

Wavestore Video RDIN

Release Documentation and Installation Guide

1st October 2019



A Whole World of Integration



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1 Document Versions

Version	Date	Name	Change
1.0	2011-09-19	JB	Created new
2.0	2014-05-11	RS	Upgraded to CM, Implemented Playback speeds and presets
3.0	2015-04-22	DT	Bug fix package
4.0	2016-10-18	MK	Upgrade to new RDIN format, added Annotation and camera Tours support
4.1	2016-11-01	MK	Add limitations, installation instructions and event support
4.2	2019-10-01	BM	Integration upgrade with new version of SDK, added new PTZ(Iris, Focus, Washer, Wiper, Ifrared) functionality.

2 Referenced Documents

Document	Version	Description
Driver Connection and Online States Requirements (DDK-DC)	1.0	Wavestore Video Server driver must conform to all requirements in this document detailed in the section: Device Connection and Online States
Driver Video Requirements (DDK-VID)	1.0	Wavestore Video Server driver must conform to all requirements in this document detailed in the section: Video

3 Manufacturer

Name Wavestore



“Wavestore specialize in easy to install, configure and operate open platform Linux based recorders able to simultaneously record images from any combination of analogue, IP network, 360 degree and HDcctv cameras.”

Website <http://www.wavestore.com/>

4 IPSecurityCenter Versions

The driver must be compatible with the following IPSecurityCenter versions:

IPSecurityCenter Version	Supported
4.9.11+	<input checked="" type="checkbox"/>

5 Operating Systems

Client Side Functionality

Operating Systems	Supported
Windows 7 64 bit	☒

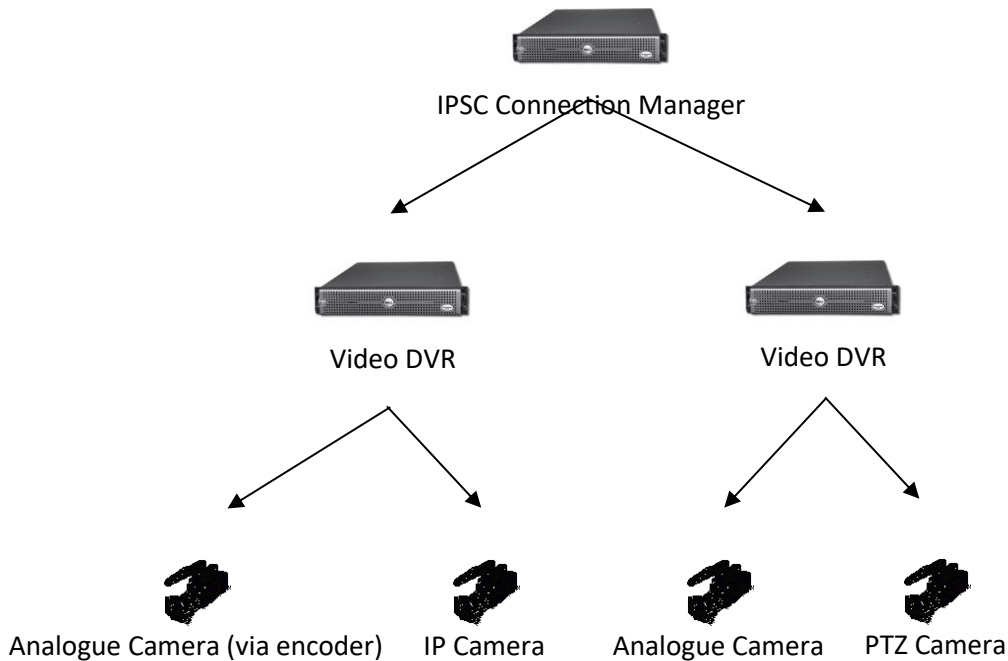
Server Side Functionality

Operating Systems	Supported
Windows Server 2008 R2	☒
Windows Server 2012	☒

6 Models / Firmware Versions

Model	Versions	SDK
VideoWave	5.2	Wavestore Video SDK 5.54.8 (32-bit)
VideoWave	5.4	Wavestore Video SDK 5.54.8 (32-bit)
WaveView	5.50.63	
WaveView	6.16.65	Wavestore Video SDK 6.14.50 (32-bit)

7 Hardware Configuration



The Wavestore Video enterprise consists of one or more DVRs, which connect to analogue cameras. All communication with the cameras under the enterprise goes through the Video SDK, via the connected Video DVR unit.

The video feeds are configured through their related DVR objects within IPSC. Each physical Video DVR must be added separately within IPSC and brought online in order to populate cameras.

8 Driver Package

The driver package is named:

CNL.IPSecurityCenter.Driver.Wavestore.Video.Version.[BUILD-VERSION].ipscdriver

9 Driver Features

9.1 Wavestore Video Server

9.1.1 Device Connection and Online States

The full requirements for these features can be found in the [Device Connection and Online States Requirements](#)

Feature	
DC1.0 Device Online Status	SDK
DC2.0 Authentication	Wavestore SDK

9.1.2 Video

This device does not support video.

VID5.0 Web Client Support

9.1.3 Properties

Name	Type	Description	Default Values & Ranges
IP	string	IP Address of the Wavestore DVR server	Host names are not supported, only provide IP address.
Port	int	Port to connect to Wavestore DVR	Default: 8601
Client Code	Int	Client code used in Login	
Encrypted Stream Private Key	string	The private key required to decrypt video streams	Default: <empty>
Video Export Format	VideoExportFormat	Video format of the exported video files.	Supported formats: wsb/avi/mp4/ mov/wmv/dvd/ swf/flv/asf
Annotation Track	AnnotationTrack	Set the recording camera tracks to be annotated. The option affects Set Annotation method on Wavestore Camera devices.	Supported values: FirstAvailableTrack AllTracks
Child Devices State Update Delay	int	Time delay in milliseconds after the Server device goes Online to ensure the child devices set to a right state.	Default: 2000 Min: 1000 Max: 10000

Keep Alive Interval	int	Time interval in seconds between DVRs connectivity checks.	Default: 30 Min: 5 Max: 1000
Time Zone Offset	int	The Wavestore server Time zone offset. The Annotations start and end time are calculated according to the Time Zone. The setting must match the Time Zone setting on Wavestore.	Default: 0 Min: -10 Max:13 The time zone must be a whole number except the following: Non-whole Time Zones: -4.5, -3.5, -3.5, 3.5, 4.5, 5.5, 5.75, 6.5, 6.5

NOTES:

Encrypted Stream Private Key

If the Wavestore is producing an encrypted video stream you will need to enter the private key into this field. If the private key is not present, encrypted video streams will not load and an error message will be presented informing the user that the stream is encrypted. Users can still export video from the device in .wsb format, but will be unable to view the exported video until opening it in the native WaveView application and specifying the private key. This field should hold the private encryption key as a string, not as a file path.

9.1.4 Events

General requirements for events can be found in [Driver Project Requirements](#).

9.1.4.1 Event Received

Raised when a new event is received from the Wavestore DVR.

Performance

The driver must be able to handle 4000 events per hour.

Event Properties

Name	Type	Description
Cause	Server Event Cause	The reported event cause. Expected values: Motion, Darkening, Input, DiskFull, SectionFull, Fault, Warning, Login, LoginDenied, CameraMovement, Recording, VideoLoss
Description	string	The event description – this is set in Text field in Waveview Event Rule.

How to Trigger

Examples:

- Login – log in to Wavestore by displaying a first camera, or from Waveview
- Login Denied – try to log in with wrong credentials
- Fault – change a configuration in Waveview and save it. Then re-enable the server device.

9.2 Wavestore Video Camera

9.2.1 Device Connection and Online States

The full requirements for these features can be found in the [Device Connection and Online States Requirements](#)

Feature	
DC1.0 Device Online Status	None
DC2.0 Authentication	None

9.2.2 Video

The full requirements for these features can be found in the [Driver Video Requirements](#).

Feature	
VID1.0 Camera Population	<input checked="" type="checkbox"/> Query Device
VID2.0 Live Video	
VID2.1 Display Live Video	<input checked="" type="checkbox"/>
VID2.2 Snapshot	<input checked="" type="checkbox"/>
VID2.3 PTZ	<input checked="" type="checkbox"/>
VID2.4 Set Preset	<input checked="" type="checkbox"/>
VID2.5 Get Preset	<input checked="" type="checkbox"/>
VID3.0 Recorded Video	
VID3.1 Display Recorded Video	<input checked="" type="checkbox"/>
VID3.2 Seek	<input checked="" type="checkbox"/>
VID3.3 Pause	<input checked="" type="checkbox"/>
VID3.4 Snapshot	<input checked="" type="checkbox"/>
VID3.5 Fast Forward/Rewind	<input checked="" type="checkbox"/> <i>Play Speeds:</i> -16, -8, -4, -2, -1, 1, 2, 4, 8, 16
VID3.6 Slow Motion	<input checked="" type="checkbox"/> <i>Supports Step Forward/Backward operations to step between individual frames</i>
VID3.7 Time Bar Population	Query Device

NOTE: A PTZ camera has many functions that may or may not be available on the end device. Although the function is listed it may not actually be supported. In such a case an event is added to the 'IPSC Drivers' event log.

9.2.3 Properties

Name	Type	Description	Default Values & Ranges
Camera Identifier	int	The camera SDK identifier.	(read-only, value retrieved from the SDK)

Recording Track	int	The track to retrieve recorded video from.	Default: 1 Min: 1 Max: 3
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9.2.4 Methods

General requirements for methods can be found in [Driver Project Requirements](#).

9.2.4.1 Set Annotation

Creates a new Annotation – marking a camera recorder track with text comment between a given Start Time and an End Time. The recorder tracks where the annotation is created depends on the **Set Annotation Option** property value on the parent Wavestore Server device.

This method is exposed as an operator action.
Returns bool.


Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Annotation Start Time	DateTime	The start time of the annotated time period <u>in UTC time</u> .	Default: DateTime.Now – 10min.
Annotation End Time	DateTime	The end time of the annotated time period <u>in UTC time</u> .	Default: DateTime.Now
Comment	string	Textual annotation describing the submitted time period.	Min: 1 character Max: 500 characters

NOTE: to view the created Annotations in Waveview, **View -> Find...** menu. New Annotations don't appear automatically – use **Refresh** button.

NOTE: when Annotation is created from IPSC Client video Tile (button ) , the From and To times given must be Local Wavestor server time, not UTC time.

9.2.4.2 Start Tour

Returns bool.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Tour Id	string		Default: Min: Max:

9.2.4.3 Stop Current Tour

Stop currently running tour.

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
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9.2.4.4 Iris Open

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
IrisOpenStartStop	bool	Parameter to Start(true)/Stop(false) the Iris Open.	Default: false

9.2.4.5 Close Iris

This method starts/stop closing the camera iris. If the command is unsuccessful, an error is returned EventRecieved

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Iris Close Start/Stop	bool	Parameter to Start(true)/Stop(false) the Iris Close	Default: false

9.2.4.6 Auto Iris

This method sets automatic iris configuration on the camera. If the command is unsuccessful, an error is returned through an event EventRecieved.

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
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9.2.4.7 Camera Wipe

This method starts/stops wiping the camera. If the command is unsuccessful, an error is returned through an event EventRecieved.

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Start/Stop Wiper	bool	Parameter to Start(true)/Stop(false) the Wiper.	Default: false

9.2.4.8 Focus In

This method starts/stops focussing the camera in. If the command is unsuccessful, an error is returned through the event EventRecieved.

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Focus In Start Stop	bool	Parameter to Start(true)/Stop(false) the Focus In.	Default: false

9.2.4.9 Camera Wash

This method starts/stops washing the camera. If the command is unsuccessful, an error is returned through an event EventRecieved.

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Start/Stop Wash	bool	Parameter to Start(true)/Stop(false) the Wash.	Default: false

9.2.4.10 Auto Focus

This method sets automatic focus configuration on the camera. If the command is unsuccessful, an error is returned through an event EventRecieved.

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
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9.2.4.11 Focus Out

This method starts/stops focussing the camera out. If the command is unsuccessful, an error is returned throught the event EventRecieved.

This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Focus Out Start/Stop	bool	Parameter to Start(true)/Stop(false) the Focus Out.	Default: false

9.2.4.12 Infrared Lamp

This method turns on/off the camera lamp. If on parameter is true, lamp will be switched on, otherwise if on is false, the lamp will be switched off. If the command is unsuccessful, an error is returned through an event EventReceived. This method is exposed as an operator action.

Returns void.

Performance

The method must complete within 2 seconds.

Parameters

Name	Type	Description	Default Value and Ranges
Lamp On/Off	bool	Parameter to turns on/off the camera lamp.	Default: false

9.2.5 Events

General requirements for events can be found in [Driver Project Requirements](#).

9.2.5.1 Annotation Create Result

Raised after **Set Annotation** method is called. Notifies the new Annotation is created or failed to create.

Performance

The driver must be able to handle 4000 events per hour.

Event Properties

Name	Type	Description
Annotation Start Time	DateTime	The start time in UTC of the annotated time period in.
Annotation End Time	DateTime	The end time in UTC of the annotated time period.
Comment	string	Textual annotation describing the submitted time period.
Error	string	Error description in case new annotation failed to create.
Result	AnnotationRequestResult	Success or Failure

How to Trigger

Call the **Set Annotation** method on camera device.

9.2.5.2 Event Received

Raised when a new event is received from the Wavestore camera.

Performance

The driver must be able to handle 4000 events per hour.

Event Properties

Name	Type	Description
Cause	Camera Event Cause	The reported event cause. Expected values: Motion, Darkening, Warning, CameraMovement, Recording, VideoLoss
Description	string	The event description – this is set in Text field in Waveview Event Rule.

How to Trigger

Examples:

- Darkening – cover a camera which supports events and can detect darkening (for example: ONVIF camera AXIS M3037 PVE)
- Recording – configure camera recording on motion then trigger the motion event
- Video Loss – disconnect a camera from the Network

10 Installation

10.1 Prerequisites

10.1.1 SDK Installation

Install the SDK on all machines running the following services / software:

- Client
- Video Export Server
- Connection Manager

IMPORTANT: After SDK installation in Connection Manager need to manually register the **eventsnotifierax.dll** ActiveX by running the **regsvr32.exe** utility from Command Line. The default path to the dll: **C:\Program Files (x86)\WaveSDK-ActiveX\lib\eventsnotifierax.dll**

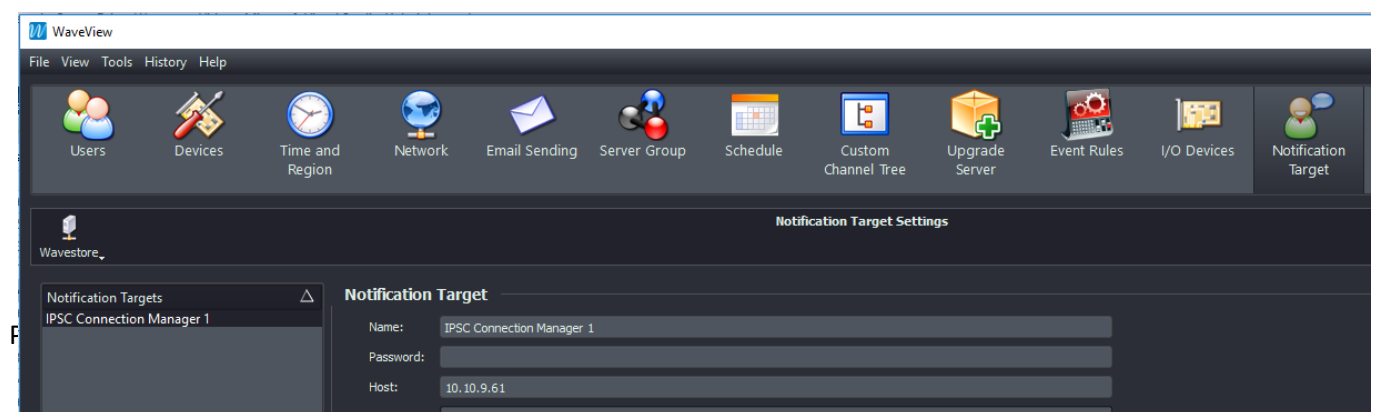
- Open command prompt as Administrator
- **cd** to the location of the ActiveX (for example: **cd C:\Program Files (x86)\WaveSDK-ActiveX\lib**)
- run the regsvr32: **regsvr32 eventsnotifierax.dll**

10.1.2 Wavestore Configuration

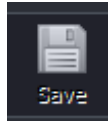
- Install Waveview on Video Export machine in order to use the **wbackuptool.exe** utility for the video export.
- To receive events from Wavestore, Waveview must be used to configure events to be sent to the driver:

1) Configure the Connection Manager machine details:

- Navigate to: **View -> Setup -> Notification Target**:
- Name: the name of the notifier for example: 'IPSC Connection Manager 1'
- **Host**: the IP address of the Connection Manager machine
- Leave **Protocol** as default: 'c'
- Leave **Type** as default value: 'On'
- Set **Password** – it has to match the **Event Password** property value on a corresponding server device.

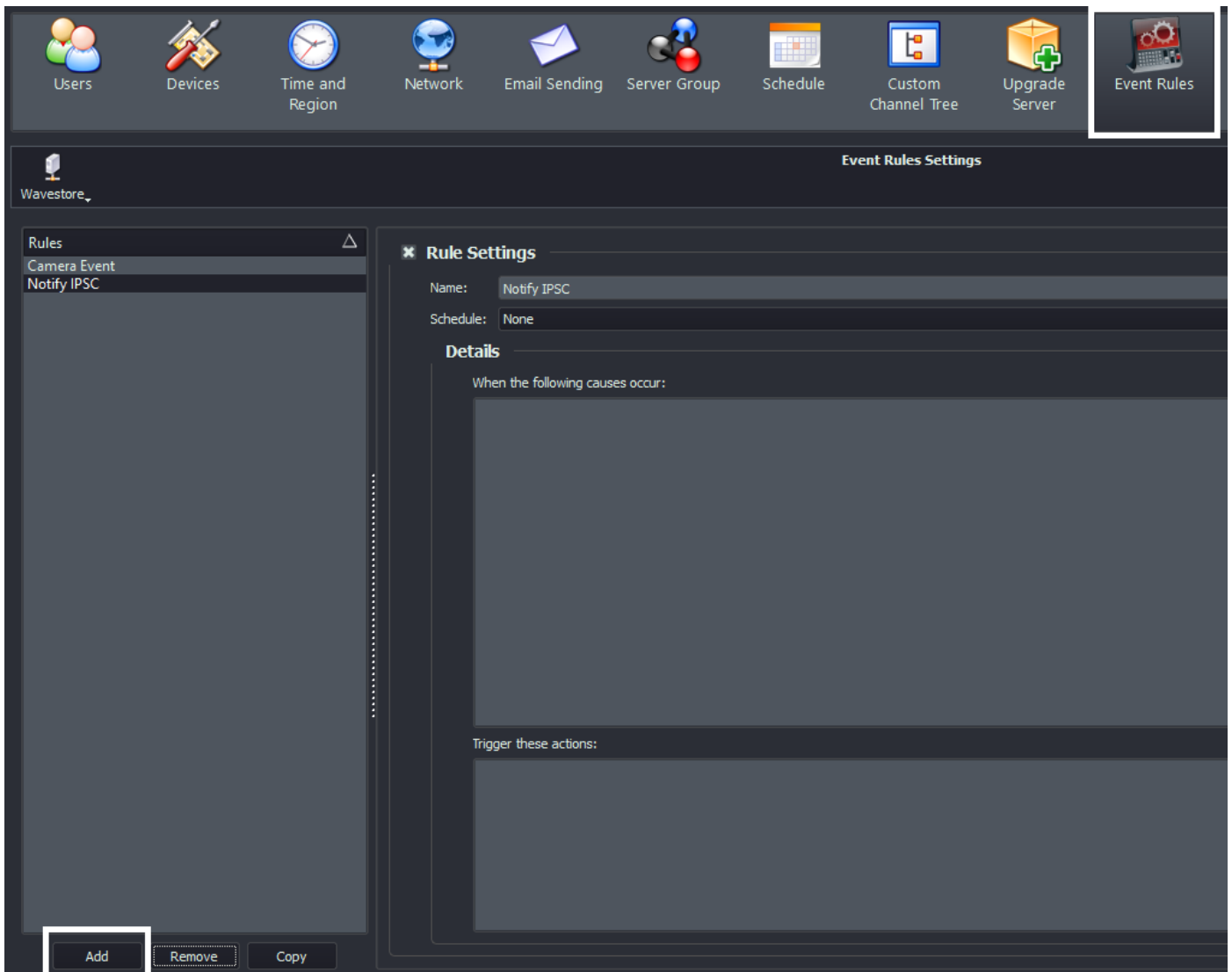


NOTE: for High Availability support repeat the above steps to define the backup Connection Manager(s)
Attention! The current Waveview GUI is buggy and tend to overwrite existing entries!

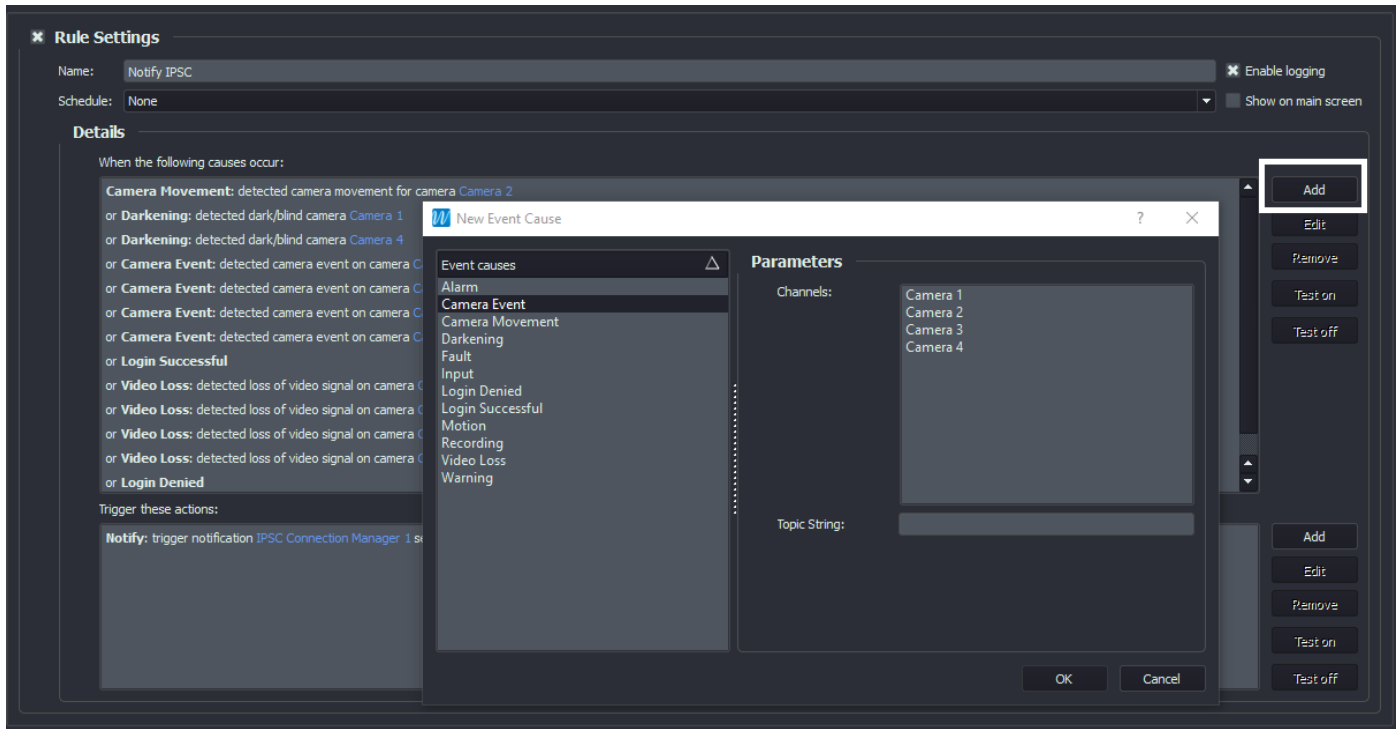


- Press Save button to save the configuration

- 2) Configure the event Rules – configure separate Rule for each event type (for camera events configure a separate Rule for each camera):
 - Navigate to: **View -> Setup -> Event Rules:**
 - Create a new Rule – click **Add** button under the Rules list on the left, give it a readable name, leave Schedule at 'None':

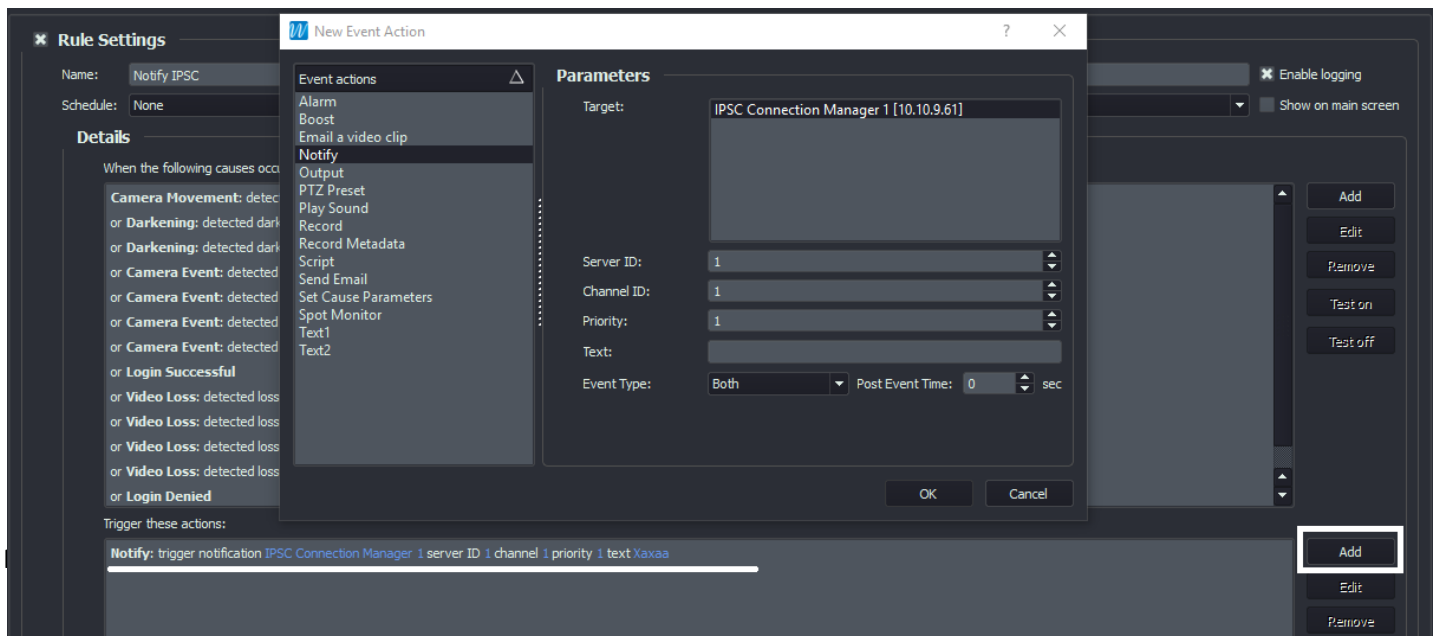


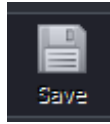
- Add any event(s) or which will trigger this notification – click **Add** button on the right:



- Add a new event action, define it as **Notify** and set the notification target as the Target created in 1):
Fill the following fields:
Channel ID – this is reported by the Wavestore SDK as a camera ID. Set this to **0** for any Server-level events like Fault, Login, Input, Warning. Set it to the relevant Camera ID when creating a Rule for a specific camera.
IMPORTANT – the actual camera received in the driver is the Channel ID, and not the camera Id(s) selected in the Rule conditions!

Text – this will be reported in the driver as event description, assign a user-friendly description here.





- Press Save button to save the configuration in the Wavestore server.

3) Restart the Wavestore server

- Navigate to: **View -> Setup -> Devices:**
- Press **Reboot System** button in **Server Administration** section

10.2 Driver Installation

- Start the IPSecurityCenter™ client and any supporting services
- Open the Device Driver Manager from the System Configuration
- Click the **Install** button
- Select the Wavestore Driver Package in the Open file dialog
- Wait for the driver to be uploaded

10.2.1 Device Configuration

- Right click in a folder (e.g. Devices) in the System Configuration: **New → Device On → Server**
- Click **Next** on the introduction
- Select **Wavestore** in the **Manufacturer** list
- Select **Wavestore Video Server** in the Available Devices list
- Click **Next** to enter the device details: enter the Wavestore DVR hostname or IP address, the port (use 0 to use the default port), user name and password.
- Click **Next** and **Finish** to add the device.
- Enable the device to bring it online.

11 Best Practices

- Encrypted video streams can only be exported in **wsb** format. Streams exported in **wsb** will require the WaveView software to decrypt the stream or export the video into a more universally accepted video format. Note that in order to use Video Export on this driver the *Video Export Tool Filepath* must be set on the main Wavestore server object.
- Because the event Listener is global (i.e. it is shared between all the Wavestore server devices, disabling a server device does not stop the listener. To stop the listener need to restart the Connection Manager service and enable any Wavestore server device on this Connection Manager.

12 Known Issues and Limitations

12.1 Live Video

- Cameras that are not configured within the Wavestore system should not be displayed in tile layouts as they fail to render correctly. Make sure any unused cameras remain in a 'Disabled' state within IPSC so they are not used.
- Wavestore SDK has a side effect: before a video is rendered a video control shows an empty blue screen. The duration of the blue screen display varies from camera to camera and normally not visible if the connection is fast
- Displaying multiple cameras (6 or more) with high frame rate make Windows Client slow down and respond slow. The reason: SDK consumes a lot of CPU resources for rendering. It also depends on the screen area used.
- Because of this driver is used with Pelco Matrix the camera Video Control doesn't show the standard IPSC error message upon camera disconnection – a native Wavestore black screen is shown instead.

12.2 PTZ and Presets

- There is no 'Set Preset' support currently within the SDK. IPSecurityCenter generates 255 Presets which are used purely for lookup purposes. Users will not be able to delete these Presets, but will be able to rename them. Put simply, selecting Preset 1 tells the Wavestore system to go to the first Preset.
- **Start Tour** and **Stop Current Tour** commands are available on all cameras but they only have effect on PTZ cameras. The camera methods triggered on non-PTZ cameras will return **false**.

12.3 Connection

- Because event listener recognize the event origin by IP address, always supply IP address in the server device IP property rather than a DNS host name.
- The driver does not support High Availability as it is only possible to define one Notify Target at Waveview (Waveview bug)

- The SDK intermittently doesn't connect with the exception: 'Attempted to read or write protected memory. This is often an indication that other memory is corrupt.' Restarting Connection Manager service solves the problem.

12.4 Playback

- There are known issues with video playback when the video stream has gaps in the recording. When the end of a chunk of recording is reached the processing cursor is displayed for a brief period until the next available playback chunk is retrieved and video playback begins. This can be unintuitive if you have not worked with the Wavestore driver before.
- Due to SDK limitations the driver doesn't report the real times or recorded chunks, but only reports one continuous chunk.
- If no recorded video is found for a requested time, the driver will automatically play the next available video chunk (this logic is implemented internally in the Wavestore SDK).
- Slow motion speeds are not supported by the SDK – Step Back and StepForward custom playback buttons are added instead to move between single frames:



12.5 Video Export

- SDK limitation: The export functionality is running in separate process.
- The Time Zone Offset on the PC where the Waveview is running must match the Time Zone set in Wavestore server otherwise video export will fail.

12.6 Configuration Changes

- Camera configuration changes (name, PTZ support, camera Enabled/Disabled) are only updated in the driver when the corresponding server device is reconnected (re-Enabled) in IPSC

12.7 Camera Device States

- SDK limitation: the driver doesn't supports camera state changes: camera devices won't change when cameras connection is disconnected and restored.

12.8 Screenshot

- Wavestore doesn't support screenshot functionality, so the driver saves a screen capture which includes the video control buttons