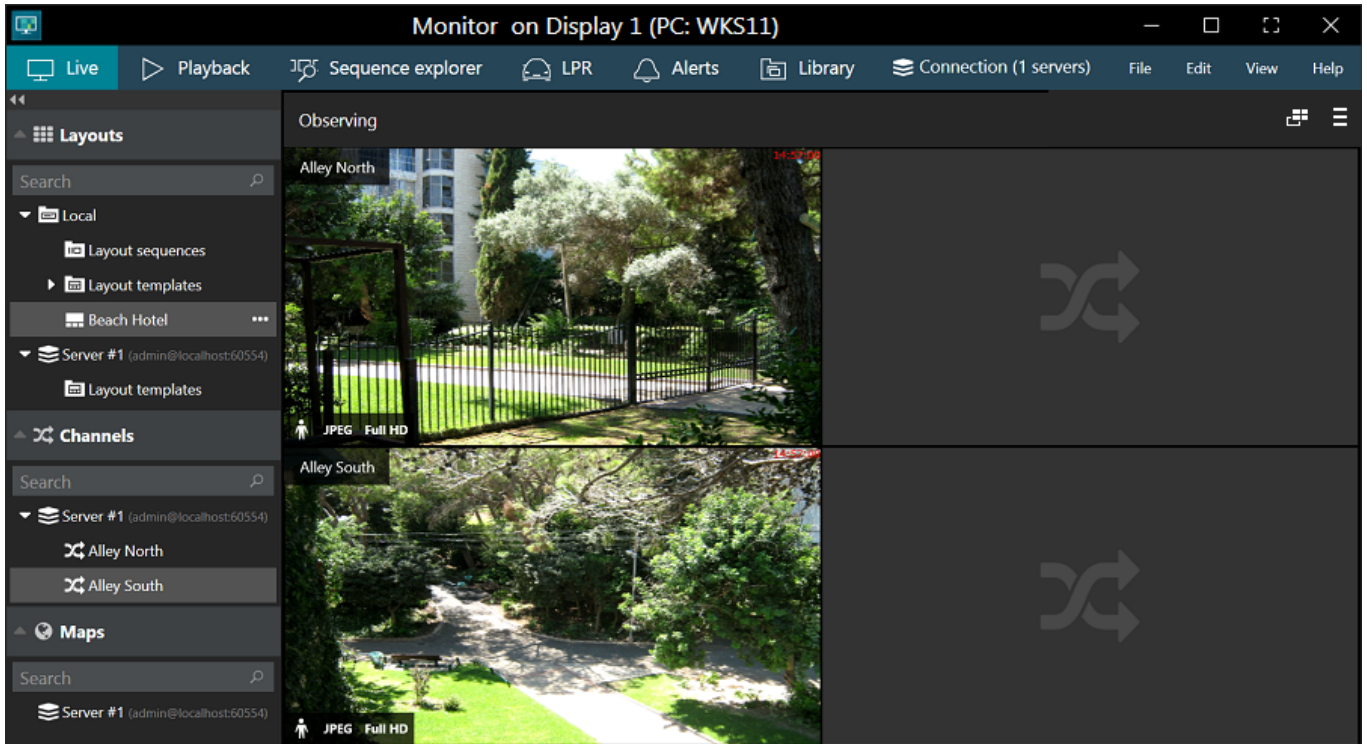
The Luxriot Monitor application window title displays window name, display number, computer station name, and also video wall title and display number.

Upper panel - tabs

The upper panel contains tabs that allow you to quickly switch between the main software functionalities.

Upper right: main menu

This section contains the main application menu items.

Left menu

This section displays resources from connected servers: layouts, channels, maps and configured servers.

Main window

Main window displays contents provided by server, which depend on the tab selected.

Please refer to the Interface Elements section of this document for detailed information about all Luxriot Monitor panels, buttons and other controls.

2 Interface Elements

This topic covers Luxriot Monitor interface elements in more details.
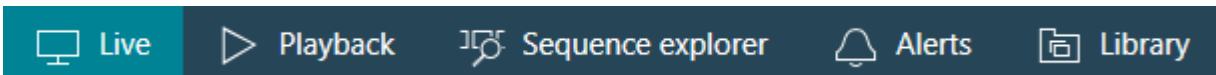
Upper right corner - window controls

From this panel, the Luxriot Monitor application window can be:

- opened in fullscreen mode
- minimized to taskbar
- maximised/restored to default size
- closed

To enter fullscreen, F11 can also be used; to exit fullscreen mode, press *Escape* or *F11* on the keyboard.

Upper panel - tabs

The upper panel contains tabs that allow you to quickly switch between main software functionality. The following tabs may be available, depending on the software version:
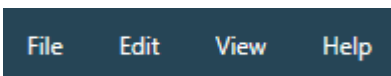
- **Live**: real-time video
- **Playback**: recorded video
- **Sequence Explorer**: recorded video analysis
- **Alerts**: generated alerts
- **Library**: exported video and snapshots

Upper panel - server connections
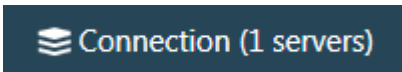
The *Connection* button opens server connection setup window and also displays the number of currently configured servers.

Upper right: main menu
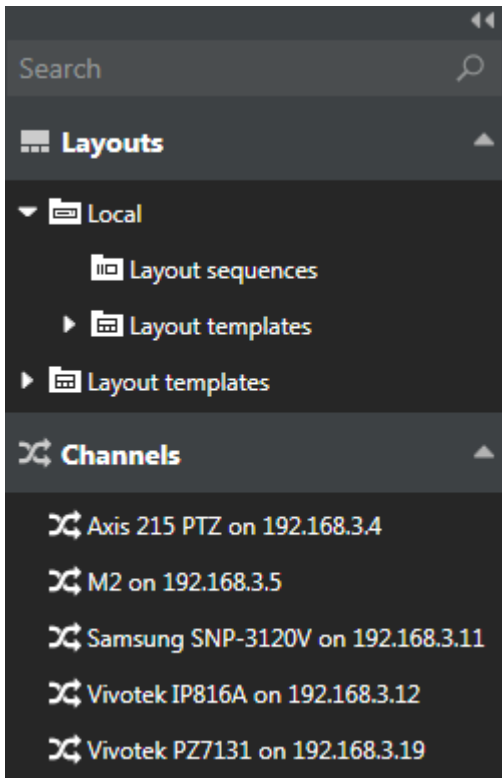
This section contains the main application menu items.

- **File**
  - *Exit*: close the Luxriot Monitor application
- **Edit**
  - *Settings*: application settings
- **View**: operation modes
  - *Always on top*
  - *Exclusivity mode*
  - *Locked application*
- **Help**
  - *About*: about Luxriot Monitor

Left menu - resources

This section displays resources from the connected servers: layouts, channels and maps loaded from configured servers. If visual grouping has been configured for the target server, the resources will be arranged into expandable lists.

The panel can be docked to the left by pressing the << arrows in the upper part of the panel, and restored back by clicking the >> arrows; individual resource lists can also be collapsed and restored by clicking the subsection name. *Search* field in the upper panel part allows you to filter the resources based on the entered text.

- **Search**: global resource search
- **Layouts and layout templates**
    - Local resources: stored on Luxriot Monitor machine
    - Server resources: loaded from connected server(s)
- **Channels**: per server or mixed, if *Merge resources* option has been enabled in the [server connection](#) properties
- **Maps***
- **User Buttons***

*Some resources may be unavailable for certain software editions.

Main window

The main window displays content provided by the server, which depend upon the selected tab. Please see the corresponding sections of this document for detailed information about each mode.

3　　About

Information about currently running software can be viewed using the local computer in following way: in Luxriot Monitor, go to the main menu, click Help and select *About*.

4   License Limitations

Please note that, as Luxriot Monitor application is a single interface for all Luxriot EVO editions, some features described further may not be available in certain Luxriot EVO versions.

When the Luxriot Monitor is connected to a server that is operating with a free license, the following limitations apply:

- the maximum video stream resolution is Full HD (1080p)
- each Luxriot Monitor application can be connected to a single free server at a time
- each free server can have no more than one simultaneous Luxriot Monitor connection
- some types of the resources will be not available (e.g., video wall, maps)
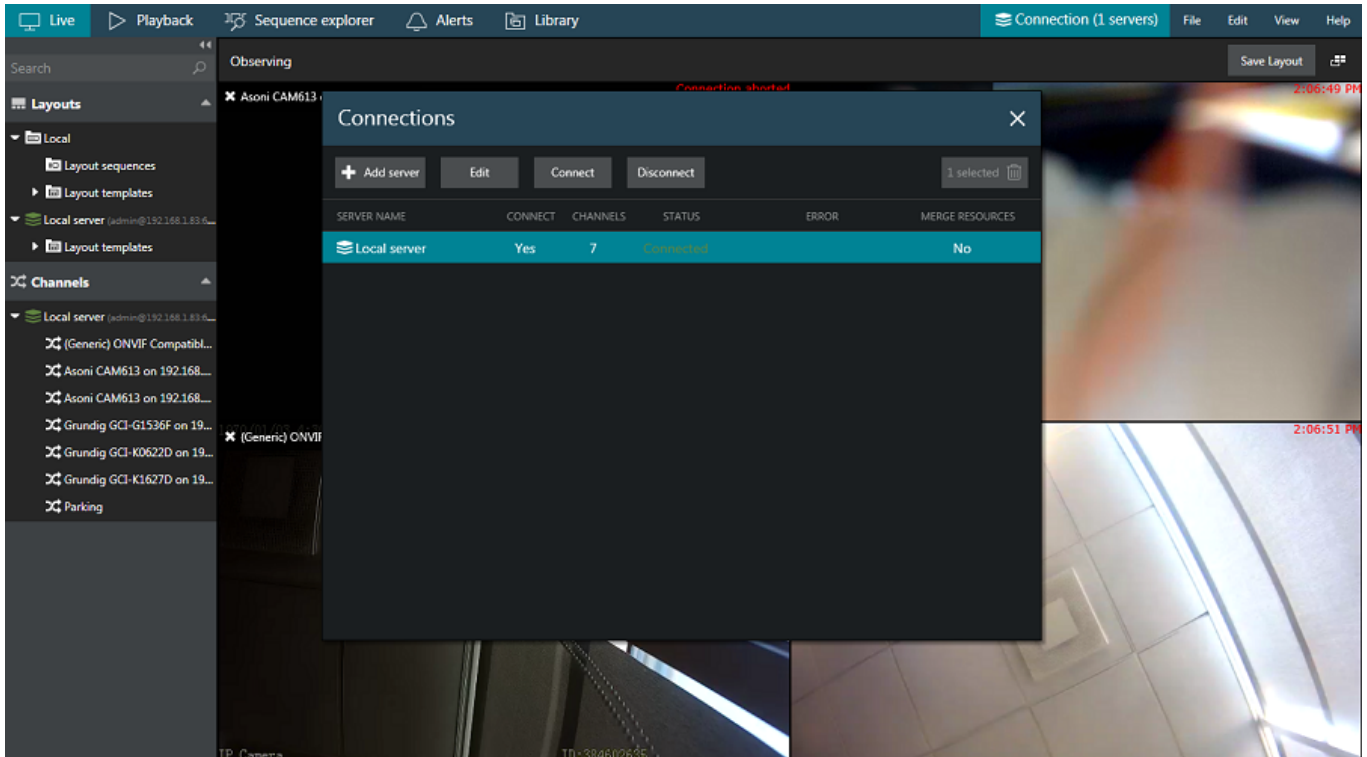
5 Server Connections

The Luxriot EVO software edition allows a maximum of 1 (one) simultaneous connection to the server; Luxriot Monitor can also only be connected to one Luxriot EVO server at once.

Luxriot Monitor application contains local server connection by default. If you wish to connect to a remote server, follow the steps below.

Select the *Connection* section in the upper panel to bring up the dialog box.

Click the *Remove* button in the upper-right-hand corner to delete the existing (which, by default, is the local one) server connection. Click the + *Add server* button to create a new server connection and fill the connection parameters.
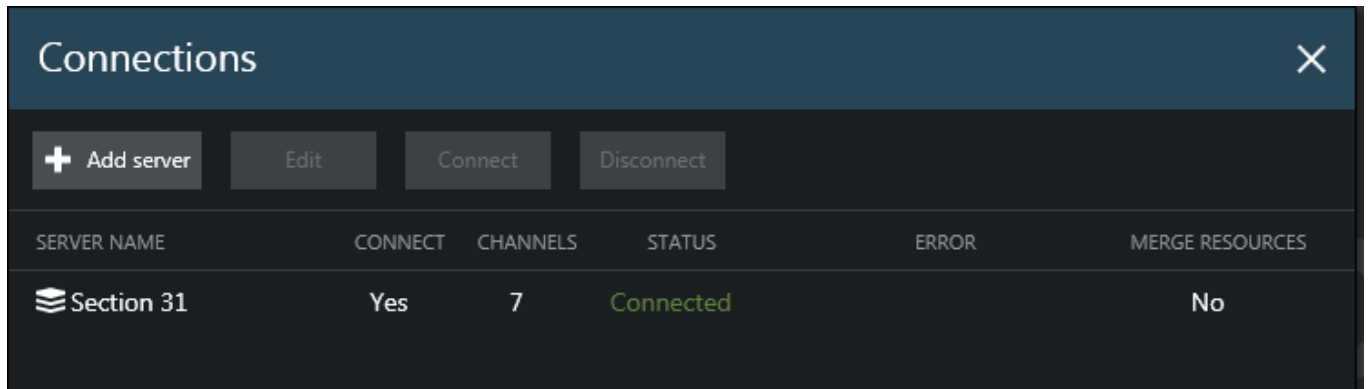
The table below contains details about the available parameters.

Setting	Description	Default value
Server Title	User-defined server name	Server #N
Server IP Address	Local/Internet IP address or host name of the target server	localhost
Server Port	TCP port for remote connection	60554
User Name	User account name for remote connection	admin
User Password	Password for the provided user profile provided	[empty]
Merge Resources	Do not display the source server for accessed resources; shuffle server resources (for multiple servers)	Disabled

Click *Save* when you have finished. The server connection created will appear in the item list and Luxriot Monitor will attempt to establish the connection immediately.
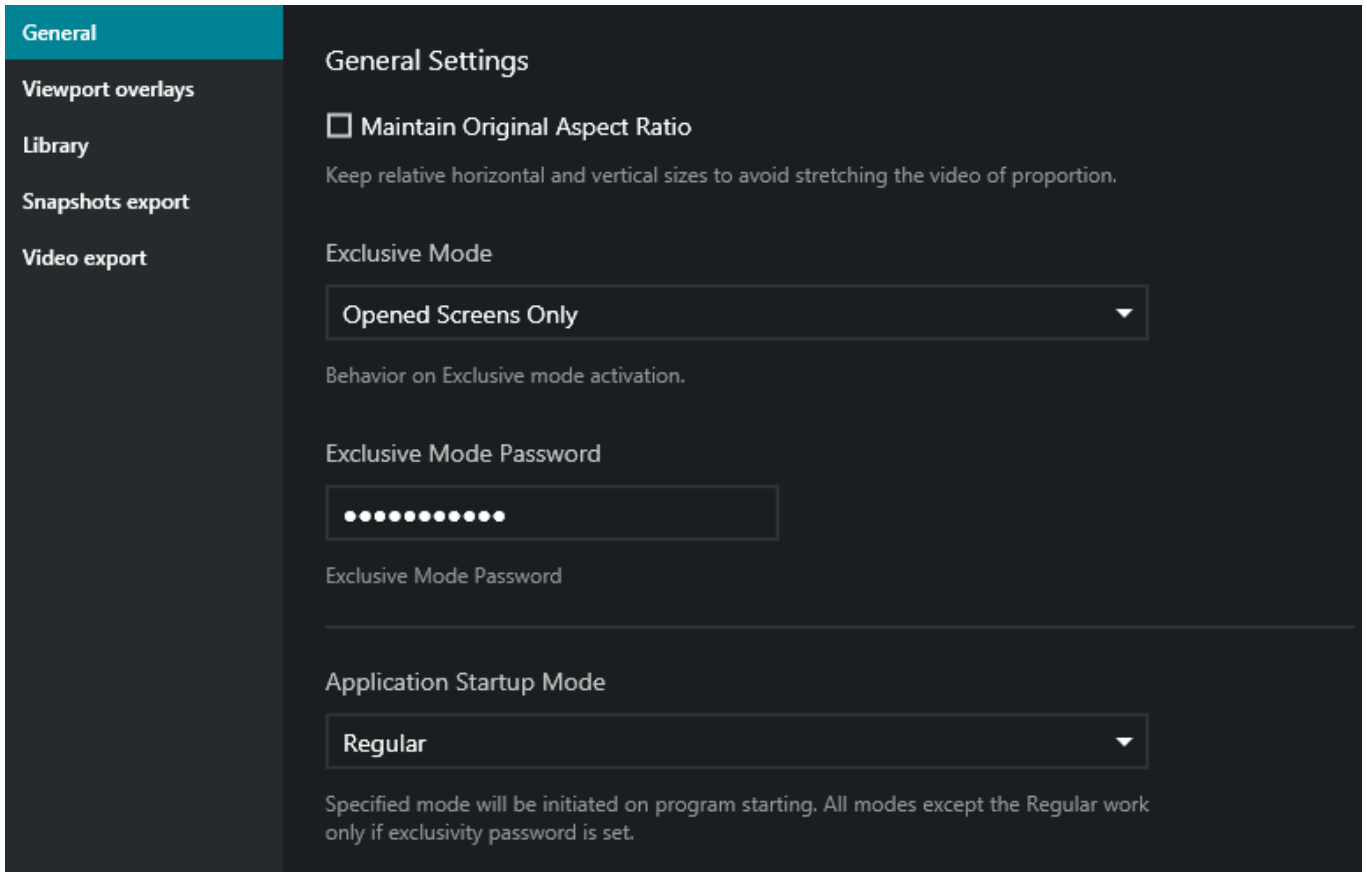
Select a server by clicking it in the item list and click *Connect* in order to (re-)establish a connection with the selected server. Server resources will automatically appear in the left hand panel.

Click *Disconnect* in this same dialog box to log out from the selected server.

6 Application Settings

Application settings are reachable via the main menu by clicking *Edit -> Settings,* and these cover all configurable options of the program GUI. Note that parameters here are defined for the whole application and cannot be set separately for application instances and/or individual layouts, channels etc.

General

The table below contains a detailed description for each setting.

Setting	Description	Default Value
Maintain Original Aspect Ratio	Keep original picture proportions; when OFF, image will be stretched to fill in the viewport	Disabled
Exclusive Mode	Defines if exclusivity mode is applied to all monitors or currently opened application instances only; *All Monitors* mode will force fill all displays with child Luxriot Monitor application instances upon enabling exclusivity mode; *Opened screens only* mode will still allow background application/OS access via displays where no Luxriot Monitor is launched	Opened screens only
Exclusive Mode Password	User-defined password for unlocking exclusivity and locked application modes	[none]
Application Startup Mode	Enables the application to be started in the specified mode (locked/exclusive/both/none); regular = no special mode	Regular
Interactive User Idleness Action	Overrides or allows OS screensaver	System Settings

Viewport Overlays

You can assign separate settings to each overlay item. Note that, regardless of application settings, some controls are not displayed if corresponding action is not available for the target device, e.g., the Instant Playback control item is not shown if there is no archive. The following options are available:

- **Always ON**: always display the overlay element
- **ON if selected**: only display the element when viewport is selected
- **Always OFF**: never display the element

For your convenience, visual overlay elements are previewed on the left side of each setting.

Setting	Description	Default Value
General	Items displayed in the upper-left-hand corner: • Title (device or resource name) • Close (a control allowing to close the current stream and free the viewport) • Lock (a control allowing to lock the stream in its current viewport, making it immune to pop-ups) • User buttons	Always ON
Display status section	Data displayed in the bottom-left-hand corner of the viewport: • Writing On Disk (recording status) • Motion Detection (motion presence) • Video Resolution (picture size) • Video Compression (stream video codec) • Video FPS (stream frame rate) • Video Bitrate (stream data amount)	ON if selected
Display controls section	Controls displayed in the bottom-right-hand corner of the viewport: • Instant Playback (switch mode) • PTZ Toggle (PTZ and preset controls ON/OFF) • PTZ Controls (virtual PTZ sphere) • Digital PTZ Toggle (DPTZ ON/OFF) • Digital PTZ Controls (digital zoom control overlay) • Motion Detection Grid Toggle (MD grid ON/OFF) • Substream Mode Toggle (switch displayed stream: main/sub/auto) • Maintain Aspect Ratio Toggle (auto/fill/original) • Export Snapshot (save frame to library) • Output Audio Toggle (a press-to-speak audio OUT control) • Input Audio Toggle (incoming audio ON/OFF) • Toggle Notifications Pane (panel ON/OFF) • Notifications Pane (panel presence)	ON if selected, except for PTZ controls
PTZ controls section	Pan, tilt and zoom controls: • PTZ Control (PTZ functionality ON/OFF regardless of HUD presence) • PTZ HUD (virtual PTZ sphere) • Iris Slider (iris open/close) • Focus Slider (manual focus control) • Zoom Slider (zoom IN/OUT) • PTZ Toolbar (advanced PTZ controls: presets, tours)	ON if selected

Motion detection section	Show motion detector grid overlay	Always OFF

💡 If you set PTZ Control to *Always OFF*, you will have to use the PTZ Toggle overlay control in order to enable PTZ functionality in live view. If you disable PTZ toggle item, too, user will have no access to PTZ from the viewport.

Library
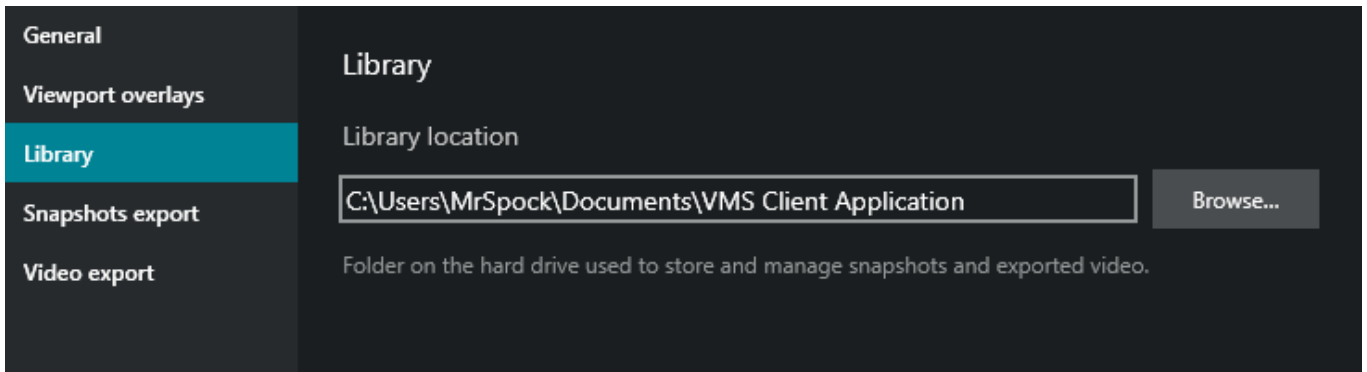
Define the default location for snapshots and exported video to be saved to. The original default location is:

C:\Users\<Windows_user>\Documents\Luxriot Monitor

Snapshot Export
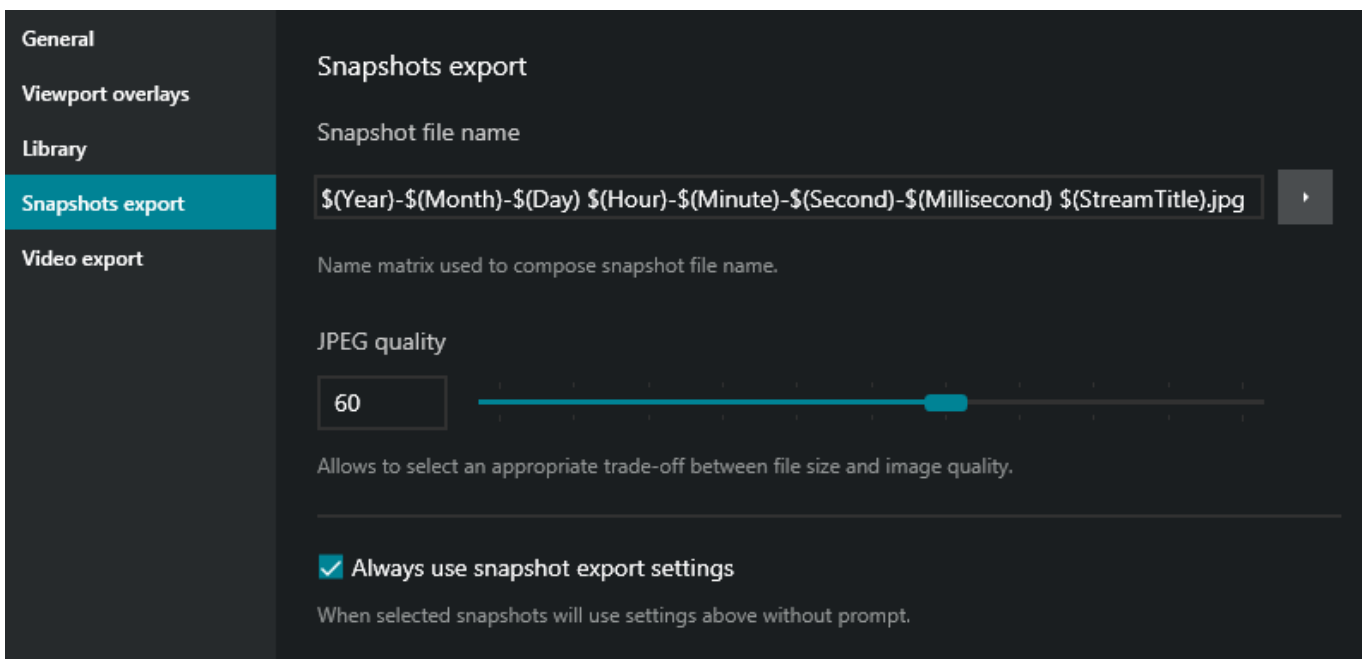
Set file properties for the exported snapshots. The table below contains a detailed description for each setting.

Setting	Description	Default Value
Snapshot file name	File name for exported JPEG snapshots; $(variables) are used for automatic timestamps	$(Year)-$(Month)-$(Day) $(Hour)-$(Minute)-$(Second)-$(Millisecond) $(StreamTitle).jpg
JPEG quality	Picture quality, 1 to 100%	60
Always use snapshot export settings	If enabled, the settings above will be used for all snapshots, otherwise the user will be prompted for these every time	Enabled

Video Export

Set file properties for the exported video clips. The table below contains a detailed description of each setting.

Setting	Description	Default Value
Video file name	File name for the exported video; $(variables) are used for the automatic timestamps	$(Year)-$(Month)-$(Day) $(Hour)-$(Minute)-$(Second) $(StreamTitle)
Video output file type	Choose between AVI and frame series	AVI
Video compression	Keep the original compression or use regular JPEG compressor	Original
Resolution	Choose between full and quarter original resolution	Full
Subtitles	Enable hard merged subtitles for the exported video	Disabled
Reduce long gaps	Merge chunks of video together if the exported footage has gaps	Enabled
Always use archive export settings	If enabled, the settings above will be used for all the exported video clips, otherwise the user will be prompted for these every time	Enabled

7 Live View Section

Click the *Live* tab on the upper panel in order to switch to live video monitoring.

The panel on the left displays resources from connected servers: layout templates, layouts, channels, maps and user buttons loaded from configured servers.

- **Search**: global resource search
- **Layouts and layout templates**
    - Local resources: stored on Luxriot Monitor machine
    - Server resources: loaded from connected server(s)
- **Channels**: per server or mixed, if the *Merge resources* option has been enabled in server connection properties
- **Maps***
- **User Buttons***

*Some resources may be unavailable for certain software editions.

Depending on the resource type, you may be able to click and/or drag items. See the relevant sections of this manual for detailed information on how to use and manage each of these resources.
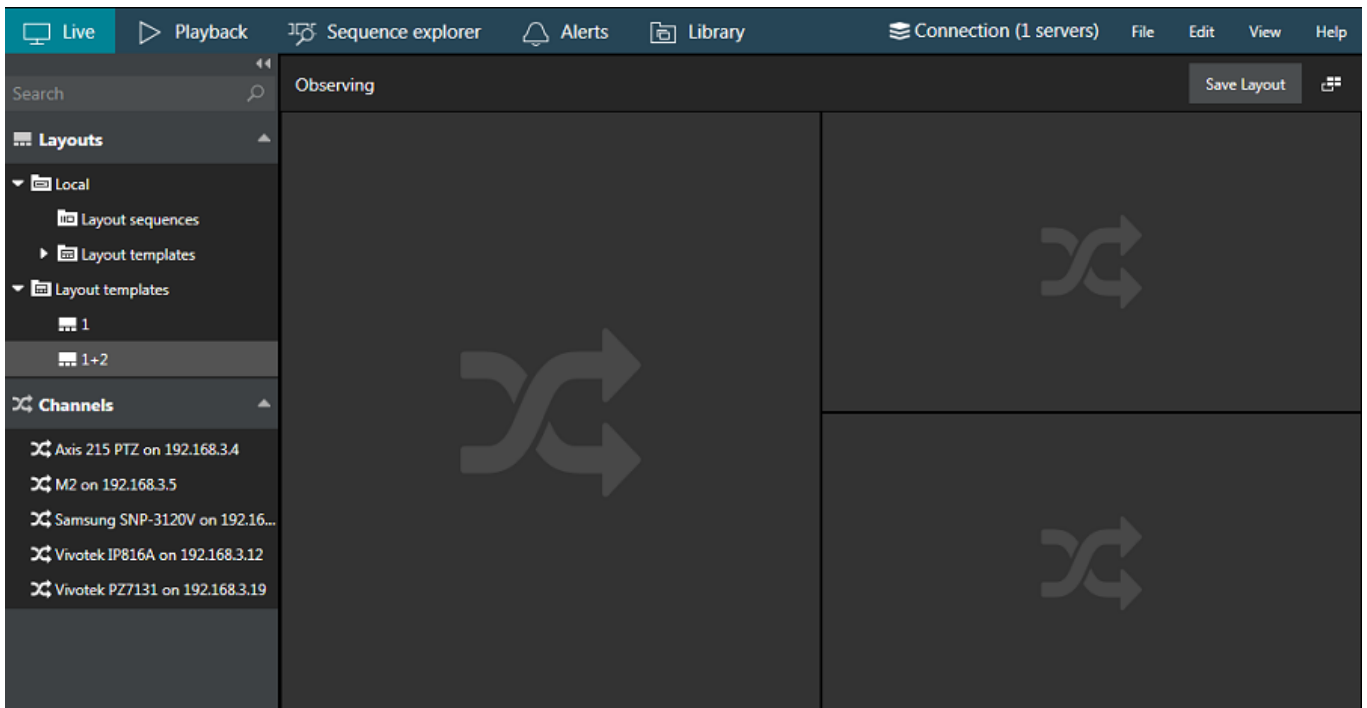
From the *Layouts* menu on the left, select your desired layout template and then drag and drop it into the viewing area. Next, drag and drop channels from your desired server to the empty slots, using the *Channels* menu section on the left. You can save the current layout using the *Save layout* button in the upper-right-hand corner; it will become available in the layout list on the left under the target server name. Right next to it, there is a button that can be used to auto-detect displays, which is especially useful in multi-monitor systems.

Layout templates can be selected either from default local templates or from server layout templates. The latter can be created on the specified server via the Luxriot Console management application.
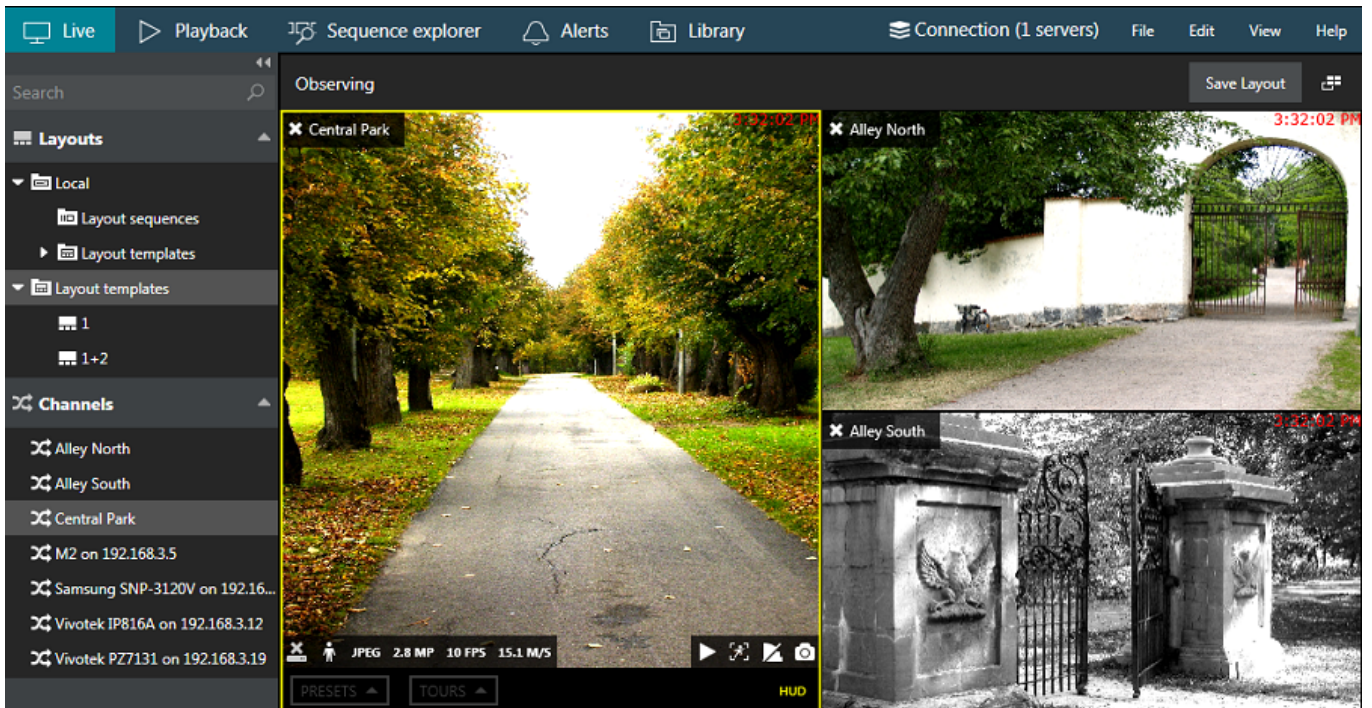
The camera name is displayed in the top left corner of each channel; the current device time will appear in the upper-right-hand corner.

Click any live view to bring up additional channel-specific parameters and quick controls. Overlay preferences can be changed via Application settings. By default, these are:

- Upper-left: general viewport controls
    - **X** - close live stream and free viewport - available with or without viewport selection
    - viewport **lock status**: unlocked (default) or locked; unlocked means that the viewport can be used for map/camera pop-up
    - **camera name**
    - user button, if assigned
- Upper-right: current time on the server from which the device originates
- Lower-left: **stream details**
    - recording status: X = not recording, yellow arrow = recording
    - motion detector status: running = motion present, standing still = no motion detected
    - video codec of the stream
    - picture resolution, abbreviated
    - stream frame rate, FPS
    - stream bitrate, KBytes/s or MBytes/s
- Lower-right: **controls**; enabled items are highlighted yellow
    - instant playback (not available if there are no recordings)
    - PTZ toggle: PTZ HUD and bottom panel ON/OFF
    - DPTZ toggle
    - motion grid ON/OFF
    - incoming audio ON/OFF (if enabled and supported by camera/software integration)
    - audio OUT: press and hold the microphone to speak (control is present only if the feature supported by camera/software integration)
    - substream: auto/main/substream
    - aspect ratio (auto/stretch to fill viewport/original)
    - notification panel toggle
    - snapshot export to library
- Bottom: PTZ controls

- Presets
- Tours
- HUD (Heads Up Display) ON/OFF
- Centre: PTZ HUD controls
  - Pan and tilt arrows
  - Zoom slider
  - Iris slider
  - Focus slider

The upper-right-hand corner of live view section contains controls for multimonitor and video wall setup.

8   Viewport Overlay

Each video displayed in live view is placed into a 'slot', a part of the layout, called viewport. In addition to the picture itself, viewport contains detailed information about the video stream, as well as several quick controls. These elements overlay the video stream, meaning that the actual video does not contain them and they only exist as a part or GUI for enhanced user interaction.

Live View

The following overlay controls are available in live view:
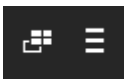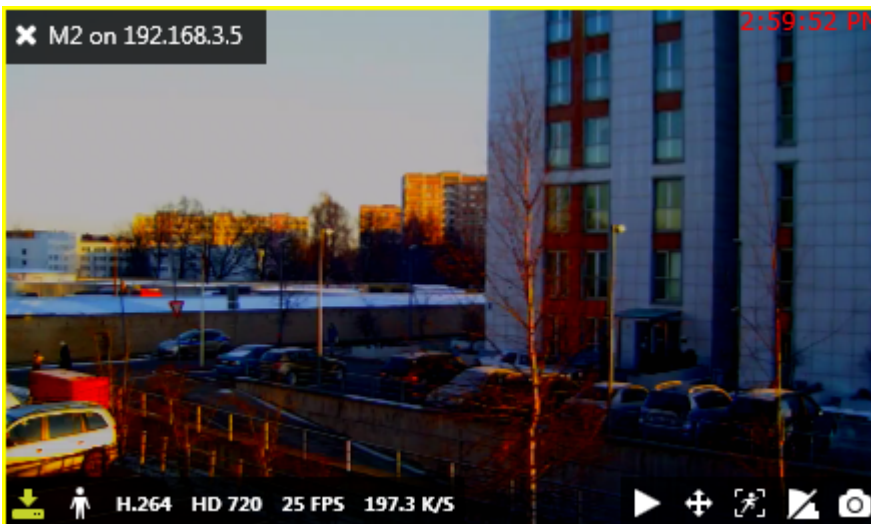
- Upper-left: general viewport controls
    - **X** - close live stream and free viewport - available with or without viewport selection
    - viewport **lock status**: unlocked (default) or locked; unlocked means that the viewport can be used for map/camera pop-up
    - **camera name**
    - user button, if assigned
- Upper-right: current time on the server from which the device originates
- Lower-left: **stream details**
    - recording status: X = not recording, yellow arrow = recording
    - motion detector status: running = motion present, standing still = no motion detected
    - video codec of the stream
    - picture resolution, abbreviated
    - stream frame rate, FPS
    - stream bitrate, KBytes/s or MBytes/s
- Lower-right: **controls**; enabled items are highlighted yellow
    - instant playback (not available if there are no recordings)
    - PTZ toggle: PTZ HUD and bottom panel ON/OFF
    - DPTZ toggle
    - motion grid ON/OFF
    - incoming audio ON/OFF (if enabled and supported by camera/software integration)
    - audio OUT: press and hold the microphone to speak (control is present only if the feature supported by camera/software integration)
    - substream: auto/main/substream
    - aspect ratio (auto/stretch to fill viewport/original)
    - notification panel toggle
    - snapshot export to library
- Bottom: PTZ controls

- Presets
- Tours
- HUD (Heads Up Display) ON/OFF
- Centre: PTZ HUD controls
    - Pan and tilt arrows
    - Zoom slider
    - Iris slider
    - Focus slider

Live view has its own **notification panel** for each channel, which can be turned ON and OFF by using the notification panel toggle control in the bottom-right-hand corner of each viewport. It contains recent stream errors, e.g., PTZ related errors, which have occurred since the time the channel was opened for live view.
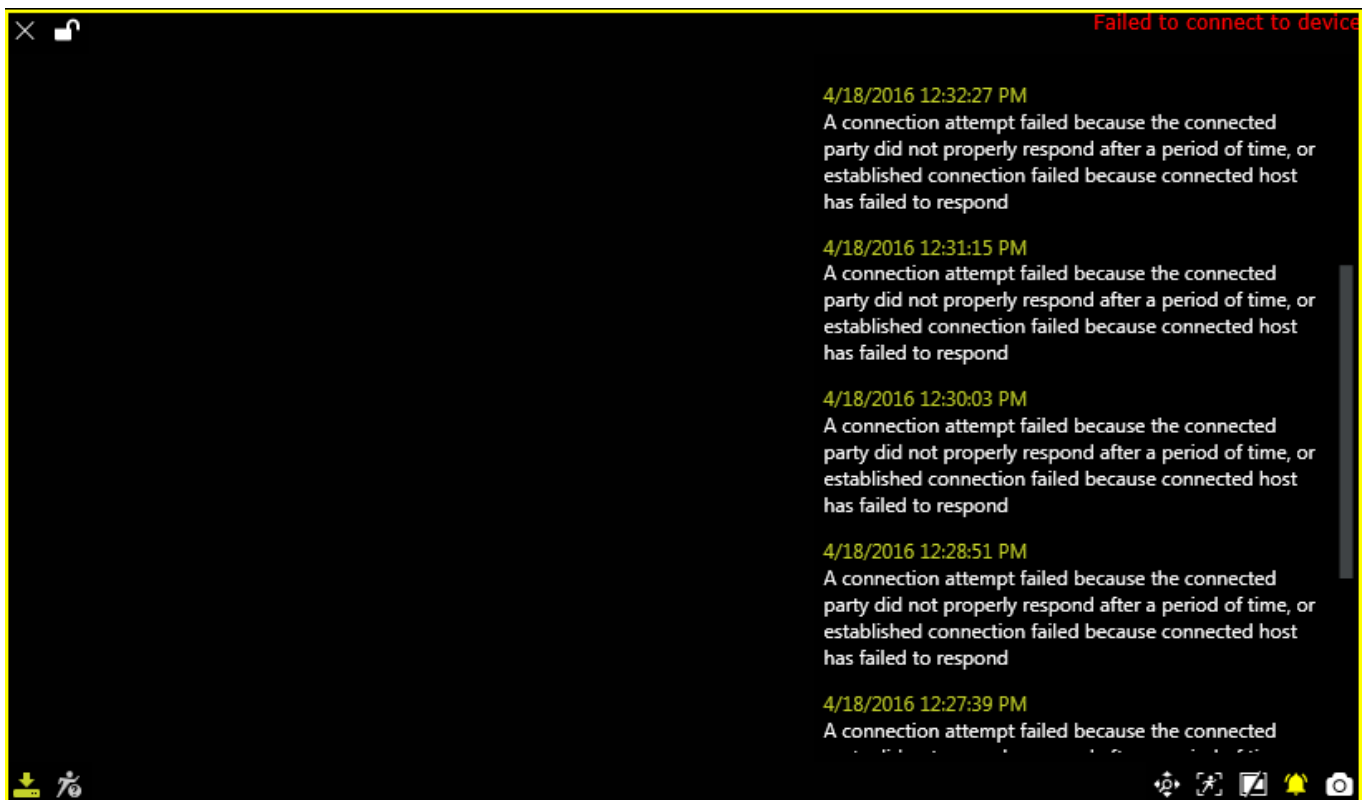
> 💡 The overlay control set may vary depending on device capabilities and settings. For example:
>   - if no archive is recorded for the target stream, instant playback will not be available
>   - for PTZ-incapable cameras, PTZ toggle will be absent
>   - substream toggle will not be displayed when device only has one stream
>   - audio OUT will not be displayed if this feature is not supported by camera or is not implemented on the software side etc.

Overlay elements can be modified in Application Settings, which are reachable via main menu by clicking *Edit -> Settings*. Note that overlay parameters are defined for the whole application and cannot be set separately for the application instances (windows) and/or individual devices.

Instant Playback

Overlay elements in the instant playback mode are different from those in live view.
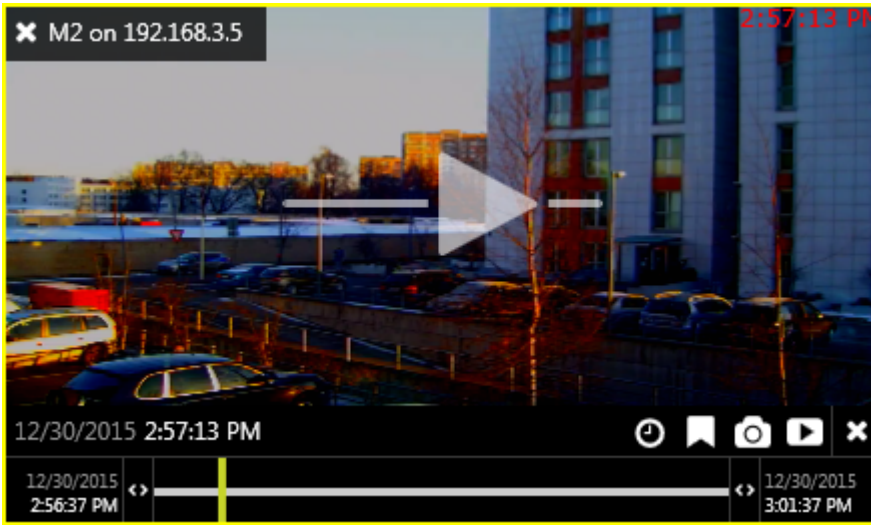
The following overlay controls are available in the instant playback mode:

- Upper left:
    - **X** - close live stream and free viewport
    - viewport **lock status**: unlocked (default) or locked; unlocked means that the viewport can be used for map/camera pop-up and may therefore be replaced by other camera at any moment
    - camera name
- Centre: **play/pause**
    - click to play
    - drag to the centre of the line to pause
    - drag right to go fast forward
    - drag left to rewind fast
    - release from dragging to continue normal playback
- Bottom right: **controls**
    - go to specific time (keyboard shortcut: Space)
    - create a bookmark with current timestamp
    - take a snapshot
    - automatically export loaded footage
- Bottom: **timeline**
    - use the <> arrows to adjust the loaded footage time boundaries (which, by default, are the last five minutes)
        - drag right to go forward in time
        - drag left to go backwards in time
    - the vertical yellow line indicates current playback moment, drag it anywhere or click to move along the timeline

Sequence Explorer

Once you have selected a fragment or a set of fragments, the overlay controls in the bottom right corner of the selection offer the following possible actions:

- **Magnifier** button: make a new sequence out of selected fragments; use the *History* controls <> in the upper panel to go back
- **Play** button: play selected footage in archive playback mode
- **Video** button: export video from the selected time range (no additional S*et time range* window is displayed)

More detailed control and operation descriptions for the sequence explorer can be found here.

9   Substreams

Substream is a lower resolution video used for reducing Luxriot Monitor PC resource usage (CPU, network) for live view display. For example, main stream for recording can be set to 1920x1080 at 30fps and substream - to 640x480 at 15fps, which would provide much lower load for Luxriot Monitor PC to display video stream. This allows to have high quality recordings combined with the ability to view many video streams on a low-performance Luxriot Monitor PC and with limited bandwidth.

Both streams are available for live view and for recording (the latter is configured via Luxriot Console). The live stream selection is configured to Auto by default, which means automatic switching between higher/lower resolution streams depending on the image size in order to save network and CPU resources. For instance, Luxriot Monitor may show a high-resolution stream if you view one camera at a time, but if you go to 4x4 view, Luxriot Monitor will automatically switch all the cameras to substreams, if they are available.

Luxriot Monitor application has the following visual indication for substreams in **live** view as a viewport overlay item (bottom right):

 Automatic selection between high and low resolution

 High quality picture

 Low quality picture (substream)

When no substream is available, the viewport overlay indicator simply does not appear at all for the target channel.

Substreams must be activated on the camera via Web browser and, for some devices, also in the stream properties in Luxriot Console. Please verify camera performance to make sure substream can be handled by the camera along with the other features enabled on the camera: some devices tend to lower overall FPS with the second stream turned ON.

Most cameras provide second stream as first stream image scaled to fit low resolution; however, some devices crop the centre of a high-resolution image to fit the small frame, and thus the substream picture appears as if it were zoomed in. Keep this in mind when you are using substream for live view and especially for software-side motion detector analysis.

If both main stream and substream are configured for **recording**, the target channel will be expandable in playback mode and will have both streams available for playback.
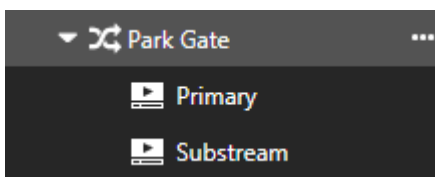
10   PTZ

For PTZ-enabled cameras, pan, tilt and zoom controls are available both for live and playback modes. Note that available controls may depend on selected model and actual camera capabilities.

> 💡 When two or more simultaneous PTZ command requests (either from an action or from direct user input) are sent at the same time, **PTZ priority** parameter is used to decide who gains access first. When this happens, request with a higher priority is fulfilled while request with a lower priority is delayed for ten seconds. If after ten seconds the higher-priority action is still going on, the lower-priority action is denied PTZ access for ten more seconds and so on.
>
> If two users or actions with the **same** PTZ priority level have an access conflict, they will be both granted PTZ access simultaneously and the order of executed PTZ commands is defined by which of the commands reaches the device first.
>
> Default PTZ priority for all users, including those built-in and imported, and also for all actions is equal to five (medium priority). You can assign any user/action a higher PTZ priority (six to ten) or a lower one (four to zero) by editing individual user/action properties in Luxriot Console. The only exception is the PTZ **tours**, which by default have the lowest priority (equal to zero), which means that any user or action can intercept PTZ control; the tour will go on after the PTZ control from a higher-priority user/action is released.

PTZ control is carried out using the HUD overlay controls or point-to-PTZ style controlling without overlay elements; it is automatically enabled if the camera has PTZ facilities.

- If HUD is enabled, use the virtual PTZ sphere to control camera movement: click and hold to move the camera up/down, left/right or diagonally; the sliders allow to adjust the camera's iris and focus, as well as to zoom IN/OUT.
- If HUD is not enabled, click anywhere on the picture to re-position the camera using indicated point as a new picture centre.

> 💡 When re-positioning a PTZ camera, note that some cameras may have response delay due to heavy device load, physical distance, network latency etc. Bear this delay in mind when using PTZ and, if necessary, release the virtual PTZ sphere controls earlier.

The following controls are available:

- Pan and tilt arrows
- Zoom slider
- Iris slider
- Focus slider
- Automatic focus/iris (**A** button on the lower slider end)
- Presets and tours
- HUD (Heads Up Display) ON/OFF
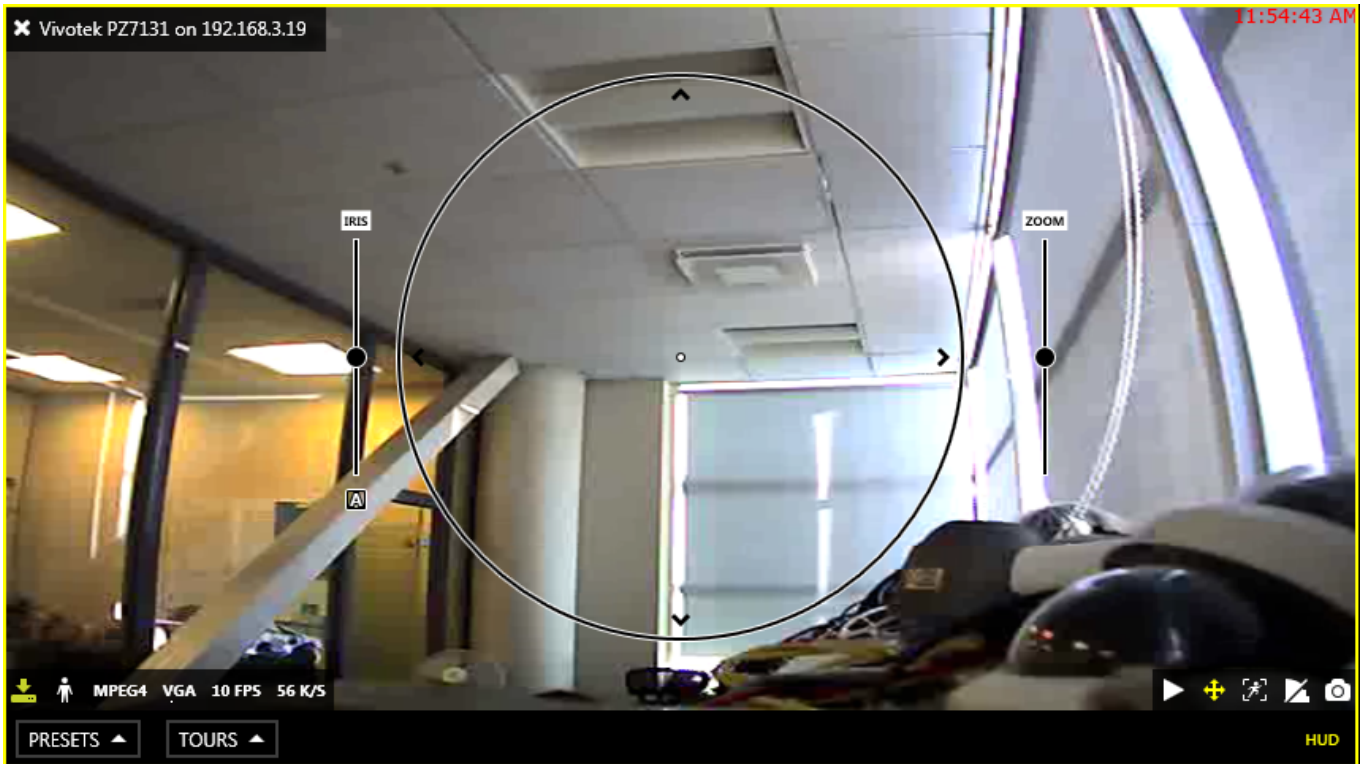
Use the bottom overlay menu for presets, tours and HUD ON/OFF switching.

Presets

Click *Presets* below the picture to view the list of available presets; select any to let camera **go** to the selected pre-defined position. To **save** a preset, adjust the camera position using PTZ controls, then click *Presets* and choose *Save preset*. Enter user-friendly name for your preset and pick a preset to be re-defined from existing preset list, then click *Save*.

Note that PTZ presets cannot be explicitly deleted: to remove an old entry, simply replace it with a new one.
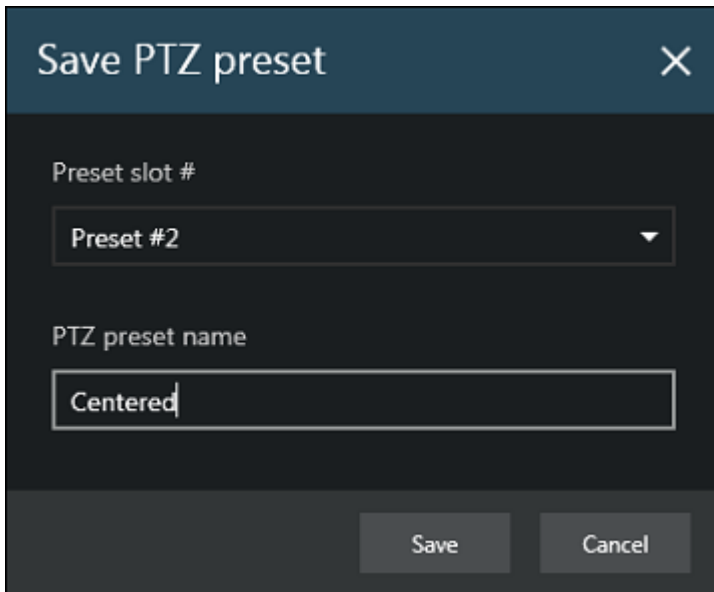

Tours

Multiple PTZ presets can be combined to create a preset tour - a series of positions for a PTZ camera to go to through repeatedly. Each preset in a tour can be assigned a duration period of its own.

Click *Tours* below the picture and select *Create tour* to make a new sequence. Before building a tour, make sure you have created all presets that will be used in the target tour.

💡 Tours are saved locally and are not synchronised between the different Luxriot Monitor installations. Make sure that, if you have multiple Luxriot Monitor connections, you do not create conflicting tours.
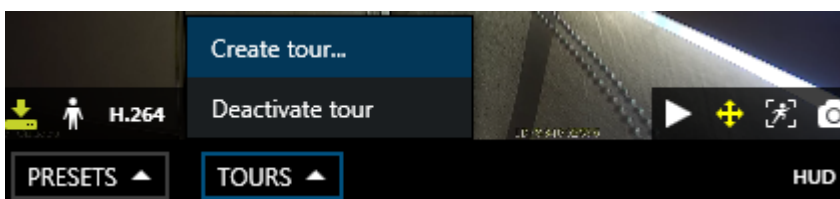
Add and remove presets by double-clicking them; newly added presets will appear at the end of the tour preset list. You can also use *Search* field to quickly find your desired preset, and the recycle bin icon in the upper-right-hand corner allows you to remove a selected preset from the target tour.
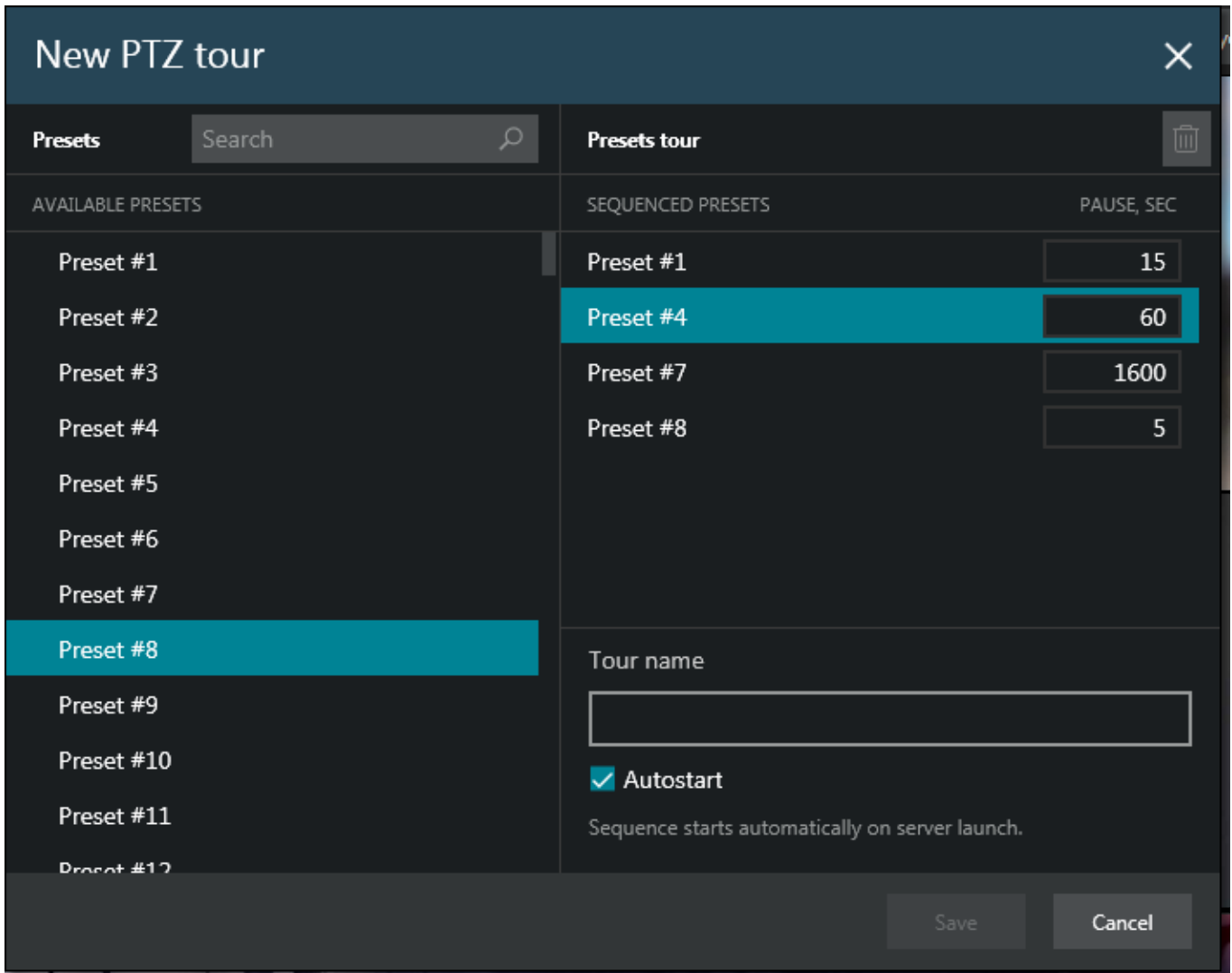
Click a tour preset to change its delay time. By default, each preset has a pause of five seconds, and you can change that to whatever time period you wish for the camera to continue overlooking that specific position. Next, define a title for the target tour and enable automatic start, if desired; if you select autostart, the sequence will be launched immediately after connecting to the server.

When you have finished, click *Save* to add your newly created tour to the list of available tours.
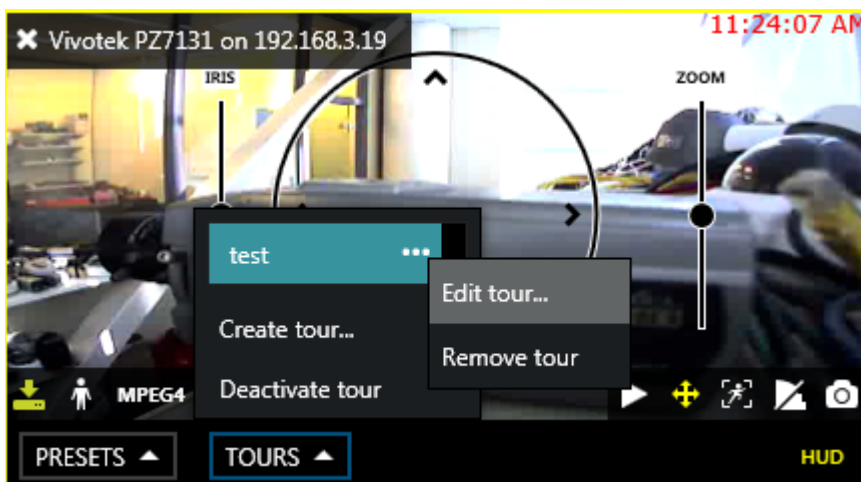
To start a tour, click *Tours* and simply select the one you want from the list; to stop it, click *Deactivate tour*. Each tour options - *Edit* and *Delete* - can be accessed via the ••• button next to the tour name.

11 Digital PTZ and Dewarp

Digital PTZ

Digital pan-tilt-zoom (DPTZ) can be enabled for both PTZ and non-PTZ cameras. This feature provides image magnification by the means of cropping and enlarging the picture. While it is mostly useful for devices without optical zoom capabilities, if you do not wish to grant some of your users PTZ control access, then DPTZ can be also used for PTZ devices.

In order to enable DPTZ in **live view**, select the target viewport and enable digital zoom by clicking DPTZ toggle button on the overlay control panel in the bottom right corner. You can also enable DPTZ controls to be visible by default via Luxriot Monitor main menu *Edit ->* Settings *-> Viewport Overlays* tab.

The overlay zoom slider will appear, allowing you to magnify the picture. Click and drag the slider UP/DOWN to zoom IN/OUT; once you have zoomed IN, click and hold any spot on the picture with your left mouse button to move left/right.

Dewarp

For cameras with fisheye and Panomorph lenses, dewarp mode is enabled when digital PTZ is turned ON. This feature can be used both in **live** view and **playback** mode; in order to use it, click the DPTZ toggle overlay control in the bottom-right-hand-corner of the viewport.

By default, **region** dewarp mode is turned ON: a part of the dewarped image is displayed in the viewport and camera becomes a virtual PTZ, which can be zoomed and moved through the entire angle that fisheye camera allows. Press left mouse button and drag to pan/tilt in corresponding direction; use the zoom slider to zoom in and out.

You can place one channel into multiple viewports on your viewport layout, enable DPTZ for all of them and then use DPTZ to display different regions of the dewarped image. The created arrangement can be saved just as usual, via *Save Layout* menu in the upper-left-hand corner: DPTZ positions will be maintained when you load the layout at any time later.
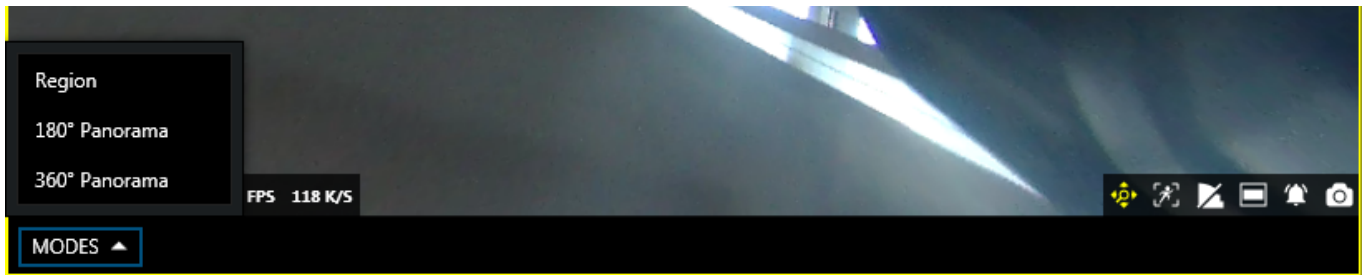
If you need a larger part of the scene to be displayed in a single viewport, you can switch to a **180-degree** or a **360-degree** panorama view using the drop-down menu, which appears in the bottom of the viewport when DPTZ is enabled.

> 💡 If you do not have a dewarped picture after enabling digital PTZ capabilities, it means that dewarp has not been configured for the target device. In order to do this, go to Luxriot Console and adjust dewarp settings in the channel properties.
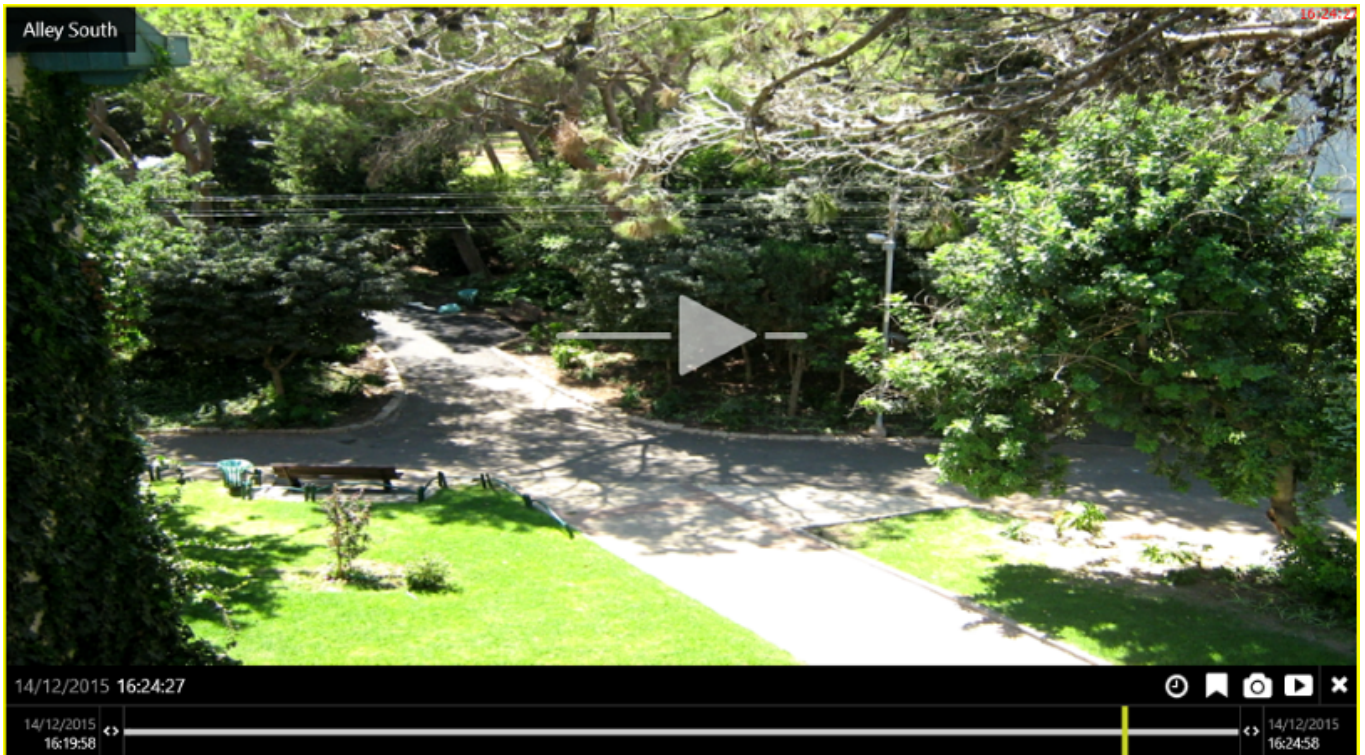
12   Instant Playback

Interactive live view mode gives you the opportunity to browse the archive right in the same viewport, without having to switch to the playback mode. This allows you to view recent footage for selected channels, while still having live view displayed for other devices. By default, footage is loaded for the previous five minutes; use the <> timeline boundary controls to change time range by clicking and dragging mouse to the right (zoom in) and to the left (zoom out) of the <> arrows. Note that this mode is only available for channels that have recording enabled.

To enable instant archive playback, use the *Play* button overlay control in the bottom right corner. The channel will automatically switch to playback mode, allowing you to select timestamps, create bookmarks and take snapshots. To exit instant playback mode, use X in the overlay controls' bottom right panel.

Instant playback mode can be enabled for one, multiple or all viewports in the current layout: you can switch between live and instant playback viewports without any limitations.

The following overlay controls are available in the instant playback mode:

- Upper left:
  - **X** - close the stream and free viewport
  - viewport **lock status**: unlocked (default) or locked; unlocked means that the viewport can be used for map/camera pop-up and may therefore be replaced by other camera at any moment
  - camera name
- Centre: **play/pause**
  - click to play
  - drag to the centre of the line to pause
  - drag right to go fast forward
  - drag left to rewind fast
  - release from dragging to continue normal playback
- Bottom right: **controls**
  - go to specific time (keyboard shortcut: Space)
  - create a bookmark with current timestamp
  - take a snapshot
  - automatically export loaded footage
- Bottom: **timeline**
  - use the <> arrows to adjust the loaded footage time boundaries (which, by default, are the last five minutes)
    - drag right to go forward in time
    - drag left to go backwards in time
  - the vertical yellow line indicates current playback moment, drag it anywhere or click to move along the timeline

13   Channels

All the channels from connected servers are listed in the *Channels* section of the *Resources* section on the left. If the server connection has the *Merge resources* option ON, all resources will be shown together without per-server grouping. Note that channels are displayed according to the logged user privileges.
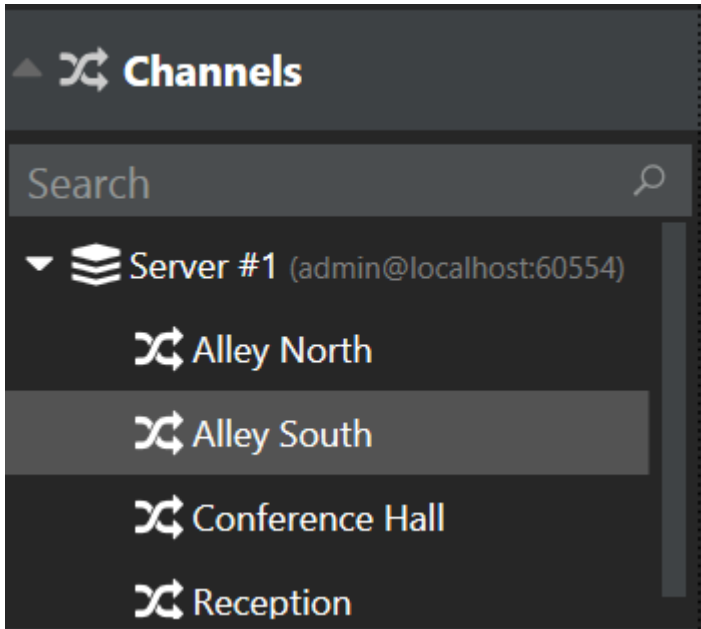
Channels are loaded with visual groups, if there are any; otherwise, they are simply listed under the relevant server name. Use the *Search* filed above the channel list to quickly find a specific channel.

Double-click or drag and drop desired channels onto the layout viewports on the main live/playback window to view stream contents. For secondary displays, use drag and drop method only.

When you double-click channels in live/playback view, they fill viewports in the following manner:

- first, all the empty viewports are filled - from top to bottom, and from left to right;
- then, the filling sequence starts again from the very first viewport.

To remove any channel from live view, click the overlay control *X* button next to the camera name in the upper-left-hand corner of the viewport.

14 Layouts

Layout is a pre-configured viewport configuration with channels assigned for live view and archive playback. Layouts are created by filling a layout template with video channels. There are two main groups of layouts: local and shared.

Local layouts are created and stored locally on the same computer where the Luxriot Monitor is installed; these are not available for other machines connected to the same server.

Shared, server-side layouts are kept on each server and are available for all users that are connected to the same server from other client computers. If the license limits the client connection number to 1, layouts can still be shared between non-concurrent client connections from different machines.

Layout template is a grid-like viewport pattern without any channels bound to it. There is a set of default layout templates stored locally with each Luxriot Monitor installation; also, user-defined custom templates can be created via Luxriot Console. Layout template with the channels assigned to viewports can be saved as a layout.
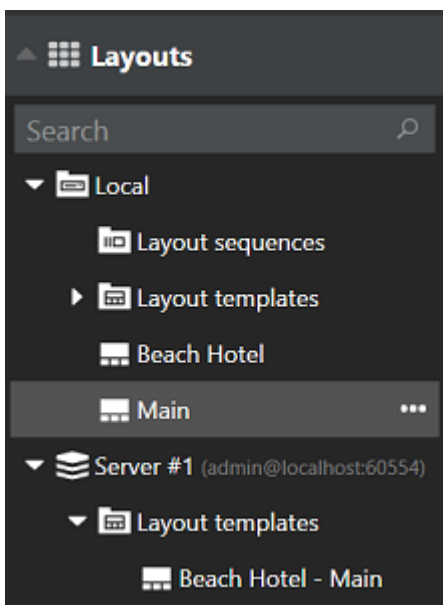
Drag and drop your desired layout template from the *Resources* menu on the left - either from the default local templates or from pre-configured layout templates available under connected server. Template will be empty; drag and drop channels from the relevant section of the menu on the left onto the layout viewports to fill the grid with cameras. Channels' contents will be loaded automatically if it is available.

Click the layout menu ☰ button in the upper-right-hand corner - just above the layout - and select *Save Layout* to save channel configuration as a new local or shared layout, or to overwrite any of the existing ones. Click the *Expand* ••• button next to the local layout name to delete it.

To make the newly created layout available to any user connected to the same server, enable the *Shared* option in the layout properties and choose your desired settings.

💡 You need at least one **layout group** to exist on the target server to be able to create shared layouts. In order to add layout groups, log into the target server via Luxriot Console under administrative account and go to *Layouts* section. Note that there are no built-in layout groups.

The layout menu also allows you to send the currently displayed layout to any of the pre-configured video wall components. Click the layout menu button in the upper-right-hand corner and select *Display on* and then choose desired video wall and target display number.

Click the *Expand* button next to any layout in the list to bring up the layout menu. From here, you can:

- **delete** the target layout, or
- send the target layout to the video wall screen.

Note that created layouts cannot be edited: if you wish to change the layout contents, load current layout contents by dragging and dropping it on the live view, make desired alterations and then overwrite existing layout by saving the current layout under the same name.

15   Layout Sequences

Multiple layouts can be organized and saved as dynamic sequences, i.e. 'layout slideshows'.

To create a sequence, click the ••• button near *Layout sequences* in the resource explorer on the left.
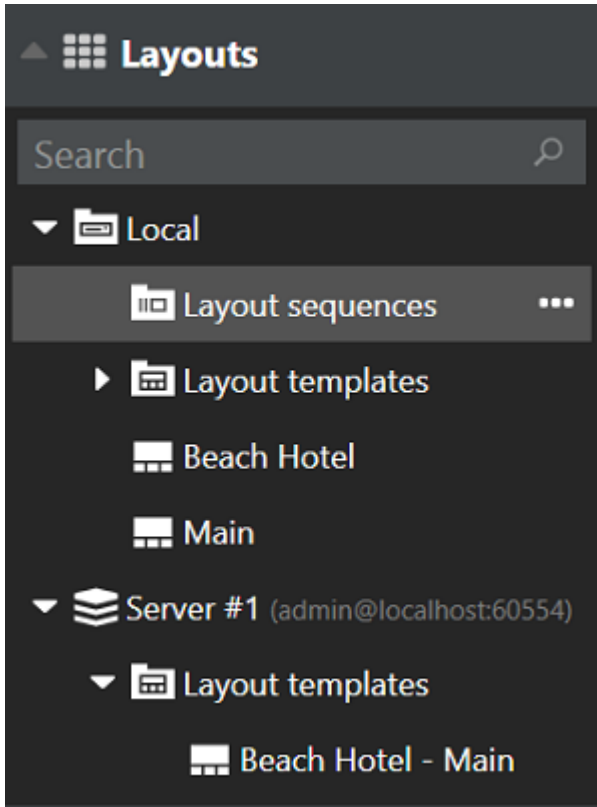
The *Create sequence* dialog box will appear.

Double-click layouts or drag and drop them to add/remove layouts to/from the sequence. For each layout, pause time can be specified separately; you can add each layout once or multiple times to appear in the sequence. If necessary, use the *Search* field in the upper-left-hand corner to find a layout by name.

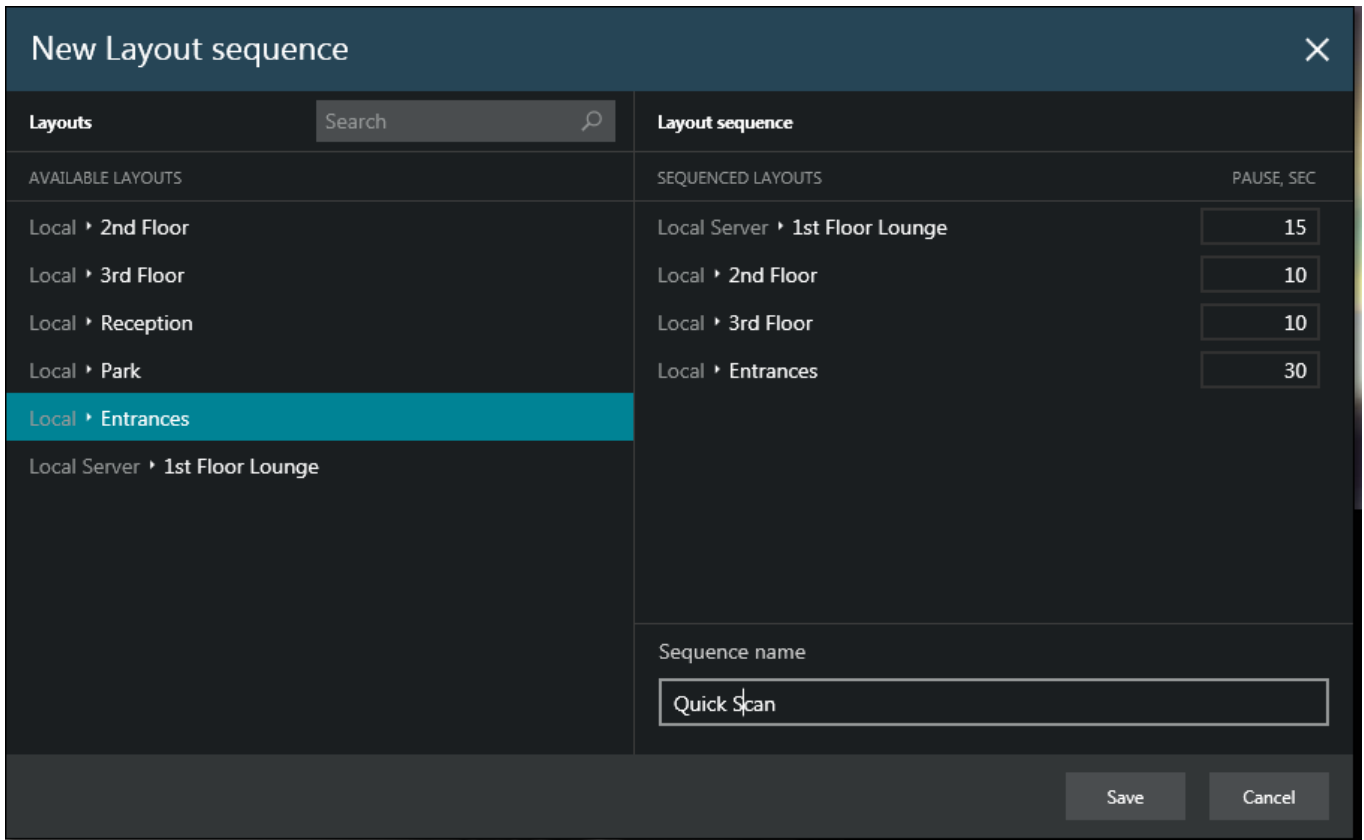Enter a name for the new sequence and then click *Save*. The sequence will appear in the resource explorer under *Layout sequences*; drag and drop it onto the main view area or double-click the name to activate it. The sequence will then start automatically; sequence controls will appear above the viewports, allowing you to switch between layouts manually and play/pause; also, the panel will also show the remaining time for the layout that is currently displayed.
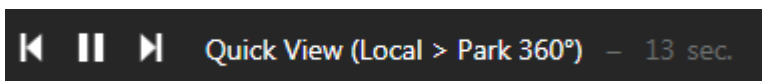
Click the |< and >| arrows to switch to the previous/next layout immediately; use the pause button to terminate playing.

To edit a sequence, click the ▪▪▪ button near the sequence name in the resource explorer and select *Edit sequence;* to remove it from Luxriot Monitor configuration, select *Delete sequence*. Note that if you delete or modify the contents of the sequence currently being played, this will not affect current layout slideshow; in order to start the updated sequence version, simply start it again.

16   Motion Overlay

Click on your desired viewport and use the motion icon control in the bottom right corner to switch the motion grid overlay ON and OFF. This will only work if motion detection is enabled for the selected channel.
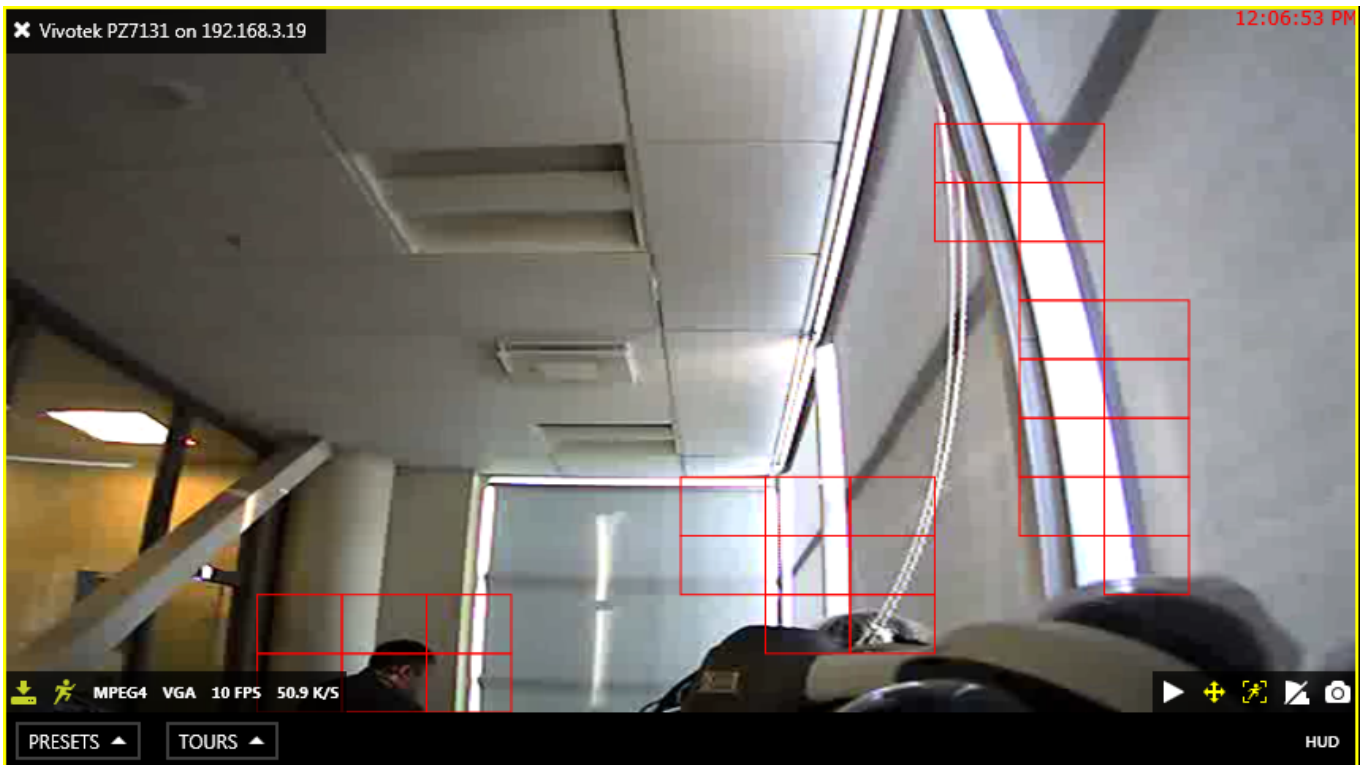
17 Maps

Maps configured via Luxriot Console can be viewed in Luxriot Monitor: simply drag and drop them from the resources list on the left to any viewport or use drag and drop to load them in the main application window in live or playback mode. Maps fill the viewports just like channels but, unlike channels, they do not have any footage or overlay controls. One map can be opened in one viewport or in many simultaneously.
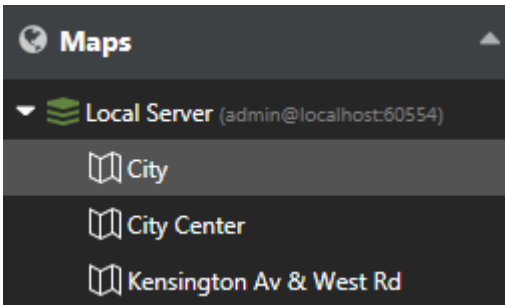

Maps inside viewports can be digitally zoomed IN and OUT with the mouse wheel and moved around using the left mouse button (click and drag to move). Double-click inside any viewport with a map to switch to single camera view, then click again to return to the layout view.
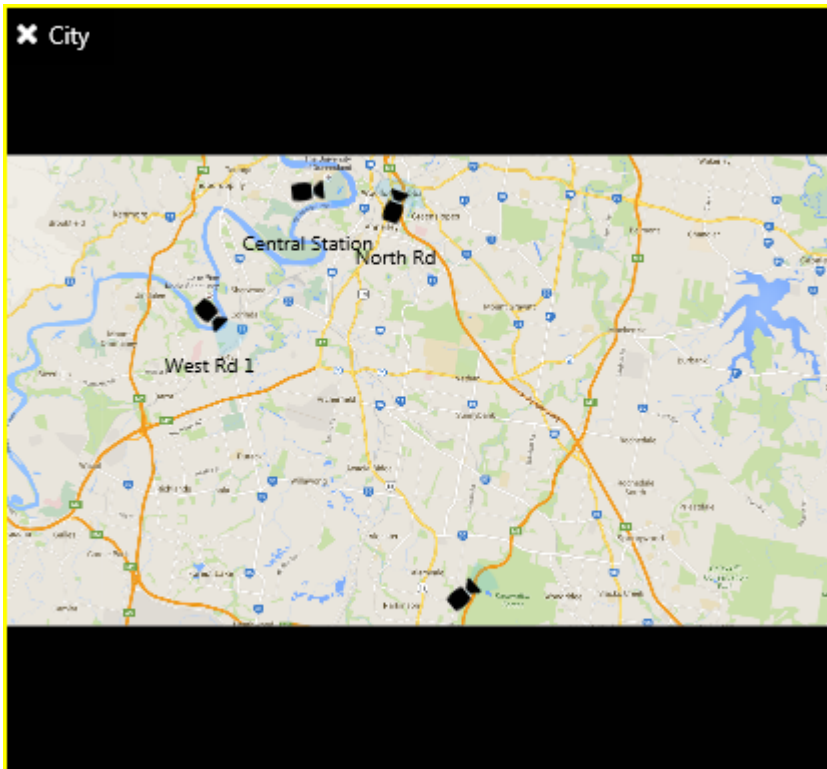
 All the cameras shown on a map can be loaded in Luxriot Monitor with a simple double-click. In order to pop up a camera:

- hover your mouse over the desired device on the map until it becomes highlighted with a pink circle
- double-click the target device in order to map it automatically on the first non-locked viewport within the current layout
- alternatively, drag and drop your desired device onto to viewport of your choice
- if the device stream is already present on the layout, it will blink with a green frame

18   User Buttons

User buttons, as well as other types of resources from the connected servers, are available in the *Resources* panel on the left.
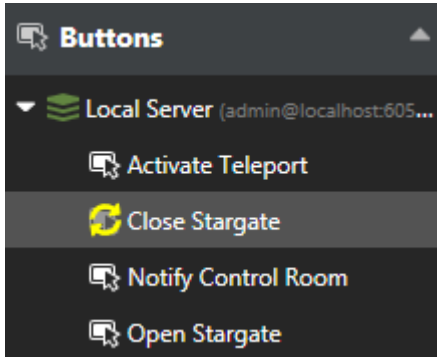
User buttons are created via Luxriot Console; button behaviour is defined via Luxriot Console using the *Event & Action Configurator*. There are three ways of using user buttons in Luxriot Monitor:

- double-click any button in the list of resources to make it trigger the action assigned to it
- drag and drop any user button to a live view viewport to make the user button appear as an overlay control for your desired camera, then double-click it at any time to trigger the relevant action
- double-click user button markers on the maps (configurable via Luxriot Console)

Note that a maximum of one user button per viewport is allowed; also, user buttons cannot be added to the viewports that contain maps. Instead, go to the map management section in Luxriot Console and add user button markers to the desired maps to use them in Luxriot Monitor.

Each time a user button is pressed, the corresponding log entry appears in the *Alerts* section of Luxriot Monitor.
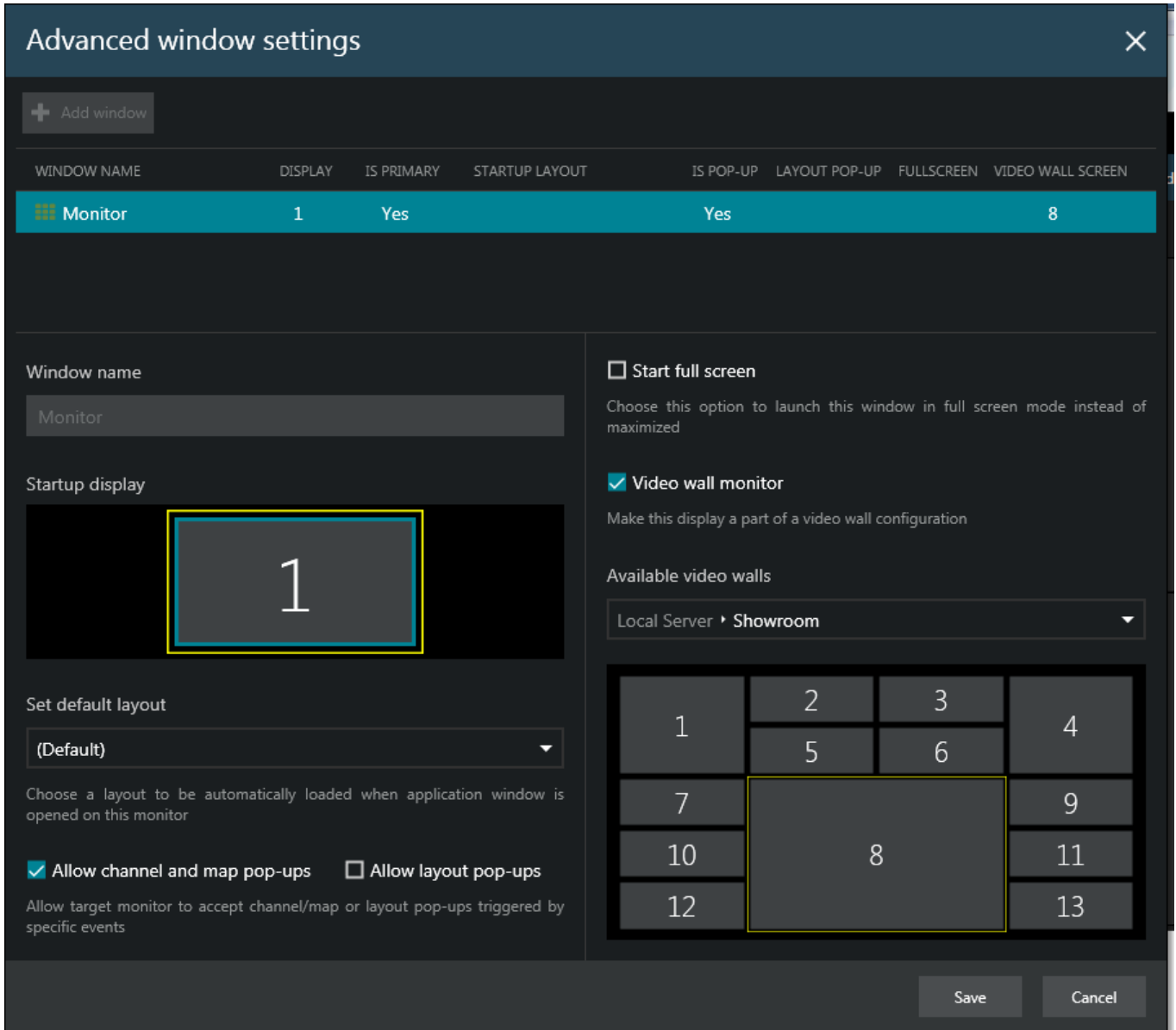
19   Video Wall

Video wall configuration in Luxriot EVO is very flexible and it allows you to set up video output in virtually any physical display combination. Templates for video walls are set up via Luxriot Console and then they become available in Luxriot Monitor, depending on the permissions of the connected user.

Video Wall Setup

To access window setup in Luxriot Monitor, open the *Live* section, click the multimonitor setup ⊞ button in the upper-right-hand corner - just under the main menu - and then click the *Advanced* button to bring up the configuration dialog box.

The advanced window settings dialog box offers the following possibilities:

- create windows for the available displays and manage their properties
- assign default layouts to windows
- bind windows to video wall displays

In the upper part of the configuration dialog box you can see the available window list. Already there by default is the main Luxriot Monitor window (marked as *Primary*), which cannot be deleted or renamed. More windows can be added, although the number is limited to the number of displays physically connected to the workstation. For each window, the following items are displayed in the summary list:

- display number
- primary or not (cannot be changed)
- startup layout, if set
- channel/map pop-ups allowed or not
- layout pop-ups allowed or not
- start fullscreen or not
- video wall screen number, if set

To add a new window, click the + *Add window* button in the upper-left-hand corner (when the window amount has reached connected display amount, the buttons becomes greyed out). Select the parameters of the new window and click *Save* for the changes to take effect.

All these parameters can be set for each window (including default primary window) in the dialog box section below window list:

- **Window name**: set window title to be displayed in the application title bar of each window
- **Startup display**: select a display to start the target window on (click to highlight with a yellow frame)
- **Set default layout**: pick a layout to be displayed on window startup; select *Default* if you do not want any layout to be displayed at Luxriot Monitor startup
- **Allow channel and map pop-ups***: enable video/map popup on the target window as a result of event/action rule execution
- **Allow layout pop-ups***: enable layout pop-ups on the target window as a result of event/action rule execution
- **Start full screen**: enable the target window to start in full screen mode; if this is disabled, the window will start up simply maximized
- **Video wall monitor**: make the target window a part of the video wall configuration; choose the video wall from the drop-down list below
- **Video wall** visual element: choose (click to highlight with a yellow frame) a video wall display to serve as the target window output

*Note that pop-up options can be selected one at a time: enabling channel/map pop-ups disables layout pop-ups and vice versa.

In order to delete a window, select it in the list and click the recycle bin ⬚ icon in the upper-right-hand corner; you will be prompted to confirm the action. Note that all the window settings will also be removed; once you have removed a window and clicked *Save* in the *Advanced settings* dialog box, the deleted window will also be closed.
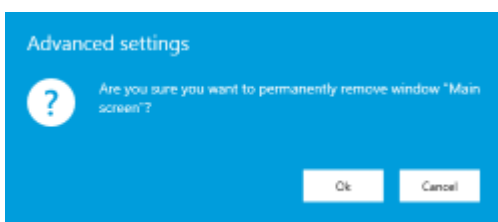
Layout Output

Once application windows have been attached to the video wall displays, it becomes possible to send layouts directly to any video wall display. To do this, click the *Expand* button near layout name in the resource list on the left and choose *Display on -> Video Wall ->* pick video wall -> pick display number. To send the currently displayed layout to the video wall, do the same thing from the layout menu in the upper-right-hand corner (above live view).

20   Playback (Archive) Mode

Select *Playback* tab to switch to archive playback mode. Your current layout will be used and recorded video streams will be displayed for channels with enabled recording. If you wish to load footage from a different channel or channels, or use a different layout or layout template, use the *Resources* panel on the left:

- Layouts: double-click your desired layout to load it
- Layout templates: double-click your desired layout template to load it, then double-click or drag and drop the channels of your choice to fill the viewports
- Channels:
    - double-click a channel to load it automatically within the current layout (first, empty viewports are filled, then non-locked channels are replaced one by one)
    - drag and drop a channel onto any viewport to load it there

All channels will be listed under the servers from which they originate; or, if you have chosen to merge resources in the connection properties, they will form an alphabetically sorted list. Each channel can be clicked and expanded in order to access recordings of its main an/or secondary stream. All the footage having no associated active channels will be available under *Orphan archive tracks*.

> 💡 For security reasons, it has been made impossible to erase recordings from individual channels and/or time periods. Recordings

Use the timeline and controls below to browse through recordings. For a multichannel layout, all channels will be played synchronously.
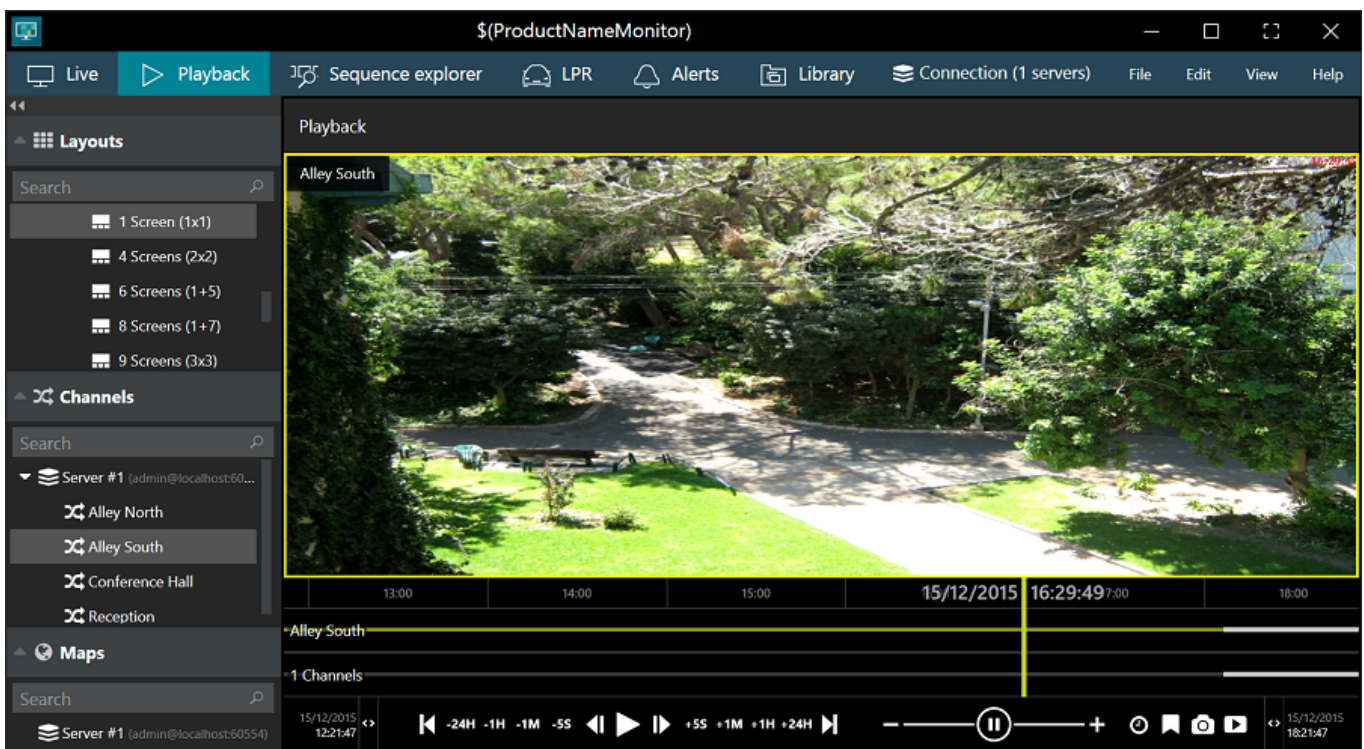
The following viewport overlay controls are available in the playback mode:

- Upper left:
    - **X** - close the stream and free the viewport
    - viewport **lock status**: unlocked (default) or locked; unlocked means that the video in this viewport can be replaced by other camera if you double-click or drag it from the *Resources*
    - camera name
- Bottom right: **controls**
    - Audio ON/OFF: disables or enables audio playback
    - DPTZ controls ON/OFF

- aspect ratio (auto/stretch to fill viewport/original)
- motion grid ON/OFF

Playback timeline

Right below the video stream, **timeline** is displayed:

- Time intervals show the timeline scale; click and drag left/right to move the timeline
- The **white** horizontal line shows recorded video
- The **cyan** line (a little bit wider than the white one) indicates motion
- The **blue** line (a little bit wider than the cyan one) shows recorded incoming audio
- The vertical line denotes current playback position

The video footage outline is shown twice: the upper outline displays the contents of the currently selected stream, with the corresponding channel name shown on the left; the lower outline shows a content summary for all the channels currently present in the viewport layout.

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The **playback mode controls** are located at the bottom of the window:

- far right and far left of the timeline:
  - timeline start and stop timestamps
  - use the <> arrows and drag left to zoom out/drag right to zoom in the timeline
  - yellow arrow indicates the location of the nearest footage if it is not present on the timeline at the time (this can happen, e.g., after zooming the timeline)
- playback controls:
  - use the *Play/Pause* button to start playback
  - use the <> arrows near the *Play* button to go one frame back/forward
  - -/+ steps: click to go back/forward with a step of 5 seconds, 1 minute, 1 hour or 24 hours
  - |< >| arrows: go to the very beginning/very end of the footage
- playback speed:
  - during playback, drag the blob to adjust playback speed from +/-0.5x to +/-32x
  - the *Pause* button duplicates the main pause control
  - when paused, set playback speed to start playing video (without pressing the *Play* button)
- additional controls:
  - clock button: go to a specific date and/or time
  - camera button: take a snapshot of the currently selected channel
  - video button: export a piece of video

21   Sequence Explorer

The sequence explorer is an archive playback extension with additional tools for footage analysis. The whole recorded stream can be split into smaller pieces down to 2 minutes in length; each of these can be played separately or exported with a single click.

In the Luxriot Monitor upper panel, click the *Sequence Explorer* tab: the current main window will then display the sequence explorer with empty viewports.
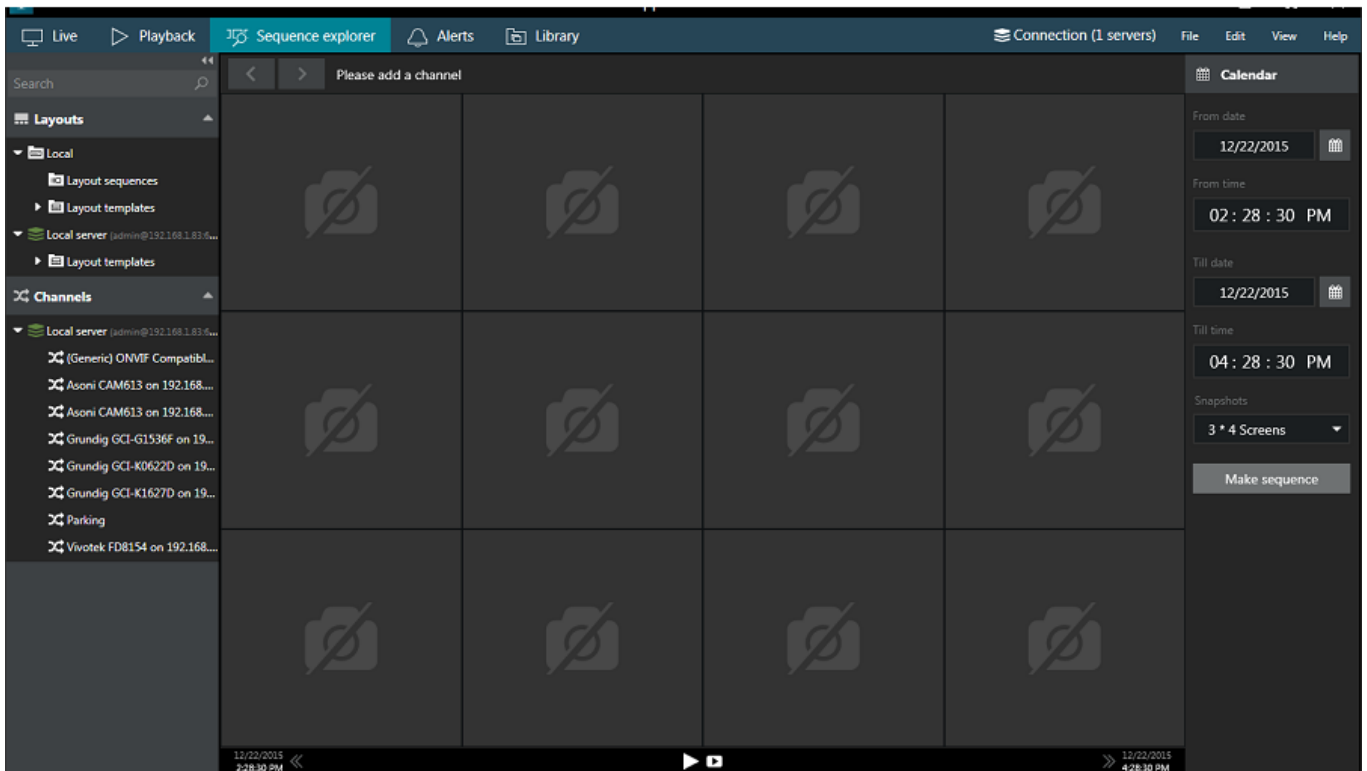
Interface Overview

Interface elements have the following designations:

- **Calendar:** specify the time period to be analysed by entering date/time boundaries, and also set the viewport layout
    - date can be entered manually or selected from calendar view
    - time can be entered manually or adjusted by mouse wheel (select the value to be changed and use mouse wheel to increase/decrease it, while keeping the mouse cursor over the field)
    - minimum time period is 120 seconds
    - available viewport layouts are: 3x4 (default), 3x5, 4x3, 4x6, 6x4, 5x5 screens
- **Top panel**: <> arrows enable users to browse viewing history within the channel in use; the name of the channel being used is displayed
- **Main window**: displays video clip sequence with corresponding controls; empty viewports mean that no footage is available for the time period selected
- **Bottom panel**: contains global sequence controls for the whole currently displayed period (and **not** the selected sequence elements)
    - the << and >> arrows on the sides enable users to load the previous/next portion of the footage sequence, with time period equal to the one set in the *Calendar*
    - next to the arrows, the date/time boundaries of the current video portion are shown
    - *Play* button in the centre of the panel will open current video portion in the *Playback* mode

- *Video* button in the centre of the panel brings up the *Video export* dialog box

Make Sequence

Drag and drop the desired channel from resources onto the main window; the camera name will appear at the top. Note that the sequence explorer works with one channel at a time, so if you drag and drop another channel onto the explorer window, all previous changes will be discarded.

Select sequence timing in the calendar panel on the right and then click the *Make sequence* button. Video footage from selected time range will be divided between all viewports, so that all of them will contain video clips of equal duration. For instance, if the selected time range is 2 hours and a 3x4 layout is set, each viewport will contain a 10-minute video clip: (2*60)/3*4 = 120/12 = 10 minutes.
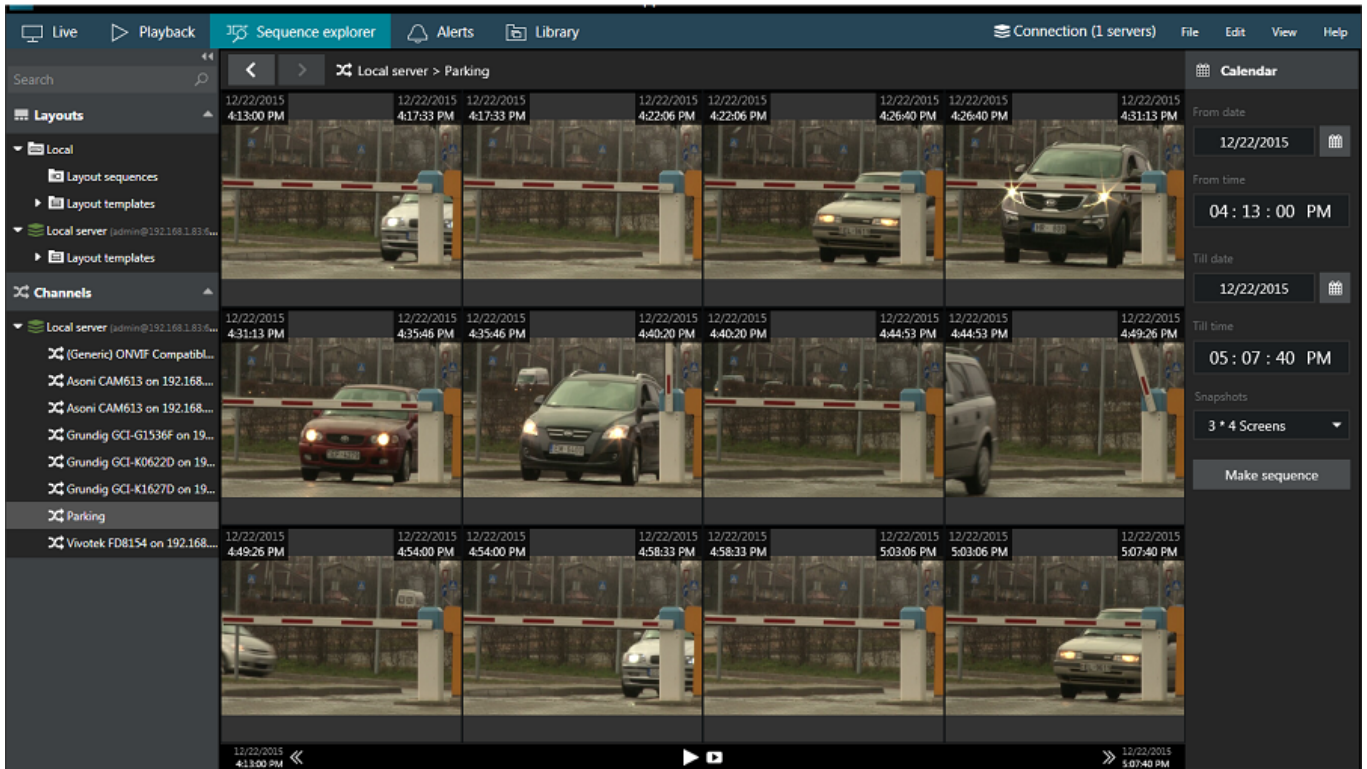
From this point onwards, you have several options for creating a new sequence:

- enter a new time period on the *Calendar* panel and click the *Make sequence* button
- select one or multiple sequence elements and click the *Make sequence* overlay control (see the control descriptions below)
- double-click a single sequence element to split it into a new sequence

If you choose to build a new sequence out of one or multiple sequence elements, their date/time boundaries will be set as new boundaries, and the video clip in the resulting sequence will be of shorter duration. In this way, any footage can be split into smaller and smaller chunks down to two minutes, facilitating footage analysis process and making it easy to find the scene of interest within a larger fragment of footage.

Use the << and >> arrows on the bottom panel to go back and forth along channel timeline. The size of the jumps back and forth will be equal to the base time period set in the *Calendar*.

Sequence Controls

Viewport overlay controls are available for each sequence element. Click any piece once to select it; click one screen once and then click another screen to select a series of fragments. Selection border style will help you control your actions: a **dashed** line denotes a single click, **solid** line appears after the second click. As a result, you will always know, which selection stage you are on when selecting multiple screens.
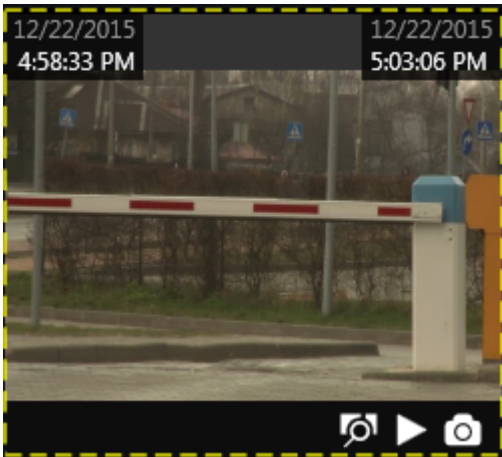
Once you have selected one or a set of fragments, overlay controls in the bottom right corner of the selection offer the following possible actions:

- **Magnifier** button: make a new sequence out of selected fragments; use the *History* controls <> in the upper panel to go back
- **Play** button: play selected footage in <u>archive playback</u> mode
- **Video** button: export video from selected time range (no additional S*et time range* window is displayed)


Timestamps in the top-left and in the top-right-hand corners of each viewport represent time range of the contained footage fragment. In case multiple screens are selected, the intermediate timestamps are skipped and time frames for the multi-fragment footage portion are displayed.

Playback

Click the *Play* button on the bottom panel to open the whole inspected footage portion in the archive playback mode. The equivalent button on each of the selected sequence fragments will open just that specific fragment for playback. Playback operation is exactly the same as for usual archive viewing and it is explained at length in the Archive Playback topic.

Video Export

Click the *Video* button in the bottom panel to bring up the *Video Export* dialog box and set your desired time range for exported footage; channel selection is limited to the one channel open at the time in the *Sequence Explorer*.
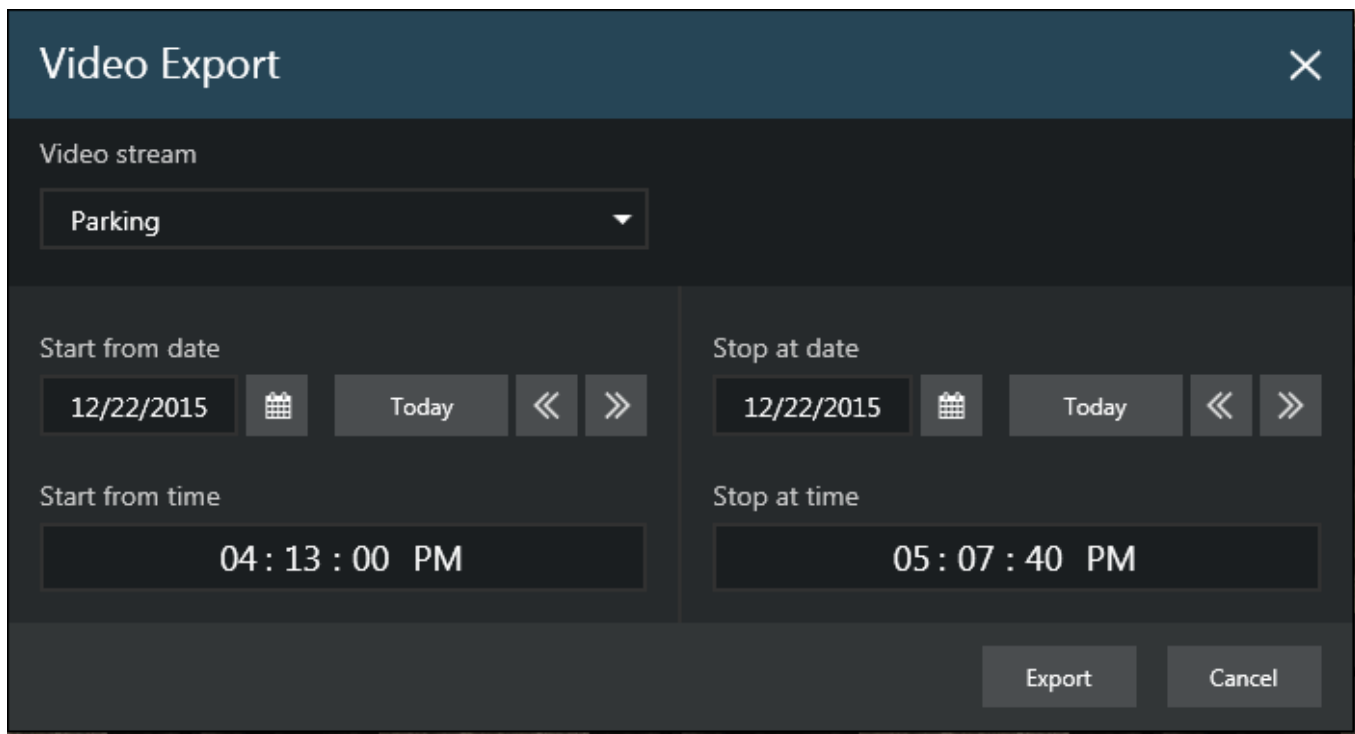
The *Video* button overlay control in the fragmented sequence screens will automatically export video from selected time range without additional prompts. In either case, the exported video will appear in the Library.

22   Alerts

The alerts section of Luxriot Monitor features server notifications, e.g., logon/logout, camera events, as well as miscellaneous errors that arise during operation: stream errors, server connectivity issues, device connection errors and others.
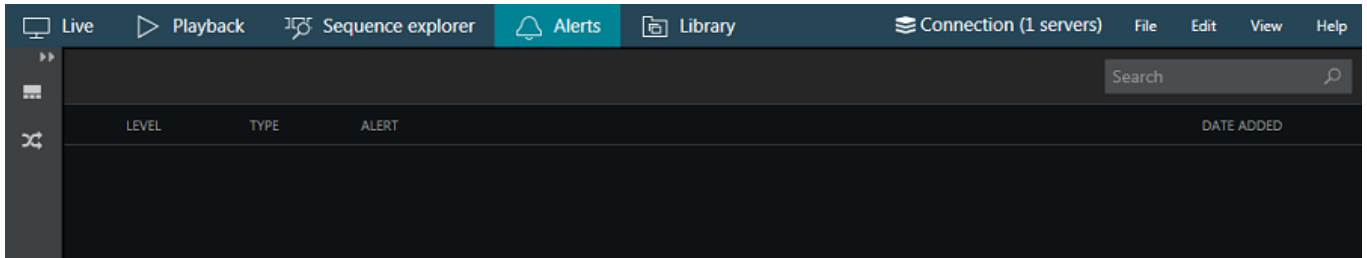
Use the *Search* field in the upper-right-hand corner to filter alert messages.
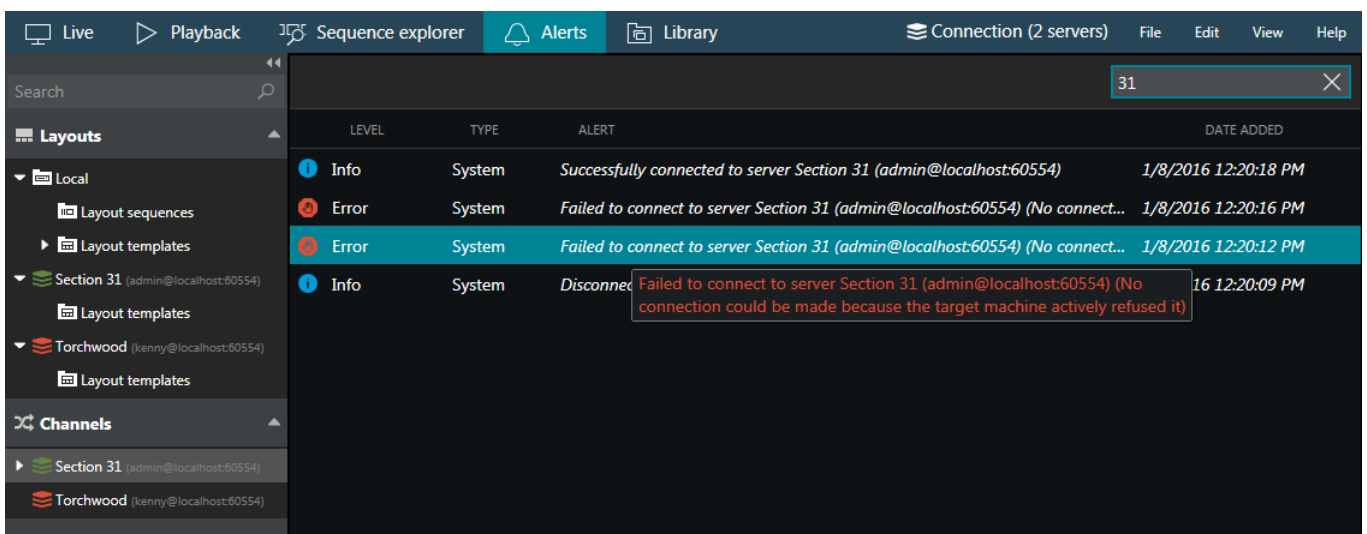
Along with type and source, alert message and time are shown for each entry. If the message is too long to be displayed in full, hover the mouse cursor over it to read full message text.

23   Video & Snapshot Export

Video clips, frame sequences and individual pictures can be exported in order to be viewed later without help of Luxriot software.

Snapshots

A snapshot can be taken at any time in live view, sequence explorer, instant playback and regular playback modes. To save a snapshot, click the Camera button in the overlay controls or bottom panel controls.

The frame will be saved with your pre-defined frame export settings, if this is enabled in the Application settings; otherwise, you will be prompted to specify stream properties and export directory.

Video Export

Video can be exported automatically (without additional dialog box prompt):

- from Sequence Explorer, by clicking *Video* button in the viewport overlay controls: selected fragment(s) will be exported and displayed in the Library immediately;
- from *Instant Playback* mode, by clicking *Video* button in the viewport overlay controls: the most recent currently loaded footage will be exported at once (last 5 minutes, by default).

A video export dialog box with additional settings can be launched in the following ways:

- from *Playback* mode, by clicking the *Video* button in the bottom right panel (the channel choice is limited to those that are currently displayed);
- from *Sequence Explorer*, by clicking the *Video* button in the centre on the bottom panel (channel choice is limited to channels currently being viewed).
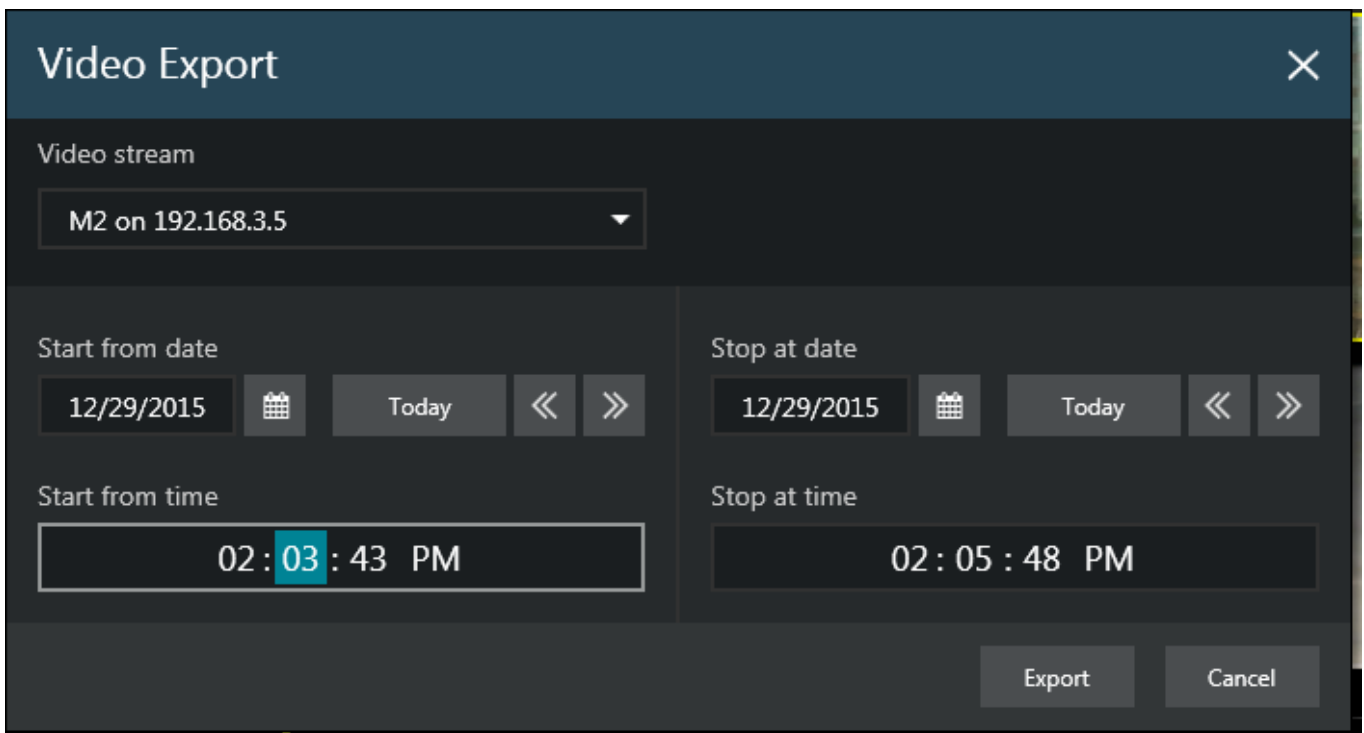
Select your desired date and time boundaries for the export of the footage: dates can be picked from the drop-down calendars, times can be adjusted by clicking hours/minutes/seconds and then scrolling up/down with mouse wheel. When you are ready, click the *Export* button; the video file will be saved with your pre-defined video export settings, if enabled; otherwise, you will be prompted to specify the stream properties and export directory.

24   Library Section

The library displays all exported video files and snapshots that are available, as well as ongoing export. The file list is refreshed upon Luxriot Monitor startup, so library entries for deleted files may exist in the list until Luxriot Monitor restart.
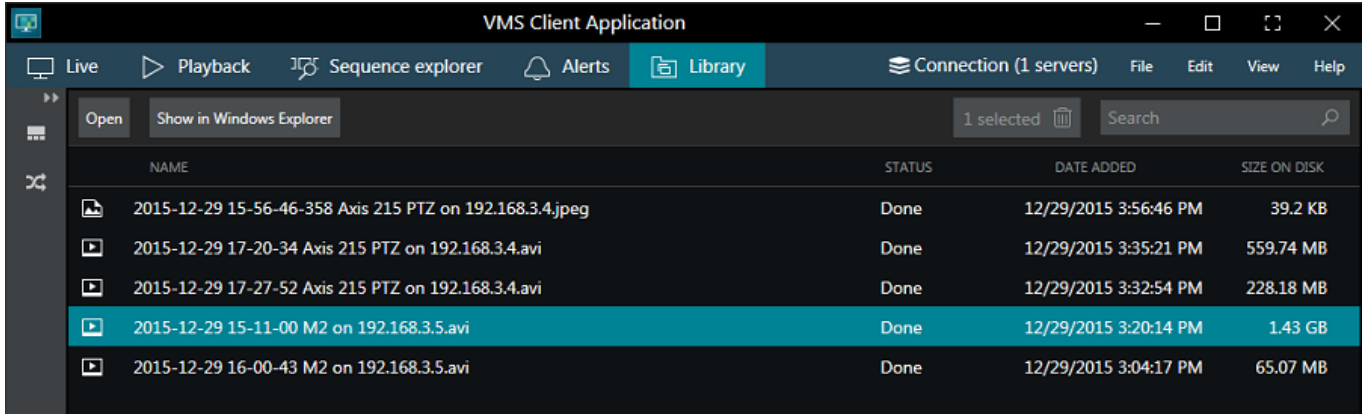
Files that are still being exported will be shown in grey, with the current export percentage shown in the *Status* field.

Click the *Open* button on the upper panel or just double-click any file to open it with your OS default media player for AVI/JPEG file formats; use the *Show in Windows Explorer* button to display the export directory containing the selected file.

To remove files both from the library and from the hard disk, select one of multiple files and click *Delete* button on the upper panel. Use the *Search* field in the upper panel to filter the items.

25   Multimonitor Setup

Click the *Multimonitor* button in the upper-right-hand corner of the live view, next to the *Save layout* button, to bring up the display selection menu.

Luxriot Monitor automatically detects computer display configuration directly from Windows display settings: click *Identify* to show the display numbers on all monitors - this will helpful if there are a large number of displays. To change your multimonitor configuration, go to the *Windows Control Panel -> Display -> Screen Resolution*.
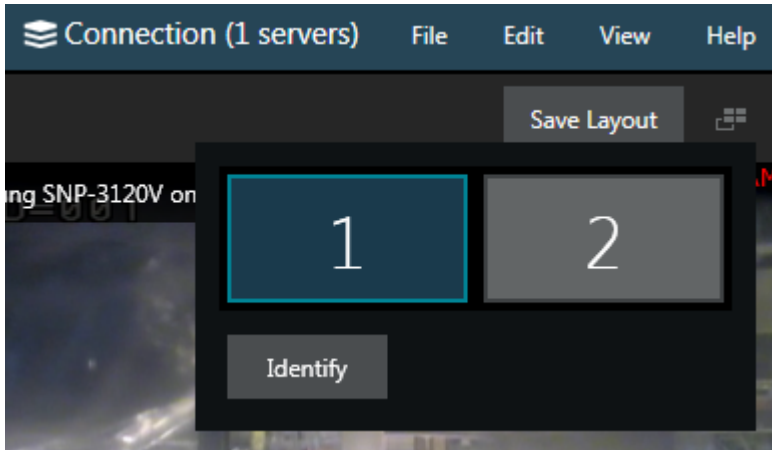
Luxriot Monitor automatically detects which screen it is currently on: this display is marked blue and it is not possible to create any child windows on it. Click on any other empty display (marked gray) to open a new live view window there: the child window will be opened maximised, with the display number shown in the application header. The controls in the upper-right-hand corner give the option to enter fullscreen or to close the extension windows.

For the multiple display configuration, the following logic is applied:

- the main Luxriot Monitor application window acts as a parent window, in the sense that:
  - child windows for extension screens can be created and closed independently
  - when the main application window is closed, all other windows are closed as well
- the main window can be located on any screen
- only one application window can be opened per screen
- child windows are maximized to fill all screen
- child windows do not have menus or panels, just live view mode
- double-click layouts and/or channels to load them in the main application window
- drag and drop layouts and/or channels from the main window list to extension monitors

26   Keyboards & Joysticks

Luxriot Monitor offers a set of keyboard shortcuts for most interface controls and operations, and also gives you the option to re-program every single key combination, allowing you to assign your own key combinations to every available operation (action). This is true not only for the standard computer keyboards, but also for PTZ keyboards and joystick controllers.

> ⚠️ The controller device should be DirectShow compatible in order to be recognized in Luxriot Monitor.

All keyboards connected to the Luxriot Monitor station are automatically detected and listed as available for shortcut configuration; the list of default shortcut mappings is also attached automatically, if it is available for the target controller. For PTZ keyboards, joystick functionality is not listed but it is implied that all joysticks have the same behaviour, which includes pan and tilt on X and Y axes and zoom on Z axis. If you wish to calibrate your joystick before using it in Luxriot Monitor, please go to the Windows Control Panel and find your device under *Devices* (*Devices and Printers* section).

> 💡 The list of available commands is the same for each connected controller and cover most of the actions that can be performed in Luxriot Monitor. Commands cannot be added to the list manually at user's will but it is likely that the list of the available programmable actions will be expanded based on the customer feedback.

In order to view and edit the shortcuts, go to the Luxriot Monitor main menu -> *Edit* -> *Command mapping*.
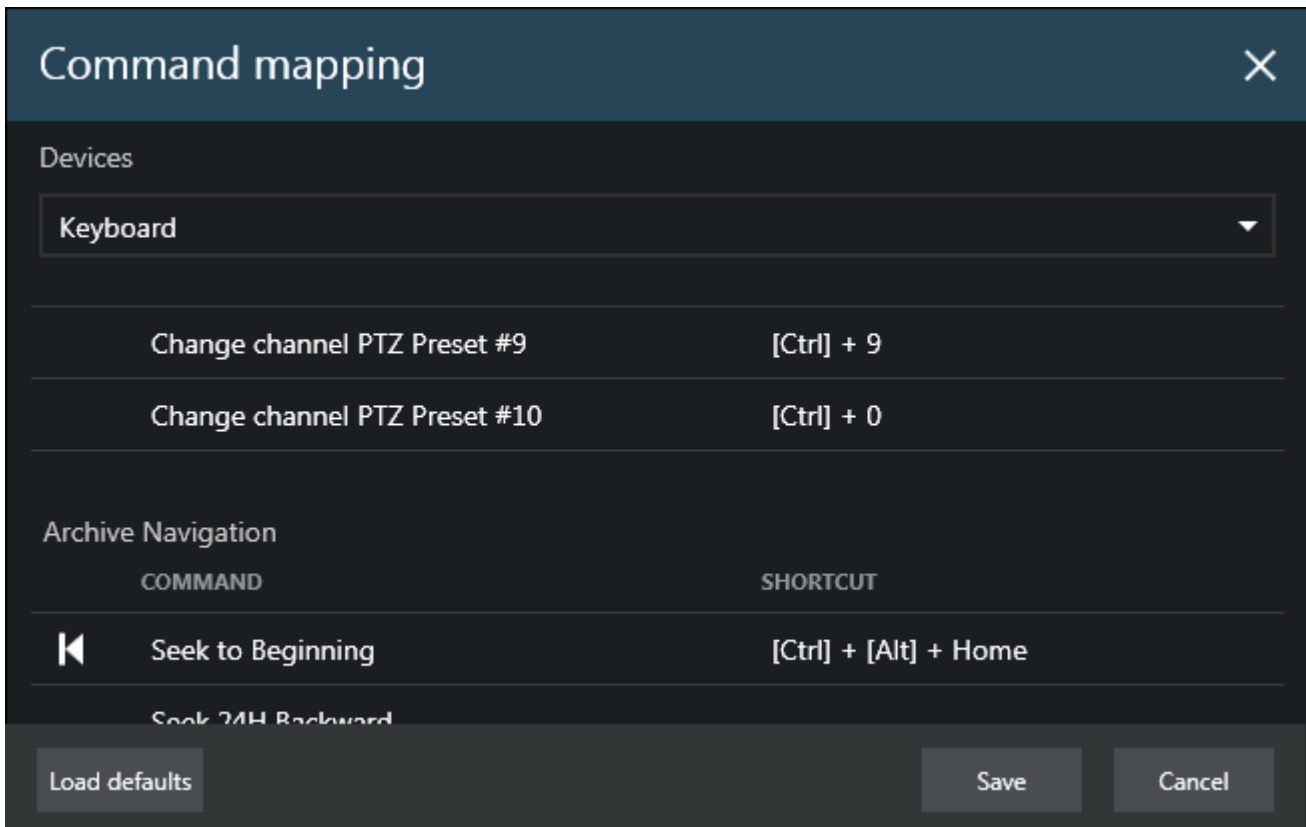
From the *Devices* drop-down list, choose the keyboard you wish to configure the shortcuts for; if your device is not in the list, make sure that it is connected to the server and that its driver has been installed correctly. Some devices, such as standard keyboards, have an extended pre-configured (default) set of command shortcuts covering almost all the available actions; generic ones have either no default configuration or shortcuts for calling first ten presets of a PTZ-capable camera.

In order to **change** shortcut mapping and replace it with your own key or key combination, simply double-click the target command and enter your desired key combination from the keyboard. A minimum of one and a maximum of four keys is expected for the standard keyboard, and a maximum of two keys - for PTZ keyboards or joysticks. If the entered key or key combination is already used somewhere else, you will be prompted to either confirm the new mapping or discard the changes and pick another shortcut.

Use the *Load Defaults* button in the bottom-left-hand corner if you wish to discard all changes for the currently selected controller and load **default** configuration instead.

When you have finished with the shortcut configuration, click *Save* to **confirm** all changes and close the dialog box. All your defined shortcuts

27   Operation Modes

Luxriot Monitor has three special operation modes:

- always on top
- exclusive (no access to other applications or resources)
- locked (all Luxriot Monitor controls are unavailable)

You can activate these by selecting the relevant option via main menu View -> [option].

Exclusivity and locked modes require a password to be defined, and this can be set in Application settings. If you have not already set a new password, you will be prompted to do so upon enabling the exclusivity/locked mode.