



Rev 1.02

AirX 5.6

User Guide

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Preface and Legal notice

AirX User Guide

"AirX User's Guide" is an operational document for describing the installation, configuration and management of the AirX software package.

AirX integrated mission-critical playout broadcast automation system, offering complete IP/SDI multi format flexibility with UHD/HD/SD support, delivering an end-to-end workflow ecosystem from ingest to compliance recording and media management.

As a software-based ecosystem, AirX may be deployed on premise, in the cloud or in a hybrid environment. The architecture affords speedy deployment and ease of launching new channels and services.

AirX enables you to broadcast multi-format, multichannel UHD 4K, HD, SD with frame accuracy. The system has built-in low latency switching/routing of input and output signals and full remote operational workflow. Encode/transcode multiple outputs per channel in NDI, ST2110, SRT, UDP, RTMP, HLS, MPEG-Dash.

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Thank you for purchasing our product!

AirX structure

Components and application

AirX, as a broadcast automation system, has a distributed client-server architecture, including:

- Server components that are running as the background process, according to configuration settings. Settings have to be performed by AirX Control server application.
- Client components for managing the broadcast playout server and control over the server functionality. Management have to be performed by Channel Manager client application
- Client components for creation of on-air graphic design scenes and/or graphics conversion to the internal graphic scene format for AirX software (Scene Editor client application).

Component Interaction:

1. The server operates in the background as a windows system process and provides automatic execution of the target functions of the broadcast playout server
2. Server settings are stored in *.xml configuration files. Changing the settings (configuration file) from the side of the client application is not possible.
3. The components interact via the Ethernet network, using the UDP or TCP IP

Technical specifications

Input interfaces

- SMPTE-2110 4K UHD
- NewTek NDI®
- SD/HD/UHD-SDI (Embedded Audio)
- Composite S-video
- YUV - Analog Audio: balanced/unbalanced
- IP TS (MPEG 2, AVC/H264, HEVC/H265)
- HDMI (576, 720, 1080, 2160)
- WEB RTMP
- RTSP
- HLS Multi-Bitrate
- MPEG-Dash
- Haivision SRT

Output interfaces

- SMPTE-2110 4K UHD
- NewTek NDI®
- SD/HD/UHD-SDI (Embedded Audio)
- Composite S-video
- YUV
- Analog Audio: balanced/unbalanced
- IP TS (MPEG 2, AVC/H264, HEVC/H265)
- HDMI (576, 720, 1080, 2160)

- WEB RTMP
- RTSP
- HLS Multi-Bitrate
- MPEG-Dash
- Haivision SRT

FILL+KEY graphics

- SD/HD/UHD-SDI
- NewTek NDI®

PCI-E Capture cards and decoders

- NVIDIA
- Intel
- Mellanox technologies
- Blackmagic design
- DekTec
- A.J.A.
- BirdDog
- Stream Labs

Formats and codecs SD/HD/UHD (media files)

- **Formats:** AVI, MOV, MXF, MP4, MPG, BMP, TGA, GIF, PNG, JPG, TIF
- **Codecs:** DVCAM, DVCPR025, DVCPR050, DVCPR0100, HDV, IMX (30,40,50), XDCAM EX (SP, HQ), XDCAM HD (LP, SP, HQ), XDCAM HD422, DNxHD (36,145,220), AVC/ H-264, MPEG2 GOP, Apple ProRes.

Full list of supported formats: **Table of codecs**

Automated AD insertion

- Input events: DTMF, SCTE-35/104
- Output events: SCTE-35/104 TS IP, HLS, SCTE-104 in SDI.

External devices and services

AirX Control application allows connecting and managing of matrix switchers, redundancy devices, headend platforms and external graphics systems, connected through RS-232/422, GPI, SOFT GPI, Telnet, etc.

Preparing for installation (Server-side)

Preparing for installation includes reviewing system requirements and pre-installation revising the machine notes.

Hardware requirements

Requirements for supported operating systems:

- "Windows 10" x64 build 1909 or higher

- "Windows Server 2019" x64 build 1909 or higher

Windows Server 2019 is recommended for server platforms. Windows 10 is recommended for server platforms, workstations and desktop PCs.

Before the initial installation of the software, it is necessary to preliminarily prepare the OS:

- Check and install the latest motherboard drivers
- Update Windows to apply the latest Microsoft updates and patches
- Check local NTP server settings - AirX applications operates with NTP
- Adjust the power mode in Windows - high performance. Turning off disks and the display must be prohibited
- Remove unnecessary services from startup and Windows Update

Recommended graphics card driver versions:

- NVIDIA GeForce driver build 27.21.14.5167
- NVIDIA QUADRO driver build 26.21.14.4219
- Blackmagic DeckLink driver build 12.2.2
- Dektec DTA SDI card driver build 4.28.0 3

Minimum hardware requirements:

1 standard definition (SD) channel on one server:

- "Intel Core i5 gen 8" or higher;
- 8 Gb RAM;
- NVIDIA GeForce GTX1060 GPU supporting "DirectX 11" or higher

Simultaneous operation of 2 high definition (HD) channels or 4 standard definition (SD) channels on one server:

- "Intel Core i7 gen 8" or higher;
- 8-16 Gb RAM;
- NVIDIA GeForce GTX 1060 GPU supporting "DirectX 11" or higher

Simultaneous operation of 2-5 high definition (HD) channels or 1 ultra-high definition (UHD) channel on one server:

- "Intel XEON Silver 4214R";
- 24-48 Gb RAM;
- "NVIDIA QUADRO P2200/RTXA4000" GPU supporting "DirectX" 11 or higher.

For media library it is strongly recommended to use an additional HDD/SSD or external storage.

Notes:

1. It is important to use memory in multi-channel mode, for example 4x4Gb, 6x8Gb or 8x8Gb cards.
2. For the broadcast playout server, it is recommended to use a fault-tolerant RAID array of high-speed hard drives, at least 7200 rpm, SATA-III or SSD to create internal disk storage. We recommend using RAID 5, RAID 6, or RAID 10. Make sure the selected hard drives are recommended by the manufacturer for usage in RAID storage systems.
3. It is strongly recommended to separate file data sources and data streaming between two physically separated networks. Make sure all your servers and

workstations have two Gigabit Ethernet adapters. We recommend using professional network cards such as Intel I350.

4. For any nVidia graphics card, make sure that the card is installed in a full-size PCIe x16 Gen.2 or Gen.3 slot and the graphics card driver is up to date. In addition, we recommend checking the format support and the number of supported sessions on the nVidia website:

<https://developer.nvidia.com/video-encode-decode-gpu-support-matrix>

These guidelines are for informational purposes only. The final configuration for each specific task must be calculated individually by Telestrider Company.

Preparing for installation (Client-side)

Hardware requirements

Requirements for supported operating systems:

- "Windows 10" x64;
- "Windows Server 2019" x64;
- Local Admin Rights.

Minimum hardware requirements:

- "Intel Core i5 gen 8" or higher;
- Minimum 8 GB of RAM;
- "Intel UHD Graphics" or "NVIDIA" supporting "DirectX 11" or higher;
- Monitor with a screen resolution of 1920x1080 or more;
- Audio playback system.

Note: It is recommended to install two monitors: a monitor with a screen resolution of 1920x1080 or more for the client workplace, and SDI monitor to control the quality of live sources.

Server-side component installation

For installation of the AirX software, it is necessary to check the readiness of hardware and log in into PC's operating system with Admin rights

Then execute the AirX installer file you received from Telestrider technical support team.

**Since the AirX software has client-server architecture, the installer must be downloaded to both the broadcast playout server and the client workstation.*

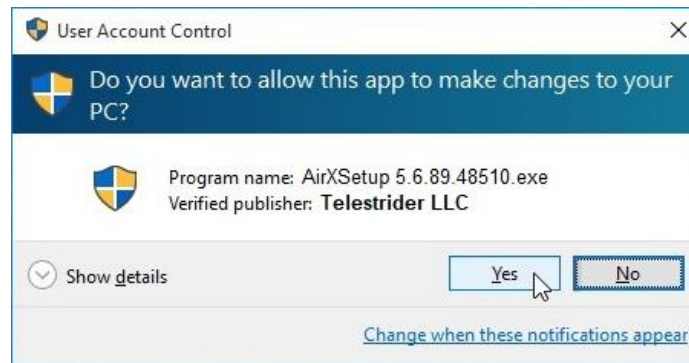


Figure 1. User Account Control

Next, the installation Wizard window will show the license agreement. Choose the language and read the License terms and conditions.

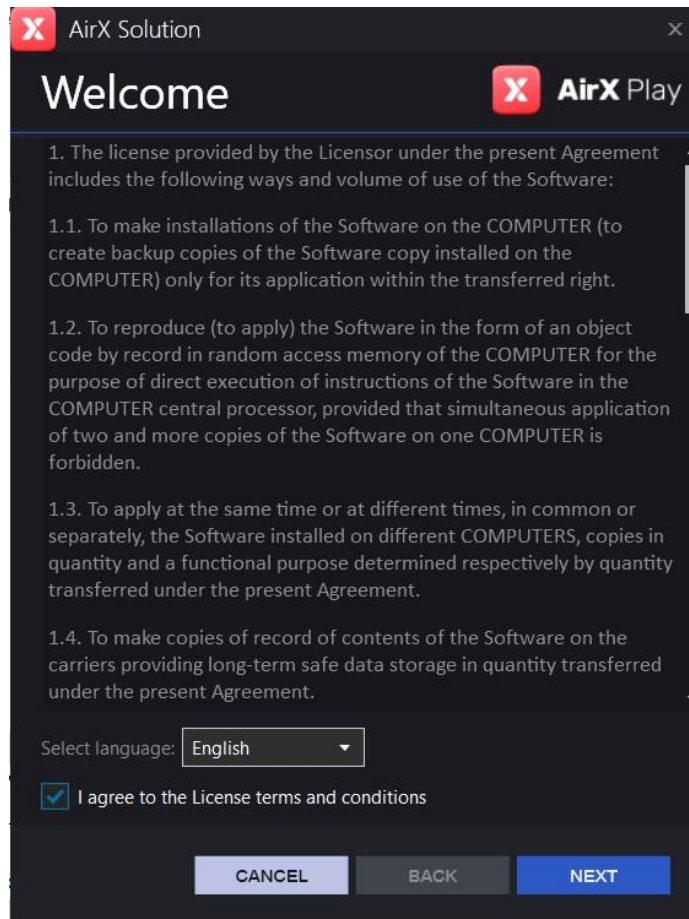


Figure 2. License terms and conditions

After reading, check the box to agree to the terms and click **Next**. The following interface will give you the options to install the components.

WARNING: if you do not agree with the License terms please terminate the installation by **Cancel** button.

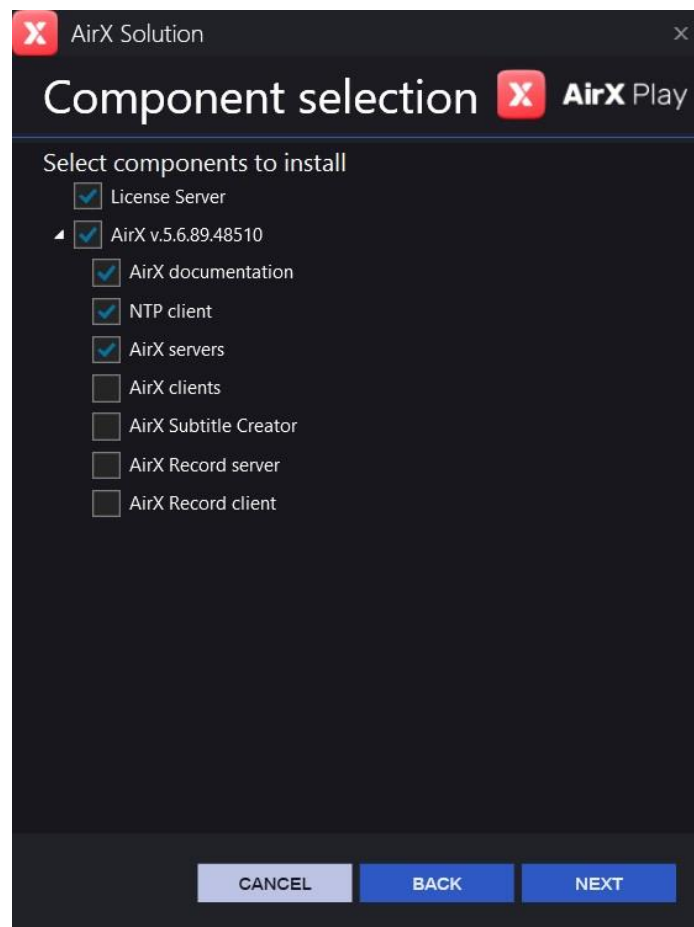


Figure 3. Component selection

License Server performs the operation of the software components in accordance with the purchased licenses. For the detailed description of setting up the License Server, see the **License** chapter.

AirX v.NN – broadcast automation system components, including:

- AirX documentation – self-explanatory
- NTP client – provides synchronization of the broadcast playout server and the client application with NTP server. By default, AirX is synchronized with system time of the server
- AirX servers – software components, necessary for the operation of the broadcast playout server
- AirX clients – software components for a remote client application.
- AirX Subtitle Creator – built-in subtitle creation tools
- AirX Record server – software components of the AirX recording server
- AirX Record client – software components for a remote recording client application

Check the boxes shown in Figure 3 to install AirX on the broadcast playout server: License Server, AirX documentation (optional), NTP client and AirX servers. Then click **Next**. In the next window you will see a list of components, selected for installation:

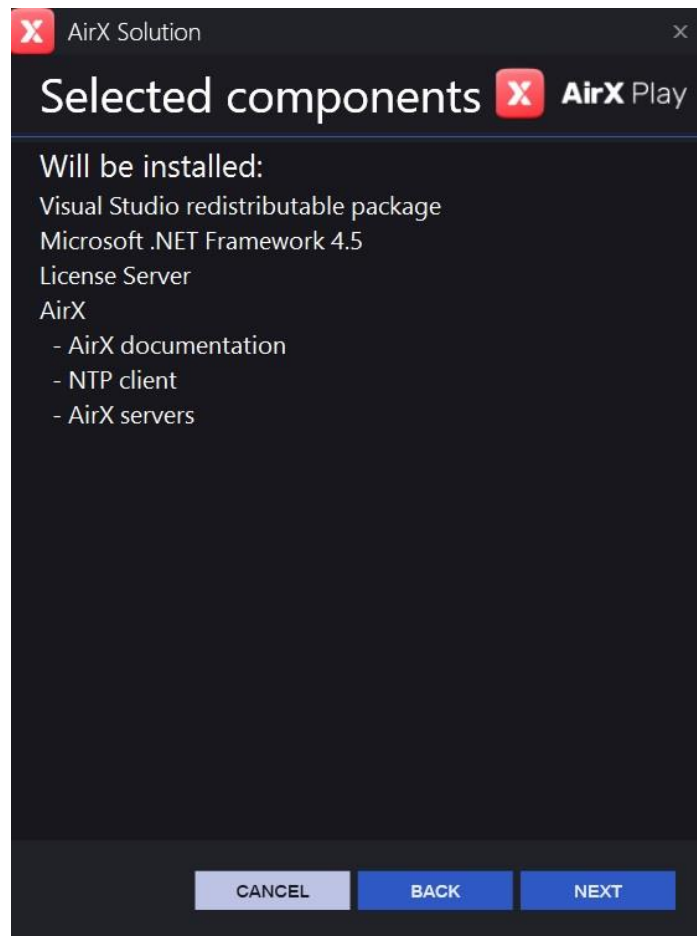


Figure 4. Selected components

Click **Back** to make changes to the list of components, Click **Next** to confirm the installation of the components.

On next step, the window will contain the checkbox to start AirX services after installation. For the initial installation of AirX the checkbox is inappropriate, because AirX services (such as the configured input signal, playout channel, or channel output stream) do not exist yet. When updating the software with configured services, set the checkbox to immediately start the services after installation.

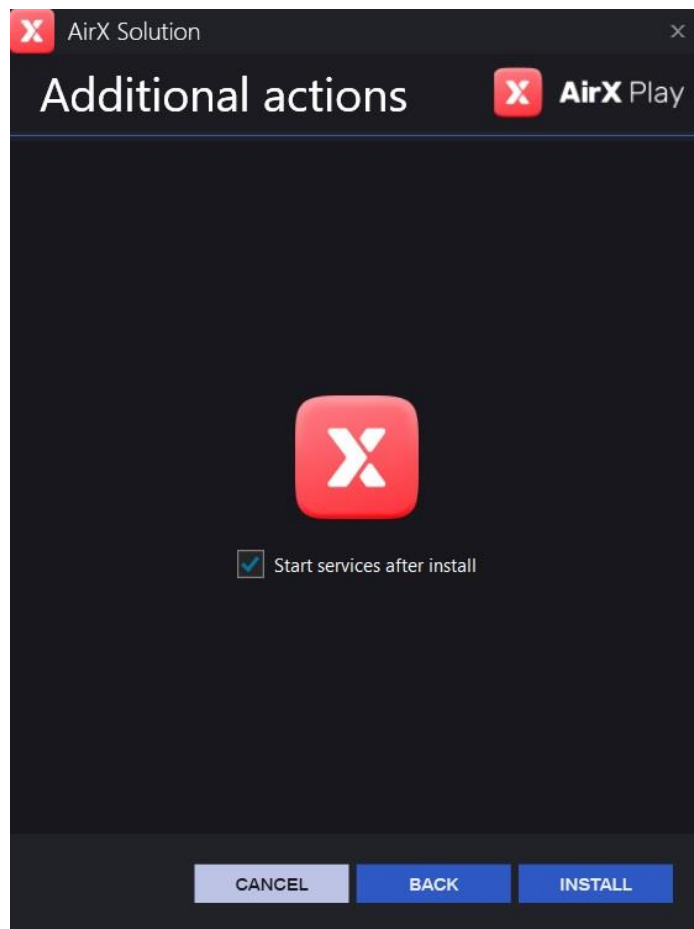


Figure 5. Start services after install

Click **Install** to start the process. Installation progress bar will be shown in the same window

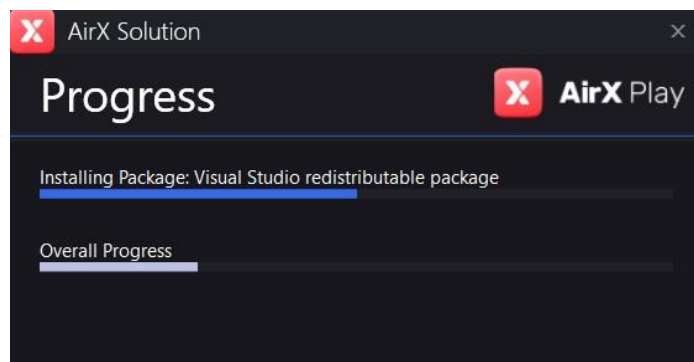


Figure 6. Installation progress

After the installation process is finished, you will be prompted to launch the Control application to configure services and close the installer window.

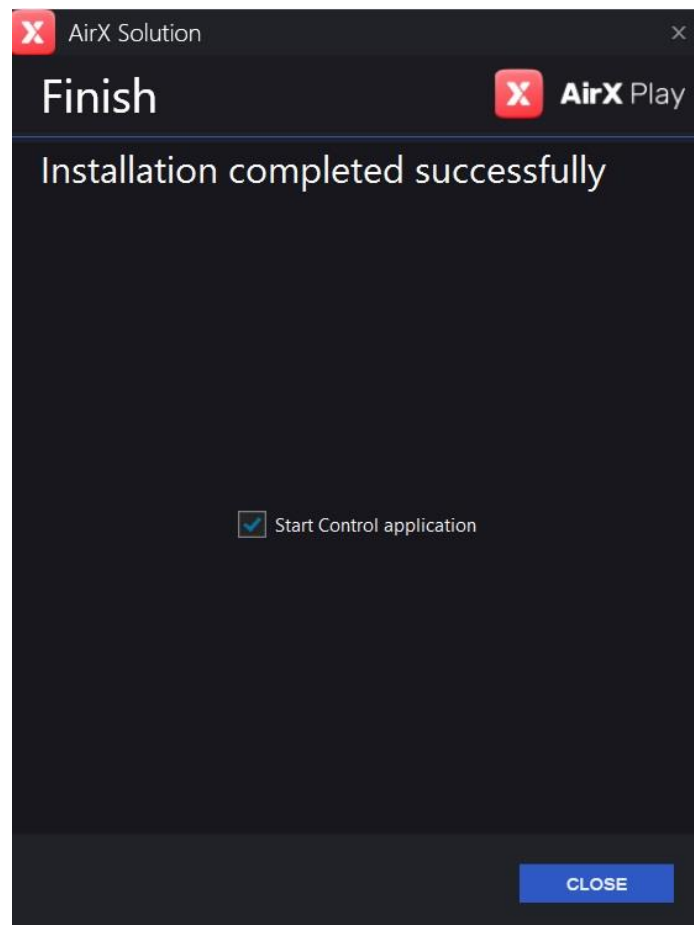


Figure 7. Installation completed

After closing the installation app, the following desktop shortcuts will be created:

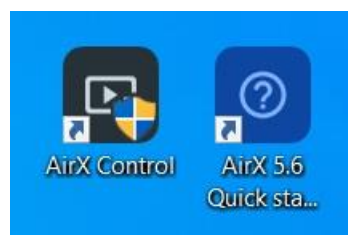


Figure 8. AirX shortcuts

AirX Control - the configurator launcher for setting up the Server

AirX Quick start guide - self-explanatory

License

License key activation, license update.

After installing the AirX software, you must install license keys. Please contact Telestrider technical support team, which will generate a personal license key associated to the hardware configuration of each specific broadcast playout server. Provide the technical support the **HW ID** of your server to generate a personal license

key. To get a unique HW ID, find the green shield icon in the status bar (shown in the figure below):

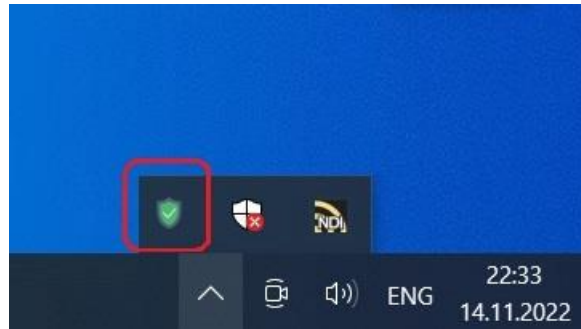


Figure 9. License server icon

ATTENTION: during the first installation of the License server, a red exclamation mark (!) may be displayed instead of a green shield.

Click on this icon to open the License server interface:

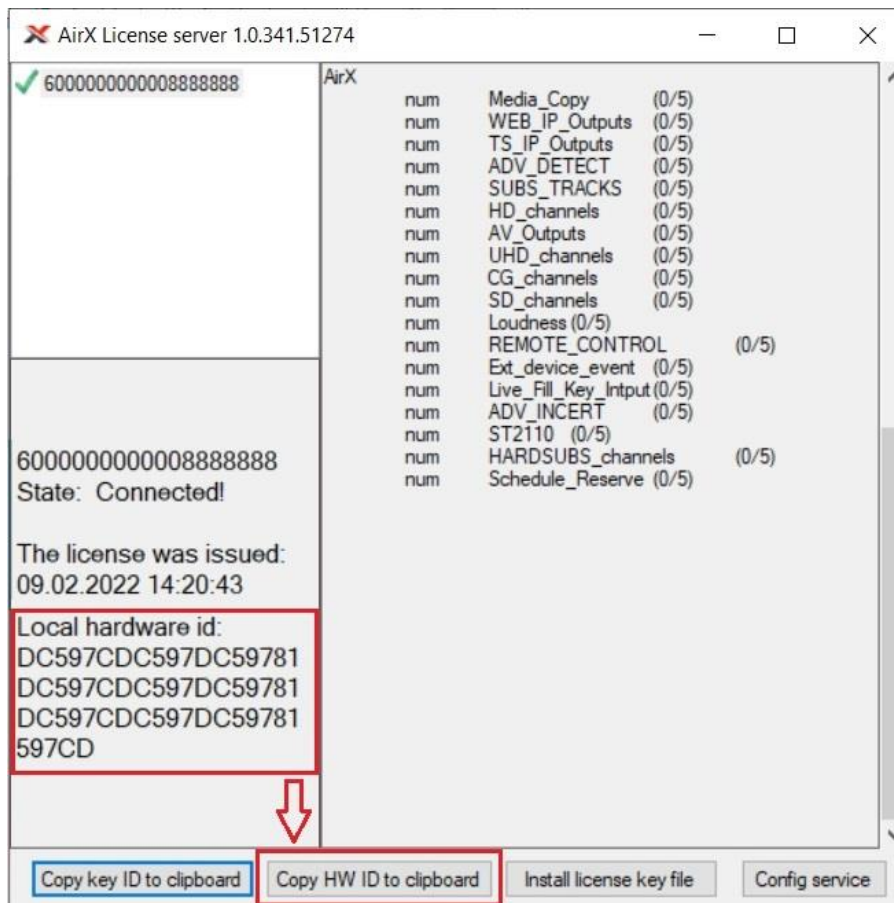


Figure 10. License server interface

The License server generates a Hardware ID (outlined in red) using built-in algorithm to make it unique. Click **the Copy HW to clipboard** button and send the ID to technical support via e-mail, Skype, etc.

Technical support will assign licenses to your key and send you back a special *.lic file, based on your Hardware ID. Save the license file to the broadcast playout server

(by default, it will be saved in C:\Users\user\Downloads folder). Then click the **Install license key file** button, find the license file and open it. The server will install all your licenses. You can see them in the right pane of the License server window.

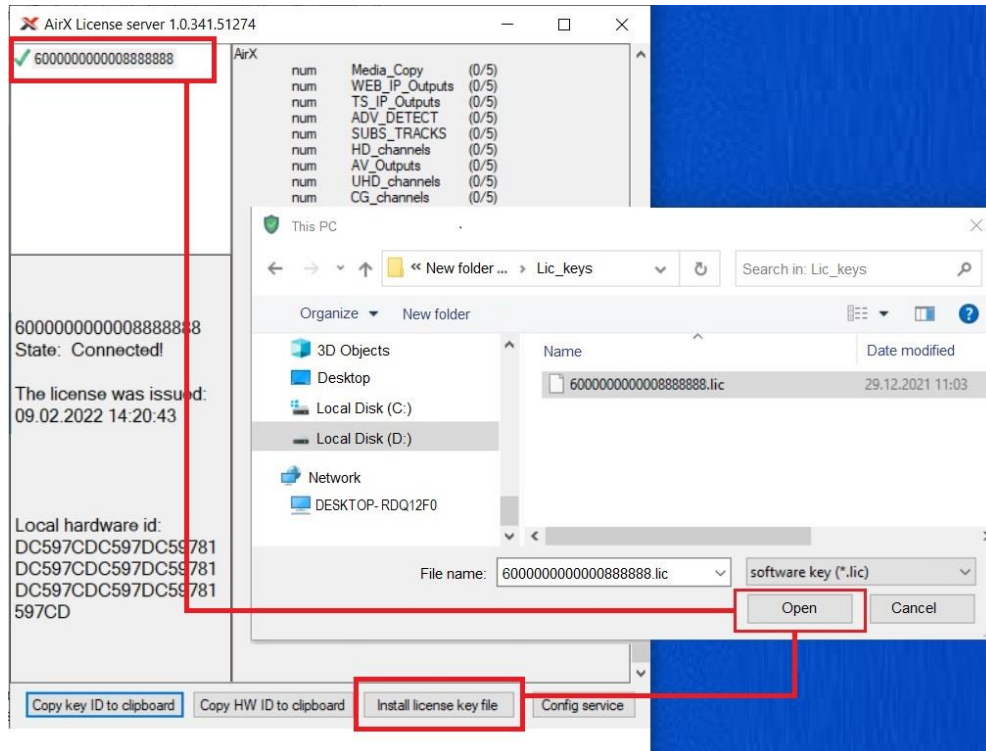


Figure 11. Install license key file

To update the license key, click the **Remove license key file** button, and then install the new license using the method, described above.

All of the above will activate the license key for all Telestrider products installed on your server. But then you have to transfer licenses to each software product (AirX or AirX Record server, or other), and register your license key in the application.

For the AirX server, launch the AirX Control application and expand the Server resource tree. Browse to the License Info branch.

On the right pane of the application window you will see an editable License ID field. Copy the license key number from the License server application into this field.

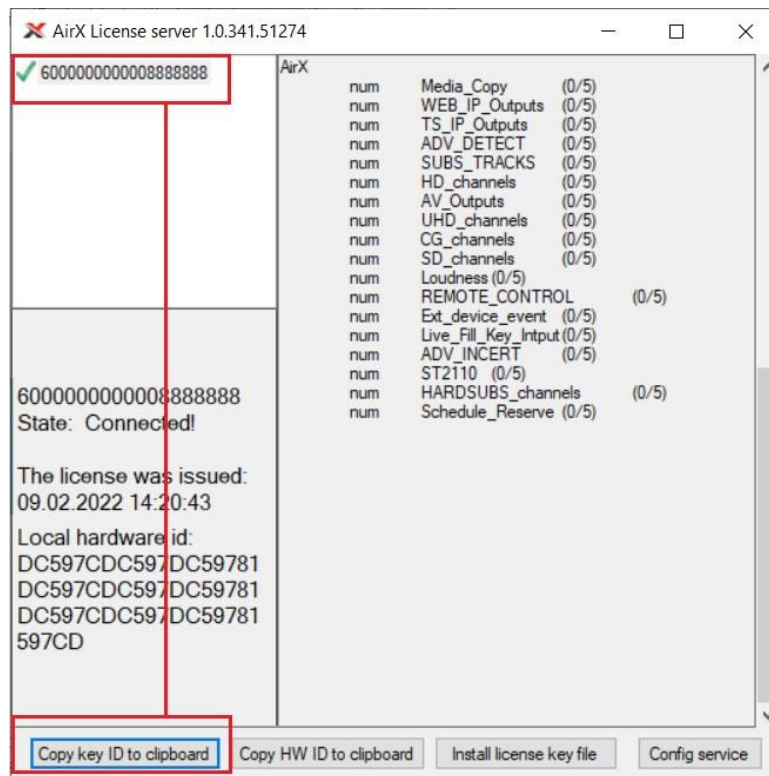


Figure 12. Key ID copy

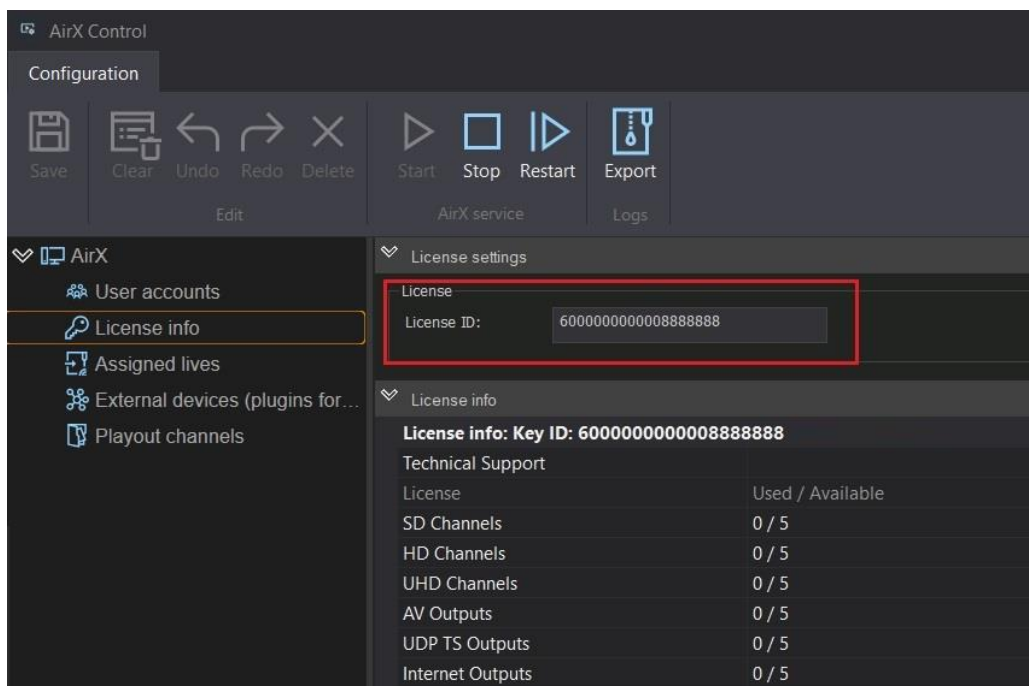


Figure 13. Key ID in AirX Control app

After copying the Key ID to AirX, click **Save** and then **Restart** in the main menu of AirX Control app to save the license key settings. Now you can work with the purchased license. In the right pane of the AirX Control window you can see a list of available/used licenses, and the expiration date of your key.

ATTENTION: If you update the license key, do not forget to save changes after updating and restart the AirX services by pressing Save and Restart. This guarantees that the changes inside the AirX services are applied.

Server interface, settings

System startup, settings

To configure AirX, run the AirX Control configurator from your desktop. The following interface will be launched:

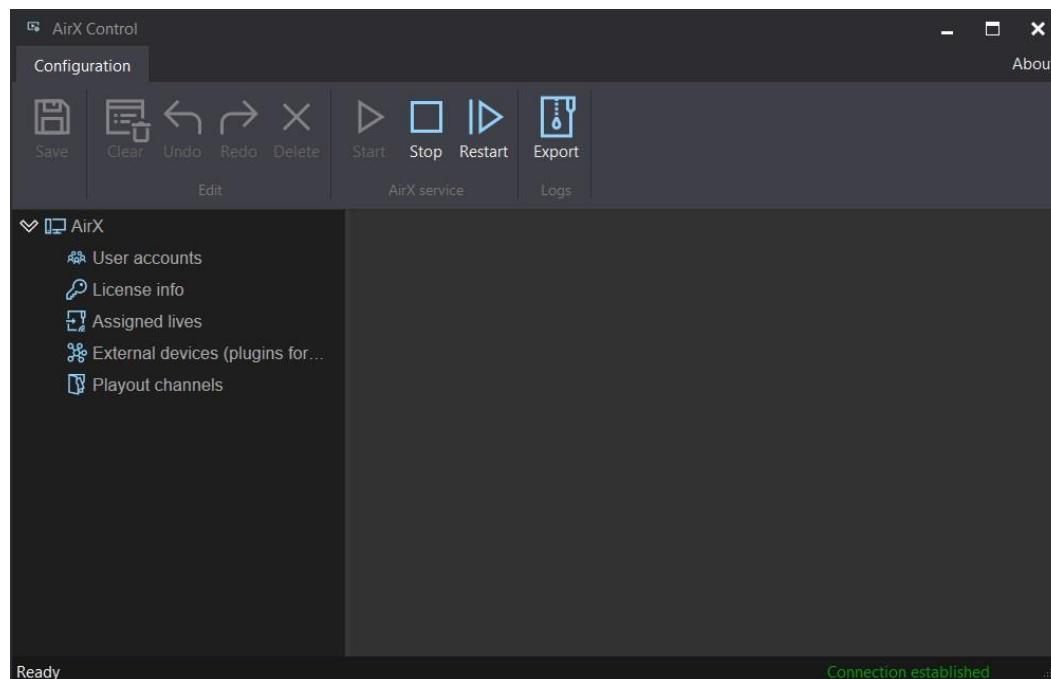


Figure 14. AirX Control startup interface

Here you can see the server control pane and resource tree.

Control commands are located in the main menu of the window:

- **Save** is for saving the configuration of the Server;

Subset **Edit**:

- **Clear** - full cleanup of configuration. Allows you to remove at once all connected sources, channels and output signals from the configuration. After pressing the **Save** button, configuration restore is not possible.
- **Undo** - cancel the last change in stack of changes;
- **Redo** - revert the change, canceled by **Undo** button;
- **Delete** - removal of parameter (source, channel or output signal) from configuration.

Subset **AirX service**:

- **Start** - start the Server;
- **Stop** - stop the Server;

- **Restart** - restart the Server. The server must be restarted after making changes and saving them (do not forget!). This is necessary because all changes are registered in the configuration files and applied in the configuration.

Subset **Logs**:

- **Export** – start the built-in application to export server log archive.

You will see the basic settings of the broadcast playout server in the right pane of the AirX Control window after you click the top item of the resource tree (in our case **AirX server**).

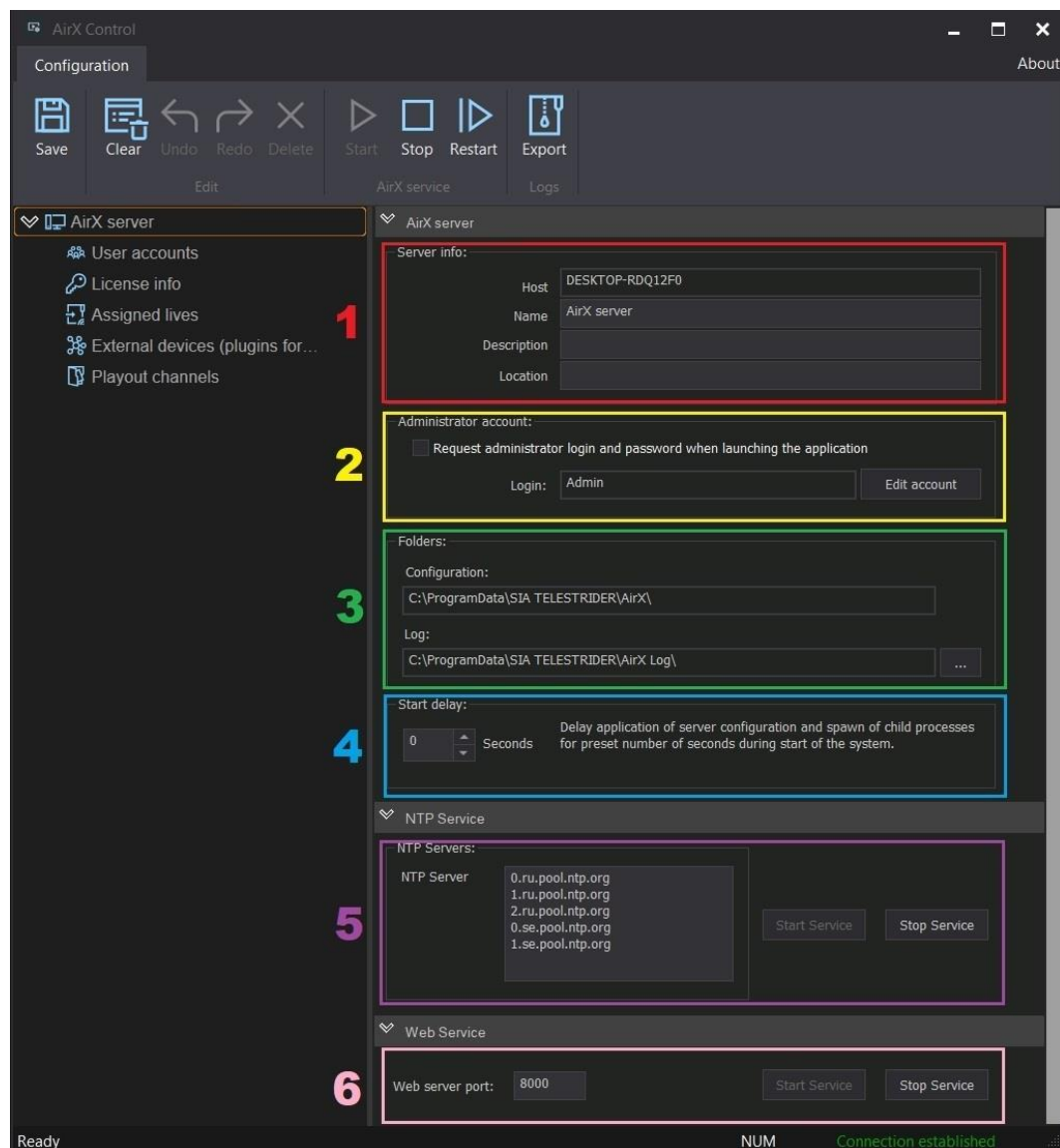


Figure 15. AirX server settings

Settings are divided by groups:

1. **Server info** - setup of general parameters of the server. **Host** – non-editable ID of the server, that is used in a systems with several AirX servers. It is equal to Windows-System-Computer name. **Name** is editable field to enter the name of the server. **Description** and **Location** are additional info fields (editable).

- Administrator account** - setup of registry record for administrator.
Checkbox "Request administrator login and password when launching the application" is intended for setup of authorization of admin during launch of the server. By default login is "Admin" with password "12345".
The "Edit account" button is dedicated to call the interface for editing the registry entry of the user whose login is entered in the "Login" field.

Please note. AirX server does not presume registry record for Administrator. User of the PC with installed AirX server and rights to operate with the channel, which has been setup in "User account", is considered to be an Admin.

- Folders** - setup of the folders of the Server.
Editable text field **Configuration** contains the path to the configuration file that stores information about all server settings (inputs, devices, channels, output signals, etc.). Value for Configuration field can be entered from the keyboard. The default path is C:\ProgramData\SIA TELESTRIDER\AirX\
Log folder contains log files of the server and also all service information for technical support. Log folder can be selected using a standard Windows file manager. The default path is C:\ProgramData\SIA TELESTRIDER\AirX Log\
Start delay - delay of starting the broadcasting service and its secondary processes after launch of the server (for example after the start of the operating system when the server is rebooted). Delay is being set in counter (in seconds). Value of the delay is being set empirically and depends on PC's hardware and system full load.
- NTP Service** - setup of synchronization of the broadcast playout server and the client application time with the NTP server. By default, AirX is synchronized with system time of the server.
It is recommended to use local NTP server, connected to GPS satellite systems.
When changing the NTP list, you have to restart the service with the Restart or Stop -> Start button.
- Web Service** - setup of the port of HTTP server and control of its work. In addition, it provides a possibility for start and stop of Web server/service.

Save and import configuration

The entire AirX server configuration, channel settings, parameters of connected external devices, sources, and outputs, are stored in Config.xml configuration file. By default, the file is located in C:\ProgramData\SIA TELESTRIDER\AirX\Config.xml (group 3 Figure 15. AirX server settings).

If you want to back up your configuration, you can save a copy of the Config.xml file to an external drive.

Any changes you make to the server configuration using the AirX Control program must be saved from the interface of this program using the **Save** button or by right-clicking on the configuration name and selecting **Save configuration** item from menu.

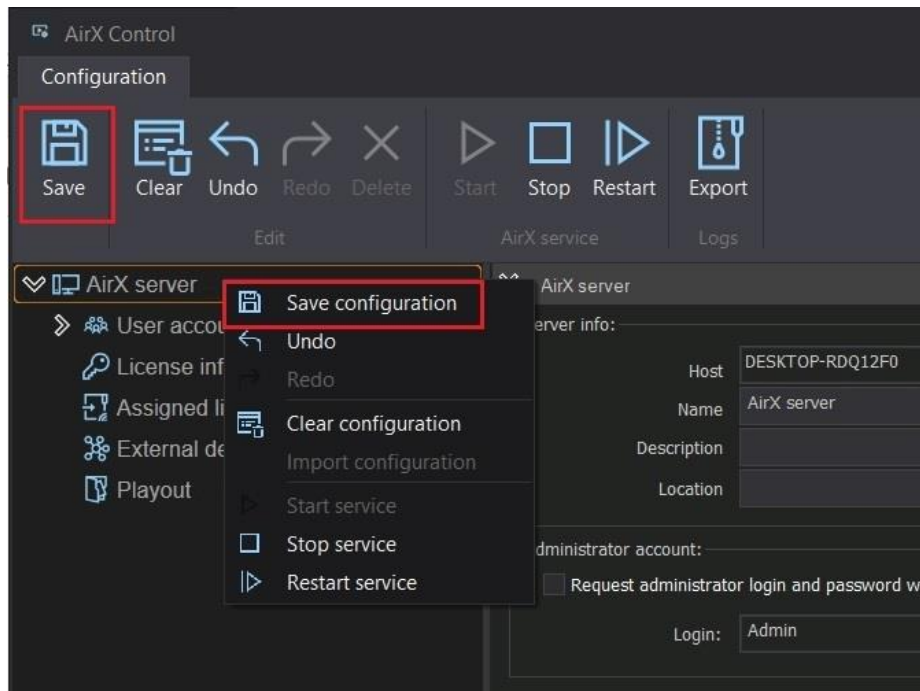


Figure 16. Save configuration

ATTENTION! Manual modification of the Config.xml file is **strictly prohibited** due to the risk of configuration corruption by human error. This may cause the incorrect work of software.

The previously saved configuration can be imported to AirX. Terminate all services with the **Stop** button, and then call the context menu by right-clicking on the configuration name.

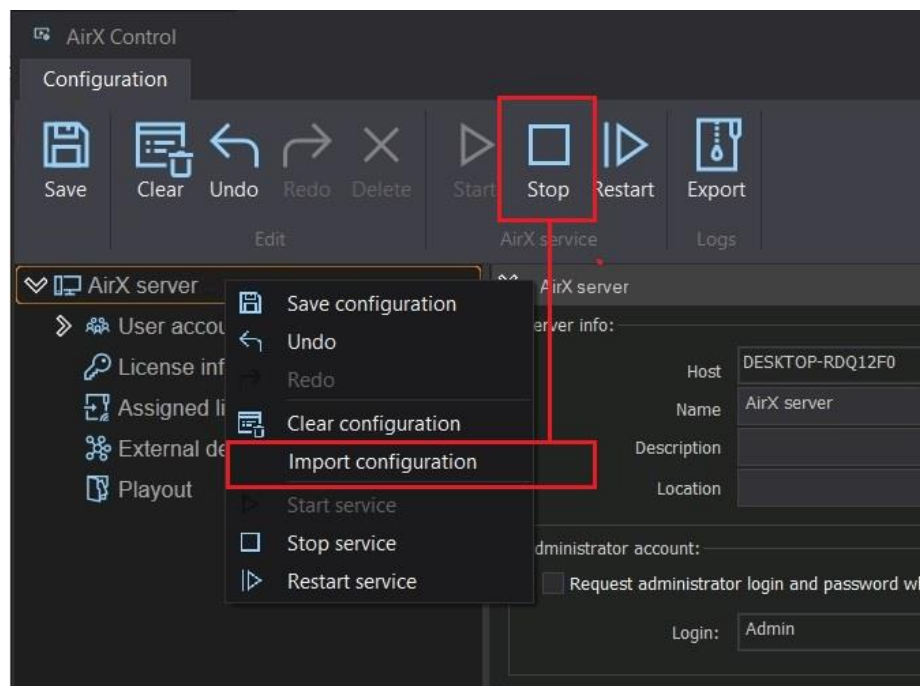


Figure 17. Import configuration

After selecting the **Import configuration** menu item, the standard Windows file manager will be opened. Find the previously saved configuration (Config.xml file) and import it to AirX.

System logs

System logs store all information about AirX server events and configuration changes, as well as user actions. By default, log files are stored in the C:\ProgramData\SIA TELESTRIDER\AirX Log folder. To collect an archive with all log files, use the **Export** button in the main menu of AirX Control app:

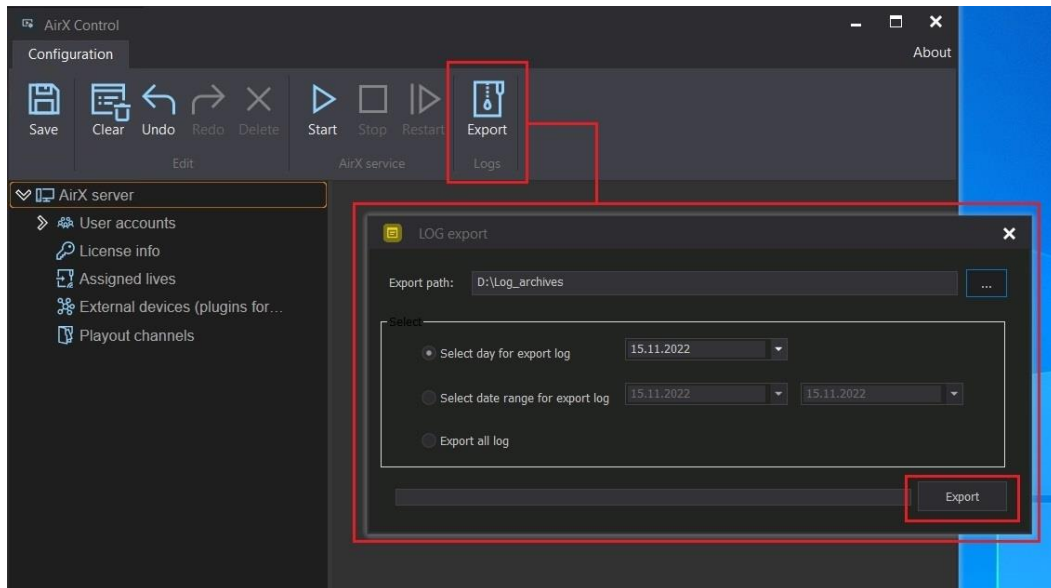


Figure 18. LOG export

Specify the path in **LOG export** window to save the archive, using standard Windows file manager. You can also select a period for downloading logs: the current day, a date range. Or you can export of all logs available on the server for all the time. Set the value and click **Export** to save the archive in the specified folder.

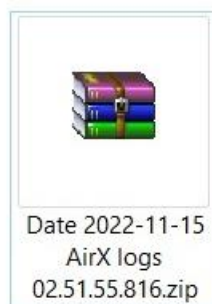


Figure 19. Log archive

Users

User account interface

AirX software allows you to create independent user profiles. This function allows differentiating the user's permissions to playout channels. Each user's profile has access to the assigned channels.

To create a new user's profile, click the **User Accounts** branch of the Server resource tree on the left pane of the application window. Right pane **Add a new user account** is intended for creation of the record in user's registry.

Enter the name, password with confirmation, and click the **Add new user** button. Login and password must contain between 4 and 16 characters. The new profile will be added in the User accounts branch.

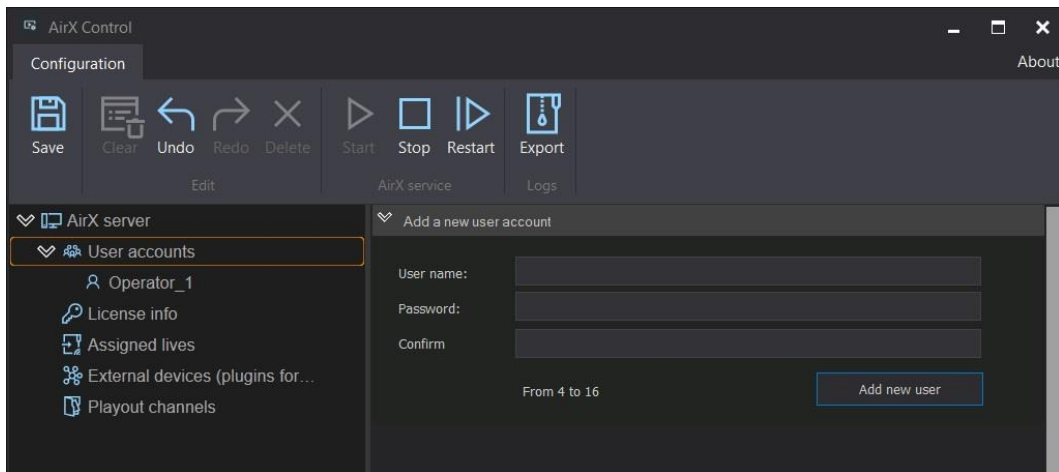


Figure 20. Add new user

You can always edit user data using the context menu. Select a username in User accounts branch with right-click and select **Edit** from the drop-down context menu.

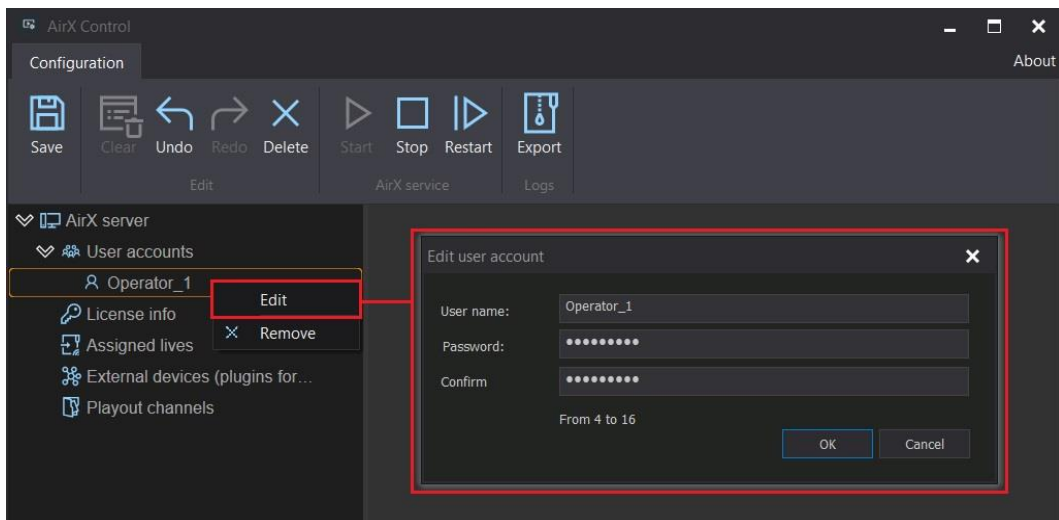


Figure 21. Edit user account

Set up the user permissions

The assignment of user permissions must be set after the creation of the playout channel. The **Users** branch of the Channel settings is intended to provide users permissions of various actions with channels.

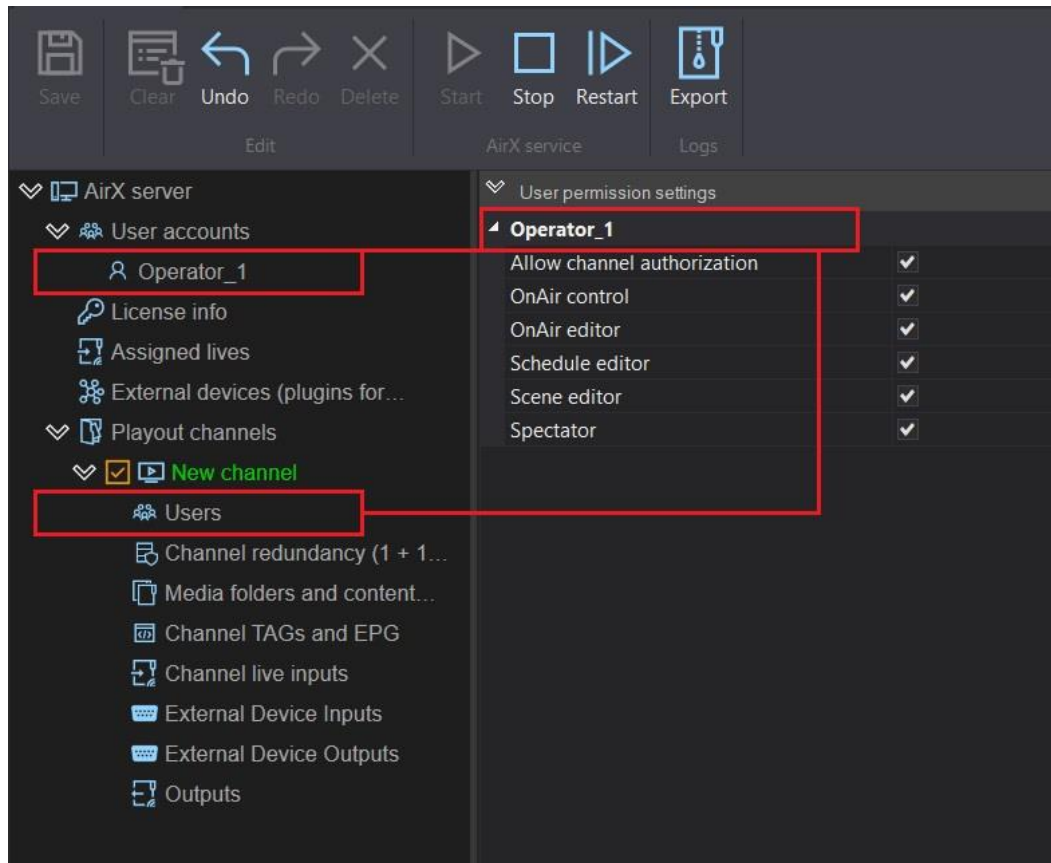


Figure 22. User permission settings

The **User permission settings** pane (right-side of the app window) contains the logins of user accounts, created in the User accounts settings. For each user there are the following checkboxes:

- Allow channel authorization - general access to the channel
- OnAir control - air control (start broadcasting or forced changing of playback position)
- OnAir editor - access to editing the on-air schedule
- Schedule editor - access to editing the saved schedule
- Scene editor - access to editing scenes
- Spectator - spectator mode, any actions are prohibited.

It means that you can assign the permissions from a simple observer to a super-administrator.

Click **Save** to save changes, then **Restart** to restart the AirX server after setup is finished.

Note: The AirX automation will start working with configured user profile only after **Authorization mode** is applied on the playout channel. The checkbox for enabling the authorization mode is located in the channel settings:

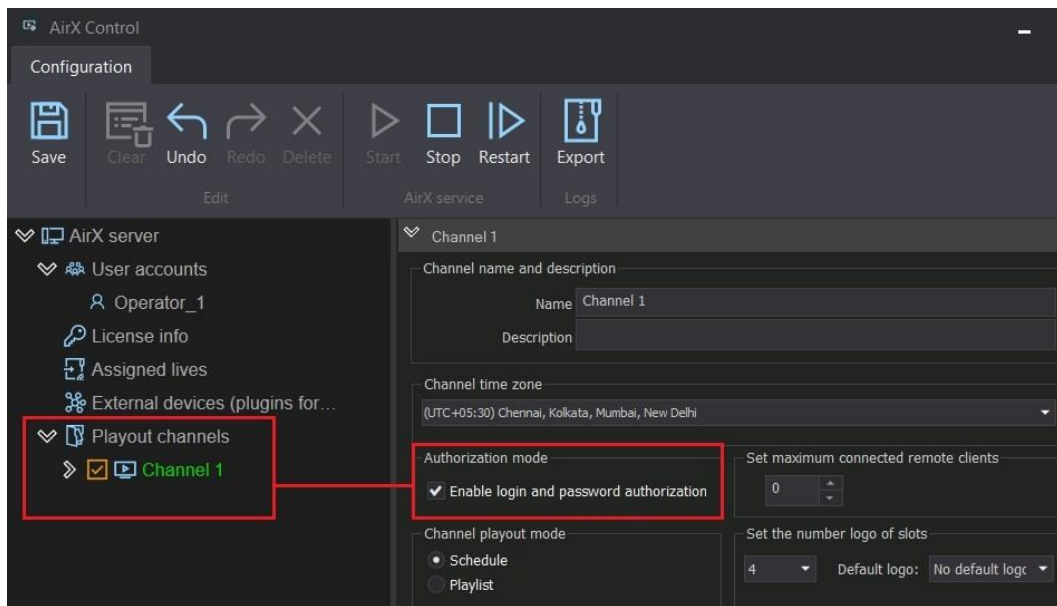


Figure 23. Authorization mode in channel settings

Configuring a Playout channel

To get started with AirX, you have to create a Playout channel first. There are three basic concepts in the AirX architecture:

- **Live source** or Input signal - a signal received in real time using capture cards or network interface controllers. Every Live source can be included in the channel schedule as **Live**.
- **Playout channel** - a program channel that is processing on the server. Playout channel may contain user-defined changes of the input signal like Upscale/Downscale, aspect ratio or fps. The Playout channel exists only within the broadcast playout server and is not a file or output stream.
- **Channel output stream** is the resulting stream with user-defined settings. One or more output streams can be added to each playout channel. Every output stream can have individual settings. This allows you to simultaneously broadcast several multi-format copies of the channel in different environments with own settings.

Channel schedule management and signal status monitoring are carried out in the remote **Channel Manager** user application.

Predicting GPU performance. Throughput optimization and resource allocation on GPUs

When AirX services are running, all Live sources, Playout channels, and Channel output streams use GPU resources.

AirX allows video encoding with CPU (Software renderer). But in most cases it has no purpose since the video adapter has a faster memory and a larger bus width. Therefore, when AirX increases the load of the GPU, it proportionally reduces the load

of the CPU and processor memory usage. Especially it is important while working with channels in UHD or 8K: the stream of processed data would require enormous processing power. That is why we strongly recommend using the additional video adapters for broadcast playout servers.

For a preliminary calculation of the server configuration, you can follow the table:

	SD channel	HD channel	UHD channel
nVidia GeForce GTX 1060	2	1	-
nVidia GeForce RTX 3080	10	6	1
nVidia Quadro P2200	8	4	-
nVidia Quadro RTX A4000	12	8	1

Table 1. Predicting GPU performance

If you plan to work with a several channels, it would be reasonable to distribute the Playout channels over several video adapters.

Hardware resources have to be distributed equally, all Live sources associated to the Playout channel and Channel output streams have to be connected to the same video adapter in order to parallelize the streams and avoid data transfer between them. This way the load of memory and the CPU (due to copying processes) will be significantly reduced, and at the same time the GPU load will be also reduced.

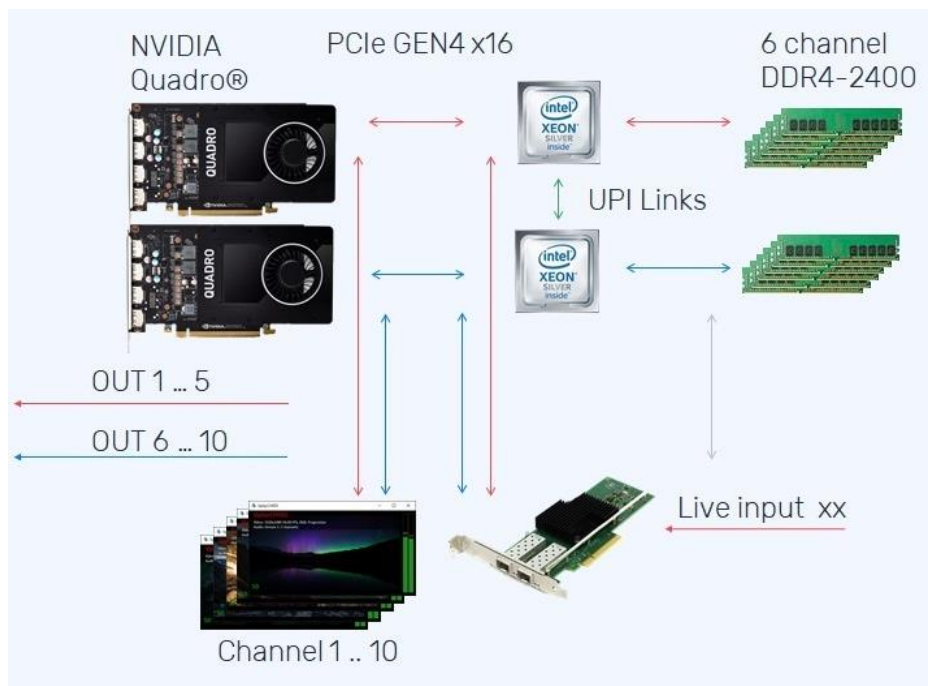


Figure 24. Resource Allocation Scheme

Check the **Allow Usage On Other Video Adapters** checkbox to allow using of multiple video adapters. Select your video adapter from the dropdown list as shown in the Figure below:

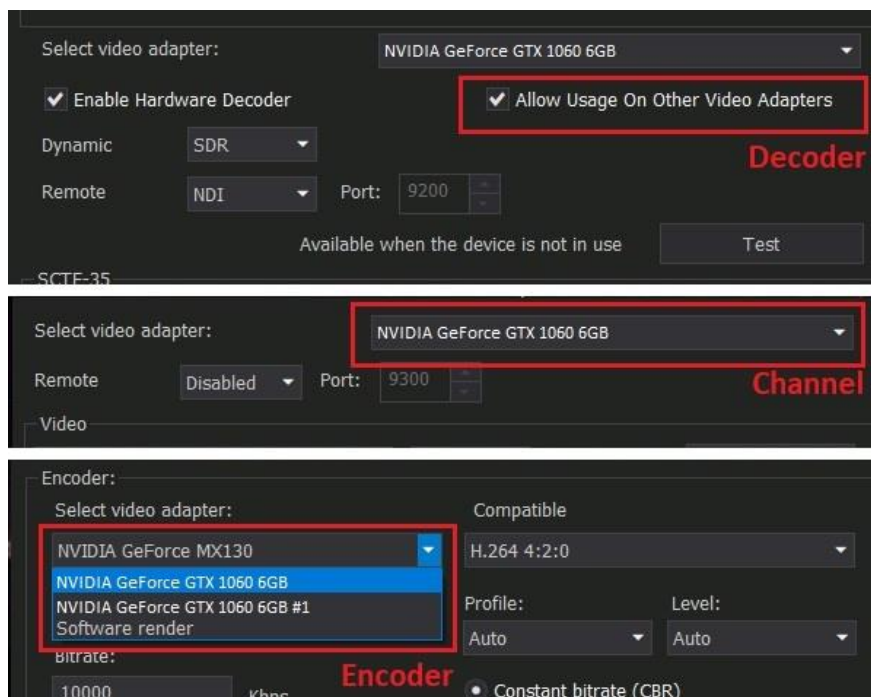


Figure 25. Selecting of multiple video adapters

If you have only one video adapter, all Playout channels, Live sources and Channel output streams work within the same GPU and all operations are executed within the memory of one GPU. Then you do not have to check the **Allow Usage On Other Video Adapters** box.

Playout channel addition and setup

Click on **Playout channels** to create a Playout channel and select **Add channel** from the context menu:

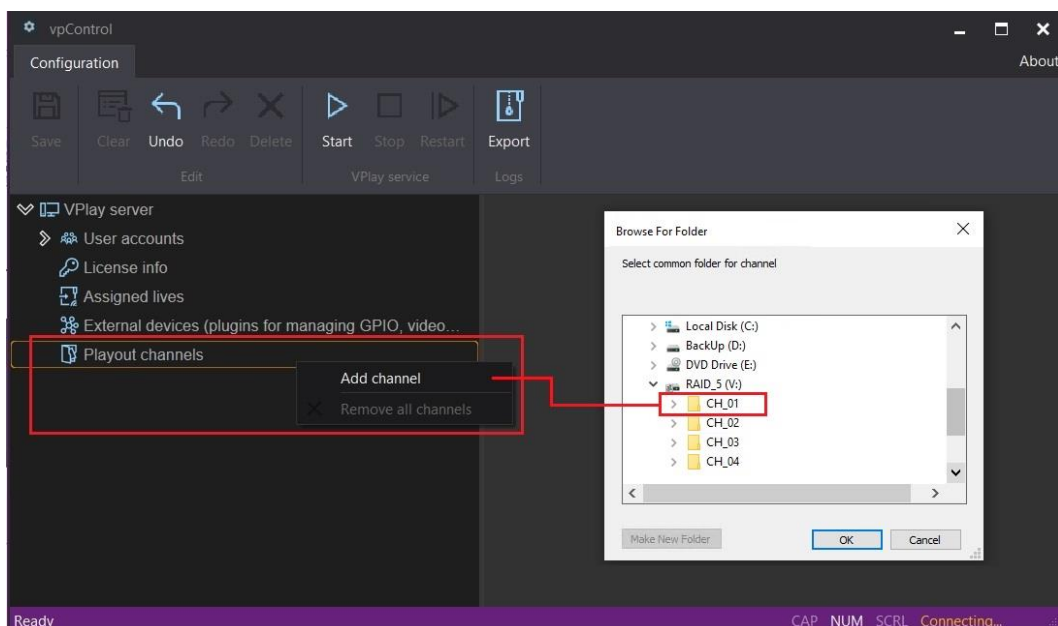


Figure 26. Add channel

Select a folder if it has already been created, or create it using **Create Folder**.

Note: The channel folder must not be located on the system drive. We recommend to use a disk with RAID.

After creating a Playout channel, a settings section will be shown in the right pane of the AirX Control window:

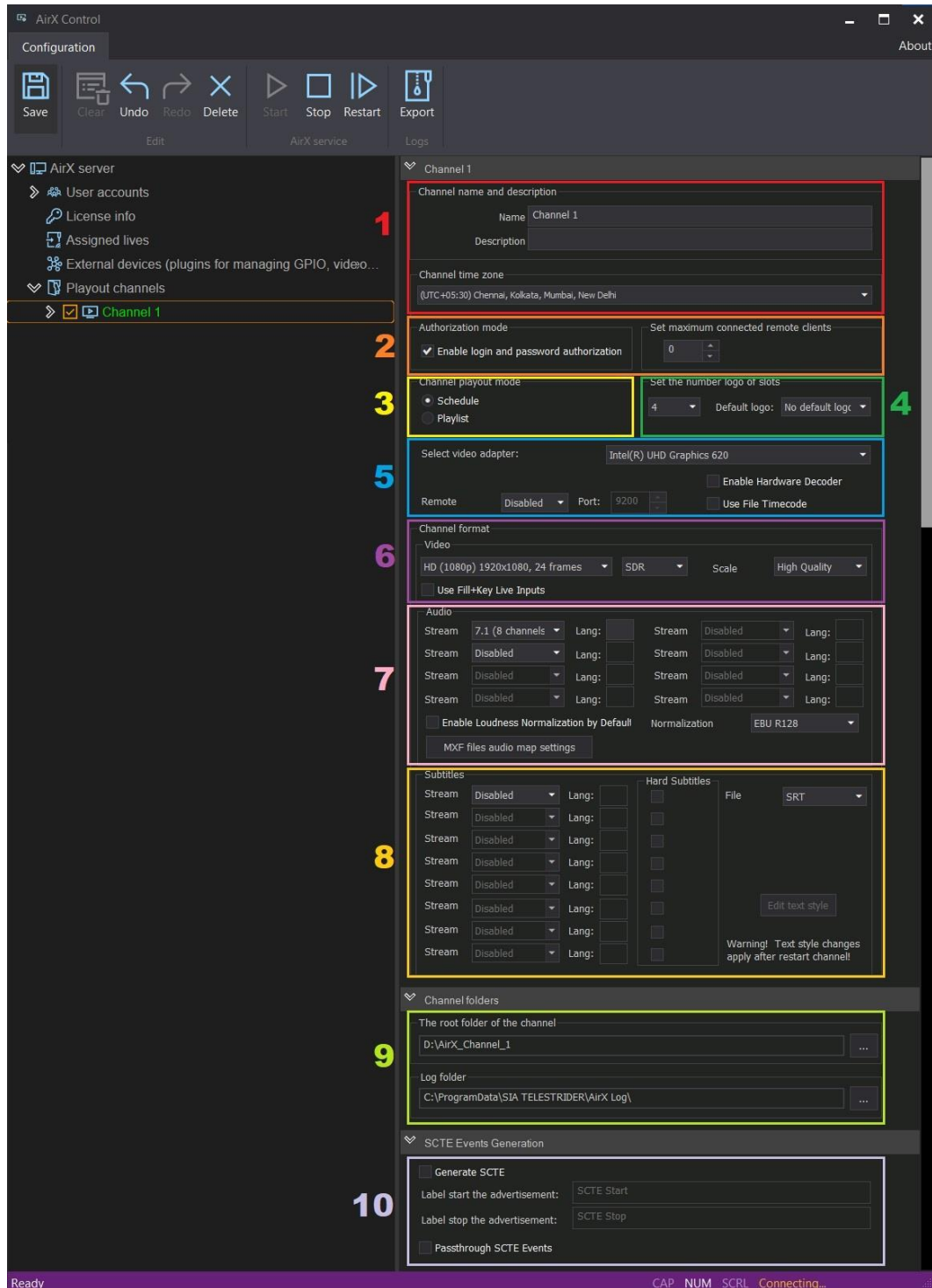


Figure 27. Playout channel main settings

- 1. Channel name and description.** The section contains fields for the Name of the Playout channel (default value is “New channel”) and for its description (optional). Fill in these fields and make sure that the correct time zone is selected.

2. **Authorization mode.** The checkbox, set in this section, activates user profiles that have been set in the **User Accounts** branch of the Server resource tree (left pane of the application window). This function allows differentiating the user's permissions to playout channels. By default, AirX system has a "super user" Admin with a password 12345.

Set maximum connected remote clients. Adjustable parameter, intended to set the number of remote client applications (workstations) that can be connected to the channel at the same time. Each remote client requires an additional license.

3. **Channel playout mode.** The checkbox set in this section, activates one of the channel workflows: "Schedule" - according to a dated on-air schedule or "Playlist" - according to a looped playlist.

4. **Set the number logo of slots.** Adjustable parameter, intended to set the number of logo slots that can be used at Playout channel (up to 16 logo slots for each channel). This setting allows you to pre-install a unique logo in each slot (for example, a Primetime or Live logo) and to use these slots in the schedule for automatic logo switch.

Default logo. Select a value from the drop-down list to be set as the default logo. The selected logo will be active all the time. And it will always be displayed on the air, unless the schedule states otherwise - the absence of a logo or its switch. If you select the **No default logo** option, the channel logo will be displayed only if it is specified in the schedule. The rest of the time the channel will broadcast without a logo.

5. **Select Video Adapter.** In the drop-down list, you can select one of the available video adapters. In multi-channel mode, make sure you are using the GPU and not the CPU (Software renderer). Otherwise, you can overload the CPU as the number of channels increases.

In addition, this section (**Remote** drop-down list) activates NDI or SRT remote preview. Specify the data transfer port for preview.

The **Enable Hardware Decoder** checkbox activates hardware decoding of input signals (Live sources) and files, used in the channel schedule. This option can reduce the CPU load.

The **Use File Timecode** checkbox allows the Playout channel to use file's timecode in the schedule. The setting applies to .mxf files recorded by VCRs.

6. **Channel format.** Basic video settings. Here you can select the video encoding resolution of the Playout channel.

Available resolutions:

Standard Definition (SD)	High Definition (HD)	Ultra High Definition (UHD/4K)
SD PAL 4:3 720x576, 25 fps	HD (720p) 1280x720, 23.98 fps	UHD (2160p) 3840x2160, 25fps
SD PAL 16:9 (Wide) 720x576, 25 fps	HD (720p) 1280x720, 24 fps	UHD (2160p) 3840x2160, 50fps
SD PAL 4:3 720x576, 23,98 fps	HD (720p) 1280x720, 50 fps	UHD (2160p) 3840x2160, 30fps
SD PAL 4:3 720x576, 24 fps	HD (720p) 1280x720, 59,94 fps	UHD (2160p) 3840x2160, 60fps
SD PAL 16:9 (Wide)	HD (720p) 1280x720,	UHD (2160p) 3840x2160, 23,98

720x576, 23,98 fps	60 fps	fps
SD PAL 16:9 (Wide) 720x576, 24 fps	HD (1080i) 1920x1080, 25 fps	UHD (2160p) 3840x2160, 24 fps
SD NTSC 4:3 720x480, 29,97 fps	HD (1080i) 1920x1080, 29,97 fps	
SD NTSC 16:9 (Wide) 720x480, 29,97 fps	HD (1080i) 1920x1080, 30 fps	
SD NTSC 4:3 720x480, 23.98 fps	HD (1080p) 1920x1080, 23,98 fps	
SD NTSC 4:3 720x480, 24 fps	HD (1080p) 1920x1080, 24 fps	
SD NTSC 16:9 (Wide) 720x480, 23.98 fps	HD (1080p) 1920x1080, 25 fps	
SD NTSC 16:9 (Wide) 720x480, 24 fps	HD (1080p) 1920x1080, 29,97 fps	
	HD (1080p) 1920x1080, 30 fps	
	HD (1080p) 1920x1080, 50 fps	
	HD (1080p) 1920x1080, 60 fps	

Table 2. Available video resolutions

In Channel format section you can also select the color space - **SDR** or **HDR HLG**. The **Scale** parameter is available for the Software Renderer. The scaling mode can be set to High Quality for Simulcast (priority to encoding quality) or Speed for technical preview (priority to low CPU usage).

The **Use Fill+Key Live Inputs** checkbox activates the access to Live sources with an alpha channel for the channel's graphic design.

7. **Audio.** The sound settings - the number of Audio streams, sound channels and language. Audio streams must be activated one-by-one by changing the value from Disabled to one of the values in the drop-down list: 2.0 (stereo), 4.0 (4 channels), 5.1 (6 channels) or 7.1 (8 channels). The language code for each stream must be entered manually into the Lang box. For example, *eng* or *es*. The **Enable Loudness Normalization by Default** checkbox intended to enable the audio normalization mode. The Normalization drop-down list contains values EBUR 128 and ATSC A85, according to broadcast standards. This option requires an additional license.

The additional settings window **MXF files audio map settings** allows audio mapping (the audio matrix correction) for MXF files.

8. The **Subtitles** section is intended to set subtitle parameters. At the moment AirX allows simultaneous work with 8 subtitle streams. Each subtitle language stream requires an additional license for a channel. Subtitle streams must be activated one-by-one by changing the value from Disabled (subtitles are prohibited) to Enabled (subtitles are allowed). The language code for each subtitle track must be entered into the Lang box manually. For example, *eng* or *es*.

The **Hard Subtitles** checkbox allows embedding (“burning”) the subtitle track into the video. The **File** drop-down contains the subtitle file formats, available for the channel. Options: SRT, SRT+STL, SRT+TSB4, SRT+TTML. The **Edit text style button** opens new window for editing the subtitle text styles.

9. **Channel folders** - here you can change the folder, contains the channel parameters (and service subfolders) that were selected automatically during channel’s creation and assign a folder for the channel logs. Remember that the channel folder must not be located on the system drive!
10. The **SCTE Events Generation** section is intended to generate and passthrough SCTE markers. The “Generate SCTE” checkbox enables the generation of SCTE markers in the Channel output stream. The “Passthrough SCTE Events” checkbox allows duplication of input SCTE markers (from an external source as part of the Input signal) in Channel output stream. The “Label start the advertisement” and “Label stop the advertisement” text fields are intended to control the insertion of advertisements. Using SCTE’s requires an additional license for each channel.

At the end of the Playout channel setup, click **Save** to save and apply the configuration. The initial press of the Save button when creating a channel will start the AirX services (visually, the channel name will change color from orange to green). When making further changes to the channel configuration, apply channel settings and restart services by pressing **Save -> Restart**.

Next to the name of the Playout channel in the Server resource tree (left pane of the application window) you can see a checkmark that means the channel is active. If you want to exclude a channel from the active configuration without deleting you can uncheck this mark. In this case the AirX service will not try to start the channel - it will be ignored until the checkbox is returned.

Channel settings, Channel resource tree

After the channel has been created and the initial settings have been applied (described in **Playout channel addition and setup**), it is necessary to configure the additional parameters of the playout channel. First expand the Channel resource tree:

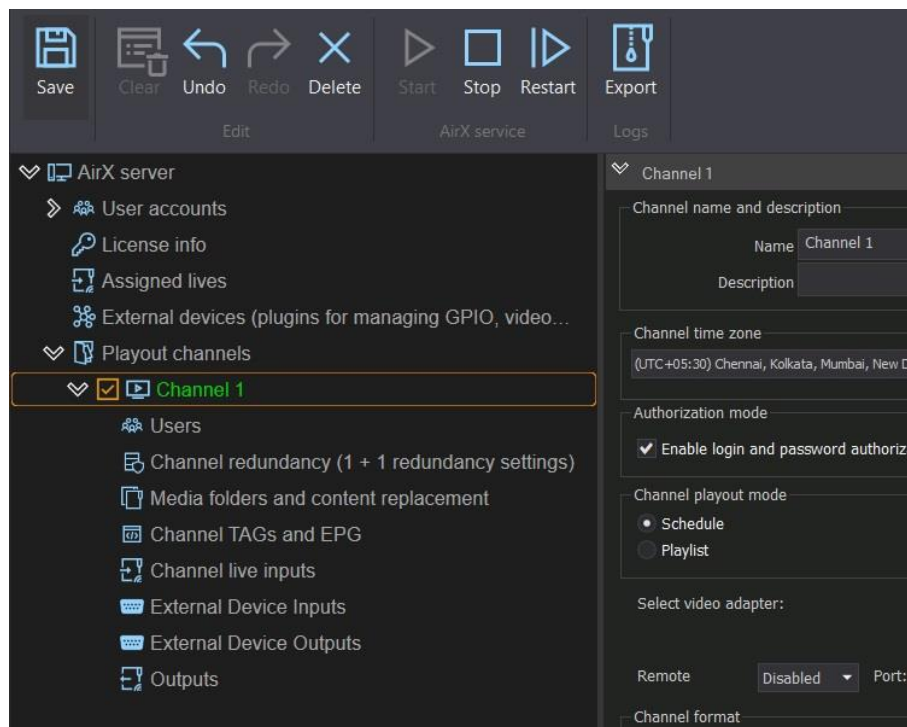


Figure 28. Channel resource tree

You have to configure all the parameters located in the branches of the Channel resource tree step-by-step. For each parameter see the explanations in the corresponding chapters.

Users

AirX software has the built-in security system that allows differentiating the user's permissions to playout channels (services) configured in the system. The **Users** branch of the Channel resource tree is intended to assign users access to various actions with channels.

The **User permission settings** pane (right-side of the app window) contains the logins of user accounts, created in the User accounts settings. For each user the meanings of checkboxes are the following:

- Allow channel authorization - general access to the channel
- OnAir control - air control (start broadcasting or forced switching of playback position)
- OnAir editor - access to editing the air schedule
- Schedule editor - access to editing the saved schedule
- Scene editor - access to editing scenes
- Spectator - spectator mode, any actions are prohibited.

It means that you can assign the permissions from a simple observer to a super-administrator.

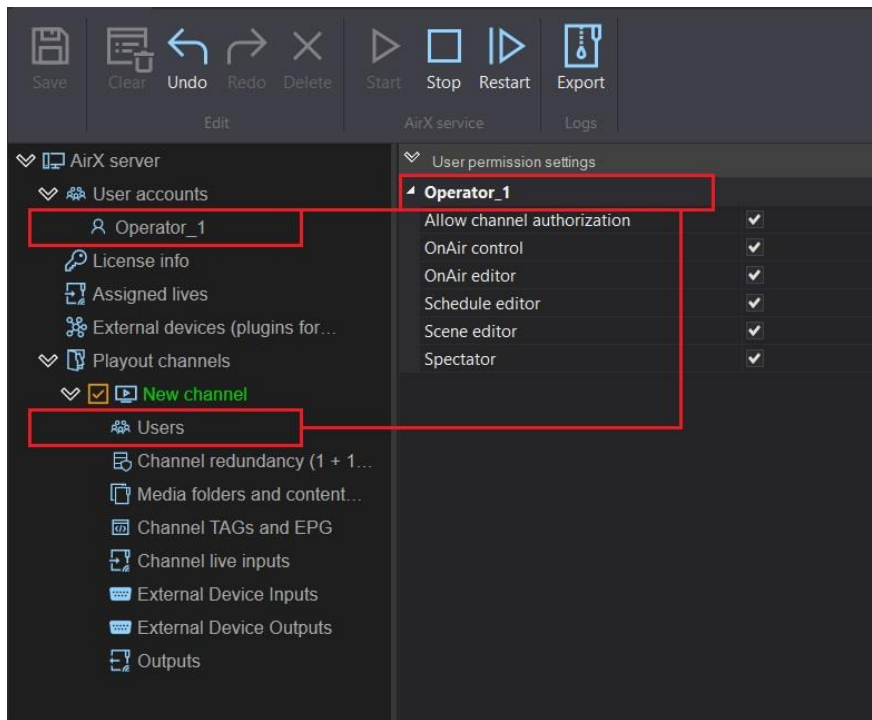


Figure 29. User permission settings

Channel redundancy (1+1 redundancy settings)

AirX software has a built-in 1+1 redundancy, based on the independent synchronous work of two playout channels controlled from one client workstation. Redundancy mode requires the additional license for each channel.

The redundancy scheme includes two broadcast playout servers. Primarily they are only synchronized by the time parameter, using the Network Time Protocol (NTP server). The only thing that connects these two servers is a **setting** that shows to the client application that these two servers are working in pair.

In the AirX Launcher application, channels, added in redundancy mode, are named **A** and **B**. This **does not mean** that server A is the main one, and server B is the backup one! Servers and channels in 1+1 mode are completely equal and letters A and B are assigned randomly.

For the client application, the redundant servers are displayed as the single playout channel. But the broadcast is being made from two servers in every moment of time. When the servers are connected in such redundancy, synchronization point is a **client application** that sends commands to both servers at the same time

Schedules and files must be uploaded to both servers. All paths, files and schedules must be identical.

ATTENTION: For the correct work in the redundancy mode, the basic settings of servers and the settings of playout channels must be identical! Make sure the settings outlined 1, 2 and 3 are equal on both servers:

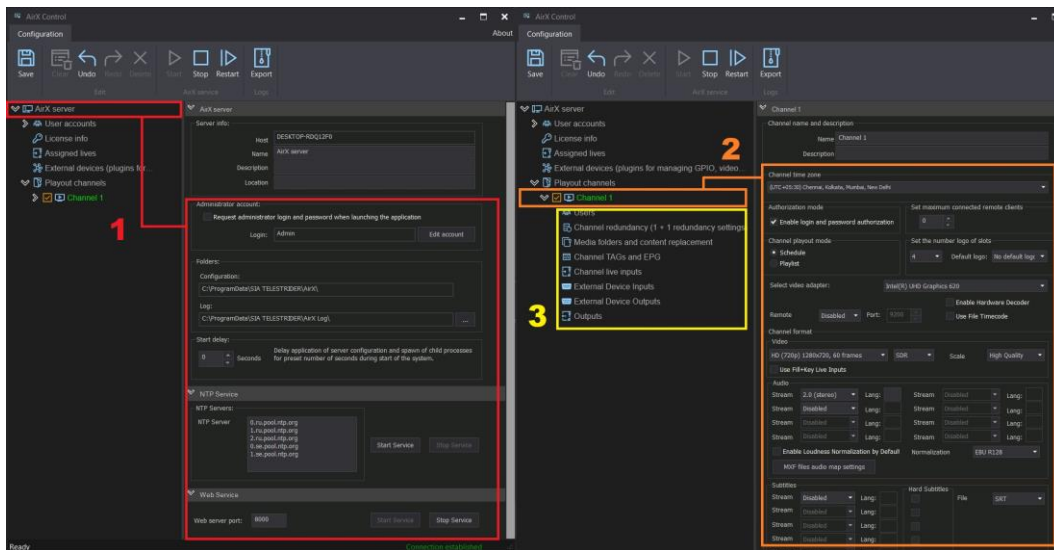


Figure 30. Settings, must be identical

The redundancy mode must be configured on two servers (or redundant channels) at the same time.

In the redundancy settings for both channels, set the checkbox to allow 1+1 mode: **Allow channel use in redundancy scheme**. After setting the checkbox, click **Save** on both channels in the main menu of AirX Control app. The channel configuration will be updated only after saving at this step, or you will not see channels ready for redundancy at the next step.

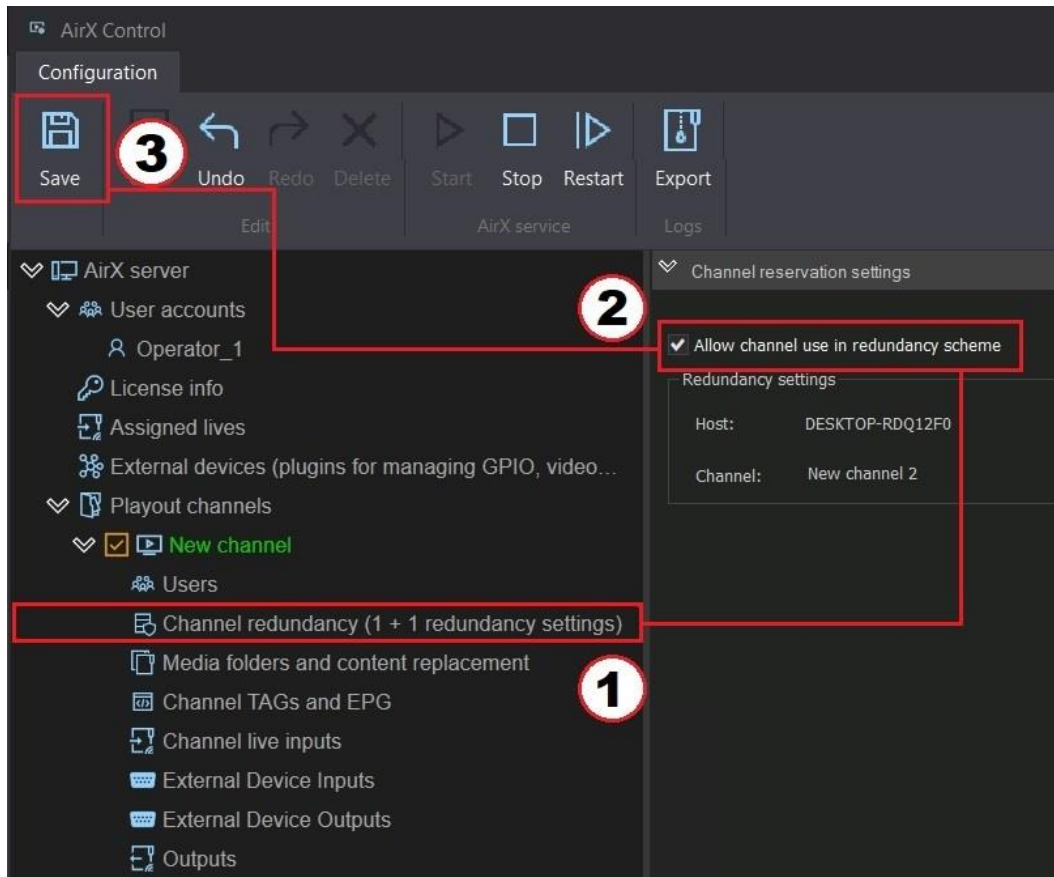


Figure 31. 1+1 redundancy settings, step 1

Next, launch the pop-up window **Channel Redundancy** by clicking the **Configure** button and then click **Search** to search for available servers.

Then select the server to set the redundancy from the drop-down list:

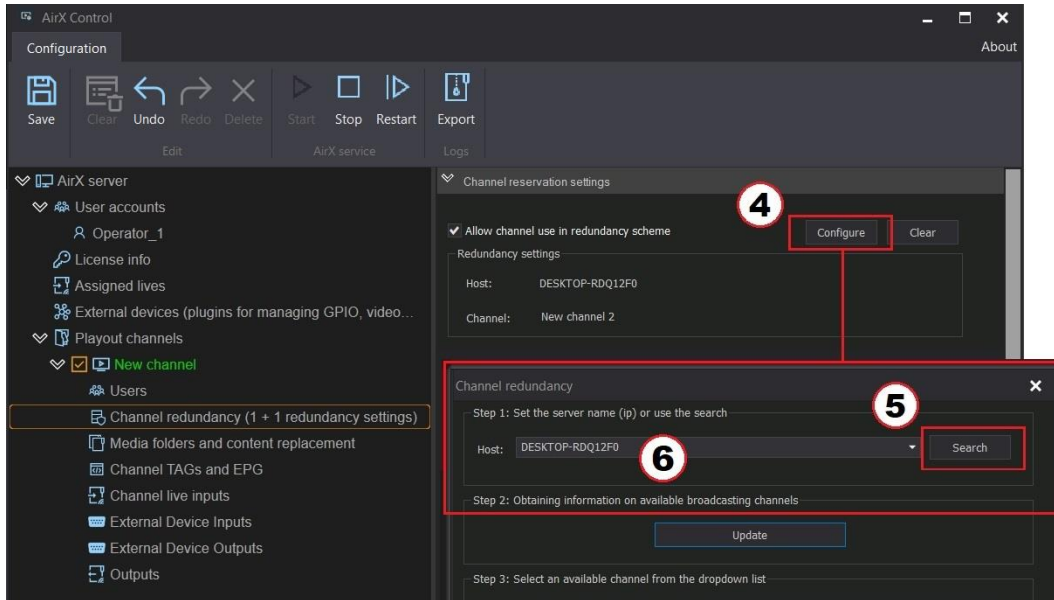


Figure 32. 1+1 redundancy settings, step 2

Click **Update** to get an up-to-date list of channels ready for redundancy on the selected server,

Next select the channel for redundancy in the **Channel** drop-down list. Save changes by clicking OK.

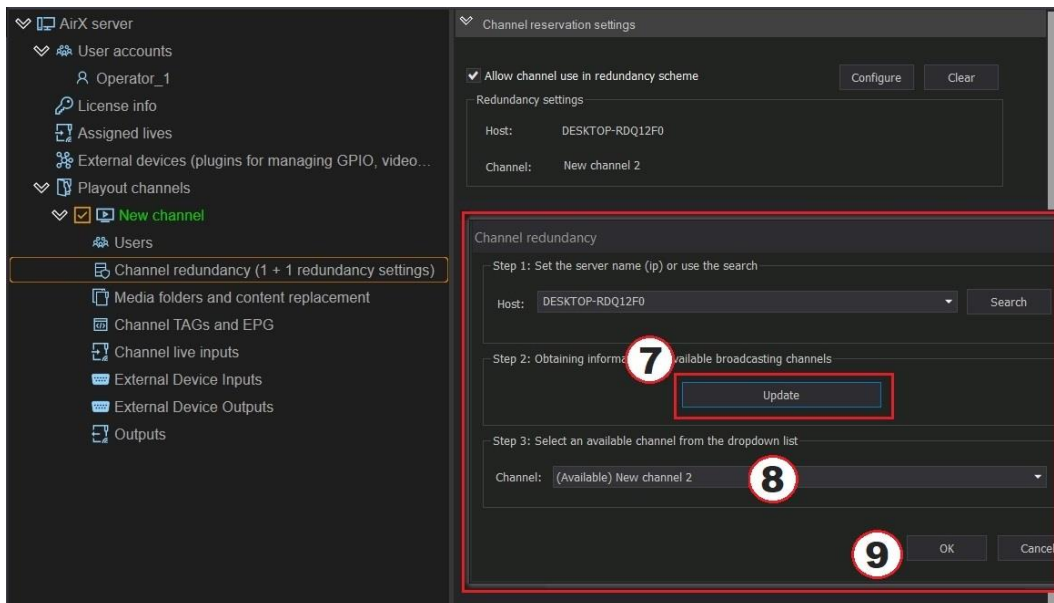


Figure 33. 1+1 redundancy settings, step 3

If you see a warning window on the screen, you have to check whether the redundancy is configured on the second server and whether the changes have been saved. Go through the steps 1-7 again. Then select the channel. Save changes with the OK button.



Figure 34. Warning window

Pass through the same steps for the partner channel on the second server. You have to select server 1 for server 2 in the settings and server 2 for server 1 respectively.

On both channels, you have to save the changes and restart the AirX service by pressing **Save - Restart** in the main menu of AirX Control app. Now you can start working in redundancy mode.

Media folders and content replacement

This branch of the Server resource tree is intended for work with media folders, files of content and automatic replacement of schedule elements.

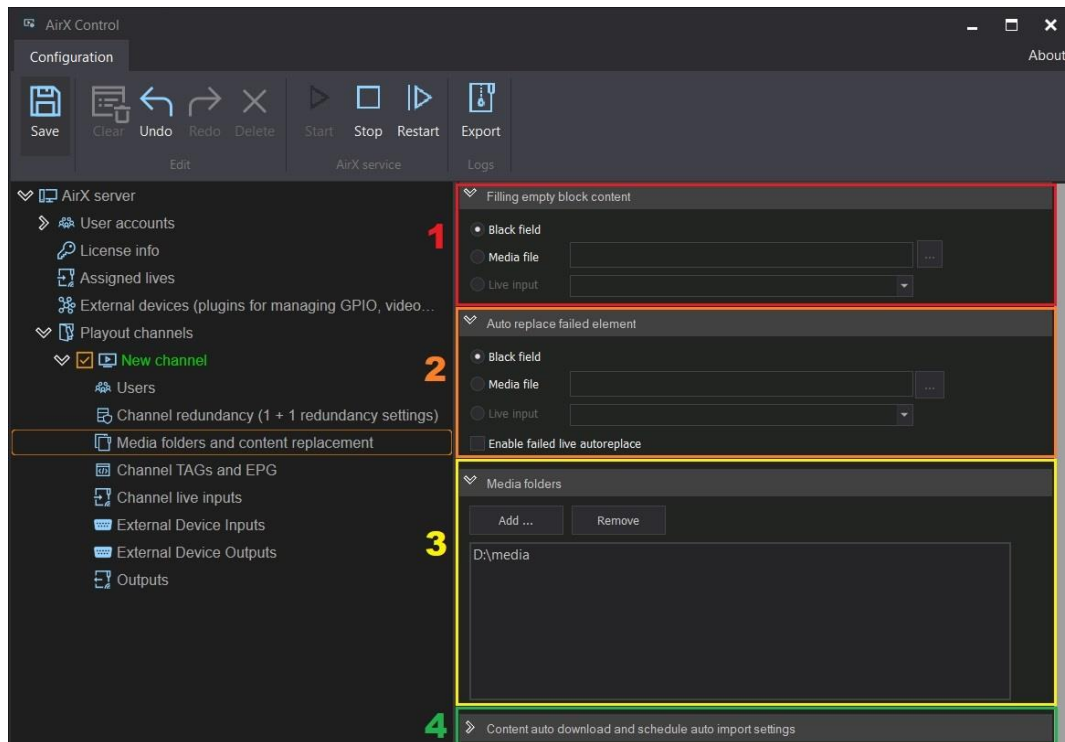


Figure 35. Media folders and content replacement

1. The **Filling the empty block content** pane includes different options for the "Empty Block" (Dummy Clip) schedule element auto-replacement. If AirX broadcast automation reaches the row containing the Empty Block during the execution of the OnAir schedule, it will follow the settings and show:
 - Black field if **Black field** is selected. This is the default value for auto-replacement.
 - A checked **Media file** checkbox will replace empty blocks with the media file, such as the splash screen.

- The **Live input** checkbox will replace the empty block with the Live source (Input signal) connected to the channel (see the **Channel live inputs** chapter for details).
2. The **Auto replace failed element** pane is intended for automatic replacement of damaged schedule elements. Replacement options are similar to the previous pane:
 - **Black field** - auto-replace an element with a black screen
 - **Media file** - auto-replace an element with a media file
 - **Live input** - auto-replace an element with Live source

By default, all of the auto-replacement options are applied only to corrupted video files in the schedule. However, in the same pane there is a checkbox **Enable failed live autoreplace**. When activated, all the options will also be applied to the damaged Live source.

3. The **Media folders** pane is intended to specify the media storage for the channel - directories and folders where content is stored are usually sorted thematically, i.e. movie folder, music folder, science fiction folder, etc. This pane allows you to quickly add and remove media folders, available for the channel. The list of folders updates in Channel Manager client application after saving the configuration with the **Save** button, without restarting the server (you do not need to click Restart!). For a list of supported containers and codecs, see the **Table of codecs** chapter.
4. The **Content auto download and schedule auto import settings** pane contains:
 - settings for schedules and media files auto import,
 - settings for interacting with external broadcast traffic management systems
 - settings for interacting with the AirXMedia service for automatically downloading content from external storage systems to AirX.

Content auto download and schedule auto import settings

AirX, as a broadcast automation system, can be integrated into the infrastructure, customer already have.

The AirX software has features for automatically importing schedules and media files from external storage systems with AirXMedia service and interacting with external broadcast traffic management systems.

All necessary settings are located in the **Content auto download and schedule auto import settings** pane of the **Media folders and content replacement** branch of the Server resource tree. For every single playout channel, auto import settings must be configured individually!

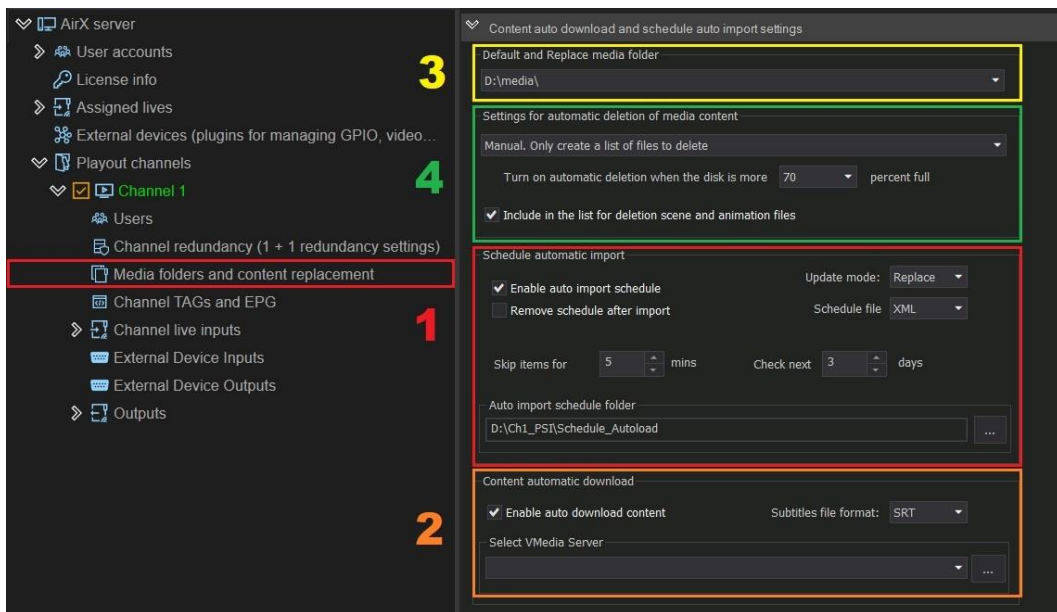


Figure 36. Content auto download and schedule auto import settings

The Settings pane contains the following sections:

1. **Schedule automatic import.** The section is intended for configuring auto loading of schedules and integration with external broadcast traffic management systems. The section fields are active when **Enable auto import schedule** checkbox is checked.

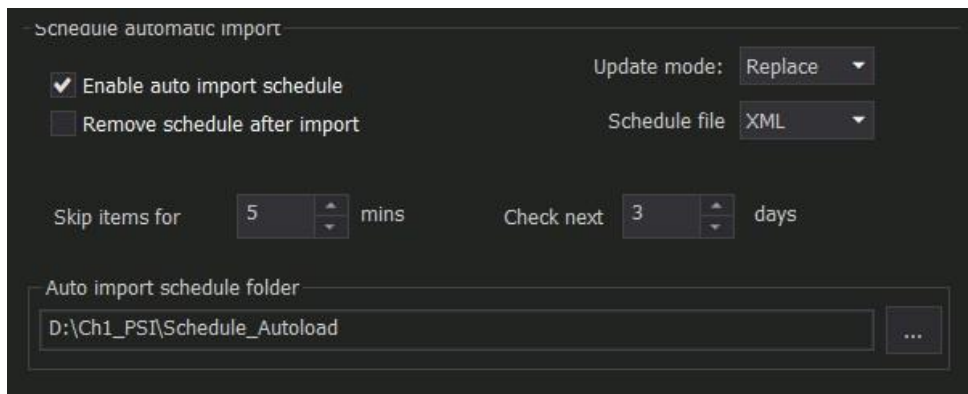


Figure 37. Schedule automatic import

1. The main field is **Auto import schedule folder**. The field specifies an intermediate folder between AirX and an external traffic system. The broadcast schedule created by third-party software must be saved to this folder. At the same time the AirX service constantly checks the folder for updates. As soon as a new schedule is uploaded to the folder, AirX moves it to the Channel Manager's on-air schedule according to the settings.
2. **Check next ... days** - adjustable parameter, intended to set the number of days AirX will search for a schedule in the Auto import schedule folder. The default value is 3. This means that when checking a folder, AirX will check for updated schedules for the current day and two days ahead.
3. **Schedule file** - a drop-down list to select the extension of the schedule file. Available file extensions are XML, XLS, CSV. The default extension is XML.
4. **Update mode** - the mode of a schedule update:

The **Replace** mode means that when a new schedule is uploaded into the autoload folder, the AirX service moves it into the Channel Manager, replacing the existing on-air schedule. The old schedule will be deleted.

Append mode means that the new schedule will not replace the current on-air schedule, but it will be added to the Channel Manager after the current one, below the last row. The old schedule will not be deleted: all positions already available in the Channel Manager will remain in their places. By default, Update mode is set to **Replace**. Append mode have to be used with caution as it is intended for highly specialized tasks.

5. **Remove schedule after import** - a checkbox to automatically remove the schedule from the autoload folder after it is loaded into the Channel Manager.
 6. **Skip items for ... mins** - adjustable parameter. As described above, when a new schedule is uploaded into the autoload folder, the AirX service moves it into the Channel Manager, replacing the existing on-air schedule. The **Skip items...** parameter shows how many minutes of the current (already-playing) on-air schedule will be guaranteed to broadcast before switching to a new schedule. The default value is 5 minutes. This setting allows quickly editing of the old schedule and smooth transition to the updated schedule.
2. **Content automatic download.** The section is intended for integration with the AirX Media service.

AirX Media is a content management system that works with AirX Playout Broadcast Automation servers to automate the retrieval of schedules/playlists, content, media and CG.

The system allows the operator to manage local content on AirX Playout Broadcast Automation servers and automates the retrieval of content from external storage systems to the internal storage of a broadcast playout server, hence making it readily available for playout.

AirX Media requires the additional license.

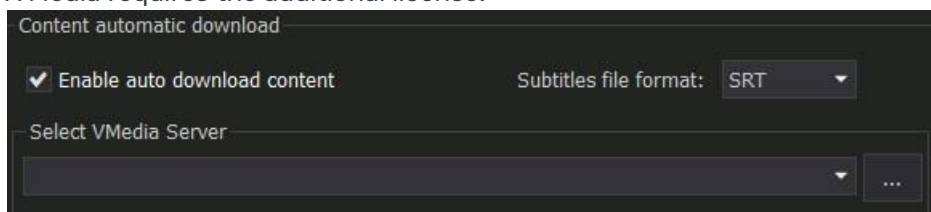


Figure 38. Content automatic download

The **Enable auto download content** checkbox activates the fields:

Select AirX Media Server is a drop-down list containing all AirX Media servers located on the current subnet.

Subtitle file format - a drop-down list containing available subtitle file extensions. The default extension is SRT.

3. **Default and Replace media folder.** The section can be activated by the **Enable auto import schedule** checkbox (see section 1 of the current pane) or by the **Enable auto download content** checkbox (see section 2 of the current pane).

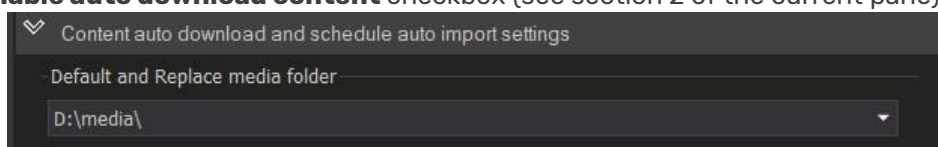


Figure 39. Default and Replace media folder

When AirX schedules autoload function is enabled the service can get a schedule from an external broadcast traffic management system. Any schedule has a required **Path field** inside: the path to the local media folder. In this folder AirX automation have to find every single media file, to avoid errors in the Channel Manager app.

The **Default and Replace media folder** setting allows you to specify an alternative media folder. AirX will check an alternative folder in case media file is not found in the main folder specified in the schedule Path field.

4. **Settings for automatic deletion of media content** are intended for automatic deletion of media content from the broadcast playout server. It is activated by the **Enable auto download content** checkbox (see section 2 of the current pane).

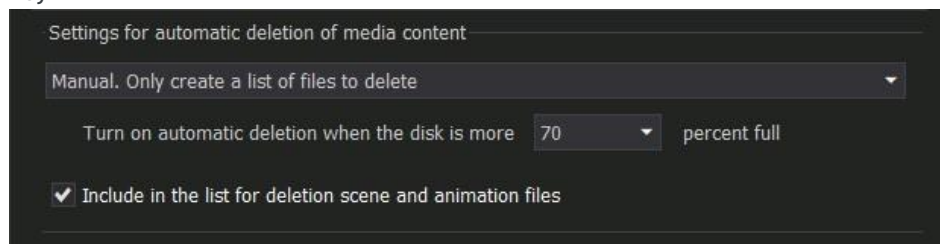


Figure 40. Settings for automatic deletion of media content

Available automatic deletion options (drop-down list):

- **Disabled** (default value) – automatic deletion of media content from the broadcast playout server is disabled.
- **Manual. Only create a list of files to delete** - the media content deletion service is in manual mode. AirX only creates a list of files that can be manually deleted. This list includes media files that are stored in the server's local storage but have not been used in the schedule for a long time.
- **Auto/Delete unused files automatically** – the media content deletion service is in automatic mode. Unused files will be deleted automatically, without any user's actions.

Turn on automatic deletion when the disk is more ... percent full - drop-down list, which allows you to set the filling limit of the server's internal storage (in percent). Upon reaching this limit the automatic deletion of media content will start.

The **Include in the list for deletion scene and animation files** checkbox is intended for automatic deletion of CG and animation files.

Channel TAGs and EPG

In this branch of the Channel resource tree you can work with content description metadata tags (meta descriptions) and EPG data fields.

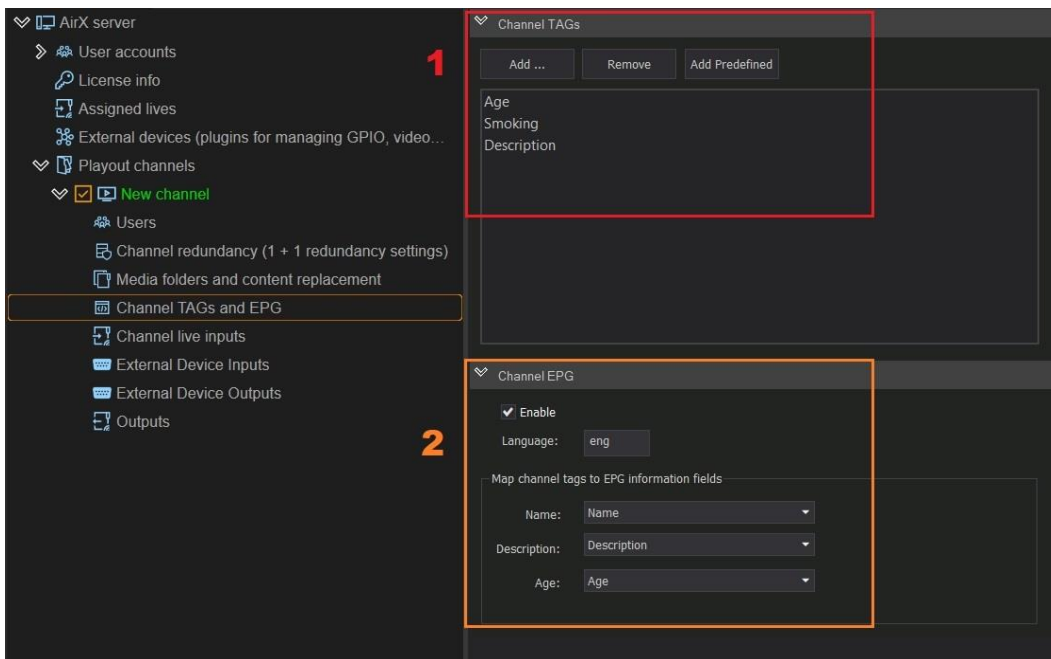


Figure 41. Channel TAGs and Channel EPG

1. **Channel tags.** When adding a TAG to the AirX Control, this tag is also embedded as an active section (column) in the **Channel Manager** client app. This way the tag can be used in the CG.

A simple example is the **Age** tag for TV Parental Guidelines. By default, AirX does not use this tag and there is no column in the schedule where you can specify the age rating value for a particular media file.

In the **Channel TAGs** pane, click **Add** and enter a name for the Age tag. Save your changes. After saving, the Channel Manager schedule will be automatically changed and a new active column **Age** will be added. You can modify any value in this column or import the entire schedule with the metadata of TV Parental Guidelines for media files.

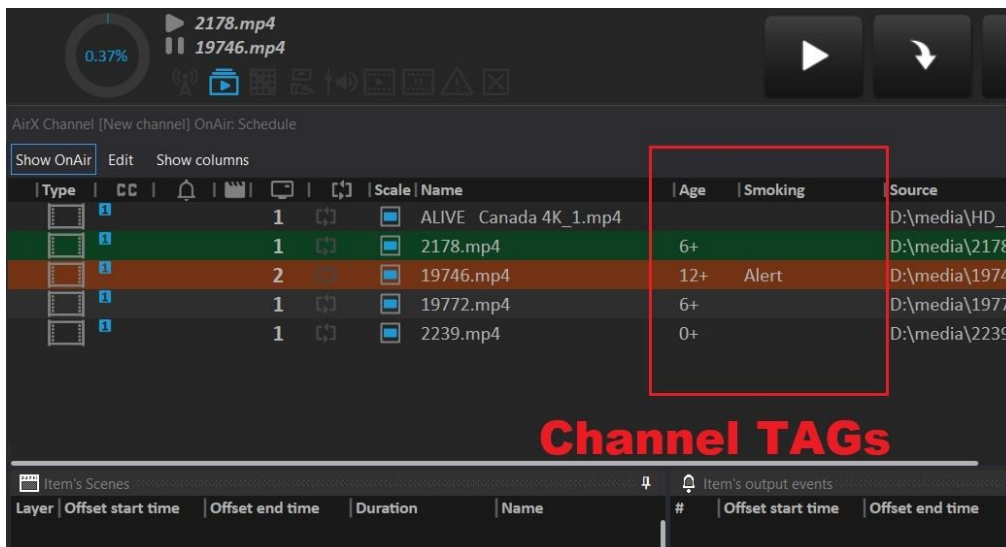


Figure 42. Channel TAGs in the Channel Manager app

2. **Channel EPG** pane is intended for generating EPG data fields. The section fields are active when **Enable** checkbox is checked. Set the language value into the **Language** field manually (for example, eng or es). Channel EPG settings allow to

generate EPG fields for each media file in the schedule with the following parameters:

- **Name** - the name of the media file
- **Description** – description of the media file (annotation)
- **Age** – TV Parental Guidelines rating.

When generating the EPG, the values of these parameters are taken from the metadata of the video files, located in the corresponding schedule columns in the Channel Manager app. The **Name** column is the default field and requires no further action. The **Description** and **Age** columns are adjustable and are not included in the schedule by default. First you have to add the **Description** and **Age** tags in the **Channel TAGs** section to use the EPG generation functionality.

Channel live inputs

The connection of Live sources (or Input signals) to AirX is two-step connection:

1. The Live sources must be connected to the server
2. Sources, connected to the server, must be distributed over playout channels.

NOTE: Each of the sources connected to the server can be added to any of the playout channels and/or to several channels at once.

Several sources can be connected to each playout channel at the same time.

Live sources do not require additional licenses – you can add as many sources to any playout channel as you need.

DVB/ATSC UDP IP source

First step: you have to select an IP of your LAN card in the context menu of the Assigned Lives branch of the Server resource tree (left pane of the application window).

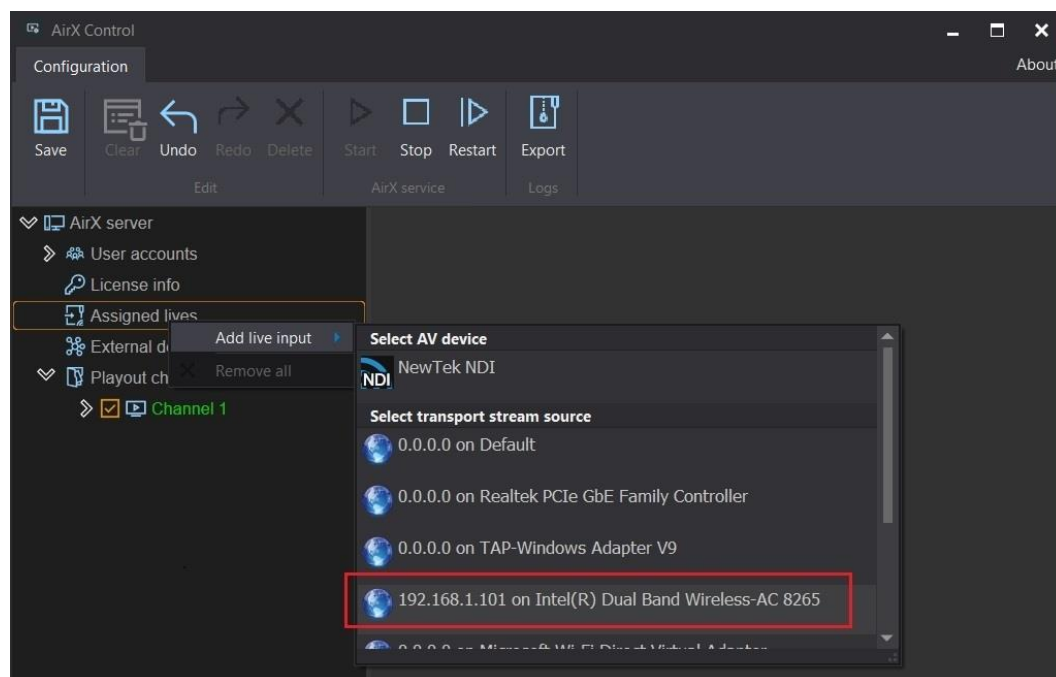


Figure 43. Add DVB/ATSC UDP IP Live input step 1

Next, using the context menu of the newly added LAN card, enter the IP address and port of the input stream into the pop-up window (for example, 235.1.3.1 and 1234).

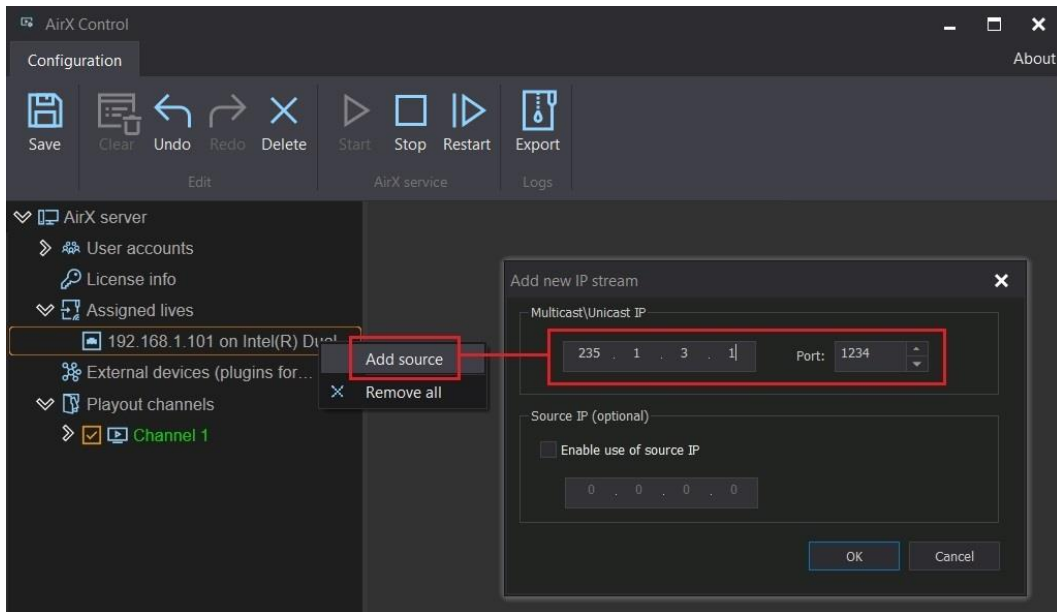


Figure 44. Add DVB/ATSC UDP IP Live input step 2

The last step: select the streams you need. Click on the IP address of the Live source and select Search in the context menu - you will receive a list of all streams coming from that address.

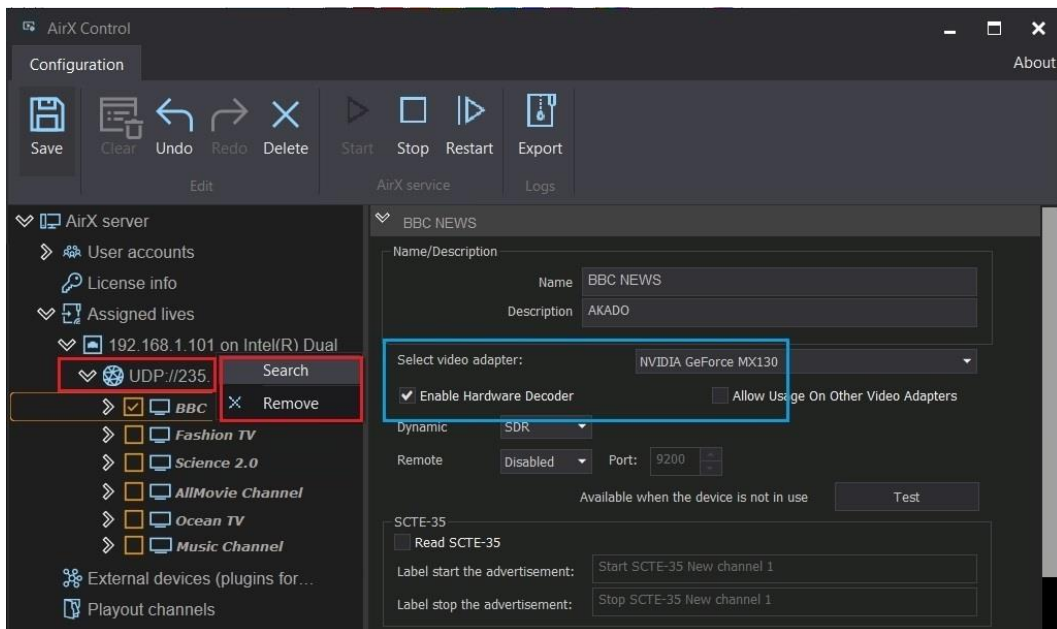


Figure 45. Add DVB/ATSC UDP IP Live input step 3

Check the required streams and click **Save**. This action will add the streams to the configuration and their names will visually change color to green.

It is really important to choose a video adapter for decoding - this significantly speeds up the decoding process and offloads the CPU (outlined in blue).

The right pane of Input stream settings is intended to configure the parameters of the input stream decoding:

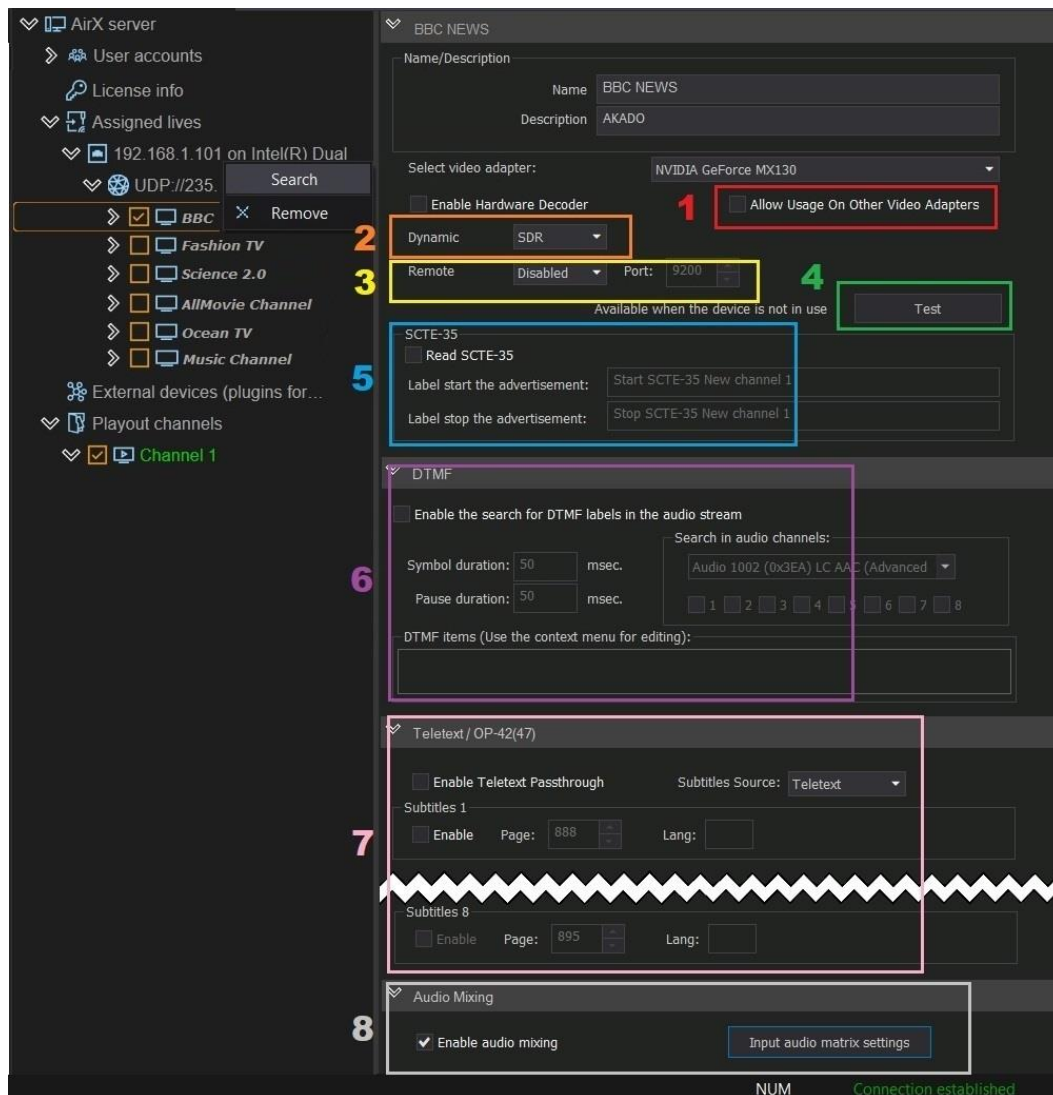


Figure 46. The parameters of the DVB/ATSC UDP IP input stream decoding

1. **Allow Usage On Other Video Adapters** for usage of multiple video adapters
2. **Dynamic SDR/HDR HLG** for color space selection
3. **Remote Disabled/NDI/SRT** enable remote preview in NDI or SRT. The preview port must also be set here.
4. **Test** for visual control of the incoming stream (see the **Channel live inputs** chapter for details)
5. **SCTE-35** for SCTE-35 markers detection in the input stream. This setting is necessary for automatic AD Insertion mode. The **"Label start the advertisement"** field requires the name of the start insertion marker. The **"Label stop the advertisement"** field requires the name of stop insertion marker.
6. **DTMF** for DTMF signals detection in the input audio stream. DTMF settings:
 - *Enable the search for DTMF labels in the audio stream* enables the DTMF monitoring mode. After checking the box, the remaining fields of the section will become available.
 - *Symbol duration* to set the duration of the DTMF keys (0-9, #, *, A, B, C, and D)

- *Pause duration* to set the duration of the pause between keys
- *Search in audio channels* with numbers from 1 to 8, to specify the audio stream in which the DTMFs will be searched
- *DTMF items* – field intended for entering the DTMF search mask (value and order of keys in the DTMF, for example #ABC).

Operation with DTMF and SCTE-35/104 requires the additional license.

- Teletext / OP-24(47)** allows the recognition of teletext and closed captions in the input stream (up to 8 tracks in each input stream). The **Subtitles Source** drop-down menu contains the subtitle formats (Teletext, Closed captions or EBU-TT), the **Subtitle 1 - Enable** checkbox allows the decoding of the first subtitle track (the same are checkboxes 2-8). The **Page** field is editable, intended to specify the page number with teletext data. For each subtitle track, it is possible to specify a language in the **Lang** field. The language must be specified in a standard format manually (for example, eng or es).
- Audio Mixing additional window is intended for customization of input audio matrix



Figure 47. Input audio matrix settings

Note: Do not forget to save changes!

Follow the instructions in the **Live sources connection and distribution** chapter to add a Live source to the playout channel.

NDI source

First step: call the context menu of the Assigned Lives branch of the Server resource tree (left pane of the application window). Select **Add live input** in the drop-down menu, and click the **NewTek NDI** input stream type.

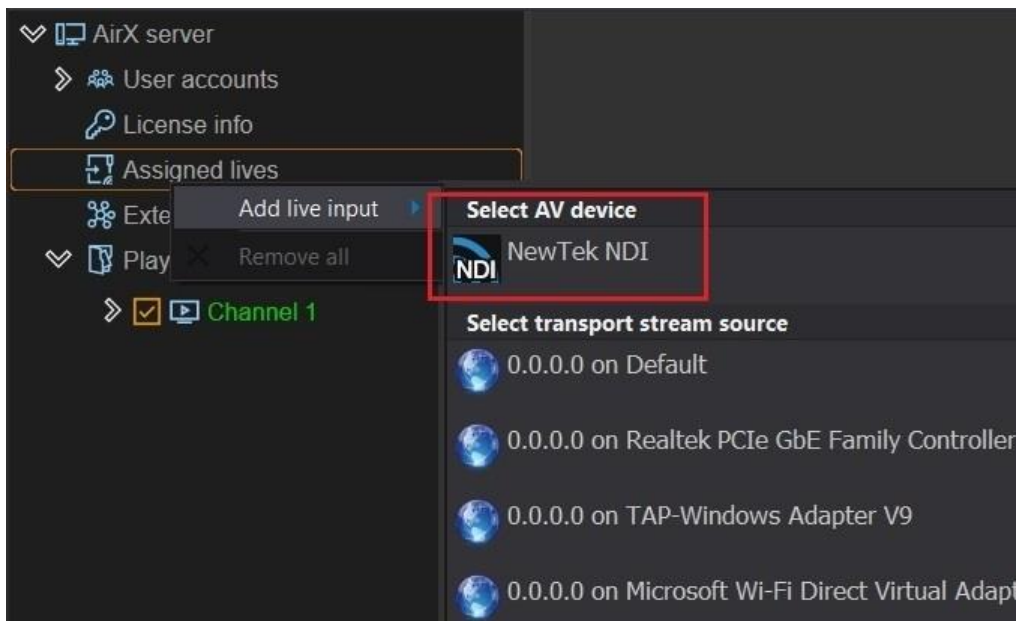


Figure 48. Add NDI Live input step 1

After NDI is added to the Assigned lives list, you have to find the input stream. Click **Search sources** in the right pane of the app window. The new window **NDI sources scan** will be opened. Specify NDI group name in the text field and click **Start Search**. If the NDI source you are looking for does not have a group, it is enough to click Start Search to find all available sources without a group.

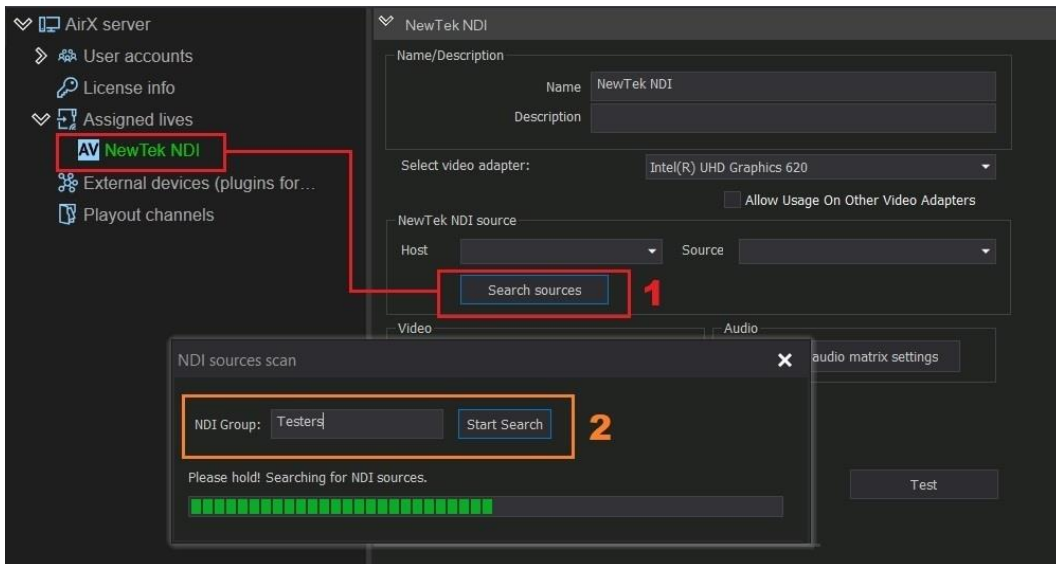


Figure 49. NDI sources scan

When the search is completed, all available Hosts and streams will appear in the **Host** and **Source** fields (Figure 50, outlined in red). Select the stream you need from the drop-down list and click **Save** in the main menu of AirX Control app to save settings.

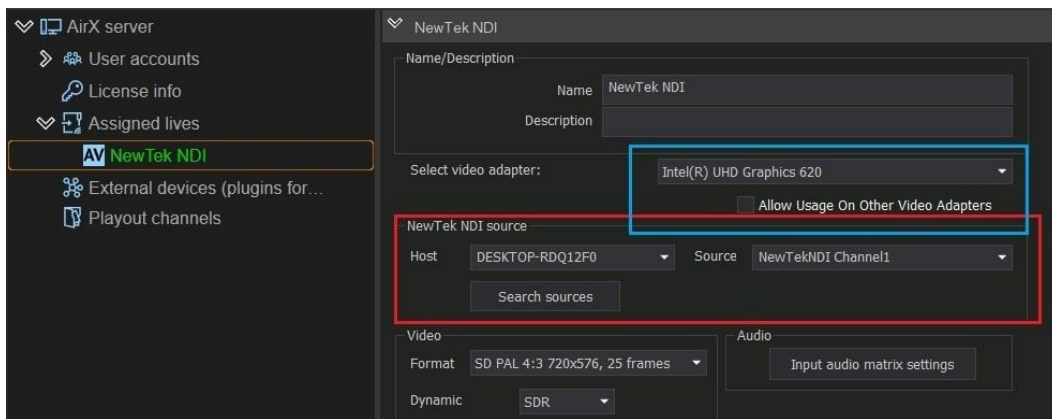


Figure 50. NDI Host and source selection

It is really important to choose a video adapter for decoding - this significantly speeds up the decoding process and offloads the CPU (outlined in blue).

In addition to selecting a decoder, the right-side settings pane is intended to configure the parameters of the input stream decoding:

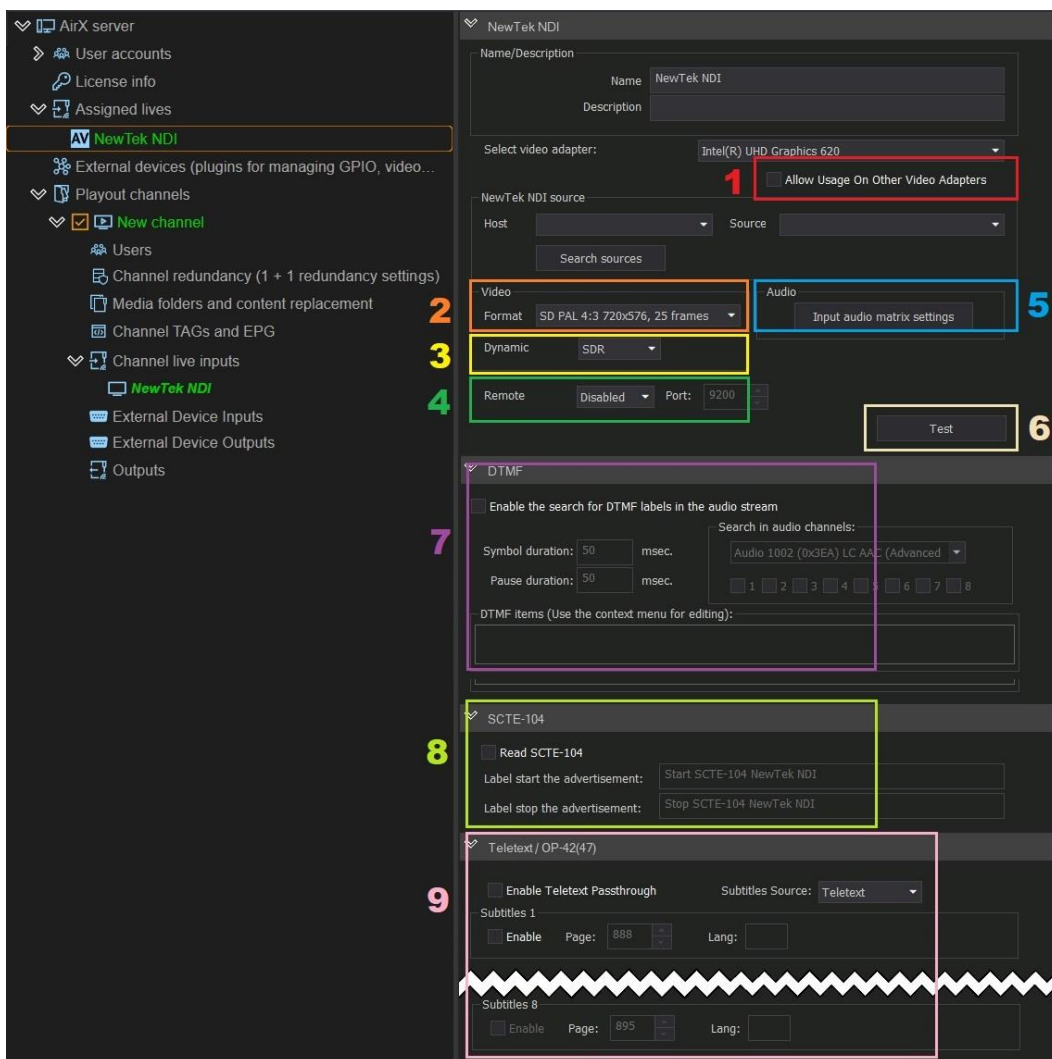


Figure 51. The parameters of the NDI input stream decoding

1. **Allow Usage On Other Video Adapters** for usage of multiple video adapters

2. **Video -> Format** for the video format of the input stream selection (see the complete list of formats in the **Channel format. Basic video settings**. Here you can select the video encoding resolution of the Playout channel.).
3. **Dynamic SDR/HDR HLG** for color space selection
4. **Remote Disabled/NDI/SRT** enable remote preview in NDI or SRT. The preview port must also be set here.
5. **Audio Mixing** additional window is intended for customization of input audio matrix

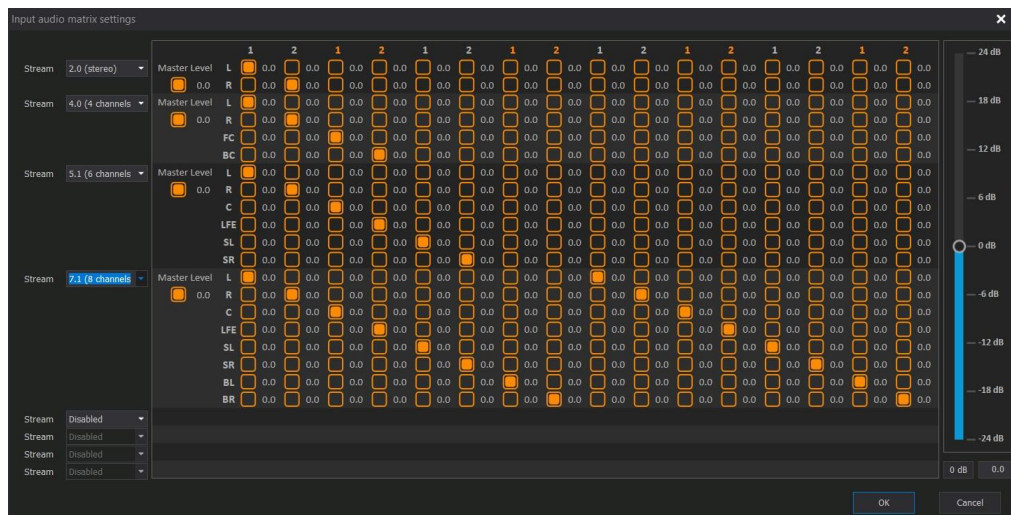


Figure 52. Input audio matrix settings

6. **Test** for visual control of the incoming stream (see the **Diagnostics tools** chapter for details)

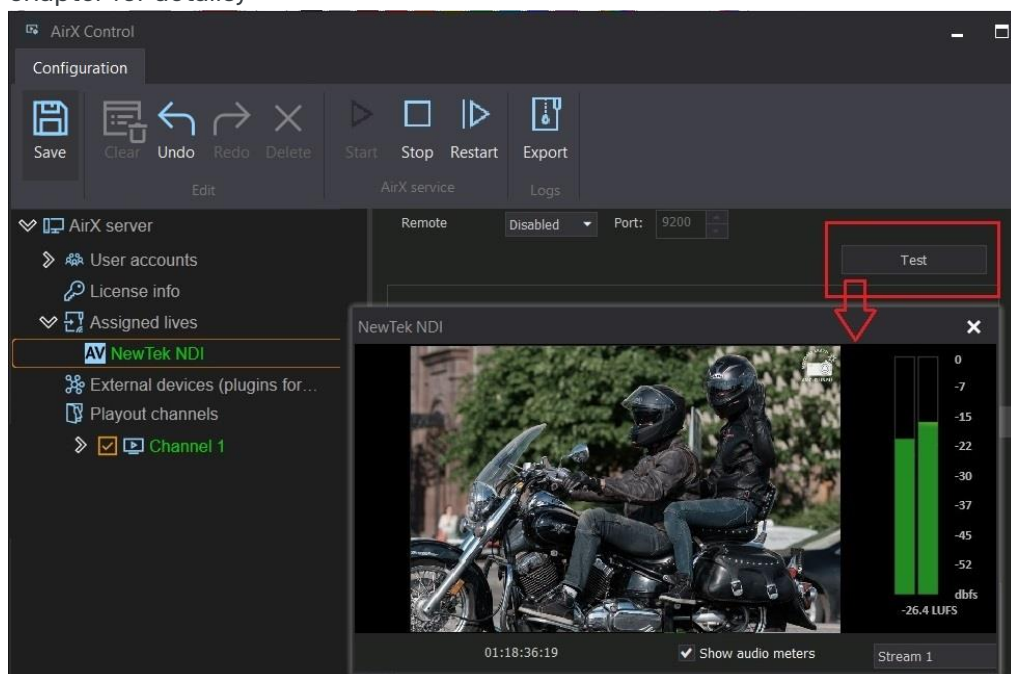


Figure 53. Input stream visual control

7. **DTMF** for DTMF signals detection in the input audio stream. DTMF settings:
 - *Enable the search for DTMF labels in the audio stream* enables the DTMF monitoring mode. After checking the box, the remaining fields of the section will become available.

- *Symbol duration* to set the duration of the DTMF keys (0-9, #, *, A, B, C, and D)
 - *Pause duration* to set the duration of the pause between keys
 - *Search in audio channels* with numbers from 1 to 8, to specify the audio stream in which the DTMFs will be searched
 - *DTMF items* – field intended for entering the DTMF search mask (value and order of keys in the DTMF, for example #ABC).
8. **SCTE-104** for SCTE-104 markers detection in the input stream. This setting is necessary for automatic AD Insertion mode. The "Label start the advertisement" field requires the name of the start insertion marker. The "Label stop the advertisement" field requires the name of stop insertion marker.

Operation with DTMF and SCTE-104 requires the additional license.

9. **Teletext / OP-24(47)** allows the recognition of teletext and closed captions in the input stream (up to 8 tracks in each input stream). The **Subtitles Source** drop-down menu contains the subtitle formats (Teletext, Closed captions or EBU-TT), the **Subtitle 1 - Enable** checkbox allows the decoding of the first subtitle track (the same are checkboxes 2-8). The **Page** field is editable, intended to specify the page number with teletext data. For each subtitle track, it is possible to specify a language in the **Lang** field. The language must be specified in a standard format manually (for example, eng or es).

Note: Do not forget to save changes!

Follow the instructions in the **Live sources connection and distribution** chapter to add a Live source to a playout channel.

SRT source

Secure Reliable Transport (SRT) is a data transfer protocol based on UDT (UDP-based Data Transfer Protocol). SRT uses a "handshake" mechanism of bidirectional data transfer; each device must be identified as either a Caller or a Listener.

A device in Caller mode is the initiator of an SRT streaming session. The Caller device must know the public IP address and port number of the device identified as the Listener. If the stream source device is set to Caller mode, the broadcast will not start until a point-to-point connection with the receiver set in Listener mode.

The device in Listener mode is waiting for a request to start an SRT streaming session. A device identified as a Listener has only to know that it must listen to an SRT stream on a specific port. If the stream source device is set to Listener mode, the receiver set in Caller mode sends a request to receive the stream. In this case, there can be several receiving points.

Briefly:

- Listener Source - the receiver set in the Caller mode sends a request to receive the stream, there can be several receiving points.
- Caller Source - Broadcasting will not start until a point-to-point connection with the receiver set in Listener mode.

SRT source setup

First step: call the context menu of the Assigned Lives branch of the Server resource tree (left pane of the application window). Select **Add live input** in the drop-down menu, and click the **SRT** input stream type.

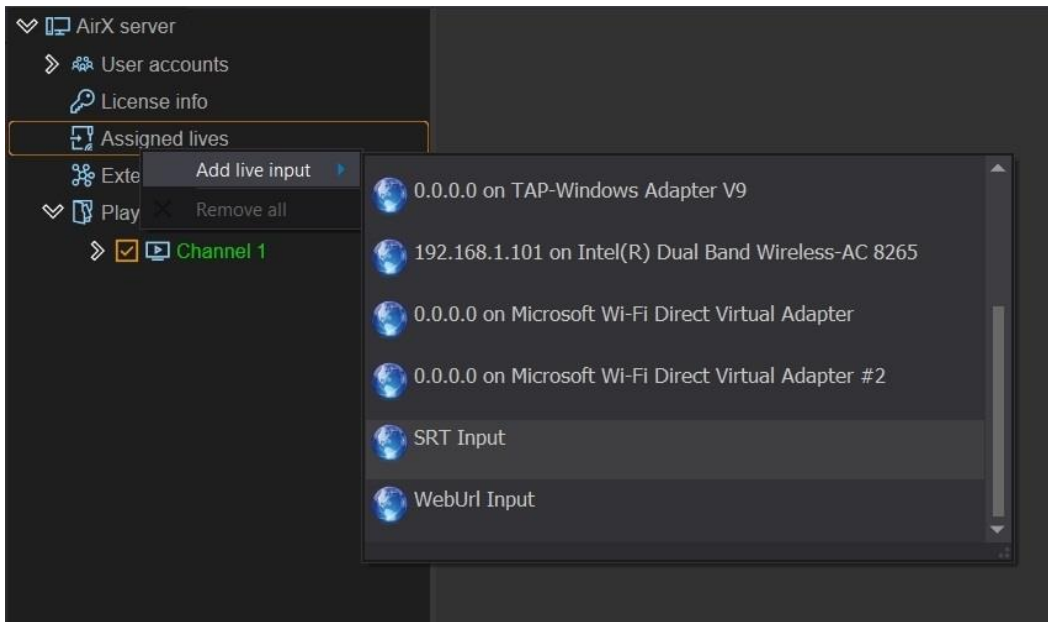


Figure 54. Add SRT Live input step 1

After SRT is added to the Assigned lives list, you have to set the input stream URL to the corresponding text field in the right side of the app window (1). Select the network mode (Caller / Listener) and, if the input stream is encrypted, select the encryption mode (AES-128 or AES-256) and enter the key (2). Finally, in the context menu of the SRT Input item (left side of the app window, Channel resource tree), click Search (3).

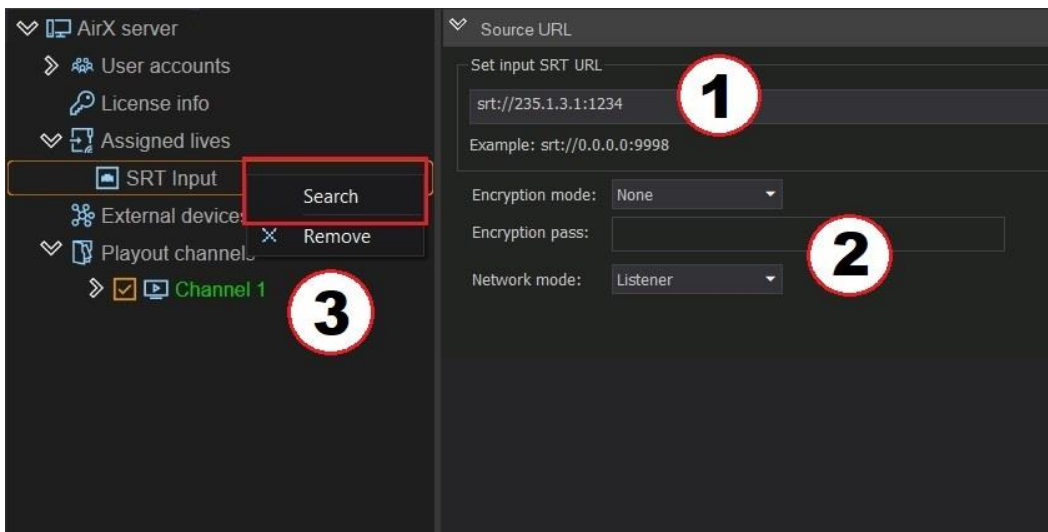


Figure 55. Add SRT Live input step 2

When the AirX service detects a stream, you will see a settings pane on the right side of the app window.

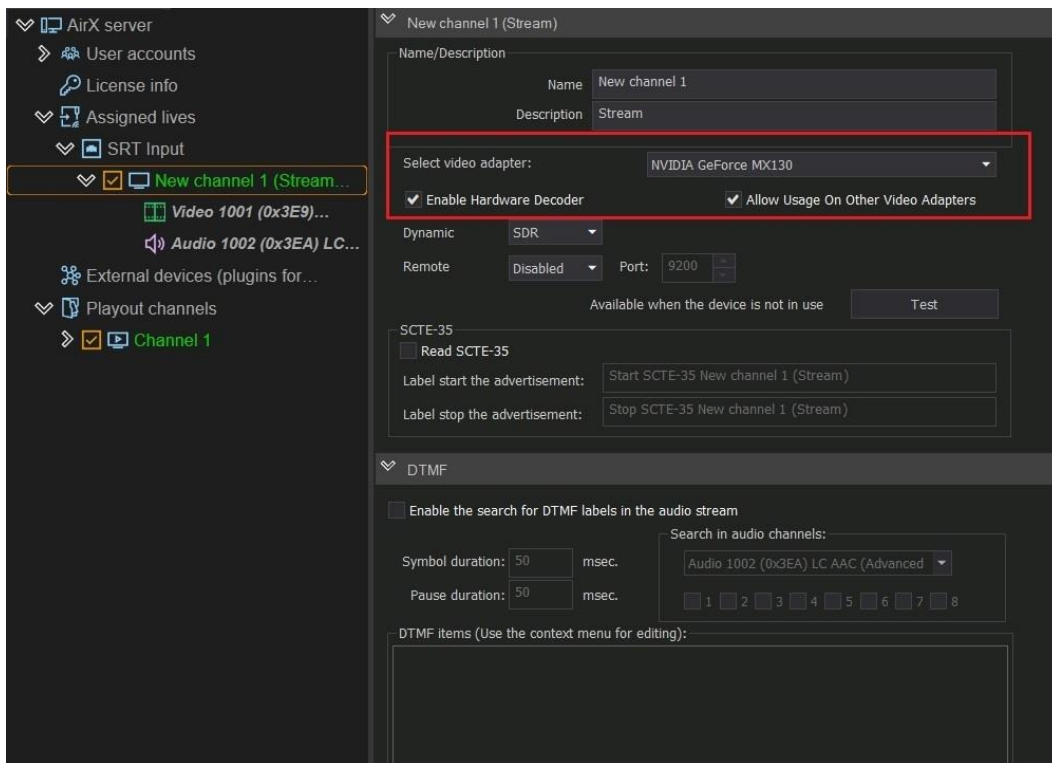


Figure 56. SRT Input stream settings

The detailed settings of the SRT input stream are identical to the UDP stream. Description of settings and screenshots are in the chapter **DVB/ATSC UDP IP** above.

Do not forget to select the video adapter for decoding the input stream (outlined in red). If you use several video adapters, remember the rule of resource allocation - the input stream, playout channel and output stream (streams) for each channel must use the same one video adapter (see **Predicting GPU performance. Throughput optimization and resource allocation on GPUs**).

Check the box next to the name of the input stream in the Assigned lives resource tree to add it to the configuration and click **Save**.

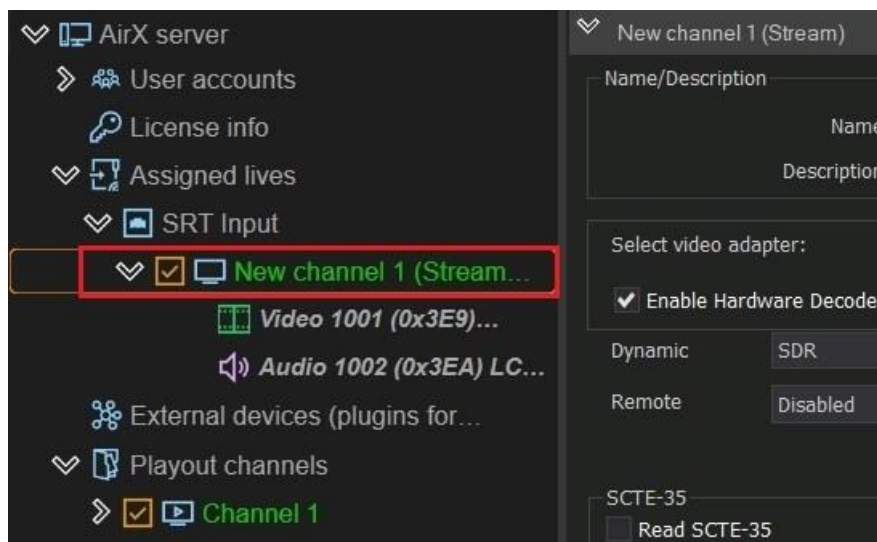


Figure 57. Active SRT input stream in the Assigned lives resource tree

The Input stream name will change color to green - the stream was added successfully.

You can use the Input stream preview to control the quality. See the **Diagnostics tools** chapter for details.

Follow the instructions in the **Live sources connection and distribution** chapter to add a Live source to a playout channel.

SDI source

If you have an SDI capture card installed, add an SDI source to Assigned lives from the context menu in the same way as a UDP source. Select the required board and the required SDI input from the list of capture cards installed (supported SDI capture cards - DeckLink, AJA, Dektec, StreamLabs, Softlab-NSK).

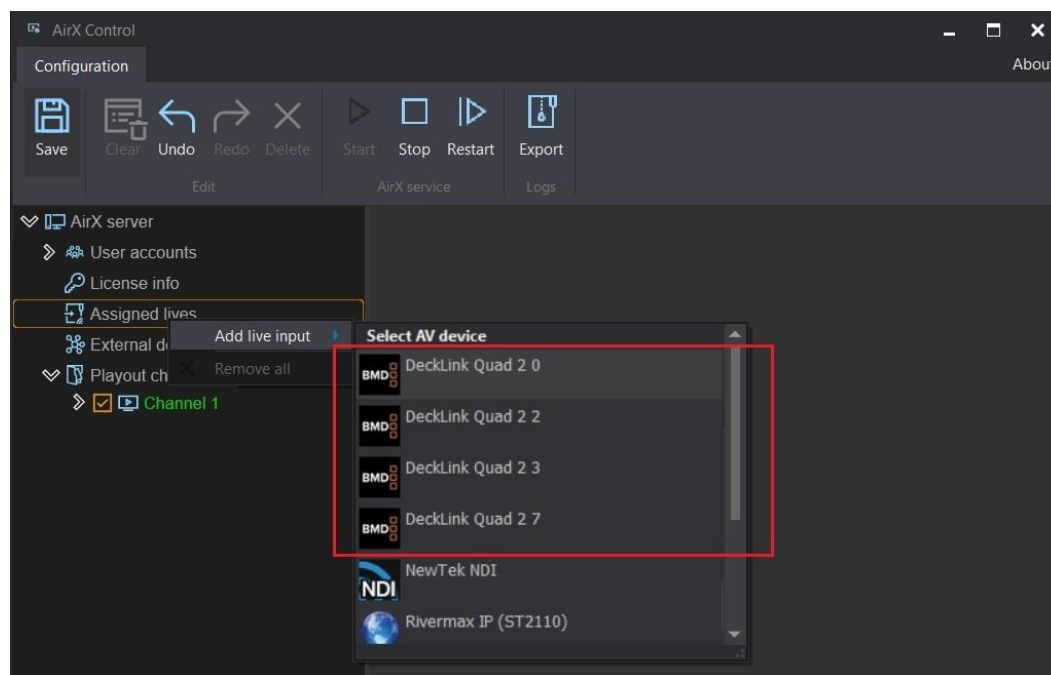


Figure 58. Add SDI Live input step 1

It is really important to set the initial settings and test them before (Figure 59, outlined in red).

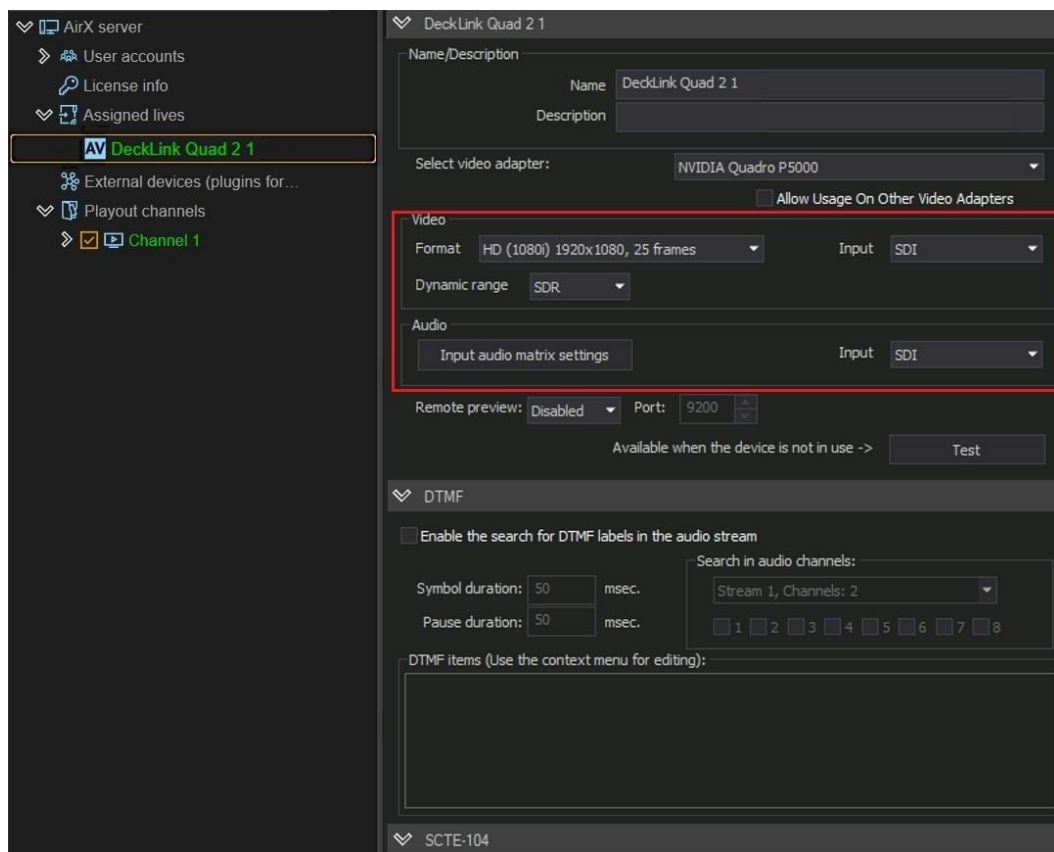


Figure 59. SDI Input initial settings

As with the inputs described above, the SDI settings pane has several settings sections:

- AV device **Name**
- **Select video adapter** - choose a video adapter for decoding. **Allow Usage On Other Video Adapters** checkbox - share channel data between multiple video adapters
- **Video** and **Audio** to adjust input signal parameters
- **Remote preview** to set up remote preview
- **Test** is a visual diagnostic tool. It is live preview of input stream. See description in **Diagnostics tools** chapter.
- **DTMF** - for DTMF signals detection in the input audio stream.
- **SCTE-104** - for SCTE-104 markers detection in the input stream in AD insertion mode
- **Teletext (OP-42/47) / Closed Captions** - subtitle decoding settings

The detailed settings of the SDI input stream are identical to the UDP stream. Description of settings and screenshots see above in the chapter **DVB/ATSC UDP IP**.

Follow the instructions in the **Live sources connection and distribution** chapter to add a Live source to a playback channel.

WEB source

First step: call the context menu of the Assigned Lives branch of the Server resource tree (left pane of the application window). Select **Add live input** in the drop-down menu, and click the **WebUrl** input stream type.

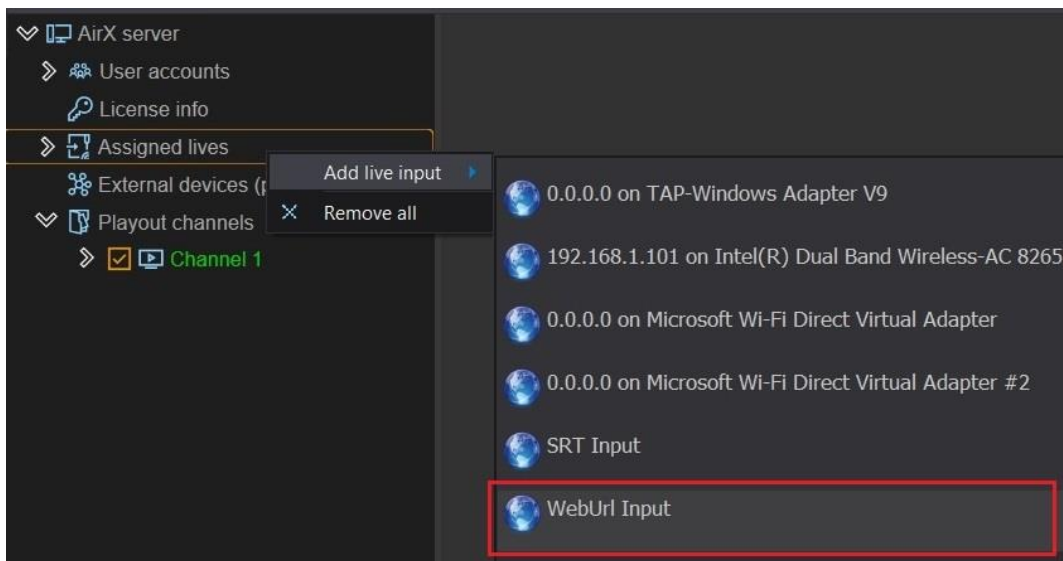


Figure 60. Add WebUrl Live input step 1

After WebUrl is added to the Assigned lives list, you have to set the input stream **URL** to the corresponding text field in the right side of the app window (Figure 61, outlined in red).

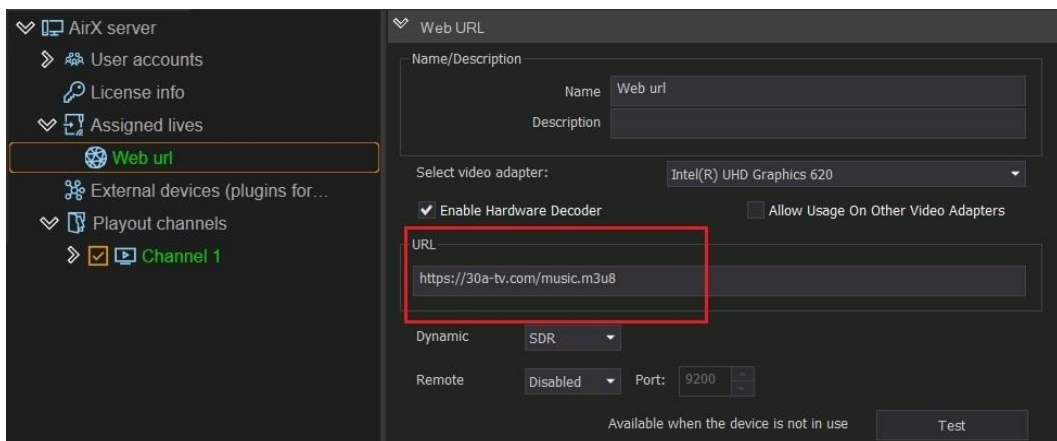


Figure 61. WebUrl settings

The detailed settings of the WebUrl input stream are identical to the UDP stream. See the description of settings and screenshots above in the chapter **DVB/ATSC UDP IP**.

You can use the Input stream preview to control the quality. See the **Diagnostics tools** chapter for details.

Follow the instructions in the **Live sources connection and distribution** chapter to add a Live source to a playout channel.

ST2110 source

First step: call the context menu of the Assigned Lives branch of the Server resource tree (left pane of the application window). Select **Add live input** in the drop-down menu, and click the **Rivermax IP (ST2110)** input stream type.

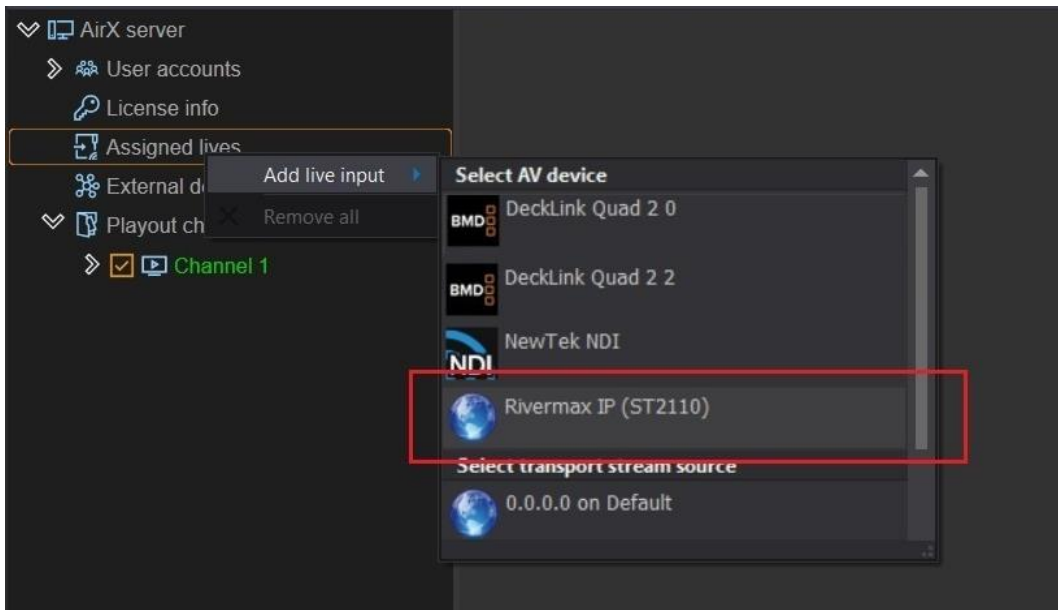


Figure 62. Add ST2110 Live input step 1

After ST2110 is added to the Assigned lives list, you will see the standard AV input settings pane on the right side of the app window.

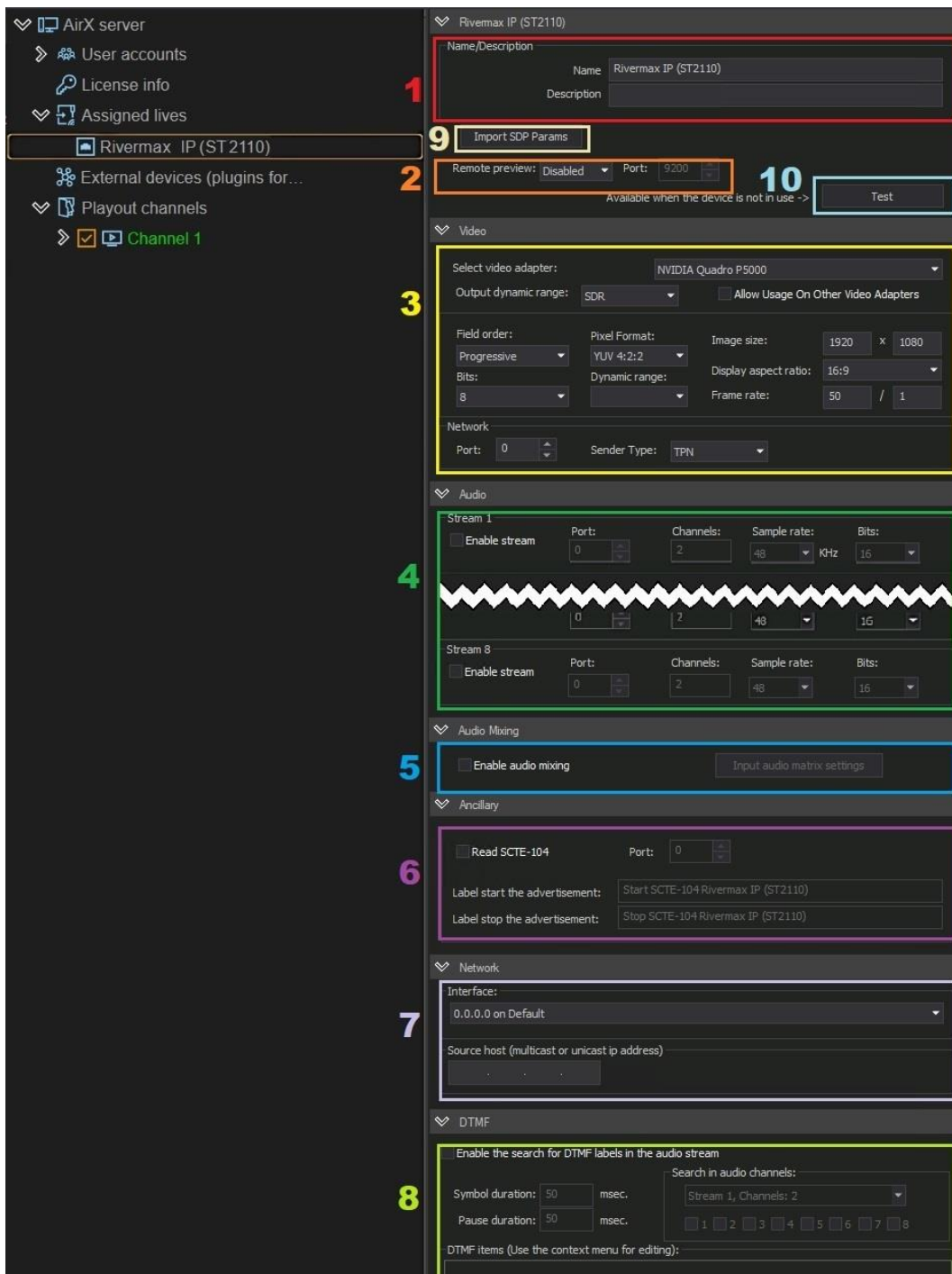


Figure 63. ST2110 settings

Like other types of sources, the ST2110 has its own settings. They are grouped in several panes:

1. **Rivermax IP (ST2110)** - AV device name, Name and Description fields.
2. **Remote preview** - remote preview enabling checkbox and port preview field
3. **Video** - selection of a video adapter for decoding, color space, parameters of the input video, network settings (port for incoming video and TPN)
4. **Audio** - parameters of the input audio.
5. **Audio Mixing** - setting up the audio matrix

The panes above are standard, see the description in the chapter **DVB/ATSC UDP IP**

6. **Ancillary** - additional service data. The section contains the "**Enable SCTE-104 Events**" checkbox which enables the SCTE-104 markers detection in the input stream in AD insertion mode. You can also specify the port for SCTE-104.
7. **Network** settings - the drop-down list "Interface" is intended to select the interface and port for the input stream. The "Source Host" field is intended to input the source IP manually.
8. **DTMF** - settings of DTMF signals detection in the input audio stream, see the **DVB/ATSC UDP IP source** chapter for a detailed description.
9. **Import SDP Params** button is an important customization setting! The setting is intended for importing an SDP file with the input signal parameters. After importing the file, the parameters "Video", "Audio", "Ancillary" will be filled automatically.
10. **Test** button is a visual diagnostic tool. It is live preview of the input stream. See the description in **Diagnostics tools** chapter.

Fill the fields 7 - **Interface** and **Source Host** - to select a specific stream that is received by the Rivermax adapter card as a single source. Then click **Save** and test the incoming stream.

Follow the instructions in the **Live sources connection and distribution** chapter to add a Live source to a playout channel.

Diagnostics tools

It is necessary to test the quality of the incoming streams (Live sources) after adding them to the configuration. AirX has two built-in diagnostics tools: visual preview and fps/dropped frame control.

First use the **Test** button in the source settings pane for visual control and control of audio tracks: **ATTENTION:** The Test mode is only available when the device is turned off.

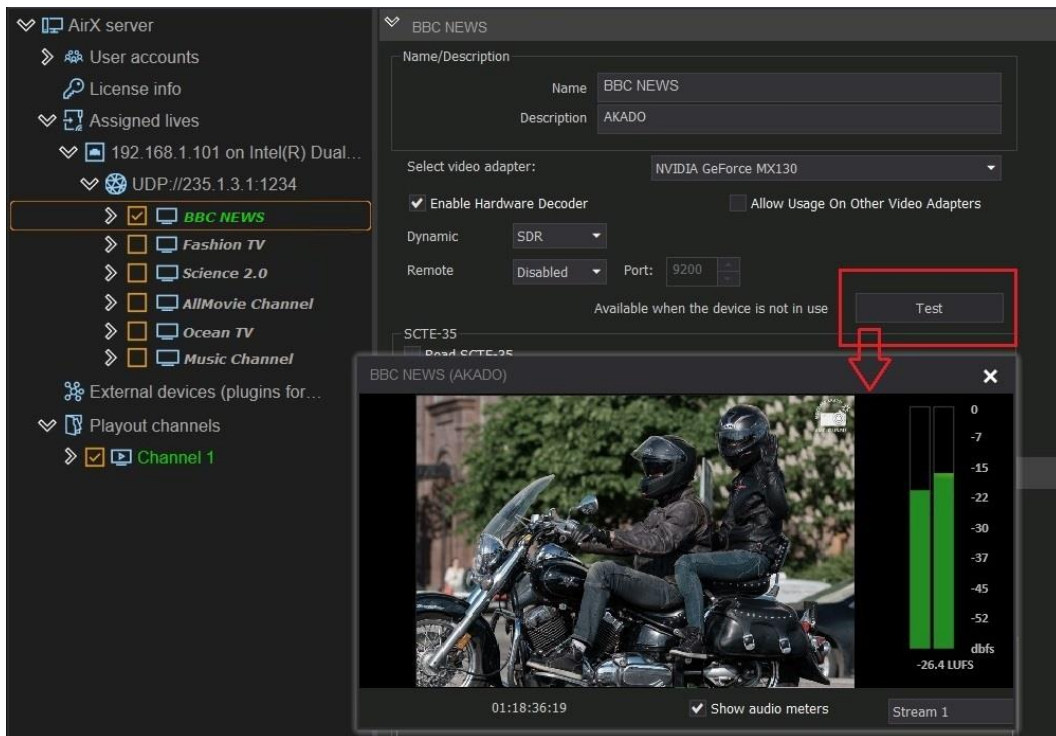


Figure 64. DVB/ATSC UDP IP Input diagnostics/visual control

Next step click on the name of the Input stream you want to check and call the context menu. Select **Preview** to enable fps/dropped frames control. A preview of the input stream will be opened in an additional window:

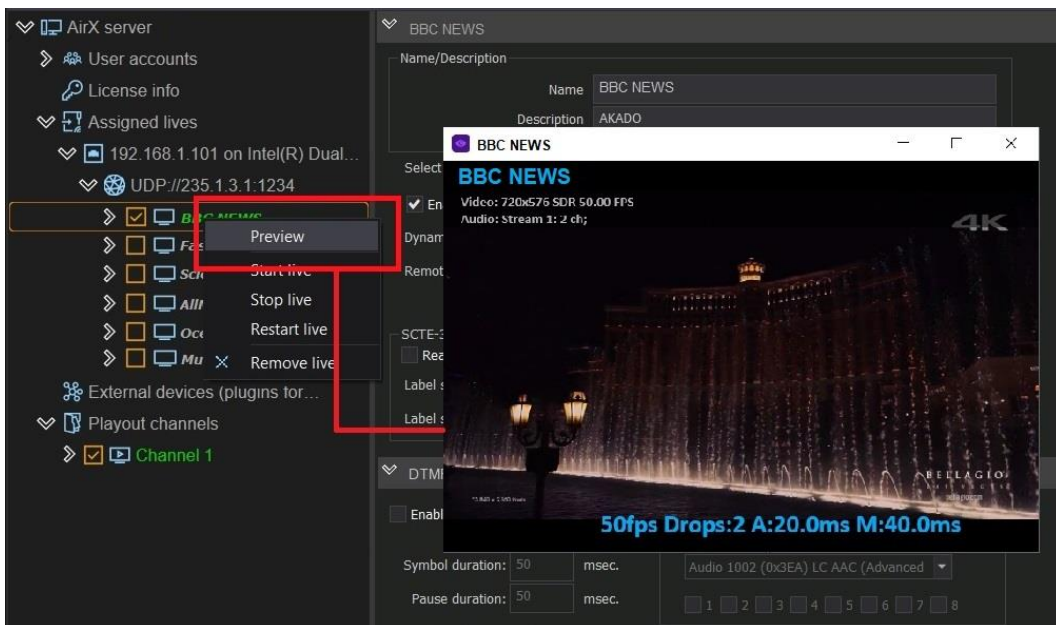


Figure 65. Input stream fps and dropped frames control

Press the keyboard shortcut **Ctrl+F7** to show the frame counter in the lower right corner of the screen. The counter will show the current stream status and the number of dropped frames. In the upper left corner of the preview window, you will see the characteristics of the input stream: Channel name, video format, color space,

fps, and number of audio tracks. Preview display and input stream monitoring are performed in real time.

ATTENTION: The above diagnostic tools are available only for correctly connected, enabled input streams. They can be identified by the green highlighting of the source name in the Assigned lives resource tree. If the source name is highlighted in red, the input stream is corrupted or missing. In this case, source troubleshooting is required.

Live sources connection and distribution

This chapter describes the connection of Live sources to the Playout channel.

Adding Live sources (or Input signals) to AirX is two-step connection:

1. The Live sources must be connected to the server
2. Sources, connected to the server, must be distributed over playout channels.

Each of the sources connected to the server can be added to any of the playout channels and/or to several channels at once.

Several sources can be connected to each playout channel at the same time.

Live sources do not require additional licenses – you can add as many sources to any playout channel as you need.

After Live sources are connected to the AirX server and tested, you can distribute them over playout channels. You must add them to the **Channel live inputs** branch of the Channel resource tree (left pane of the application window). The following figure shows how to add an NDI source to a playout channel:

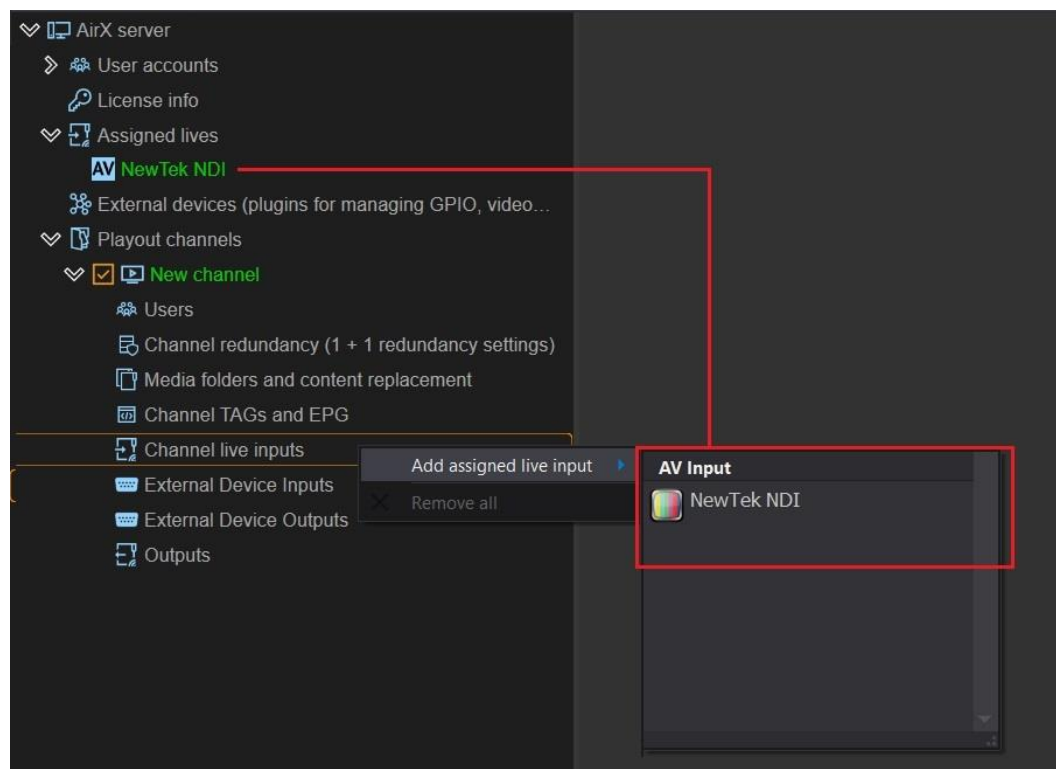


Figure 66. Add Assigned live input to the Playout channel

Right-click on **Channel live inputs** and select the available streams from the context menu (outlined in red) to connect them to the Playout channel.

The source settings pane in the right side of the app window is mainly for information. Available adjustable options are the following:

- The **Video** section contains settings for picture scaling (Letterbox/Anamorph/Pan&Scan) and checkbox to enable teletext if exists.
- The **Map AV Audio** section allows you to build audio mapping when there are multiple audio tracks in the input stream.
- The **Map AV Subtitles** section allows you to build subtitle mapping when there are multiple subtitle tracks in the input stream.

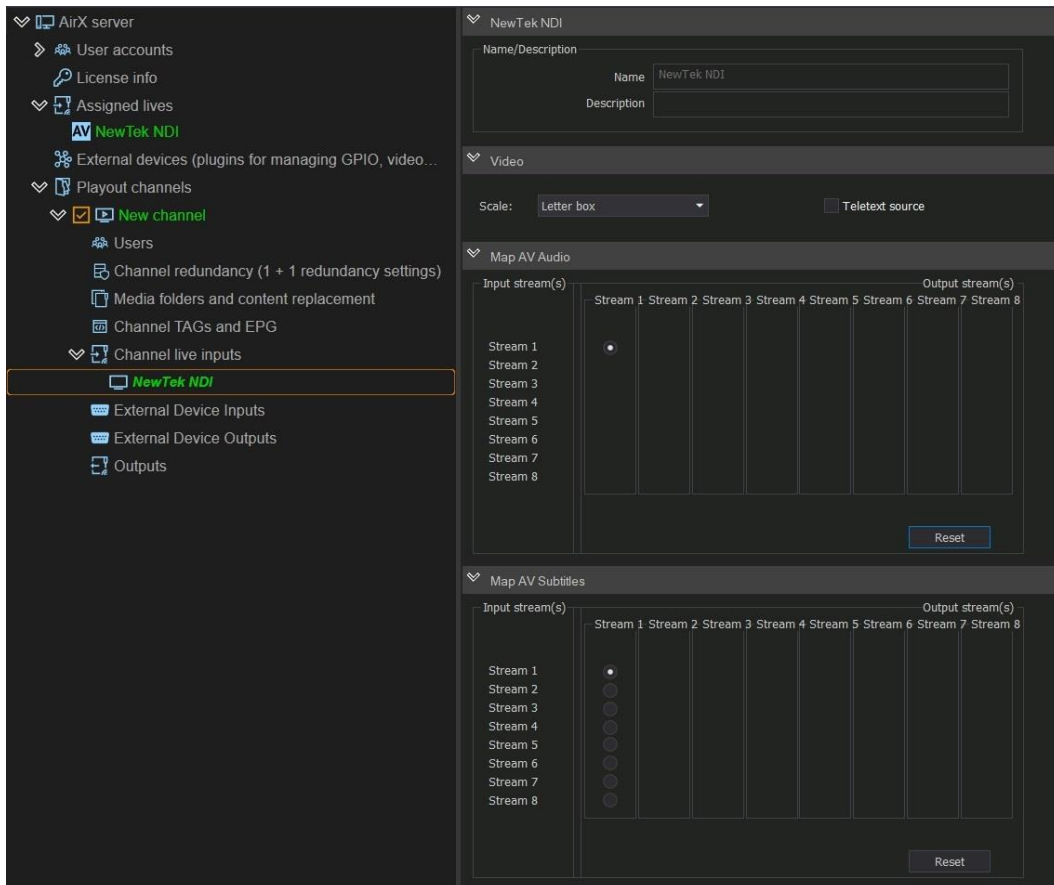


Figure 67. Live sources settings while connected to the Playout channel

Multiple source modes

AirX broadcast automation supports simultaneous operations with a large number of input streams. The number of simultaneously working Live sources is only limited by the hardware resources of the broadcast playout server. A guaranteed maximum (tested by Telestrider) is 8HD input streams per nVidia Quadro RTXA4000 GPU and less with a less powerful graphics adapter.

The final configuration for each specific task must be calculated individually by Telestrider Company.

There are two modes of operation with multiple sources:

LIVE mode

Standard mode, recommended by Telestrider. The LIVE mode provides simultaneous decoding of input streams on the broadcast playout server. This mode is more resource-intensive because a separate Windows background process is created for each input stream.

In Live mode each of the input streams is continuously monitored by AirX services. This mode provides real-time monitoring of the connection state and the signal quality of the input stream. In case of disconnection or quality loss, AirX will inform you using the built-in notifications (see the **System monitoring tools** chapter for details).

Live mode is available for input streams in any supported formats (see **Channel live inputs** chapter).

LIVE mode configuration:

1. Add Live sources to the broadcast playout server as Assigned lives (see **Channel live inputs** chapter).

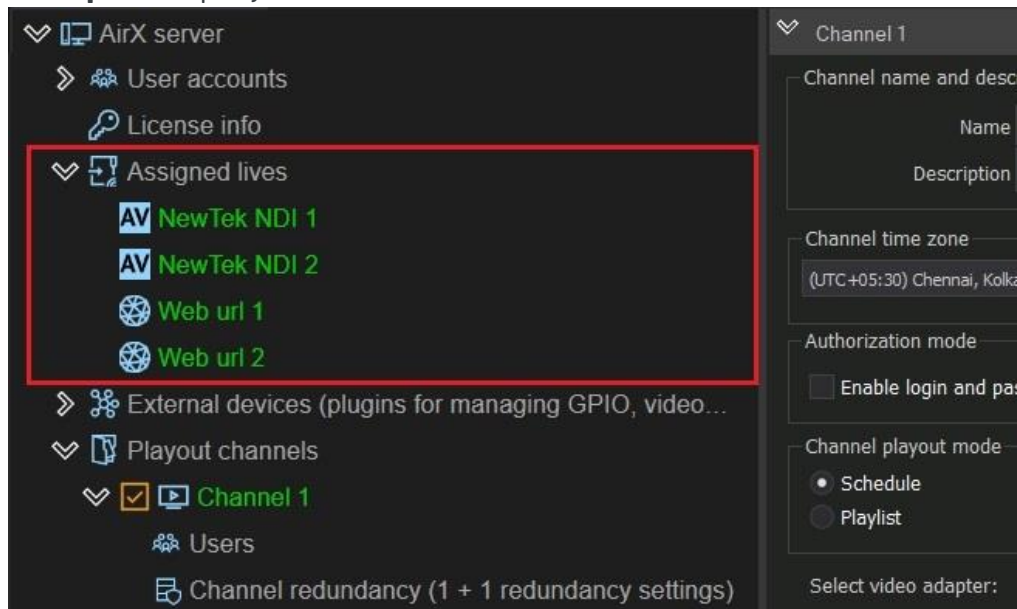


Figure 68. Add sources as Assigned lives

2. Distribute sources connected to the server over playout channels (see **Live sources connection and distribution** chapter).

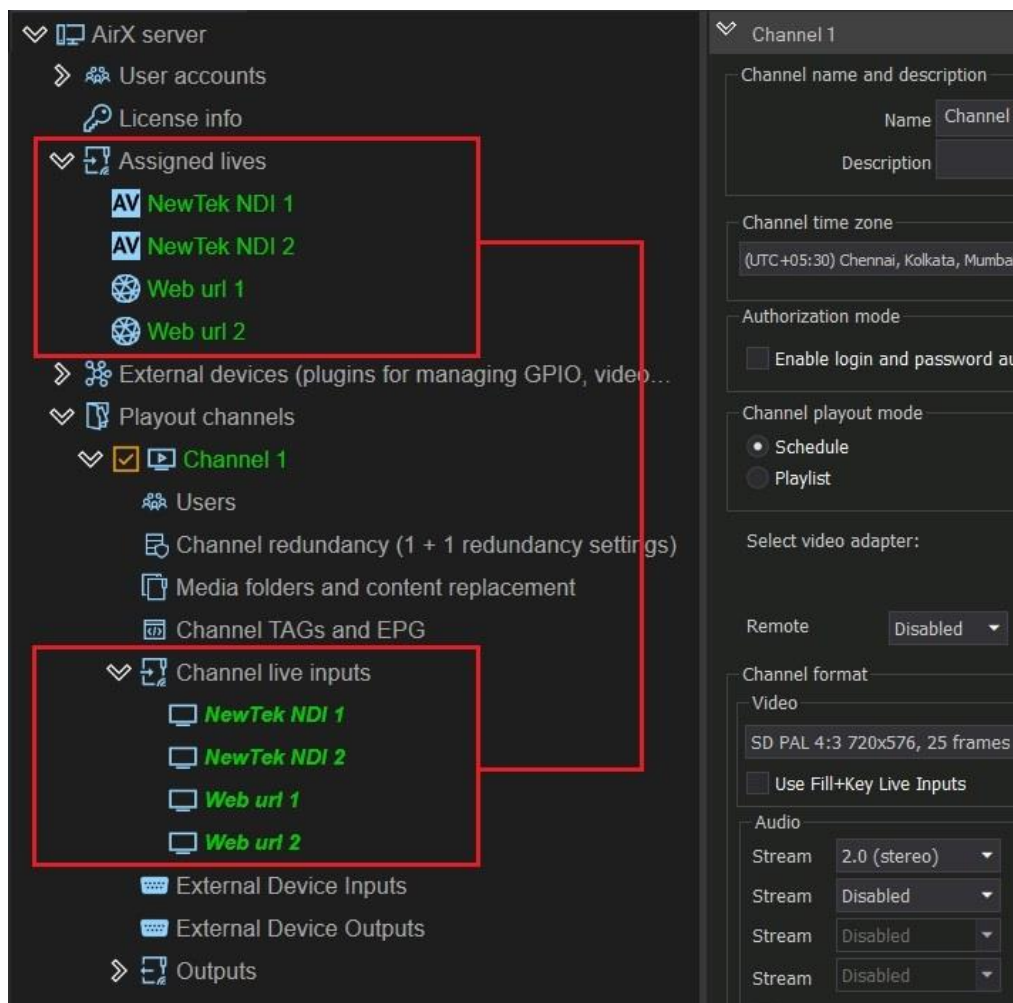


Figure 69. Add Assigned live inputs to the Playout channel

Each of the sources connected to the server can be added to any of the playout channels and/or to several channels at once.

Several sources can be connected to each playout channel at the same time.

3. After Live sources are added to the playout channel, you can use them in the schedule.

The figure below shows a part of the AirX schedule in the Channel Manager app. Expand the **Channel resources** tree in the left pane of the Channel Manager window and select the **Live** branch. The **Source content browser** contains all Live sources, available for the channel. You can add any Live source to the schedule using drag'n'drop.

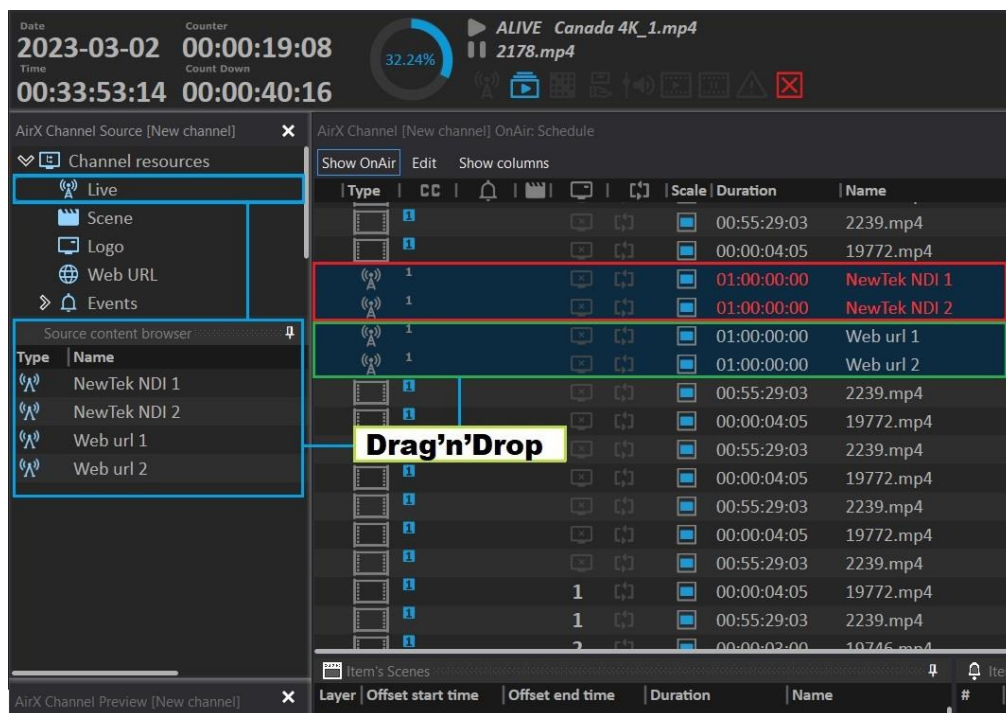


Figure 70. Add Live source to the schedule

Each Live source in the schedule is continuously monitored by AirX services. In case of disconnect or quality loss, you will see a red highlighting of the Live source in the schedule. If the Live source is Ok, it will be highlighted in blue.

WEB URL mode

Alternative mode of operation with multiple Web URL input streams. This mode is intended for reduction of the hardware load and for server resources optimization while a large number of input streams. Unlike Live mode, no Windows background processes are created on the broadcast playout server because Web URL mode **does not require** continuous decoding of input streams.

While working with Web URLs, you do not need to add them to the broadcast playout server as Assigned lives, or distribute them over playout channels. Web URL sources will not be displayed in the AirX Control configurator as channel resources. These input streams have to be configured from the client workstation from the Channel Manager application. In fact, Web URL input streams are only processed by AirX when they are in the On-air schedule position.

ATTENTION: In Web URL mode, AirX services will not provide decoding or monitoring of input streams, their connection state and the signal quality. The Web URL will be on the air, regardless of any stream corruption. AirX service will not inform you about an error.

WEB URL mode configuration:

1. Launch the Channel Manager application. Expand the **Channel resources** tree in the left pane of the Channel Manager window and select the **Web URL** branch. Then, right-click on an empty space in the **Source content browser** window and select **Add new Web Url** from the drop-down list.

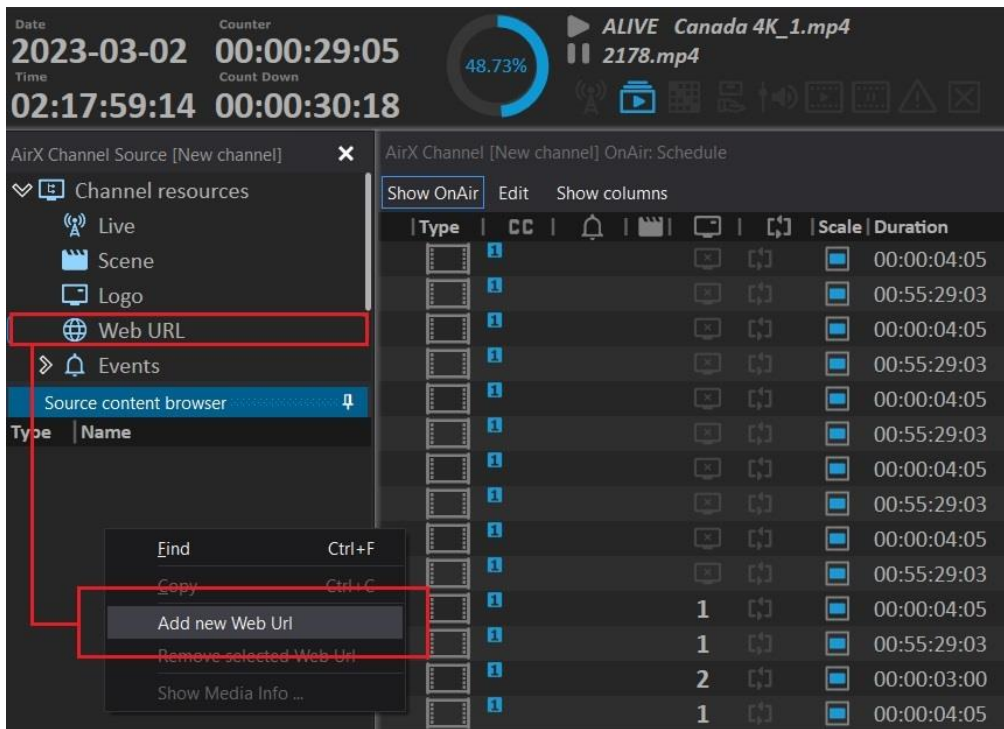


Figure 71. Add Web Url as a Channel source in Channel Manager app

2. In the **Add Web Url** window, enter the URL into the top editable field and click **Verify**. After the URL validating, the **Web url Name** and **Web url Description** fields will be enabled. Modify these fields and Click Ok to save settings.

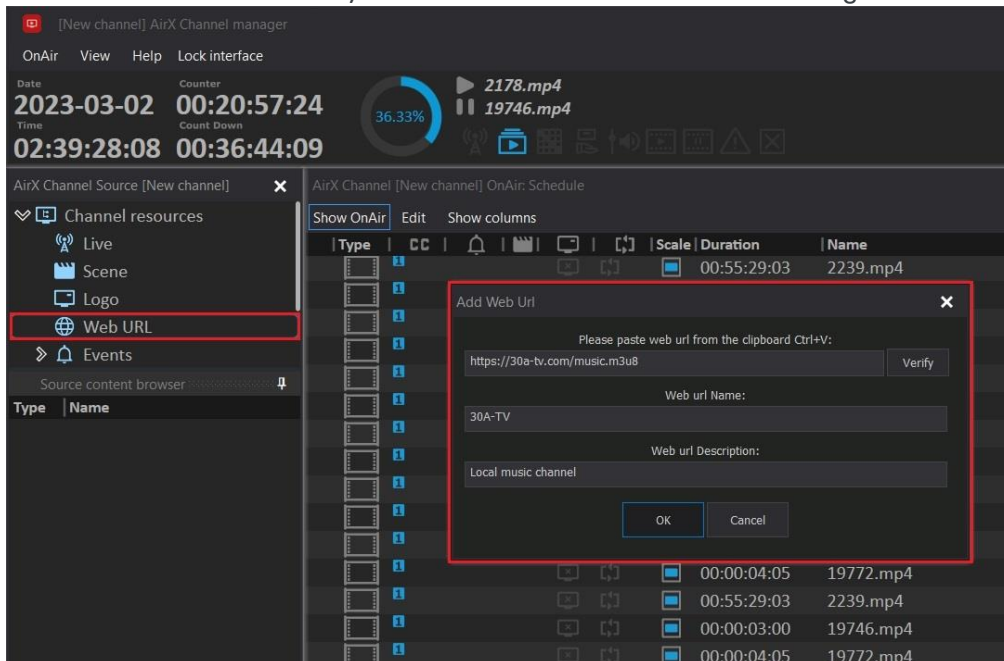


Figure 72. Web URL stream settings

3. After Web URL sources are added to the Source content browser pane, you can add any source to the schedule using drag'n'drop.

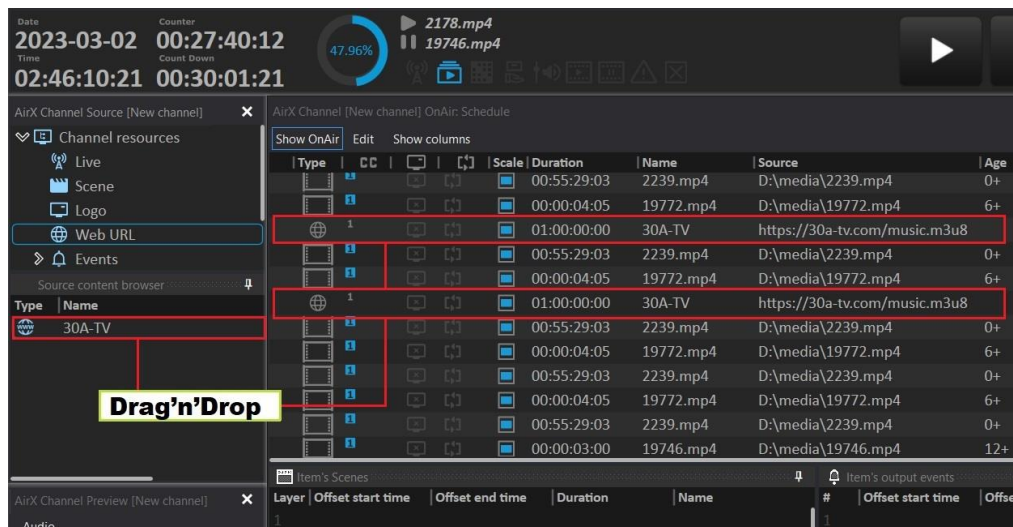


Figure 73. Add Web URL source to the schedule

As you can see in the picture above, schedule items containing Web URLs are not highlighted. This visually differ them from Live sources added to the schedule.

External devices

AirX broadcast automation uses a plug-in system to support external devices: any compatible device can be supported upon the request of the customer. The terms of implementation are individual in each case.

External devices connection is similar to Channel live inputs connection:

1. Add External device to the broadcast playout server in External devices branch of the Server resource tree (left pane of the application window).
2. Distribute devices connected to the server over playout channels.

Select **External devices** (Plugins for managing GPIO, video routers, headend ...) branch in the Server resource tree, call the drop-down menu by right-clicking on the branch name. Select **Add external device** in the drop-down list and you will see a list of available devices.

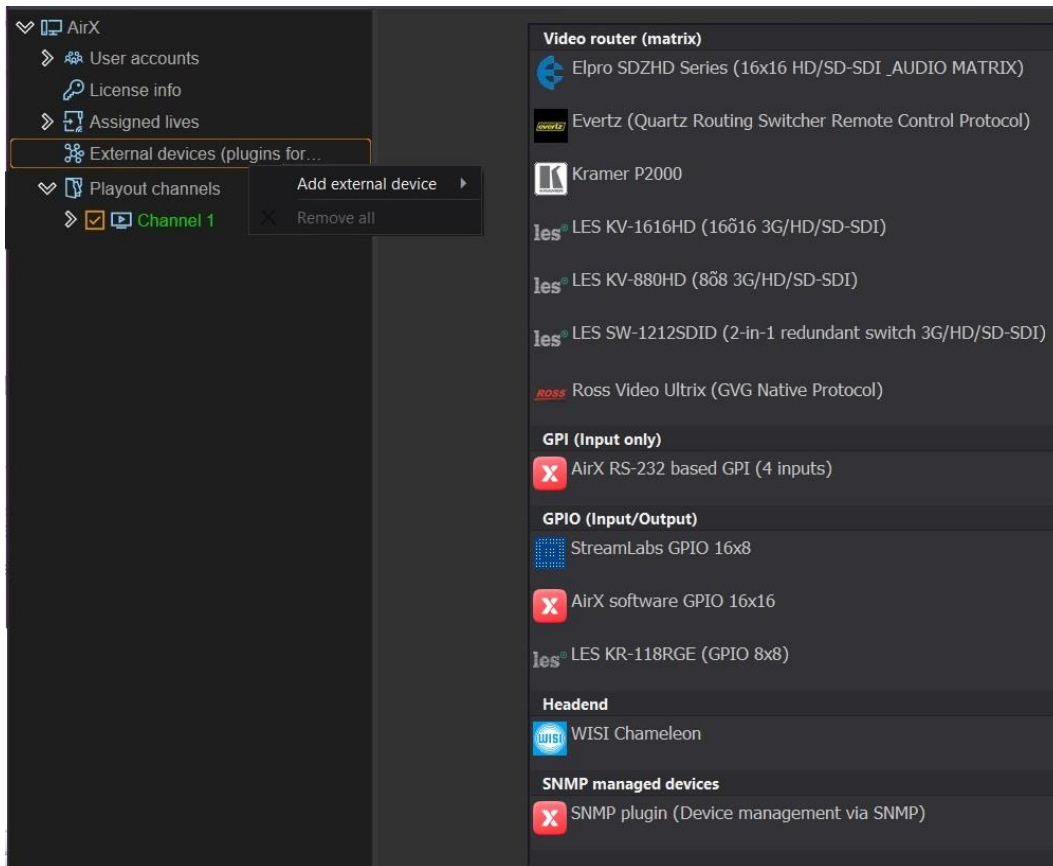


Figure 74. External devices list

Video router (matrix)

Let us review the Evertz routing switcher as an example, other devices can be connected and configured in the same way.

Select **External devices** (Plugins for managing GPIO, video routers, headend ...) branch of the Server resource tree, call the drop-down menu by right-clicking on the branch name. Select **Add external device** from the drop-down list and select the device that will receive control commands from the playout channel.

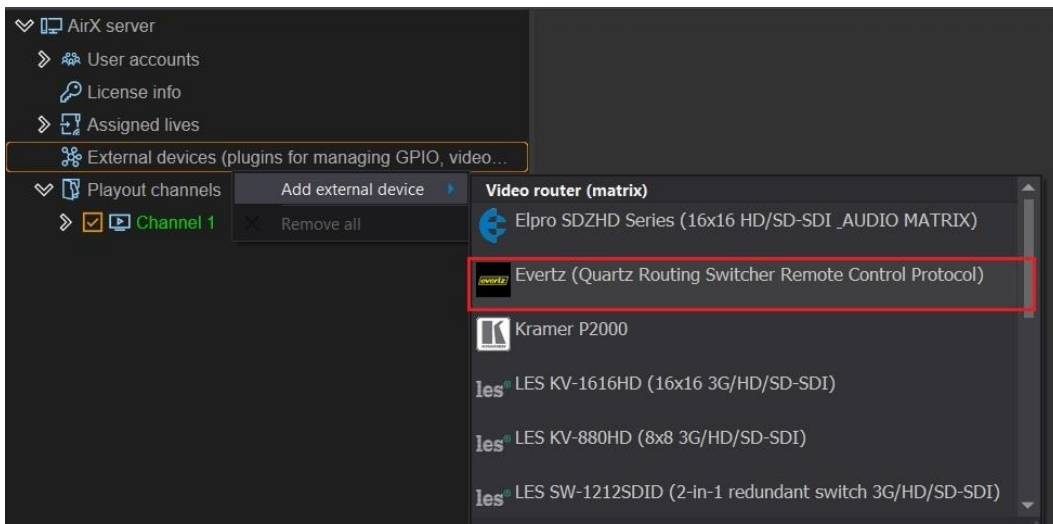


Figure 75. Add an Evertz routing switcher as an external device for the AirX server

After the External device was added, you will see the name of the device in the **External devices** (Plugins for managing GPIO, video routers, headend ...) branch of the Server resource tree.

Click the name of the device to open the settings pane on the right side of the app window. In this pane you will see Info section, connection section and the Presets settings.

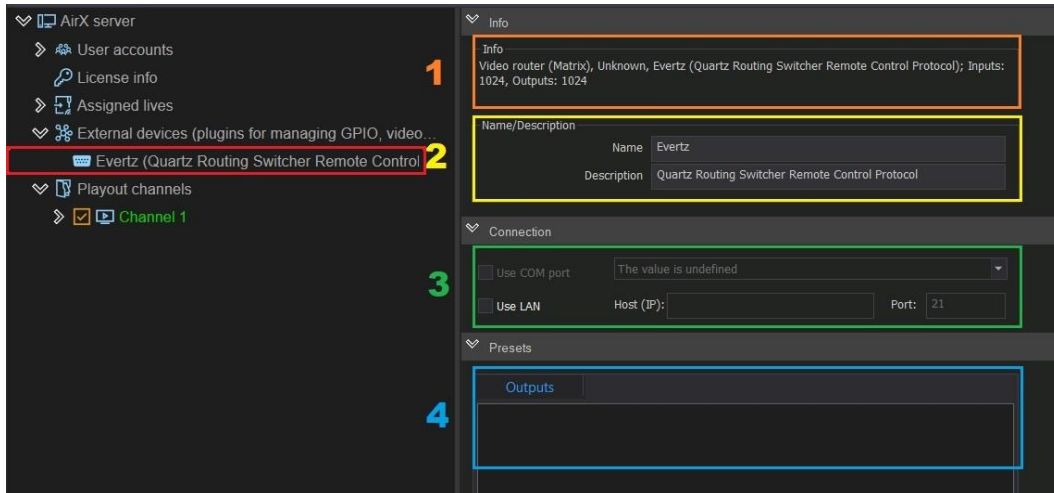


Figure 76. External device settings

1. **Info.** Non-editable field contains information about the connected device.
2. Editable **Name/Description** fields. They have default values but can be changed manually. For example, the serial number of a specific device or other service information can be entered in these fields.
3. Editable required field **Connection**. Contains checkboxes **Use LAN** and **Use COM port** for different types of device connection. For the Evertz routing switcher, check the Use LAN checkbox, enter the host address and port for connection.
4. Editable field **Presets**. Contains settings for the control commands (presets) creation. Right-click in the empty space of the Outputs window and select **Add new preset** to create a new preset for external device control.

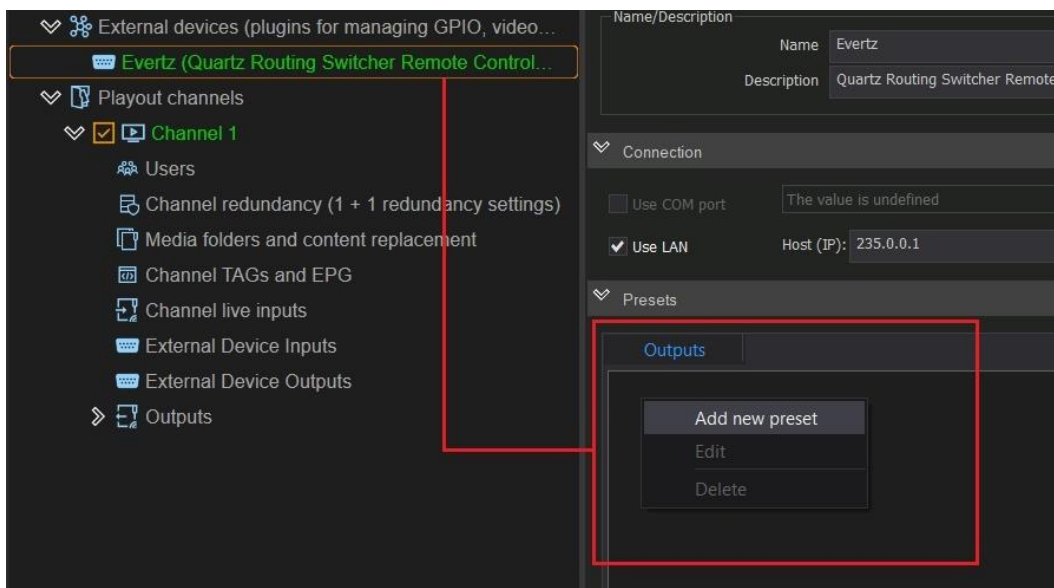


Figure 77. Add new preset for External device control

In the new **Video router (matrix) output** window enter the name of the event (switching the selected input to a specific output) and configure the switching parameters – the number of the input and the number of the output.

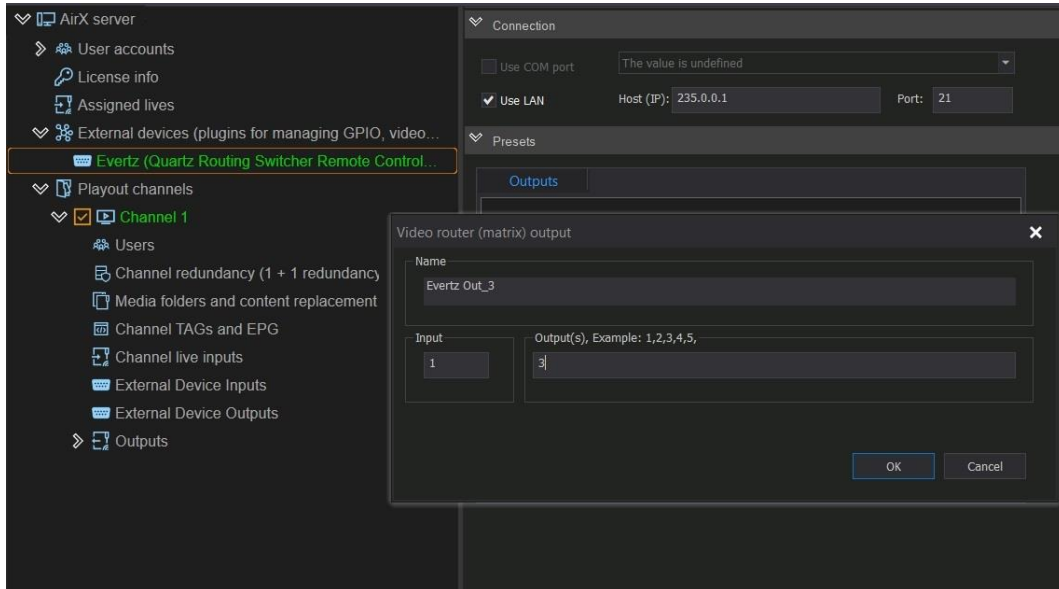


Figure 78. Configure the switching preset parameters

Click **Save** in the main menu of AirX Control app to save changes.

Next you have to distribute connected external devices over the playout channels.

ATTENTION: Each of the External devices connected to the server can be added to any of the playout channels and/or to several channels at once.

Several devices can be connected to each playout channel at the same time.

Expand the Channel resource tree and select the **External Device Outputs** branch to connect a device to a channel. Check the **Enable plugin usage** checkbox for the selected device. Then check the boxes next to the configured presets.

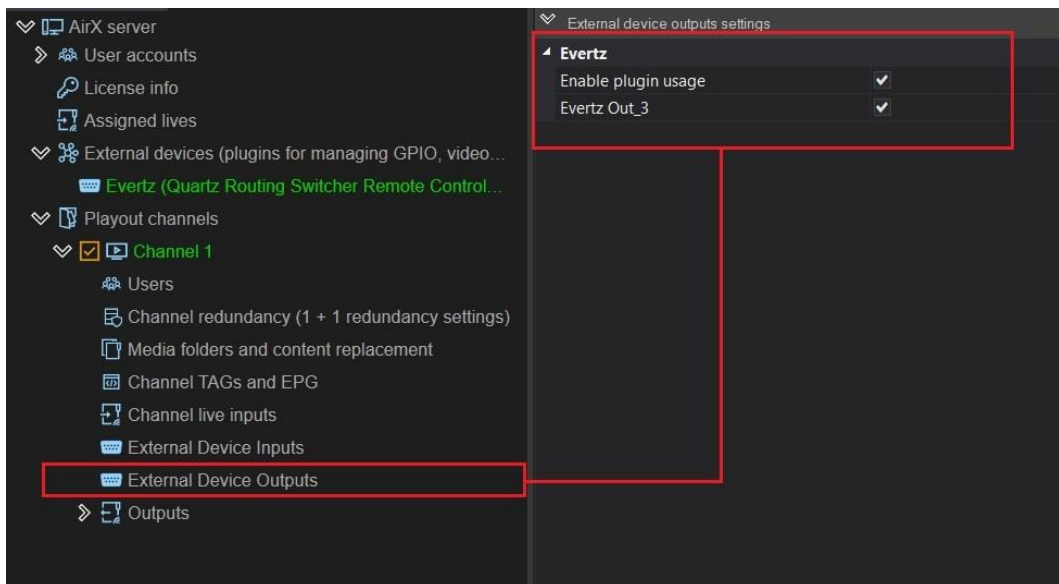


Figure 79. Enable the External device connection to the playout channel

After an External device connected to the Channel resources tree, click **Save** in the main menu of AirX Control app to save changes.

Next you have to launch the Channel Manager app and add the control commands to the schedule. In case using the **Autoload schedule** function, most likely, the control commands will be already added in the schedule by a third-party broadcast traffic management system. But if you want to create (or edit) the schedule manually, follow the instructions:

1. Open the schedule in the **Channel Manager** app. Expand the channel resource tree as shown (1).

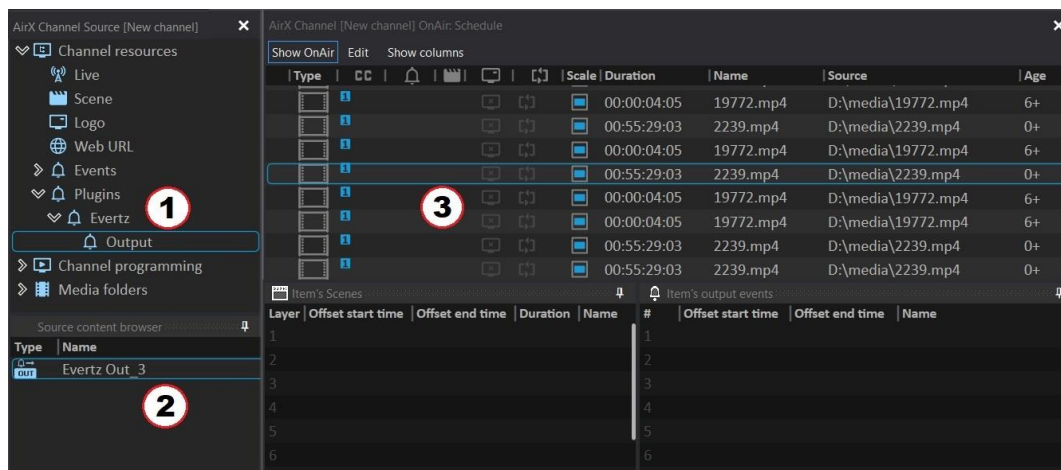


Figure 80. Add the External device preset to the schedule. Step 1

Find the list of the available presets (external events) in the **Source content browser** pane (2). Select a preset you want to add to the schedule.

In the schedule window, click (3) on the schedule row you want to combine with the external event (External device control command).

2. Move the external event from the **Source content browser** window to the **Item's output events** window using drag'n'drop (4).

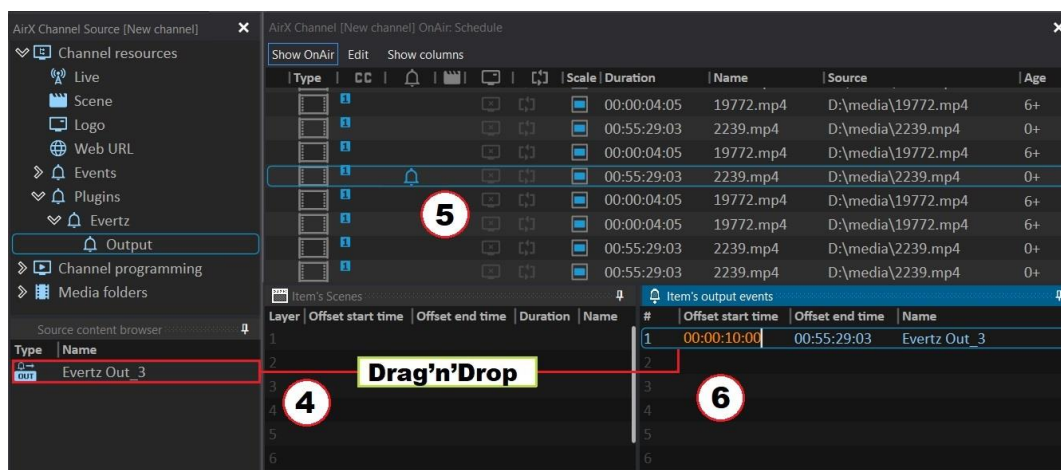


Figure 81. Add the External device preset to the schedule. Step 2

You will see the bell icon (5) on the schedule row combined with an external event.

If necessary, edit the external event's output parameters (6).

Headend

Let us review the WISI Chameleon headend as an example. Almost all the connection steps are similar to those described in the **Video router (matrix)** chapter.

Select **External devices** (Plugins for managing GPIO, video routers, headend ...) branch of the Server resource tree, call the drop-down menu by right-clicking on the branch name. Select **Add external device** from the drop-down list and select the WISI Chameleon headend device.

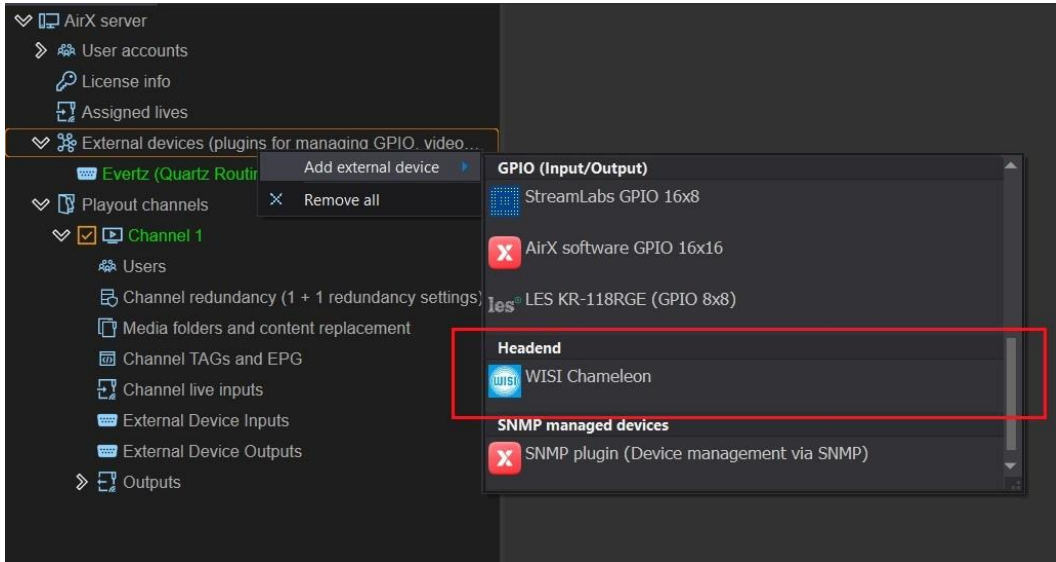


Figure 82. Add a WISI Chameleon headend as an external device for the AirX server

After the External device was added, you will see the name of the device in the **External devices** (Plugins for managing GPIO, video routers, headend ...) branch of the Server resource tree.

Click the name of the device to open the settings pane on the right side of the app window. In this pane you will see Info section, connection section and the Presets settings.

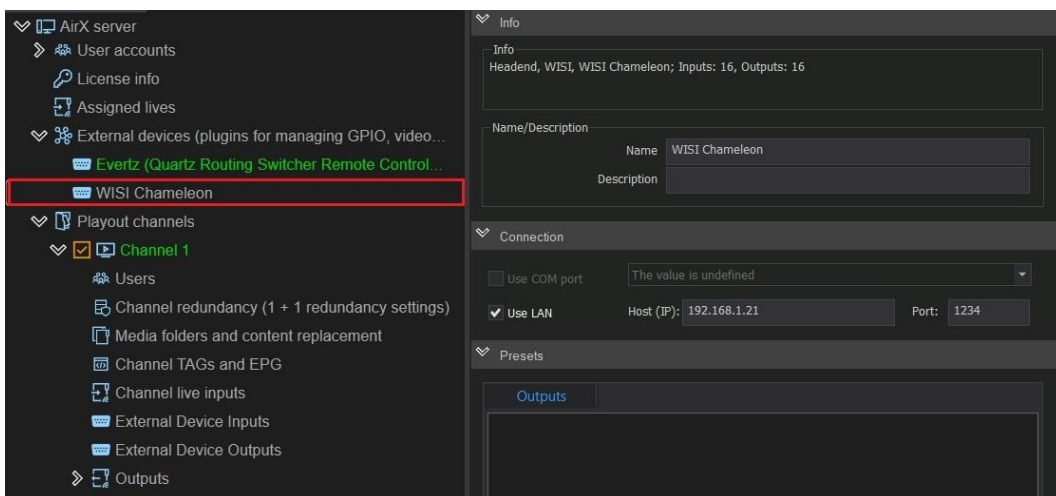


Figure 83. External device settings

The settings pane is similar to that described in the **Video router (matrix)** chapter.

Check the **Use LAN** checkbox to enable connection and enter the host address and port for connection. Set up headend presets in the **Outputs** window. Click **Save** in the main menu of AirX Control app to save settings.

Expand the Channel resource tree and select the **External Device Outputs** branch to connect a device to a channel. Check the **Enable plugin usage** checkbox for the selected device. Then check the boxes next to the configured presets.

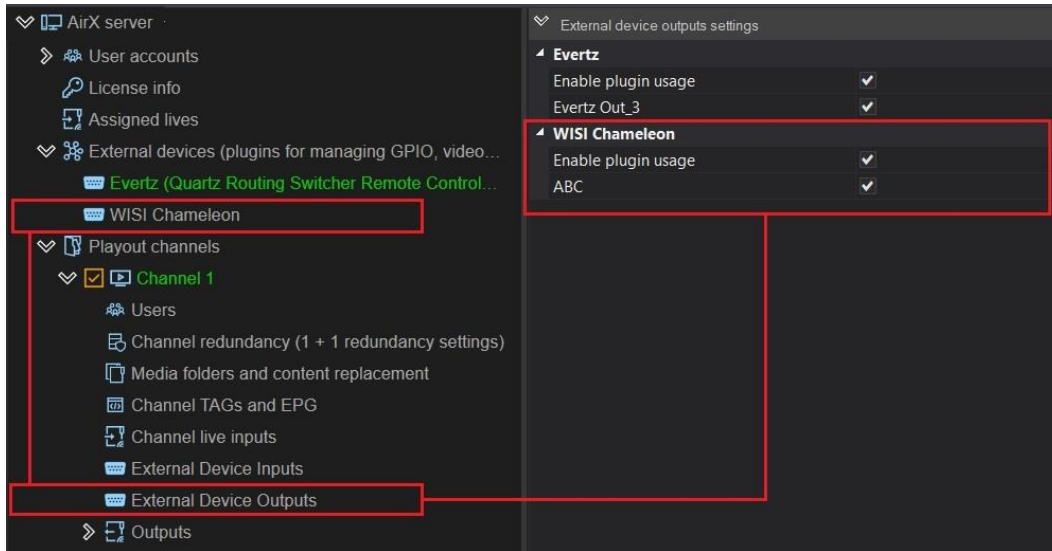


Figure 84. Enable the headend connection to the playout channel

After an External device connected to the Channel resources tree, click **Save** in the main menu of AirX Control app to save changes.

Finally you can work with the schedule as described in the **Video router (matrix)** chapter. All the steps are completely similar.

GPIO Presets

Call the context menu of the **External devices** (Plugins for managing GPIO, video routers, headend ...) branch of the Server resource tree to add a GPIO device. Select **Add external device** from the drop-down list and select the GPIO device you need. In the example below this is a LES Ethernet-GPIO cross-converter (8 GPO, 8 GPI).

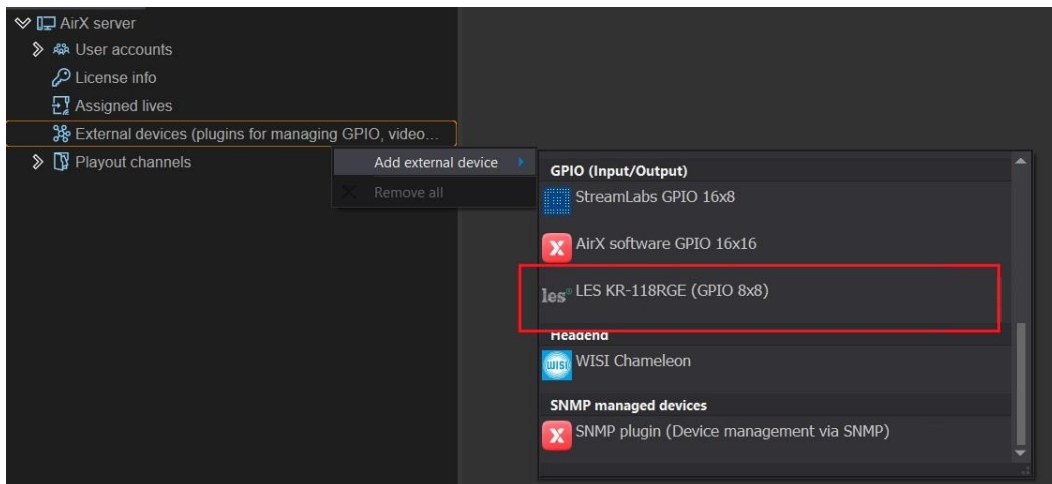


Figure 85. Add GPIO device

Click on the name of the device to open the settings pane on the right side of the app window. In this pane you will see Info section, connection section and the Presets settings:

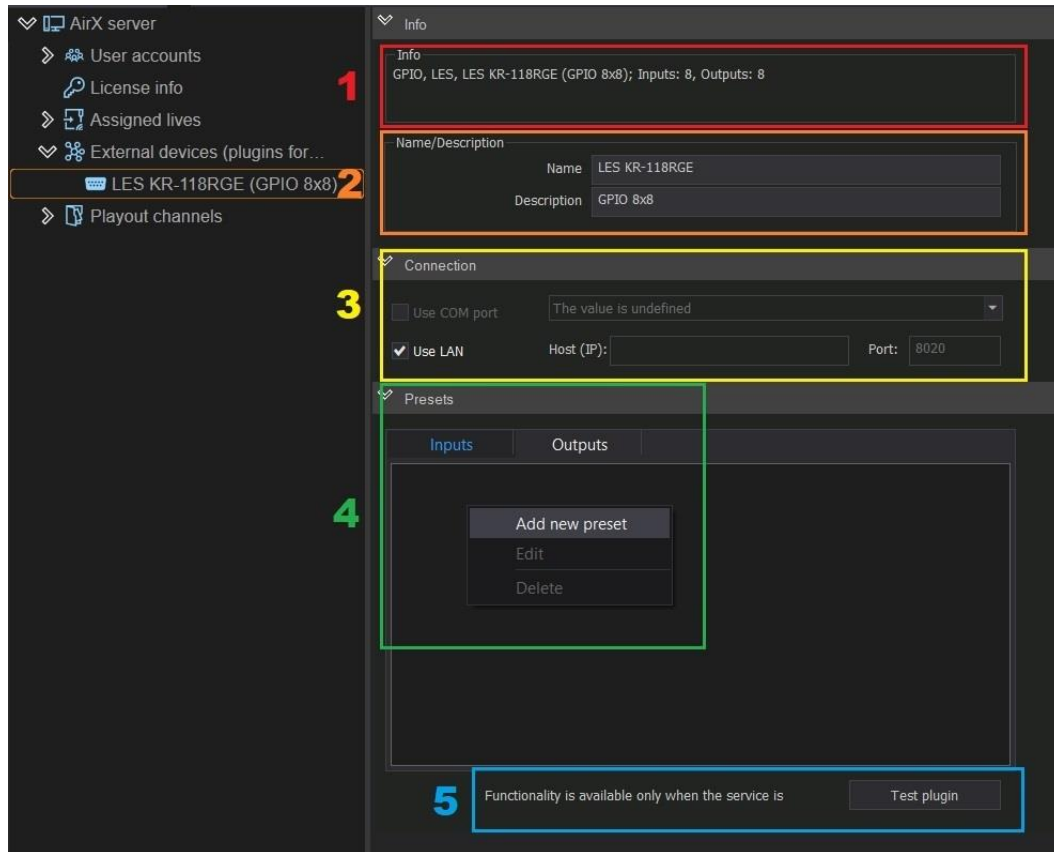


Figure 86. GPIO device settings

The settings window contains the following fields:

1. **Info.** Non-editable field that contains information about the connected device
2. Editable **Name/Description** fields. They have default values but can be changed manually. For example, the serial number of a specific device or other service information can be entered in these fields.
3. Editable required field **Connection**. Contains checkboxes **Use LAN** and **Use COM port** for different types of device connection. For the LES Ethernet-GPIO cross-converter, check the Use LAN checkbox, enter the host address and port for connection (8020 by default).
4. Editable field **Presets**. Contains settings for the GPI and GPO presets creation. You can use GPI presets to control AirX playback with an external devices. Right-click in the empty space of the **Inputs** window and select **Add new preset** to create a new GPI preset. In the new **GPI Event** window enter the name of the GPI event and check the boxes for the input mask. Click OK when the setting is complete.

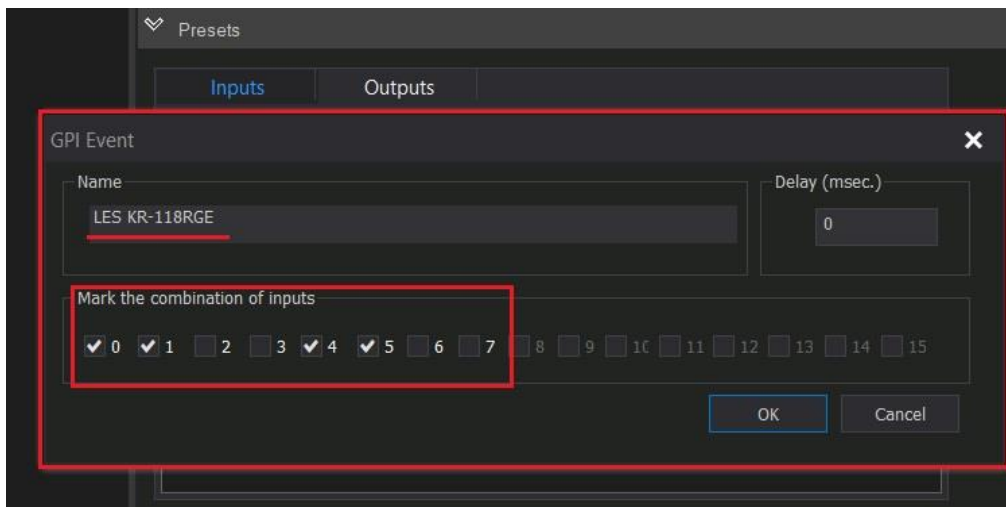


Figure 87. GPI event settings

You can also use GPO presets to manage external devices using AirX schedule. Right-click in the empty space of the **Outputs** window and select **Add new preset** to create a new GPO preset. In the new **GPO Event** window enter the name of the GPO event and check the boxes for the output mask. Click OK when the setting is complete.

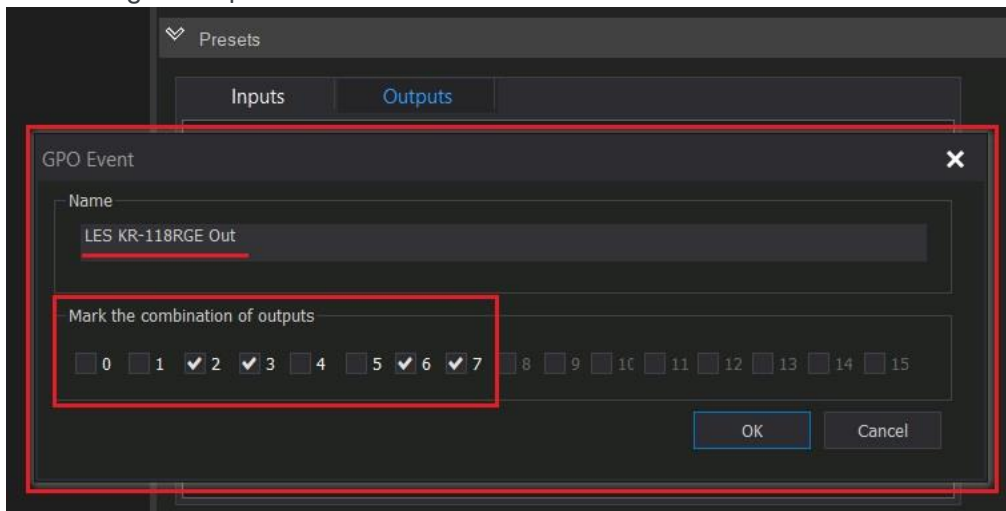


Figure 88. GPO event settings

5. **Test** plugin is only available when the AirX services are stopped.

Click **Save** in the main menu of AirX Control app to save changes. The name of the GPIO device in the Server resource tree will change color to green

If you want to edit a preset, right-click it and find the **Edit** menu. Do not forget to save changes after making them.

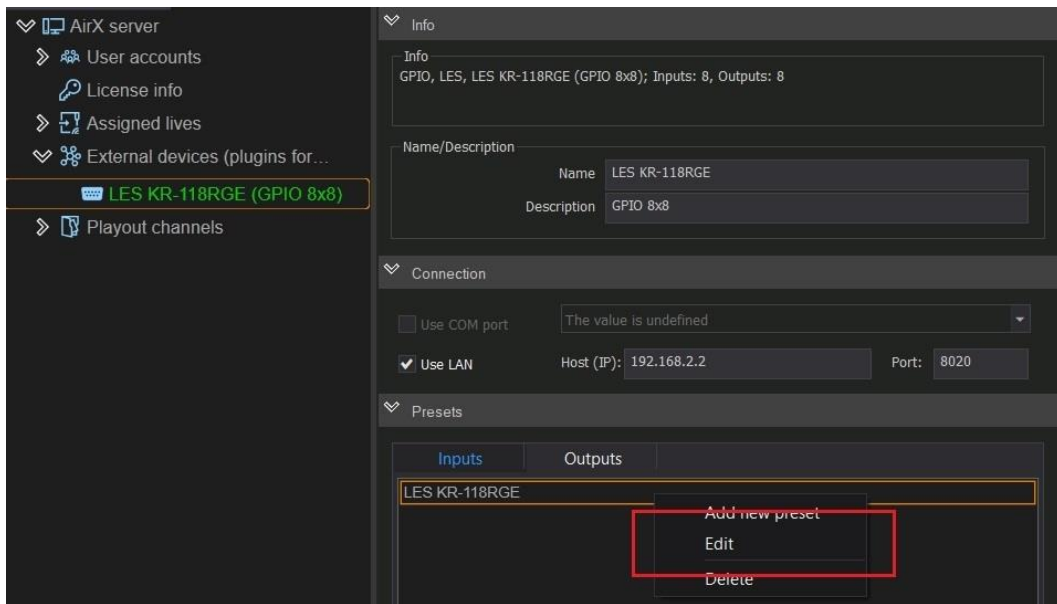


Figure 89. Edit GPIO preset

Further setup depends on whether the device is GPI or GPO.

Sending commands using AirX schedule (GPO).

Expand the Channel resource tree and select the **External Device Outputs** branch to connect a device to a playout channel. Check the **Enable plugin usage** checkbox for the selected device. Then check the boxes next to the configured presets.

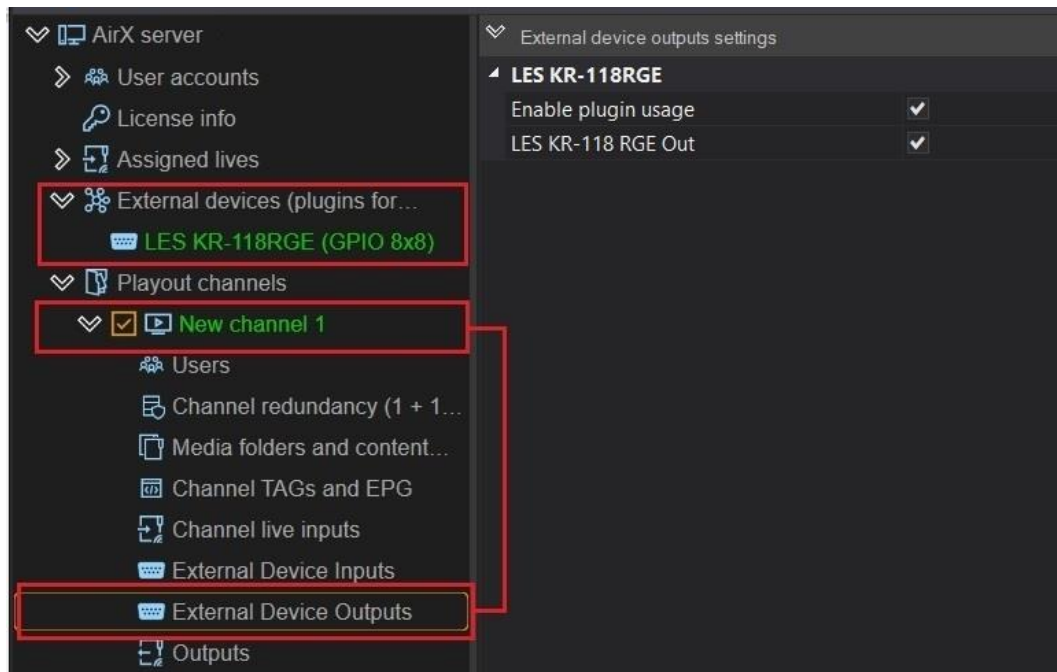


Figure 90. Enable the GPO device connection to the playout channel

After the GPO device connected to the Channel resources tree, click **Save** in the main menu of AirX Control app to save changes.

Now you can work with the schedule as described in the **Video router (matrix)** chapter. All the steps are completely similar.

AirX playback control with an external devices (GPI)

Expand the Channel resource tree and select the **External Device Outputs** branch to connect a device to a playout channel. Check the **Enable plugin usage** checkbox for the selected device. Then check the boxes next to the configured presets.

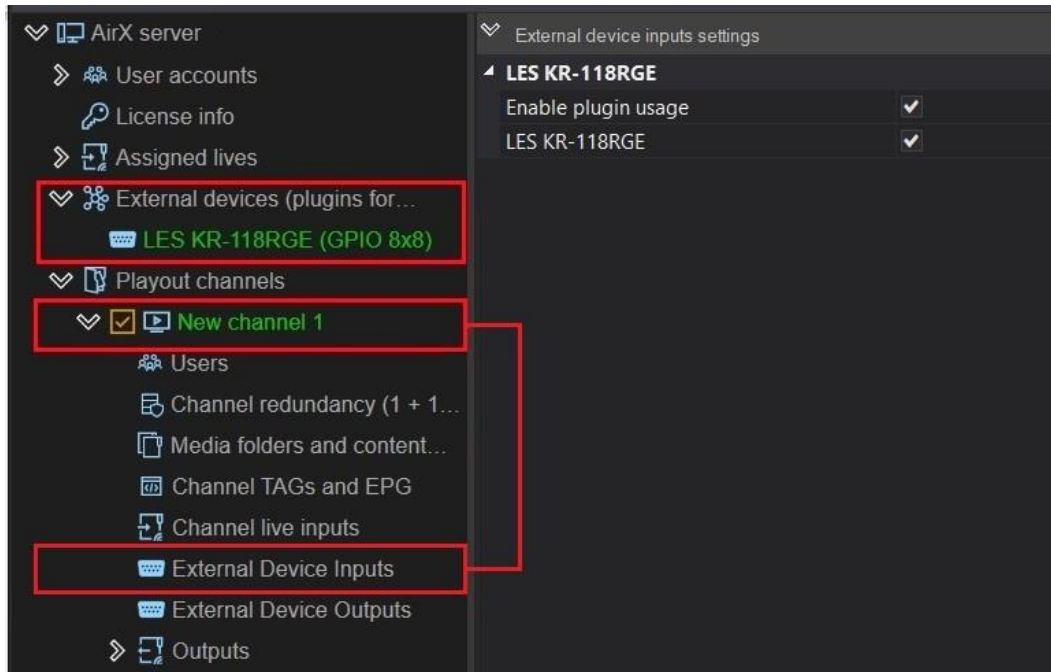


Figure 91. Enable the GPI device connection to the playout channel

After the GPI device connected to the Channel resources tree, click **Save** in the main menu of AirX Control app to save changes.

Next you have to launch the Channel Manager app and add the input events (GPI) to the schedule. In case using the **Autoload schedule** function, most likely, the GPI events will be already added in the schedule by a third-party broadcast traffic management system. But if you want to create (or edit) the schedule manually, follow the instructions:

1. Open the schedule in the **Channel Manager** app.

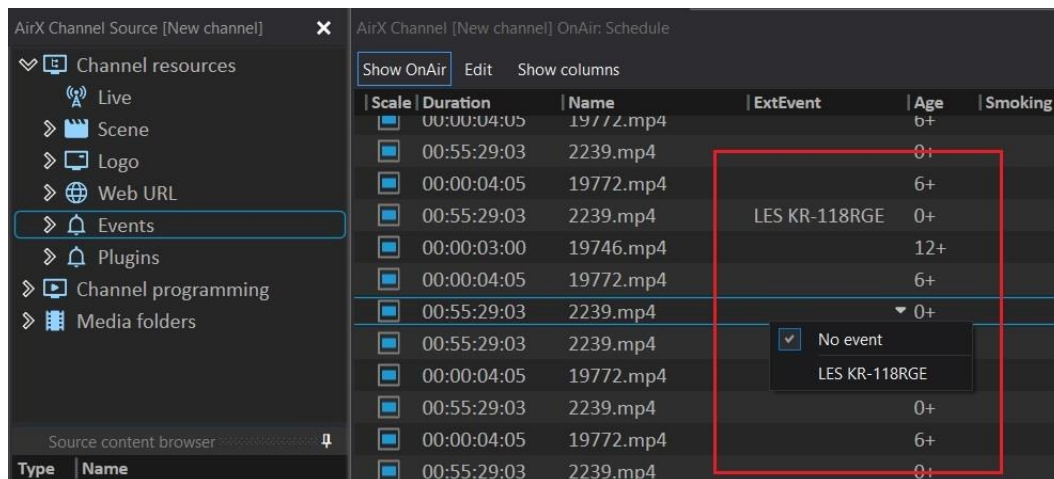


Figure 92. GPI event in the AirX schedule

2. In the schedule window, click on the schedule row you want to combine with the external GPI event. In the **ExtEvent** column call the drop-down list of events and select the event you need.
3. During playback of a schedule with GPI events, AirX is in a continuous monitoring state of the incoming GPI. When such an event occurs, AirX playback position will jump to the nearest schedule row, which has a value in the ExtEvent column.

Soft GPI events and features

The AirX broadcast automation has a built-in Software GPIO functionality that allows applications to interchange commands within the automation system.

This feature is mainly applicable to manage (or trigger) the AirX Record multi-channel recording system using AirX schedule. You can automatically start or stop the process of recording a video file using pairs of GPIO events within the same server.

You have to configure Soft GPI on both the playout channel and the recording channel to use this feature.

ATTENTION: Before you start to configure Soft GPI, the recording channel and the playout channel have already to be configured.

1. Add the AirX software GPIO 16x16 as External device to the Server resource tree, as shown:

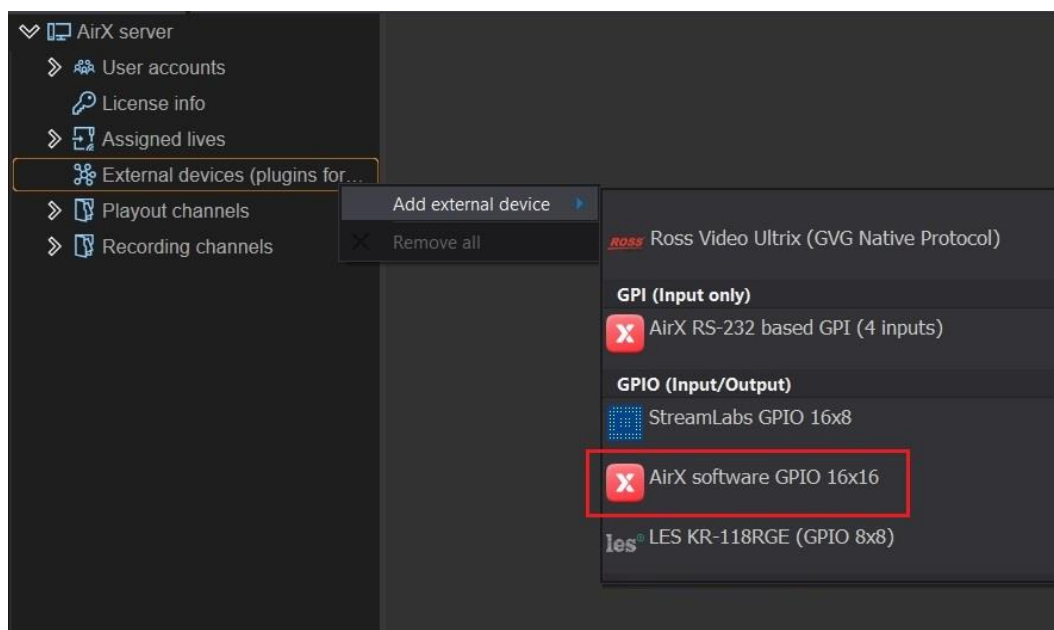


Figure 93. Add AirX software GPIO as External device

2. Add a pair of presets for the input event (**Inputs**) and for the output (**Outputs**). As described in the chapters above, right-click in an empty field of the Inputs or Outputs window and select **Add new preset** to add a preset. In the new **GPI / GPO Event** window enter the name of the event and check the boxes for the input/output mask.

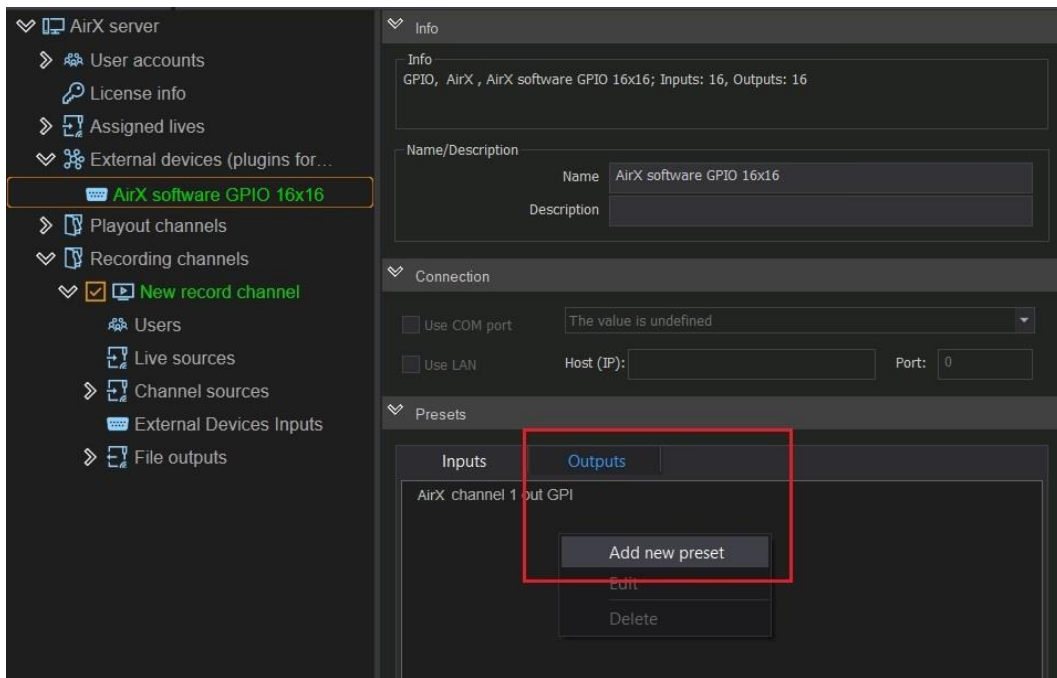


Figure 94. A pair of AirX software GPIO presets creation

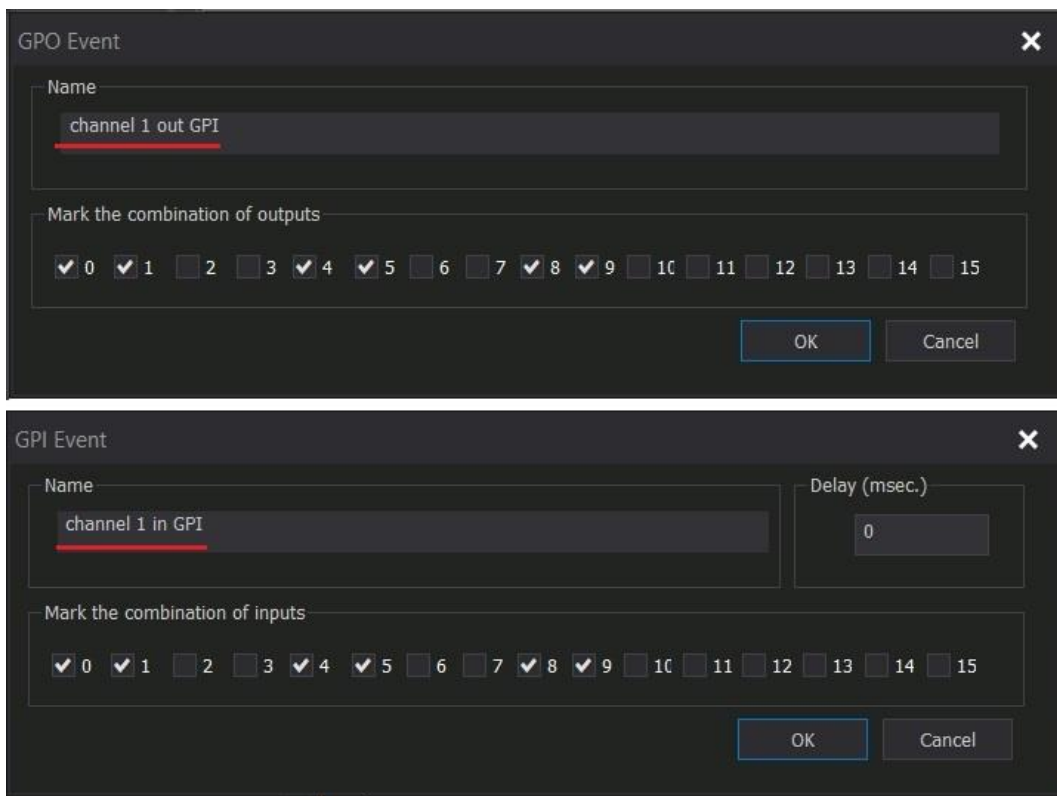


Figure 95. AirX software GPIO presets settings

3. Do not forget to click **Save** and **Restart** in the main menu of AirX Control app to save new settings and apply them.
4. The name of the AirX software GPIO device in the Server resource tree will change color to green: that means it is ready to use. The configured Soft GPI plugins will also be automatically added to the corresponding branches of the

playout and recording channels resource trees, so you do not have to add them manually. It will only be necessary to check the enable boxes of plugins.

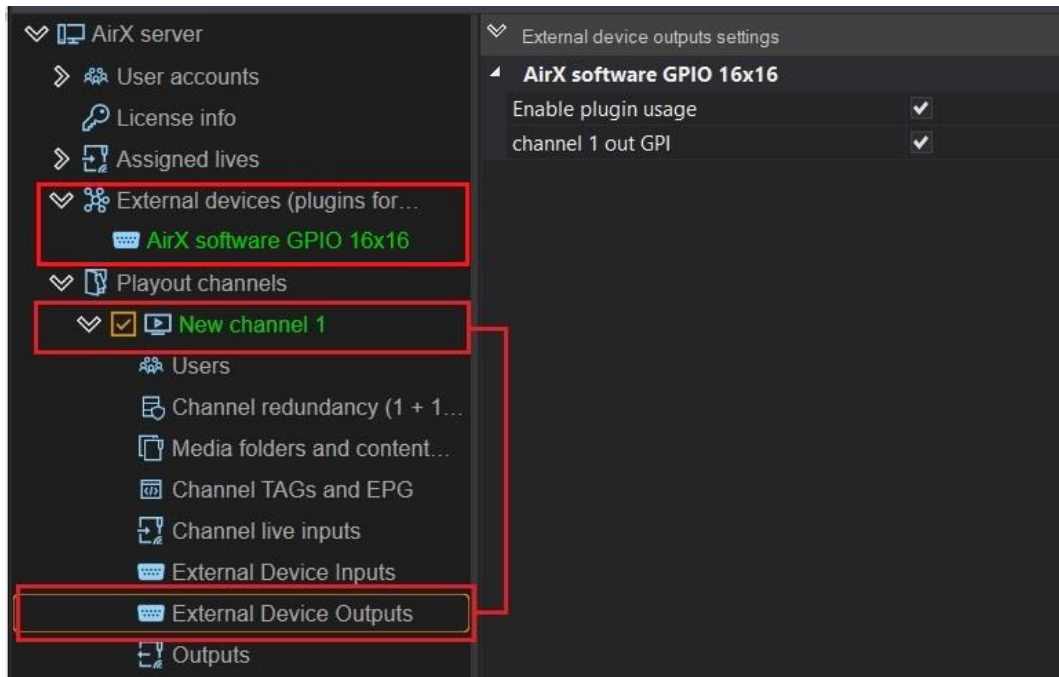


Figure 96. Enabled AirX software GPIO, connected to the playout channel

5. The next step you have to enable software GPIO both for the playout channel and for the recording channel.

Playout channel: In the Server resource tree select the playout channel you want to configure. Expand the resource tree of the selected channel. Find the **External Device Outputs** branch and click it. In the right pane of the AirX Control window check the box **Enable plugin usage** and select the presets you want to connect to this channel. These are **GPO** plugins.

Recording channel: In the Server resource tree select the recording channel you want to configure. Expand the resource tree of the selected channel. Find the **External Device Inputs** branch and click it. In the right pane of the AirX Control window check the box **Enable plugin usage** and select the presets you want to connect to this channel. These are **GPI** plugins.

ATTENTION: The **AirX** playout channel must be connected as the Channel source for the **AirX Record** recording channel.

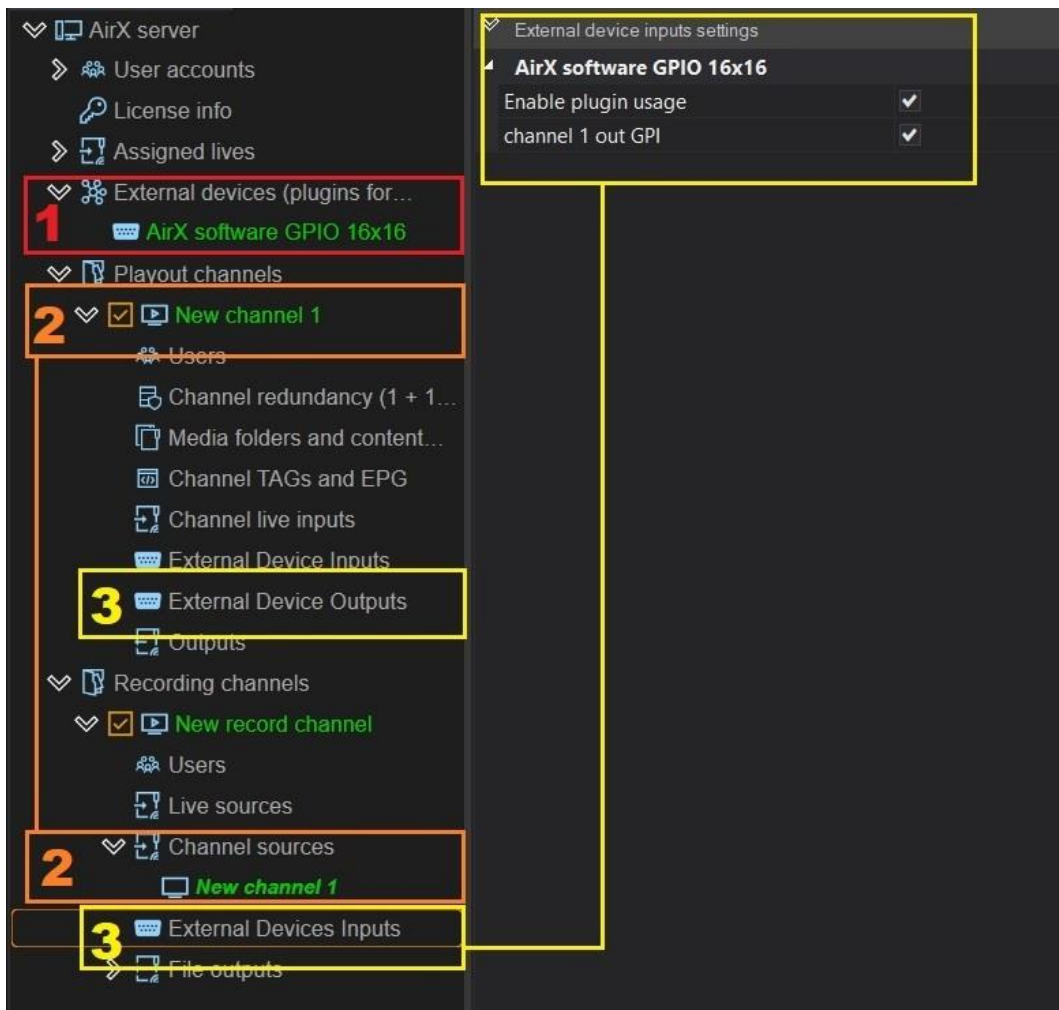


Figure 97. Software GPIO connection - playout channel and recording channel

In the Figure 97 you can see:

1. The name of the AirX software GPIO device in the Server resource tree is green. That means it is configured and ready to use.
2. The AirX playout channel is connected as the Channel source for the AirX Record recording channel.
3. Location of the software GPO branch in the playout channel resource tree (External Device Outputs) and location of the GPI branch in the recording channel resource tree (External Device Inputs). GPIO connection settings (in the right pane of the app window).

NOTE: Do not forget to save changes!

Now you can use AirX software GPIO to automate the process of recording.

How it works: AirX can send the GPOs embedded in the playout channel's output streams during of a schedule playback.

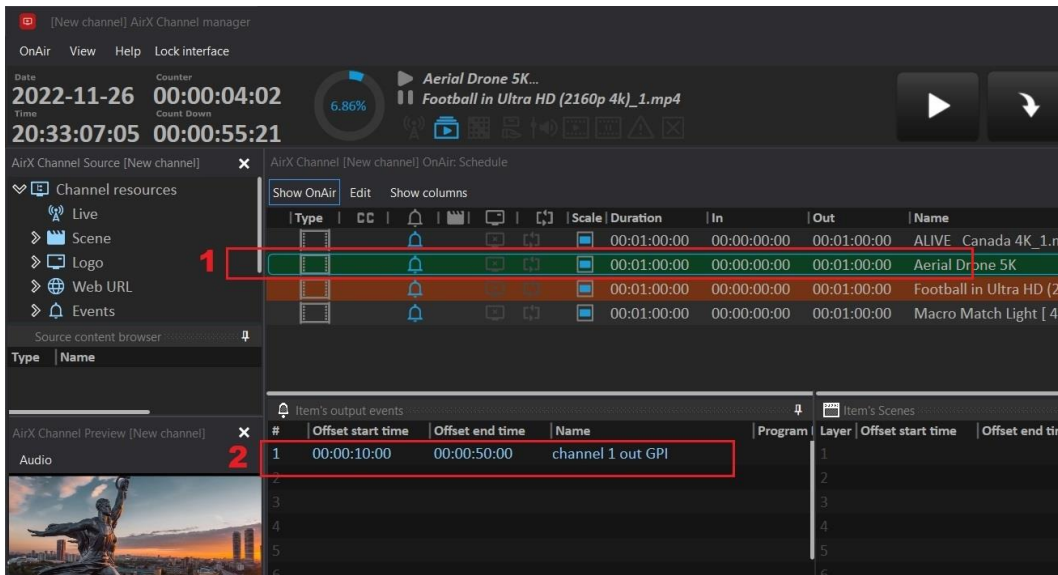


Figure 98. AirX Channel Manager app window

In the Figure 98 you can see a part of the Channel Manager application's interface. (1) Schedule rows. The active row (playback position) is green. The bell icon means that the external event is connected to the schedule row as the Item's output event. (2) Item's output events are connected to the schedule rows.

The output stream of the AirX playout channel must be connected as a Channel source for the AirX Record recording channel (see Figure 97). The AirX Record recording service must be set in the **recording by schedule** mode. In the moment AirX Record catch the GPI event from the AirX playout channel it automatically starts recording the video file.

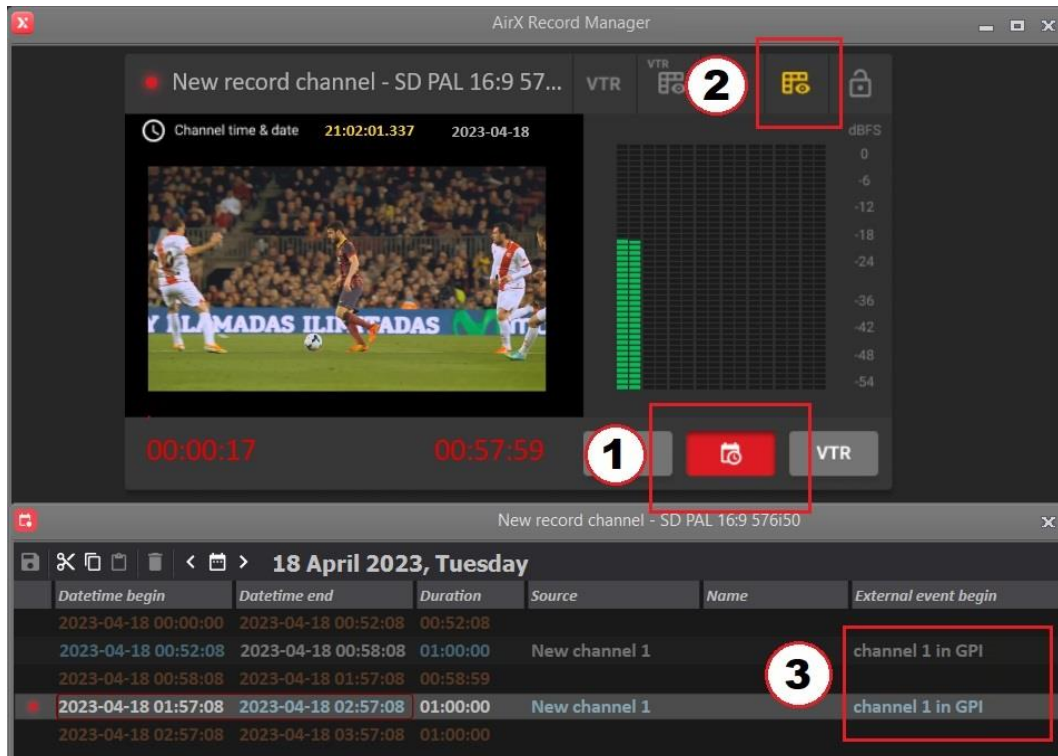


Figure 99. AirX Record app window

In the Figure 99 you can see a part of the AirX Record application’s interface. (1) The **recording by schedule** mode is set. (2) The schedule editor window is open. (3) The start of the recording by the incoming GPI is set.

Outputs

All supported **Channel output** types can be divided into three groups: IP (1), Internet (2) and AV outputs (3). If you have an AV capture card installed, you will see its outputs in the context menu in group 3.

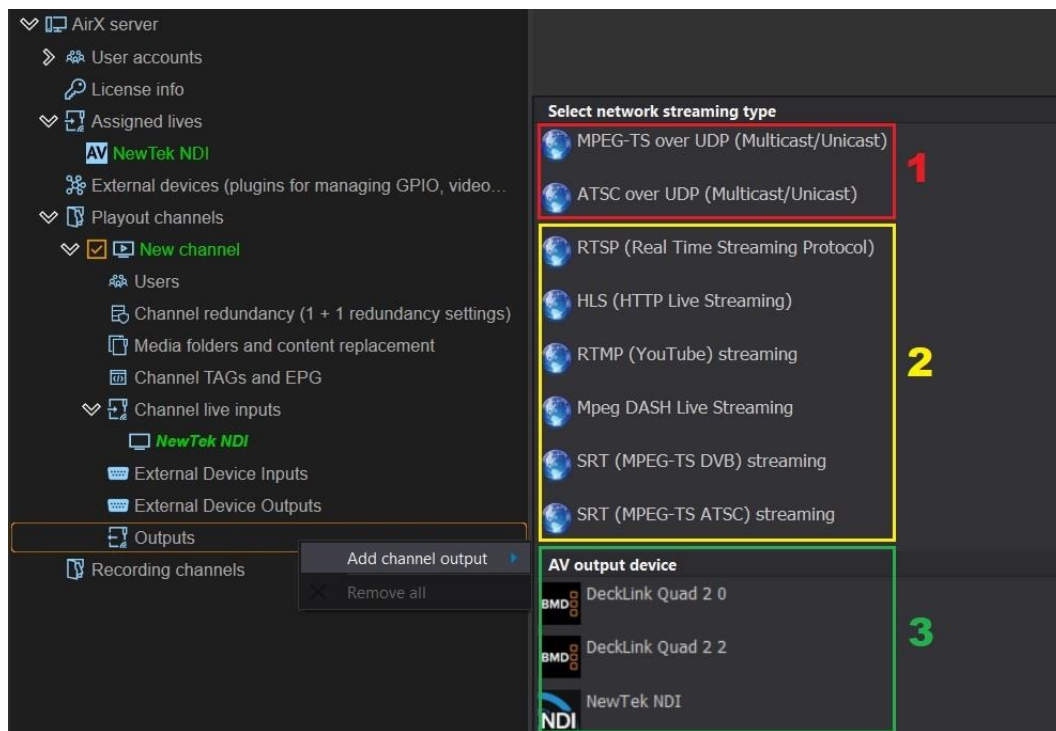


Figure 100. Network streaming types

UDP Output

The AirX broadcast automation system supports the UDP output streams in MPEG-TS and ATSC. The difference is in the multiplexer parameters (see below).

First step: call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **MPEG-TS over UDP (Multicast/Unicast)** or **ATSC over UDP (Multicast/Unicast)** output stream type.

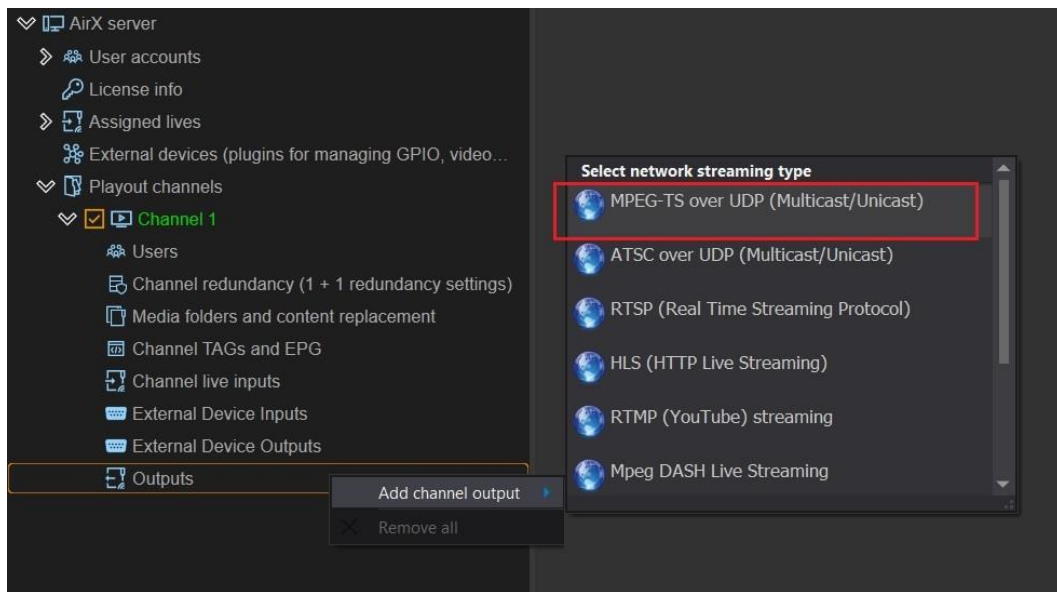


Figure 101. Add MPEG-TS over UDP channel output

After UDP is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

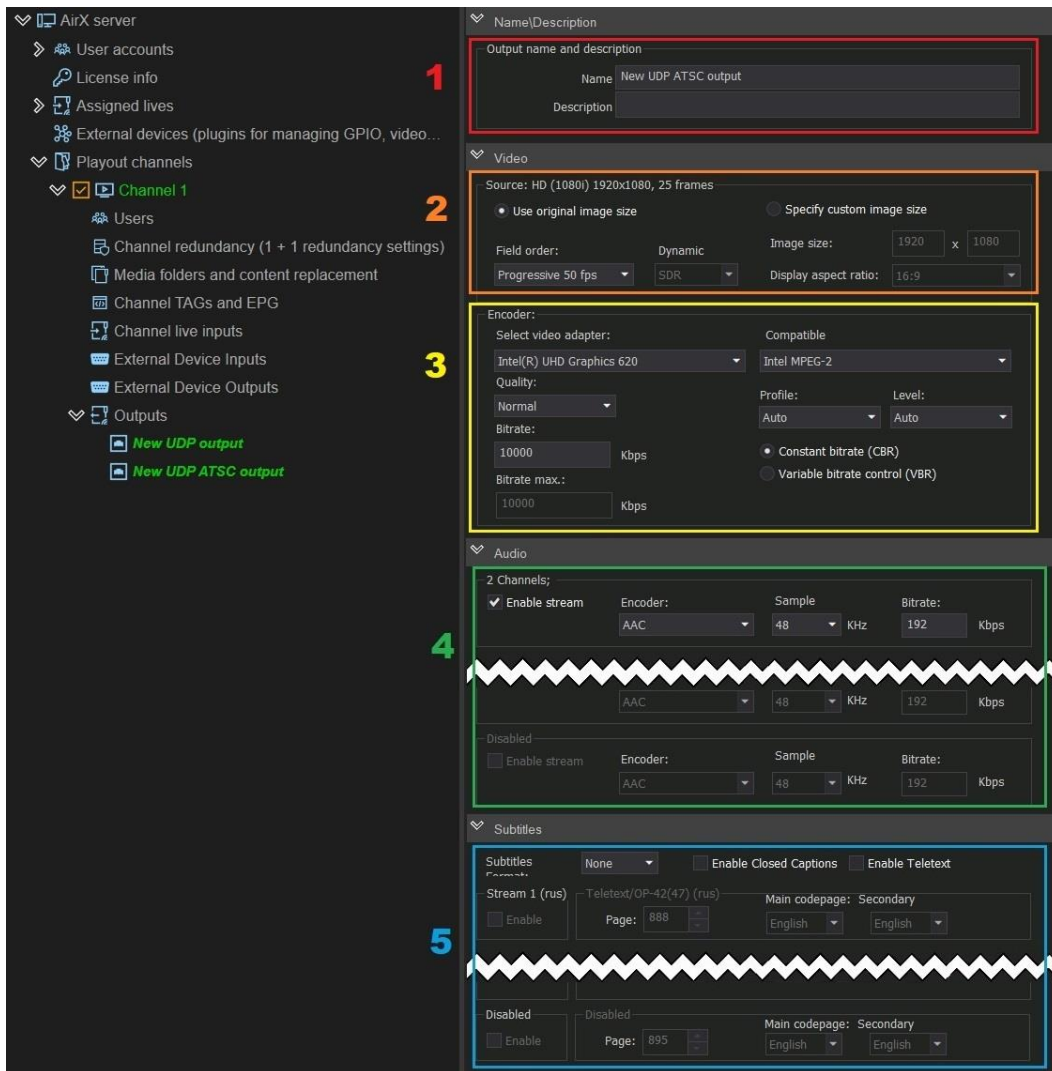


Figure 102. UDP Output settings (part 1)

1. Editable **Name/Description** fields. The Name field is required; it has the “New **UDP / UDP ATSC** output” default value, but can be changed manually. The field Description is optional.
2. The **Video** pane, the **Source** field. This field contains the parameters of the output video, such as image size or fps. The header of the field indicates the format of the playout channel the Output belongs to. In this guide, the HD channel is used as an example, so the header will be **Source: HD(1080i) 1920x1080, 25 frames**.
The field contains two checkboxes:
 - **Use original image size**. Remain the image size and aspect ratio unchanged. After checking the box, the remaining options of the field will become available: the **Field order** drop-down list - Progressive 50 fps, Progressive 25 fps, Top field first. For MPEG-TS over UDP output, the default is Top field first. For ATSC over UDP output, the default is Progressive 50 fps.
The **Dynamic** option for color space selection (SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.
 - **Specify custom image size**. The image size of the output stream can be set manually. After checking the box, the **Image size** fields become available as

- well as the **Display aspect ratio** drop-down list, containing values 4:3 and 16:9.
3. The **Video** pane, the **Encoder** field. This field contains the parameters of the output stream encoding.
 - **Select video adapter.** You can select one of the installed video adapters or use the CPU (Software renderer) to encode the output stream. If you use several video adapters remember the rule of resource allocation - the input stream, playout channel and output stream (streams) for each channel must use the same one video adapter (see **Predicting GPU performance. Throughput optimization and resource allocation on GPUs** chapter).
 - **Compatible** drop-down contains a list of available codecs. **ATTENTION!** The AirX software has the built-in protection that will not allow you to use an incompatible codec. When you select a video adapter, only available codecs will be displayed in the **Compatible** drop-down list. In addition, only changeable settings fields will be activated. If the codec does not allow changing the properties (like aspect ratio, field order, profile, level or bit rate) these fields will be blocked!
 - **Quality** - encoding quality settings. Available values: **Speed** (for encoding speed priority), **Normal, High Quality, Very High Quality** (resource-intensive modes for encoding quality priority).
 - **Profile** - drop-down list contains **Auto, Simple, Main** and **High** values to select an encoding profile. The profile defines the set of features that will be used by the codec during the encoding process. The various profiles are intended for different types of applications that work with video files and video streams. **Auto** is used for automatic selection of encoding profile. **Simple** is for applications that are undemanding to image quality and has additional loss tolerance, mainly used in mobile apps. **Main** is used mainly in standard definition digital television and TV broadcasts using MPEG-4 compression in accordance with the DVB standard. **High** is the main one for digital broadcasting and video, especially for high-definition television, used for Blu-ray video disc and DVB HDTV.
 - **Level** sets the required decoder performance for the selected profile (the max. image resolution, frame rate and bit rate for the decoder).
 - **Bitrate** - checkboxes to select a **Constant bitrate (CBR)** or **Variable bitrate control (VBR)**. When CBR is selected, the default value is 10000 Kbps. VBR checkbox activates the **Bitrate max** window, which allows you to limit the maximum bitrate.
 4. The **Audio** pane contains audio settings for the output stream. AirX software supports up to 8 output stereo pairs. Each stereo pair can be independently configured with codec (AAC, MPEG1 LayerII, MPEG2 LayerII, ATSCA/52A(AC-3), sampling frequency (48KHz or 44.1KHz) and bitrate (value must be entered manually).
 5. The **Subtitles** pane contains subtitle settings for the output stream. AirX software supports up to 8 multilingual subtitle streams for each channel output at the same time. Select the **Subtitle Format** in the drop-down list (None, DVB, EBU-TT) to enable DVB subtitles. The **Enable** checkboxes will be automatically activated. Check the boxes you want to use. The number of subtitles streams available for activation depends on the basic settings of the playout channel.

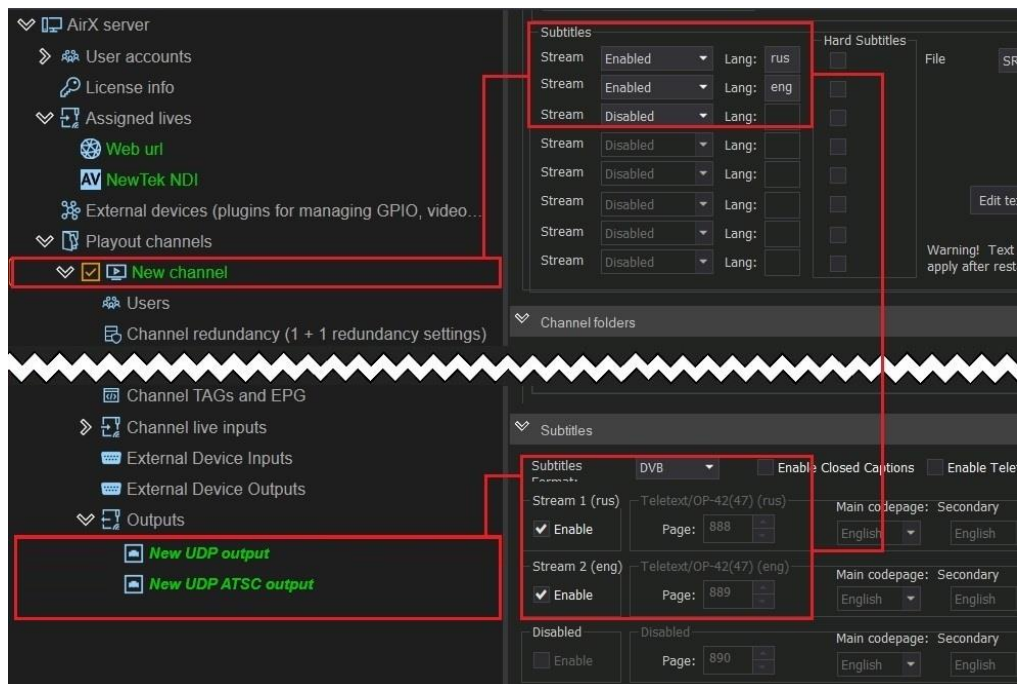


Figure 103. The subtitles output settings (UDP stream)

Check the box **Enable Closed Captions** if you want to use them. The **Enable** checkboxes will be automatically activated for all the available subtitles streams. Check the boxes you need.

The enabling of teletext is similar: check the box **Enable Teletext** and select the streams you need as described above. After selecting the subtitles streams you have to specify teletext pages in the **Teletext/OP-42(47)** field. The default value is 888, you can change it manually. And finally, select the Main and Secondary codepages languages from the drop-down lists.

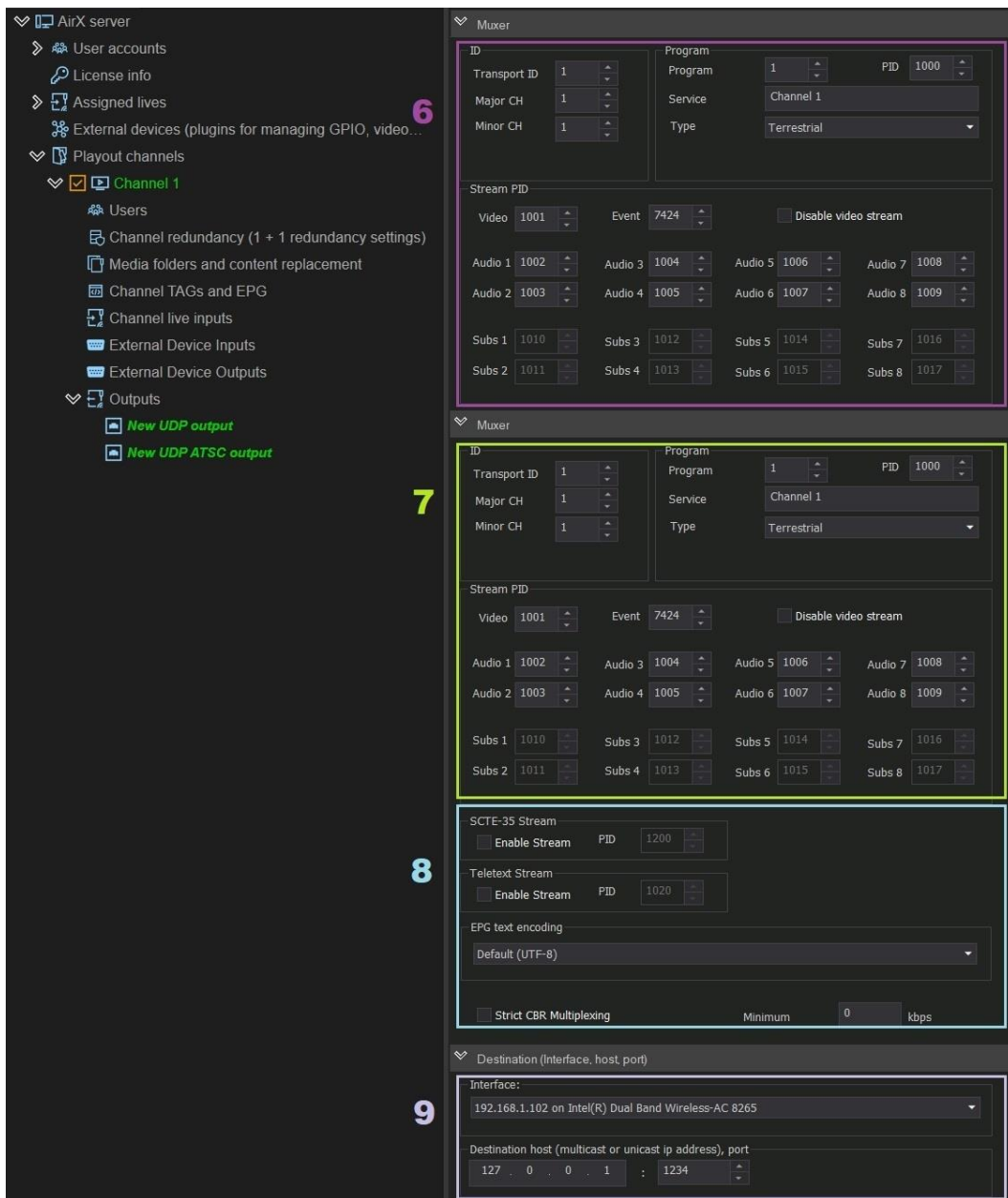


Figure 104. UDP Output settings (part 2)

The **Muxer** pane contains multiplexer settings for multistream IP transmission. Changing any settings in the Muxer pane requires a high-level of user competence in assistance with the technical documentation. Please do not change these settings unless necessary.

6. MPEG-TS over UDP Muxer settings

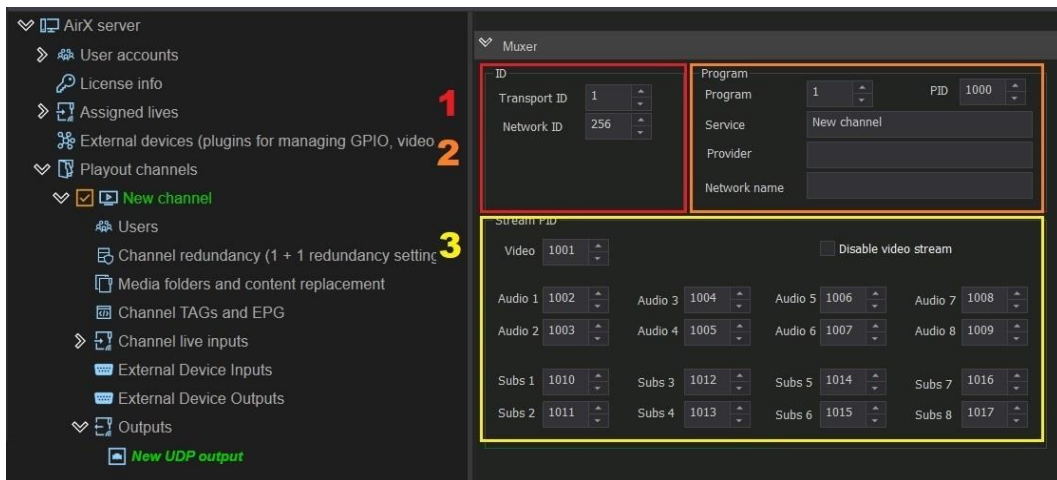


Figure 105. MPEG-TS over UDP Muxer settings

1. The **ID** pane contains the **Transport ID** field to identify the package and the **Network ID** field to identify the network.
2. The **Program** pane contains: the **Program** field for identifying the program number in the transport stream, the **PID** field, the **Service**, **Provider** and **Network name** editable text fields. You can modify these text fields.
3. The **Stream PID** pane contains the **Disable video stream** checkbox to disable video data transmission (to hold only audio and/or service data in the output stream), as well as fields for specifying the **PIDs with video data, audio data and subtitles**.

Changing any settings in Stream PID pane requires a high level of user competence and experience with the transport stream structure! We strongly recommend you do not change the settings of the Stream PID pane.

7. ATSC over UDP Muxer settings

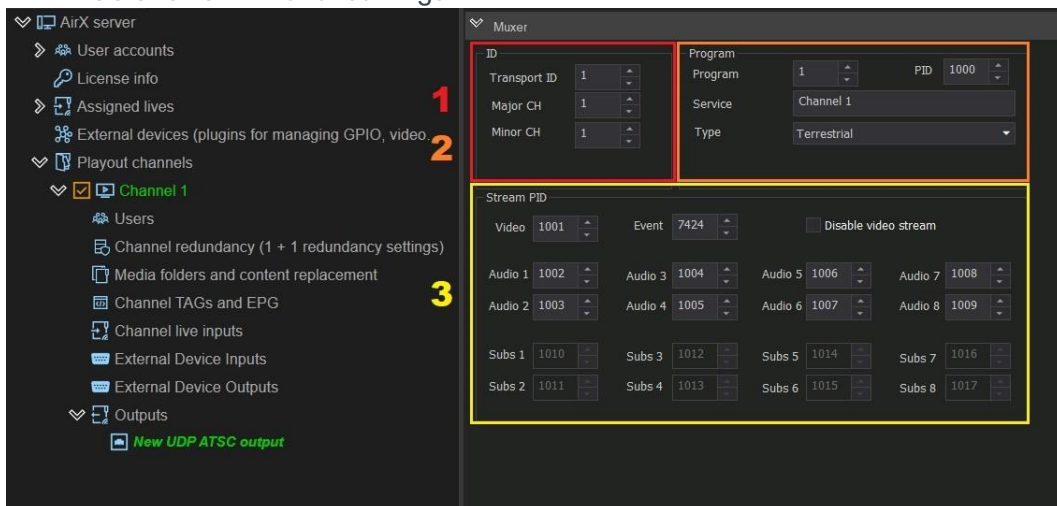


Figure 106. ATSC over UDP Muxer settings

1. The **ID** pane contains the **Transport ID** field to identify the package and also **Major CH** and **Minor CH** identification fields for digital subchannels numbering.
2. The **Program** pane contains: the **Program** field for identifying the program number in the transport stream, the **PID** field, and the **Service** editable text field. The drop-down list **Type** is intended for selection the distribution model – **Terrestrial** or **Cable**.

3. The **Stream PID** pane contains the **Disable video stream** checkbox to disable video data transmission (to hold only audio and/or service data in the output stream), as well as fields for specifying the **PIDs with video data, audio data and subtitles**.
 Changing any settings in Stream PID pane requires a high level of user competence and experience with the transport stream structure! We strongly recommend you do not change the settings of the Stream PID pane.
8. The **Muxer** pane, **SCTE-35 Stream** field contains the **Enable Stream** checkbox for insertion of SCTE-35 AD markers and a field to select the PID with SCTEs. We recommend do not change the default PID value.
 The **Muxer** pane, **Teletext Stream** field contains the **Enable Stream** checkbox to enable teletext insertion and a field to select the PID number containing the teletext data. We recommend do not change the default PID value.
 The **Muxer** pane, the **EPG text encoding** field allows you to select the EPG encoding. The default value is UTF-8.
 The **Strict CBR Multiplexing** checkbox allows you to set the multiplexing mode with a fixed bit rate and set the **Minimum** bit rate.
9. The **Destination (Interface, host, port)** pane is intended for the network parameters of the output stream. The **Interface** drop-down list contains all available network interfaces. The **Destination host (multicast or unicast IP address), port** are editable text fields. AirX broadcast automation supports both multicast and unicast streaming.

RTSP Output

First step: call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **RTSP (Real Time Streaming Protocol)** output stream type.

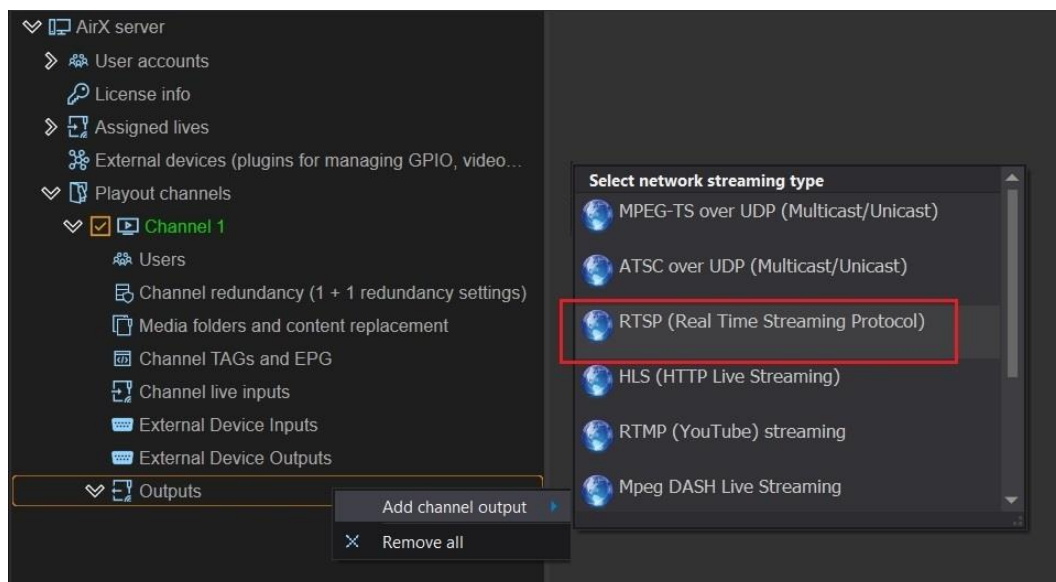


Figure 107. Add RTSP (Real Time Streaming Protocol) channel output

After RTSP is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

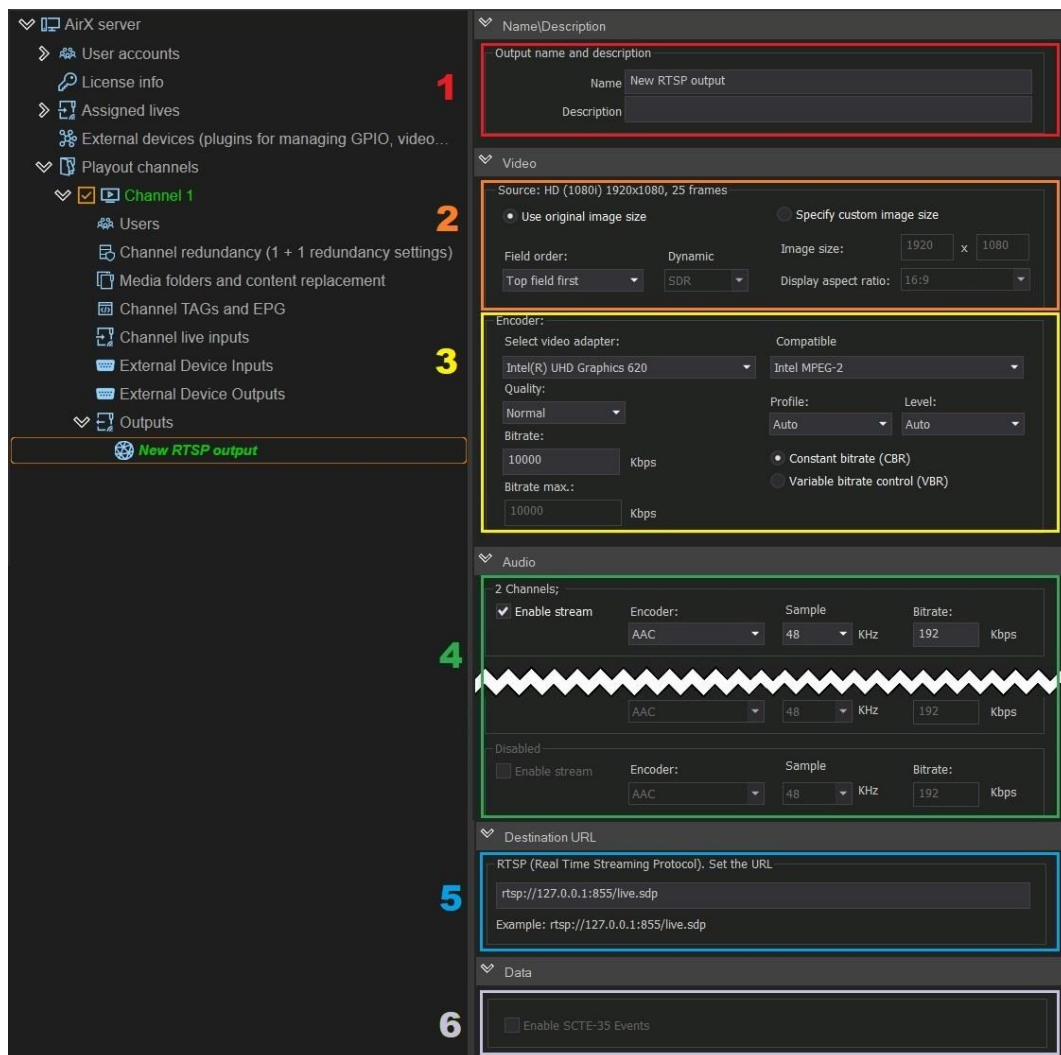


Figure 108. RTSP Output settings

1. Editable **Name/Description** fields. The Name field is required; it has the “New RTSP output” default value, but can be changed manually. The field Description is optional.
2. The **Video** pane, the **Source** field. This field contains the parameters of the output video, such as image size or fps. The header of the field indicates the format of the playout channel, the Output belongs to. In this guide, the HD channel is used as an example, so the header will be **Source: HD(1080i) 1920x1080, 25 frames**.
The field contains two checkboxes:
 - **Use original image size**. Remain the image size and aspect ratio unchanged. After checking the box, the remaining options of the field will become available: the **Field order** drop-down list - Progressive 50 fps, Progressive 25 fps, Top field first. For RTSP output, the default is Top field first.
The **Dynamic** option for color space selection (SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.
 - **Specify custom image size**. The image size of the output stream can be set manually. After checking the box, the **Image size** fields become available as well as the **Display aspect ratio** drop-down list, containing values 4:3 and 16:9.

3. The **Video** pane, the **Encoder** field. This field contains the parameters of the output stream encoding.
 - **Select video adapter.** You can select one of the installed video adapters or use the CPU (Software renderer) to encode the output stream. If you use several video adapters, remember the rule of resource allocation - the input stream, playout channel and output stream (streams) for each channel must use the same one video adapter (see **Predicting GPU performance. Throughput optimization and resource allocation on GPUs** chapter).
 - **Compatible** drop-down contains a list of available codecs. **ATTENTION!** The AirX software has the built-in protection that will not allow you to use an incompatible codec. When you select a video adapter, only available codecs will be displayed in the **Compatible** drop-down list. In addition, only changeable settings fields will be activated. If the codec does not allow changing the properties (like aspect ratio, field order, profile, level or bit rate), these fields will be blocked!
 - **Quality** - encoding quality settings. Available values: **Speed** (for encoding speed priority), **Normal, High Quality, Very High Quality** (resource-intensive modes for encoding quality priority).
 - **Profile** - drop-down list contains **Auto, Simple, Main** and **High** values to select an encoding profile. The profile defines the set of features that will be used by the codec during the encoding process. The various profiles are intended for different types of applications that work with video files and video streams. **Auto** is used for automatic selection of encoding profile. **Simple** is for applications that are undemanding to image quality and has additional loss tolerance, mainly used in mobile apps. **Main** is used mainly in standard definition digital television and TV broadcasts using MPEG-4 compression in accordance with the DVB standard. **High** is the main one for digital broadcasting and video, especially for high-definition television, used for Blu-ray video disc and DVB HDTV.
 - **Level** sets the required decoder performance for the selected profile (the max. image resolution, frame rate and bit rate for the decoder).
 - **Bitrate** - checkboxes to select a **Constant bitrate (CBR)** or **Variable bitrate control (VBR)**. When CBR is selected, the default value is 10000 Kbps. VBR checkbox activates the **Bitrate max** window, which allows you to limit the maximum bitrate.
4. The **Audio** pane contains audio settings for the output stream. AirX software supports up to 8 output stereo pairs. Each stereo pair can be independently configured with codec (AAC, MPEG1 LayerII, MPEG2 LayerII, ATSCA/52A(AC-3), sampling frequency (48KHz or 44.1KHz) and bitrate (value must be entered manually).
5. The **Destination URL** pane is intended for the network parameters of the output stream. The **RTSP (Real Time Stream Protocol). Set the URL** text field is editable; the value has to be entered manually.
6. The **Data** pane contains the **Enable SCTE-35 Events** checkbox for SCTE-35 AD markers insertion to the output stream.

HLS Output

First step: call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **HLS (HTTP Live Streaming)** output stream type.

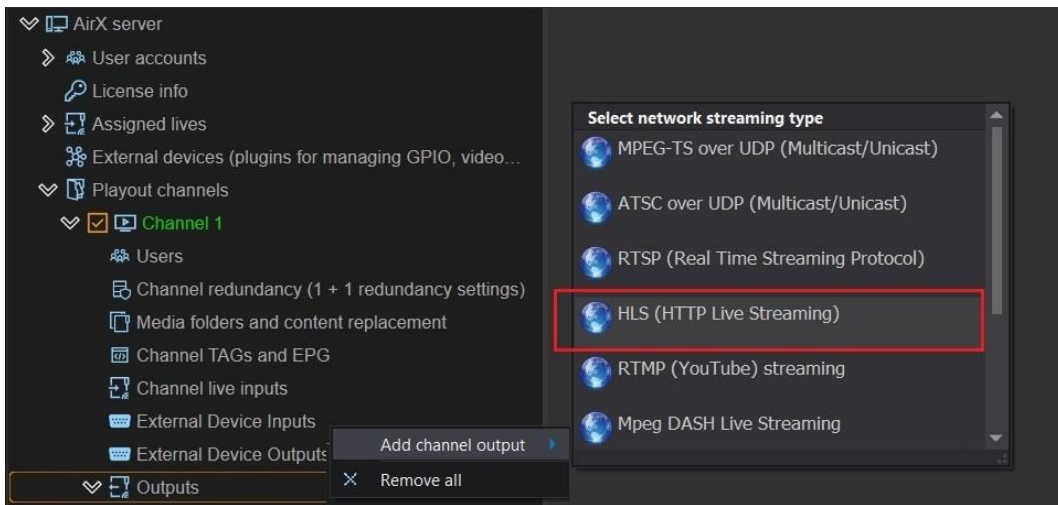


Figure 109. Add HLS (HTTP Live Streaming) channel output

After HLS is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

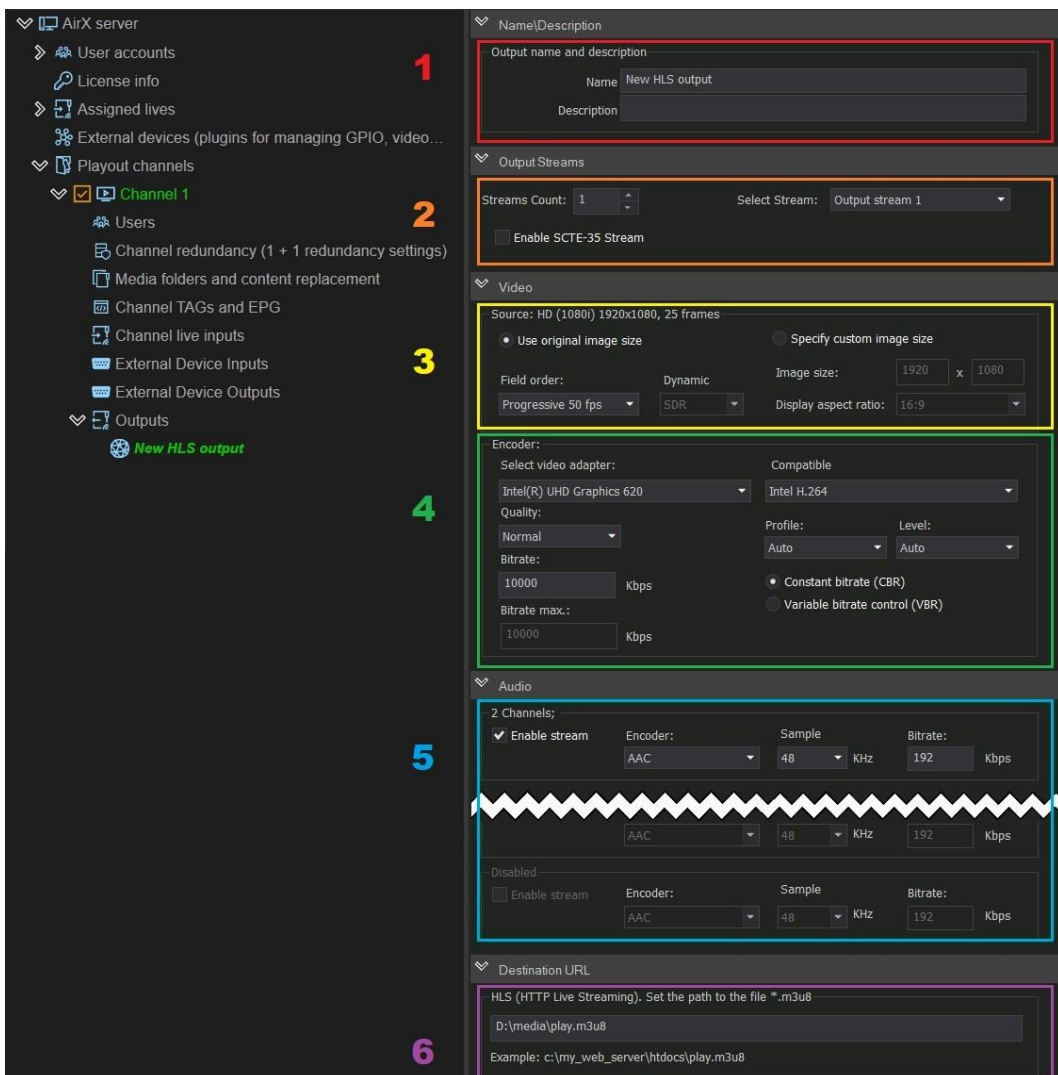


Figure 110. HLS Output settings

1. Editable **Name/Description** fields. The Name field is required; it has the “New **HLS** output” default value, but can be changed manually. The field Description is optional.
2. The **Output Streams** pane is intended to the output stream selection. The pane contains the adjustable **Stream Count** parameter, which shows the number of HLS streams, broadcasting simultaneously by the broadcast playout server. You have to set the **Stream Count** and then select the stream you want to use from the **Select Stream** drop-down list.
In addition the Output Stream pane contains the **Enable SCTE-35 Events** checkbox for SCTE-35 AD markers insertion to the output stream.
3. The **Video** pane, the **Source** field. This field contains the parameters of the output video, such as image size or fps. The header of the field indicates the format of the playout channel, the Output belongs to. In this guide, the HD channel is used as an example, so the header will be **Source: HD(1080i) 1920x1080, 25 frames**.
The field contains two checkboxes:
 - **Use original image size.** Remain the image size and aspect ratio unchanged. After checking the box, the remaining options of the field will become available: the **Field order** drop-down list - Progressive 50 fps, Progressive 25 fps, Top field first. For HLS, the default is Progressive 50 fps.
The **Dynamic** option for color space selection (SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.
 - **Specify custom image size.** The image size of the output stream can be set manually. After checking the box, the **Image size** fields become available as well as the **Display aspect ratio** drop-down list, containing values 4:3 and 16:9.
4. The **Video** pane, the **Encoder** field. This field contains the parameters of the output stream encoding.
 - **Select video adapter.** You can select one of the installed video adapters or use the CPU (Software renderer) to encode the output stream. If you use several video adapters, remember the rule of resource allocation - the input stream, playout channel and output stream (streams) for each channel must use the same one video adapter (see **Predicting GPU performance. Throughput optimization and resource allocation on GPUs** chapter).
 - **Compatible** drop-down contains a list of available codecs. **ATTENTION!** The AirX software has the built-in protection that will not allow you to use an incompatible codec. When you select a video adapter, only available codecs will be displayed in the **Compatible** drop-down list. In addition, only changeable settings fields will be activated. If the codec does not allow changing the properties (like aspect ratio, field order, profile, level or bit rate), these fields will be blocked!
 - **Quality** - encoding quality settings. Available values: **Speed** (for encoding speed priority), **Normal, High Quality, Very High Quality** (resource-intensive modes for encoding quality priority).
 - **Profile** - drop-down list contains **Auto, Simple, Main** and **High** values to select an encoding profile. The profile defines the set of features that will be used by the codec during the encoding process. The various profiles are intended for different types of applications that work with video files and video streams. **Auto** is used for automatic selection of encoding profile. **Simple** is for applications that are undemanding to image quality and has additional loss tolerance, mainly used in mobile apps. **Main** is used mainly in standard definition digital television and TV broadcasts using MPEG-4

- compression in accordance with the DVB standard. **High** is the main one for digital broadcasting and video, especially for high-definition television, used for Blu-ray video disc and DVB HDTV.
- **Level** sets the required decoder performance for the selected profile (the max. image resolution, frame rate and bit rate for the decoder).
 - **Bitrate** – checkboxes to select a **Constant bitrate (CBR)** or **Variable bitrate control (VBR)**. When CBR is selected, the default value is 10000 Kbps. VBR checkbox activates the **Bitrate max** window, which allows you to limit the maximum bitrate.
5. The **Audio** pane contains audio settings for the output stream. AirX software supports up to 8 output stereo pairs. Each stereo pair can be independently configured with codec (AAC, MPEG1 LayerII, MPEG2 LayerII, ATSCA/52A(AC-3), sampling frequency (48KHz or 44.1KHz) and bitrate (value must be entered manually).
 6. The **Destination URL** pane is intended for the network parameters of the output stream. You have to set the path to the folder, containing the HLS chunks. The **HLS (HTTP Live Streaming). Set the path to the file *.m3u8** text field is editable; the value has to be entered manually.

RTMP Output (YouTube streaming)

Call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **RTMP (YouTube) Streaming** output stream type.

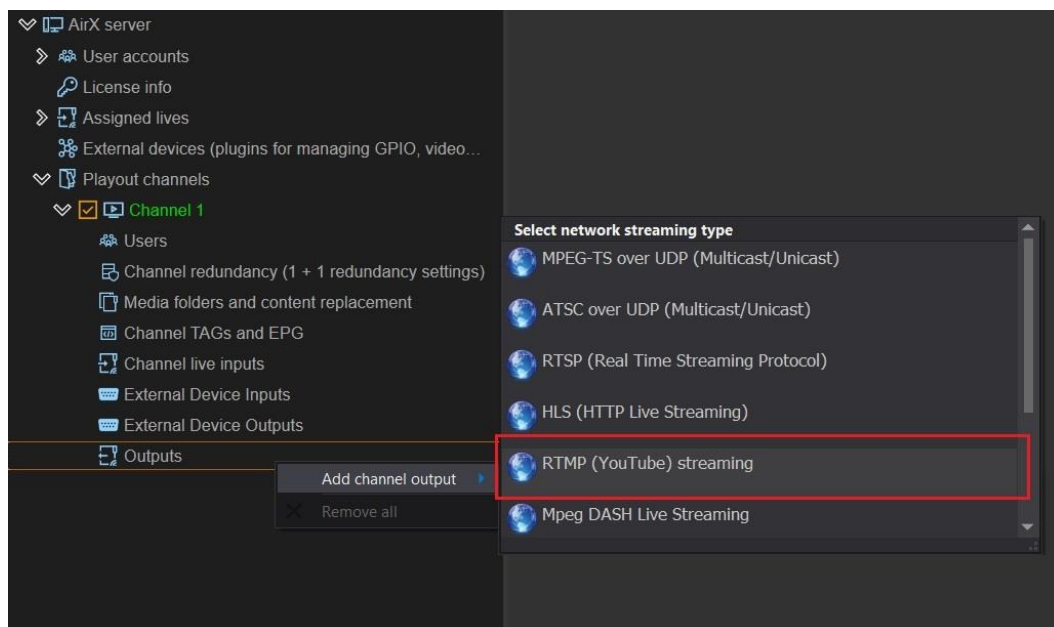


Figure 111. Add RTMP channel output

After RTMP is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

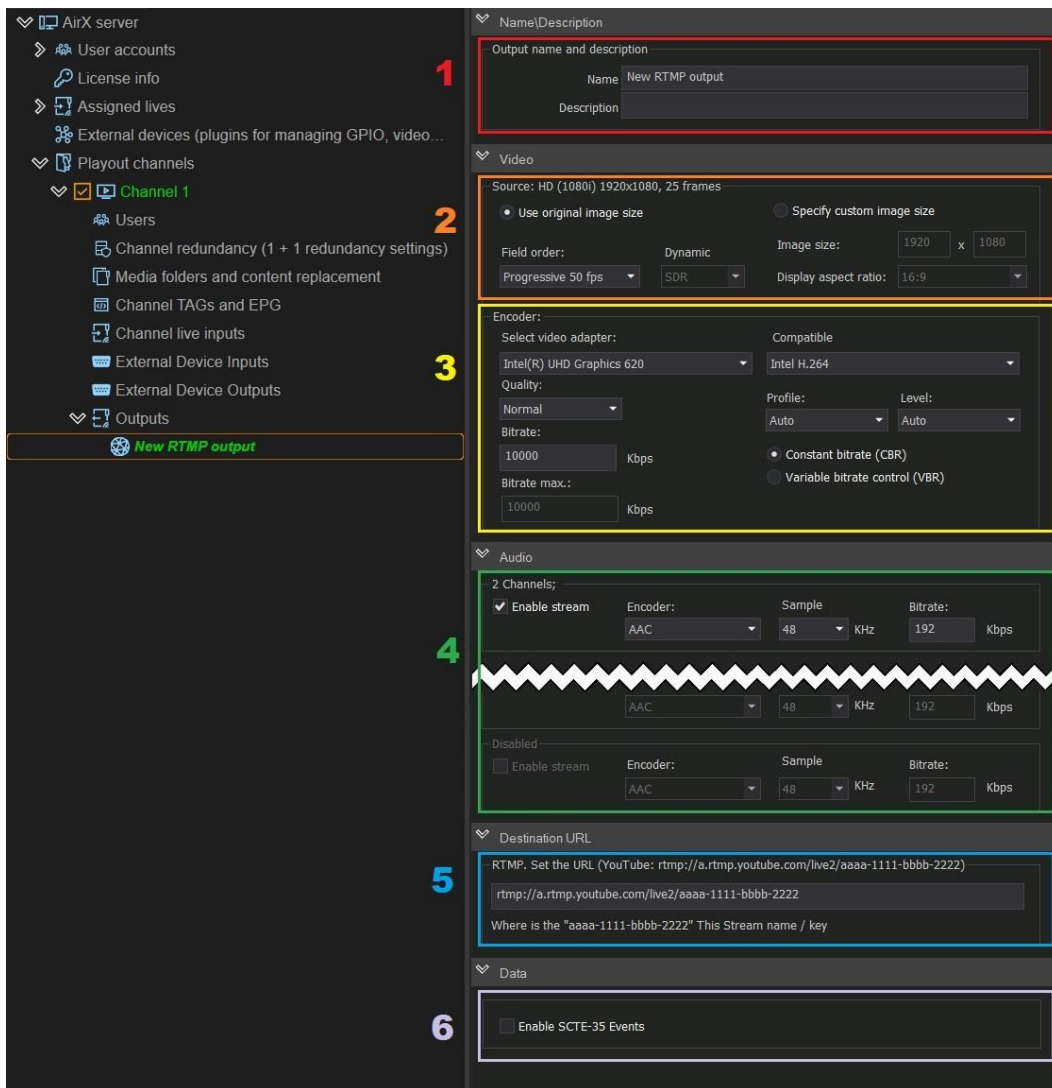


Figure 112. RTMP Output settings

1. Editable **Name/Description** fields. The Name field is required; it has the “New RTMP output” default value, but can be changed manually. The field Description is optional.
2. The **Video** pane, the **Source** field. This field contains the parameters of the output video, such as image size or fps. The header of the field indicates the format of the playout channel, the Output belongs to. In this guide, the HD channel is used as an example, so the header will be **Source: HD (1080i) 1920x1080, 25 frames**.
The field contains two checkboxes:
 - **Use original image size**. Remain the image size and aspect ratio unchanged. After checking the box, the remaining options of the field will become available: the **Field order** drop-down list - Progressive 50 fps, Progressive 25 fps, Top field first. For RTMP output, the default is Top field first. The **Dynamic** option for color space selection (SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.
 - **Specify custom image size**. The image size of the output stream can be set manually. After checking the box, the **Image size** fields become available as well as the **Display aspect ratio** drop-down list, containing values 4:3 and 16:9.

3. The **Video** pane, the **Encoder** field. This field contains the parameters of the output stream encoding.
 - **Select video adapter.** You can select one of the installed video adapters or use the CPU (Software renderer) to encode the output stream. If you use several video adapters, remember the rule of resource allocation - the input stream, playout channel and output stream (streams) for each channel must use the same one video adapter (see **Predicting GPU performance. Throughput optimization and resource allocation on GPUs** chapter).
 - **Compatible** drop-down contains a list of available codecs. **ATTENTION!** The AirX software has the built-in protection that will not allow you to use an incompatible codec. When you select a video adapter, only available codecs will be displayed in the **Compatible** drop-down list. In addition, only changeable settings fields will be activated. If the codec does not allow changing the properties (like aspect ratio, field order, profile, level or bit rate), these fields will be blocked!
 - **Quality** - encoding quality settings. Available values: **Speed** (for encoding speed priority), **Normal, High Quality, Very High Quality** (resource-intensive modes for encoding quality priority).
 - **Profile** - drop-down list contains **Auto, Simple, Main** and **High** values to select an encoding profile. The profile defines the set of features that will be used by the codec during the encoding process. The various profiles are intended for different types of applications that work with video files and video streams. **Auto** is used for automatic selection of encoding profile. **Simple** is for applications that are undemanding to image quality and has additional loss tolerance, mainly used in mobile apps. **Main** is used mainly in standard definition digital television and TV broadcasts using MPEG-4 compression in accordance with the DVB standard. **High** is the main one for digital broadcasting and video, especially for high-definition television, used for Blu-ray video disc and DVB HDTV.
 - **Level** sets the required decoder performance for the selected profile (the max. image resolution, frame rate and bit rate for the decoder).
 - **Bitrate** - checkboxes to select a **Constant bitrate (CBR)** or **Variable bitrate control (VBR)**. When CBR is selected, the default value is 10000 Kbps. VBR checkbox activates the **Bitrate max** window, which allows you to limit the maximum bitrate.
4. The **Audio** pane contains audio settings for the output stream. AirX software supports up to 8 output stereo pairs. Each stereo pair can be independently configured with codec (AAC, MPEG1 LayerII, MPEG2 LayerII, ATSCA/52A(AC-3), sampling frequency (48KHz or 44.1KHz) and bitrate (value must be entered manually).
5. The **Destination URL** pane is intended for the network parameters of the output stream. The **RTMP. Set the URL (YouTube ...)** text field is editable; the value has to be entered manually.
6. The **Data** pane contains the **Enable SCTE-35 Events** checkbox for SCTE-35 AD markers insertion to the output stream.

Mpeg DASH Output

Call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **Mpeg DASH Live Streaming** output stream type.

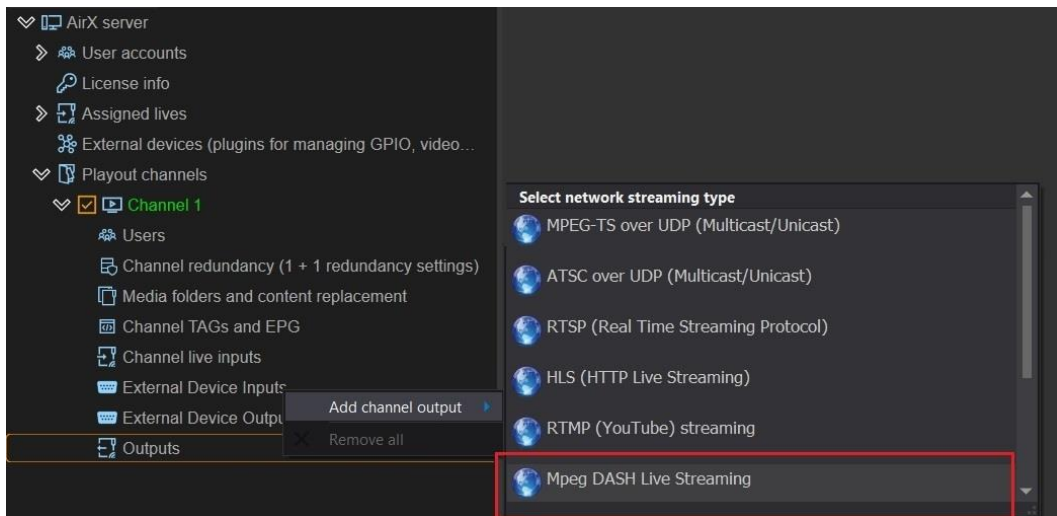


Figure 113. Add Mpeg DASH channel output

After Mpeg DASH is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

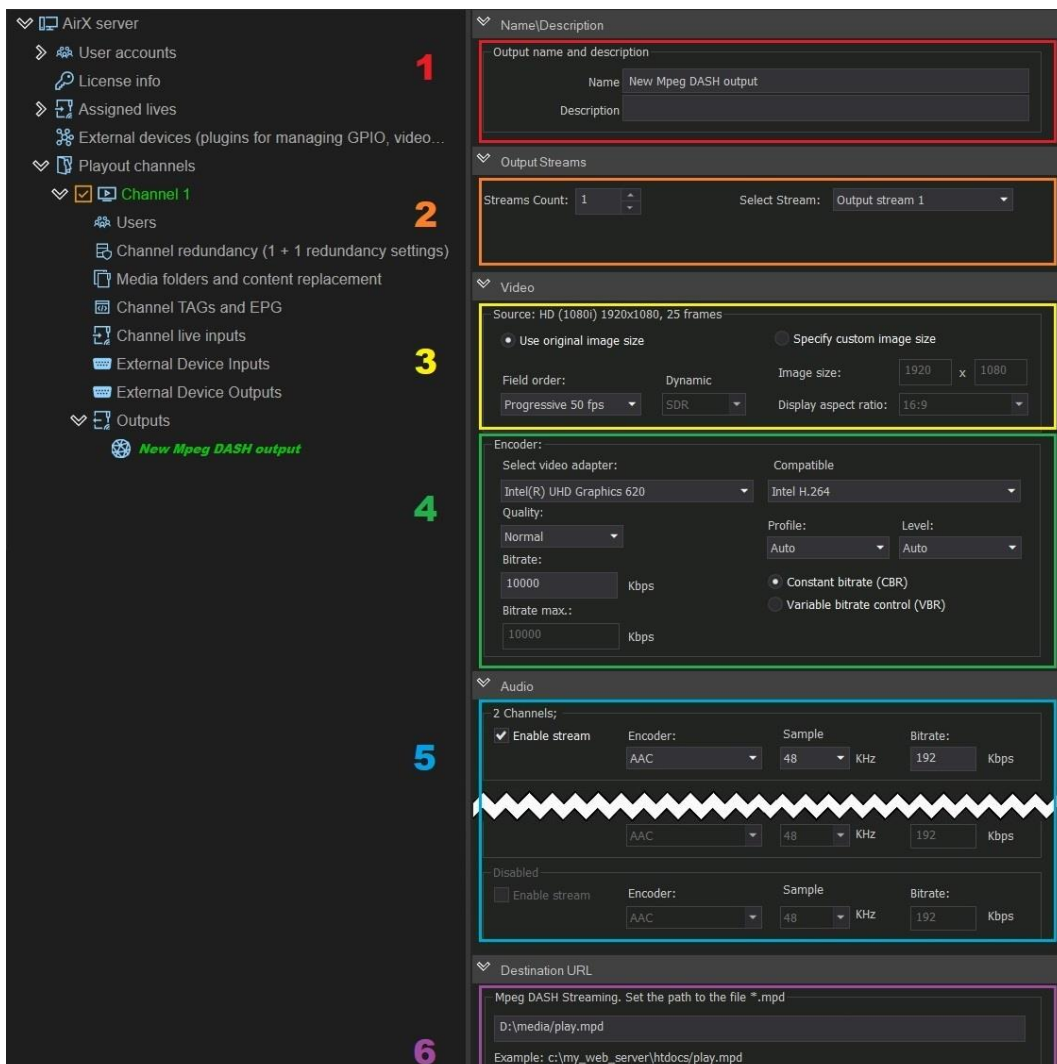


Figure 114. Mpeg DASH Output settings

1. Editable **Name/Description** fields. The Name field is required; it has the “New **Mpeg DASH** output” default value, but can be changed manually. The field Description is optional.
2. The **Output Streams** pane is intended to the output stream selection. The pane contains the adjustable **Stream Count** parameter, which shows the number of Mpeg DASH streams, broadcasting simultaneously by the broadcast playout server. You have to set the **Stream Count** and then select the stream you want to use from the **Select Stream** drop-down list.
In addition the Output Stream pane contains the **Enable SCTE-35 Events** checkbox for SCTE-35 AD markers insertion to the output stream.
3. The **Video** pane, the **Source** field. This field contains the parameters of the output video, such as image size or fps. The header of the field indicates the format of the playout channel, the Output belongs to. In this guide, the HD channel is used as an example, so the header will be **Source: HD(1080i) 1920x1080, 25 frames**.
The field contains two checkboxes:
 - **Use original image size.** Remain the image size and aspect ratio unchanged. After checking the box, the remaining options of the field will become available: the **Field order** drop-down list – Progressive 50 fps, Progressive 25 fps, Top field first. For Mpeg DASH output, the default is Progressive 50 fps.
The **Dynamic** option for color space selection (SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.
 - **Specify custom image size.** The image size of the output stream can be set manually. After checking the box, the **Image size** fields become available as well as the **Display aspect ratio** drop-down list, containing values 4:3 and 16:9.
4. The **Video** pane, the **Encoder** field. This field contains the parameters of the output stream encoding.
 - **Select video adapter.** You can select one of the installed video adapters or use the CPU (Software renderer) to encode the output stream. If you use several video adapters, remember the rule of resource allocation – the input stream, playout channel and output stream (streams) for each channel must use the same one video adapter (see **Predicting GPU performance. Throughput optimization and resource allocation on GPUs** chapter).
 - **Compatible** drop-down contains a list of available codecs. **ATTENTION!** The AirX software has the built-in protection that will not allow you to use an incompatible codec. When you select a video adapter, only available codecs will be displayed in the **Compatible** drop-down list. In addition, only changeable settings fields will be activated. If the codec does not allow changing the properties (like aspect ratio, field order, profile, level or bit rate), these fields will be blocked!
 - **Quality** – encoding quality settings. Available values: **Speed** (for encoding speed priority), **Normal, High Quality, Very High Quality** (resource-intensive modes for encoding quality priority).
 - **Profile** – drop-down list contains **Auto, Simple, Main** and **High** values to select an encoding profile. The profile defines the set of features that will be used by the codec during the encoding process. The various profiles are intended for different types of applications that work with video files and video streams. **Auto** is used for automatic selection of encoding profile. **Simple** is for applications that are undemanding to image quality and has additional loss tolerance, mainly used in mobile apps. **Main** is used mainly in standard definition digital television and TV broadcasts using MPEG-4

- compression in accordance with the DVB standard. **High** is the main one for digital broadcasting and video, especially for high-definition television, used for Blu-ray video disc and DVB HDTV.
- **Level** sets the required decoder performance for the selected profile (the max. image resolution, frame rate and bit rate for the decoder).
 - **Bitrate** – checkboxes to select a **Constant bitrate (CBR)** or **Variable bitrate control (VBR)**. When CBR is selected, the default value is 10000 Kbps. VBR checkbox activates the **Bitrate max** window, which allows you to limit the maximum bitrate.
5. The **Audio** pane contains audio settings for the output stream. AirX software supports up to 8 output stereo pairs. Each stereo pair can be independently configured with codec (AAC, MPEG1 LayerII, MPEG2 LayerII, ATSCA/52A(AC-3), sampling frequency (48KHz or 44.1KHz) and bitrate (value must be entered manually).
 6. The **Destination URL** pane is intended for the network parameters of the output stream. You have to set the path to the folder, containing the video chunks. The **Mpeg DASH Streaming. Set the path to the file *.mpd** text field is editable; the value has to be entered manually.

SRT Output. Caller/Listener modes.

Secure Reliable Transport (SRT) is a data transfer protocol based on UDT (UDP-based Data Transfer Protocol). SRT uses a "handshake" mechanism of bidirectional data transfer; each device must be identified as either a Caller or a Listener.

A device in Caller mode is the initiator of an SRT streaming session. The Caller device must know the public IP address and port number of the device identified as the Listener. If the stream source device is set to Caller mode, the broadcast will not start until a point-to-point connection with the receiver set in Listener mode.

The device in Listener mode is waiting for a request to start an SRT streaming session. A device identified as a Listener has only to know that it must listen to an SRT stream on a specific port. If the stream source device is set to Listener mode, the receiver set in Caller mode sends a request to receive the stream. In this case, there can be several receiving points.

Briefly:

- Listener Source - the receiver set in the Caller mode sends a request to receive the stream, there can be several receiving points.
- Caller Source - Broadcasting will not start until a point-to-point connection with the receiver set in Listener mode.

SRT Output settings

Call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **SRT (MPEG-TS DVB) streaming** or **SRT (MPEG-TS ATSC) streaming** output stream type.

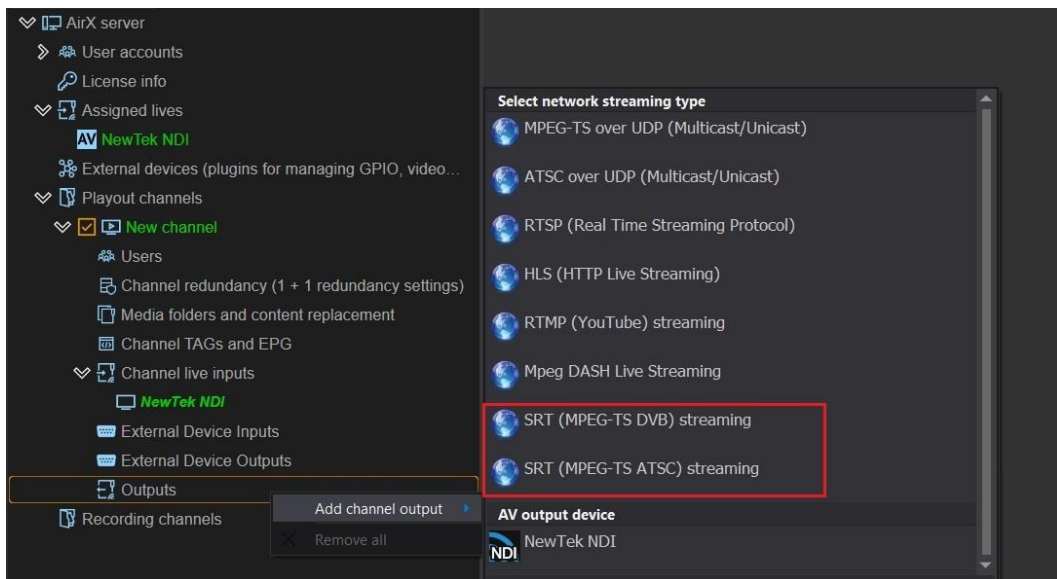


Figure 115. Add SRT (MPEG-TS DVB or ATSC) channel output

After SRT is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

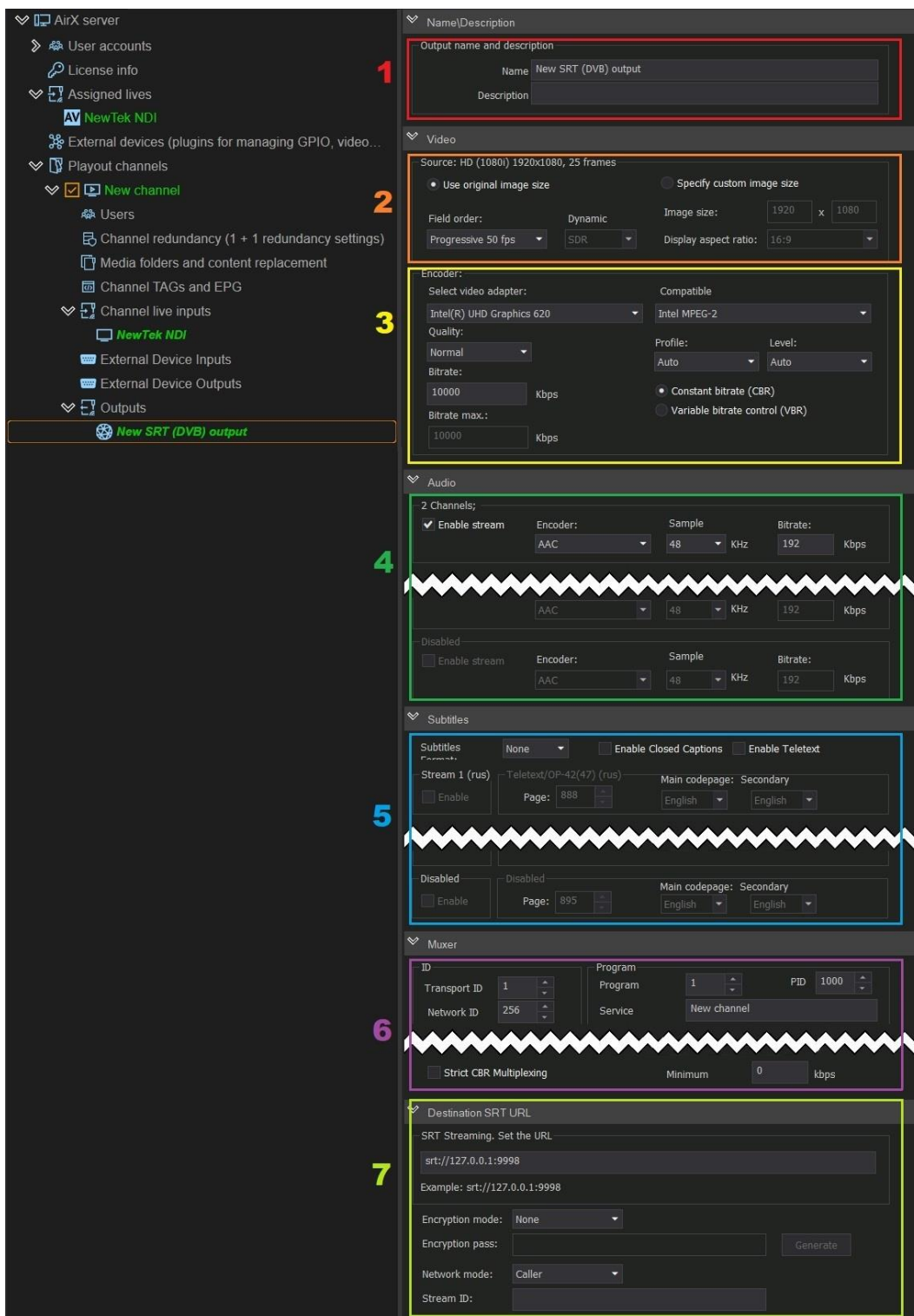


Figure 116. SRT Output settings

1. Editable **Name/Description** fields. The Name field is required; it has the “**New SRT (DVB/ATSC) output**” default value, but can be changed manually. The field Description is optional.
2. The **Video** pane, the **Source** field. This field contains the parameters of the output video, such as image size or fps. The header of the field indicates the format of the playout channel, the Output belongs to. In this guide, the HD

channel is used as an example, so the header will be **Source: HD (1080i) 1920x1080, 25 frames.**

The field contains two checkboxes:

- **Use original image size.** Remain the image size and aspect ratio unchanged. After checking the box, the remaining options of the field will become available: the **Field order** drop-down list - Progressive 50 fps, Progressive 25 fps, Top field first. The **Dynamic** option for color space selection (SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.
 - **Specify custom image size.** The image size of the output stream can be set manually. After checking the box, the **Image size** fields become available as well as the **Display aspect ratio** drop-down list, containing values 4:3 and 16:9.
3. The **Video** pane, the **Encoder** field. This field contains the parameters of the output stream encoding.
- **Select video adapter.** You can select one of the installed video adapters or use the CPU (Software renderer) to encode the output stream. If you use several video adapters, remember the rule of resource allocation - the input stream, playout channel and output stream (streams) for each channel must use the same one video adapter (see **Predicting GPU performance. Throughput optimization and resource allocation on GPUs** chapter).
 - **Compatible** drop-down contains a list of available codecs. **ATTENTION!** The AirX software has the built-in protection that will not allow you to use an incompatible codec. When you select a video adapter, only available codecs will be displayed in the **Compatible** drop-down list. In addition, only changeable settings fields will be activated. If the codec does not allow changing the properties (like aspect ratio, field order, profile, level or bit rate), these fields will be blocked!
 - **Quality** - encoding quality settings. Available values: **Speed** (for encoding speed priority), **Normal, High Quality, Very High Quality** (resource-intensive modes for encoding quality priority).
 - **Profile** - drop-down list contains **Auto, Simple, Main** and **High** values to select an encoding profile. The profile defines the set of features that will be used by the codec during the encoding process. The various profiles are intended for different types of applications that work with video files and video streams. **Auto** is used for automatic selection of encoding profile. **Simple** is for applications that are undemanding to image quality and has additional loss tolerance, mainly used in mobile apps. **Main** is used mainly in standard definition digital television and TV broadcasts using MPEG-4 compression in accordance with the DVB standard. **High** is the main one for digital broadcasting and video, especially for high-definition television, used for Blu-ray video disc and DVB HDTV.
 - **Level** sets the required decoder performance for the selected profile (the max. image resolution, frame rate and bit rate for the decoder).
 - **Bitrate** - checkboxes to select a **Constant bitrate (CBR)** or **Variable bitrate control (VBR)**. When CBR is selected, the default value is 10000 Kbps. VBR checkbox activates the **Bitrate max** window, which allows you to limit the maximum bitrate.
4. The **Audio** pane contains audio settings for the output stream. AirX software supports up to 8 output stereo pairs. Each stereo pair can be independently configured with codec (AAC, MPEG1 LayerII, MPEG2 LayerII, ATSCA/52A(AC-3),

sampling frequency (48KHz or 44.1KHz) and bitrate (value must be entered manually).

- The **Subtitles** pane contains subtitle settings for the output stream. AirX software supports up to 8 multilingual subtitle streams for each channel output at the same time.

Select the **Subtitle Format** in the drop-down list (None, DVB, EBU-TT) to enable DVB subtitles. The **Enable** checkboxes will be automatically activated. Check the boxes you want to use. The number of subtitles streams available for activation depends on the basic settings of the playlist channel.

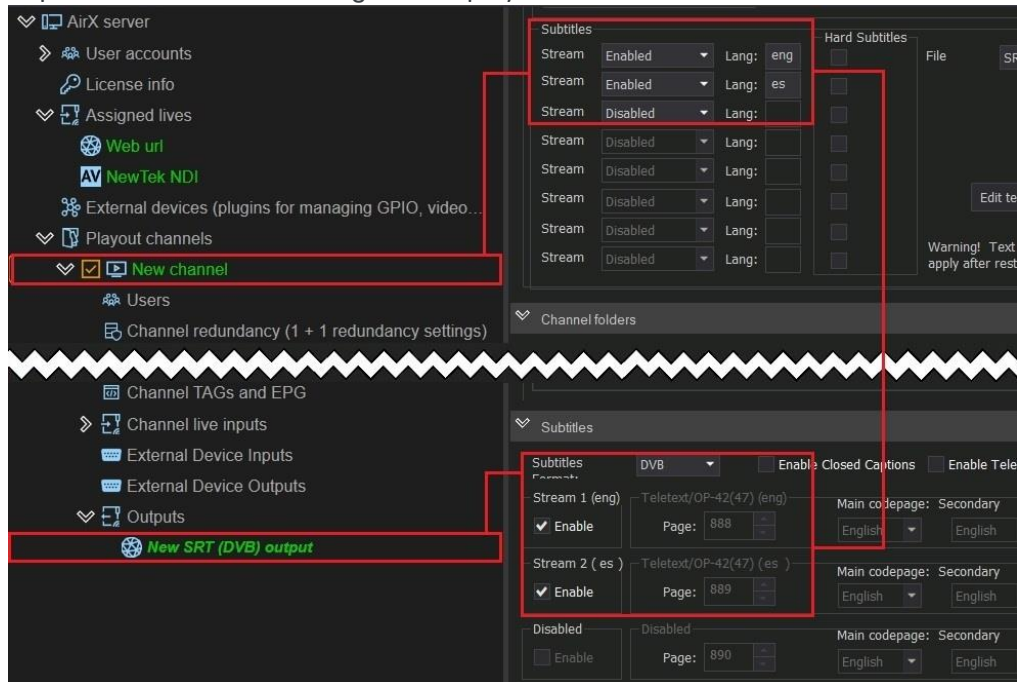


Figure 117. The subtitles output settings (SRT stream)

Check the box **Enable Closed Captions** if you want to use them. The **Enable** checkboxes will be automatically activated for all the available subtitles streams. Check the boxes you need.

The enabling of teletext is similar: check the box **Enable Teletext** and select the streams you need, as described above. After selecting the subtitles streams, you have to specify teletext pages in the **Teletext/OP-42(47)** field. The default value is 888, you can change it manually. And finally, select the Main and Secondary codepages languages from the drop-down lists.

- The **Muxer** pane contains multiplexer settings for multistream IP transmission. Changing any settings in the Muxer pane requires a high-level of user competence, in assistance with the technical documentation. Please do not change these settings unless necessary.

- The **Destination SRT URL** pane is intended for the network parameters of the output stream and encryption settings.

Enter the destination URL in the **SRT Streaming. Set the URL** field. Select the **Encryption mode** in the drop-down list - AES-128 or AES-256. Click **Generate** to generate an encryption key. This key will be required to decode the stream signal on the receiving side.

Select the Caller/Listener mode in the **Network mode** drop-down list. When choosing the Caller mode, enter a unique Stream ID to the editable field located at the bottom of the settings pane.

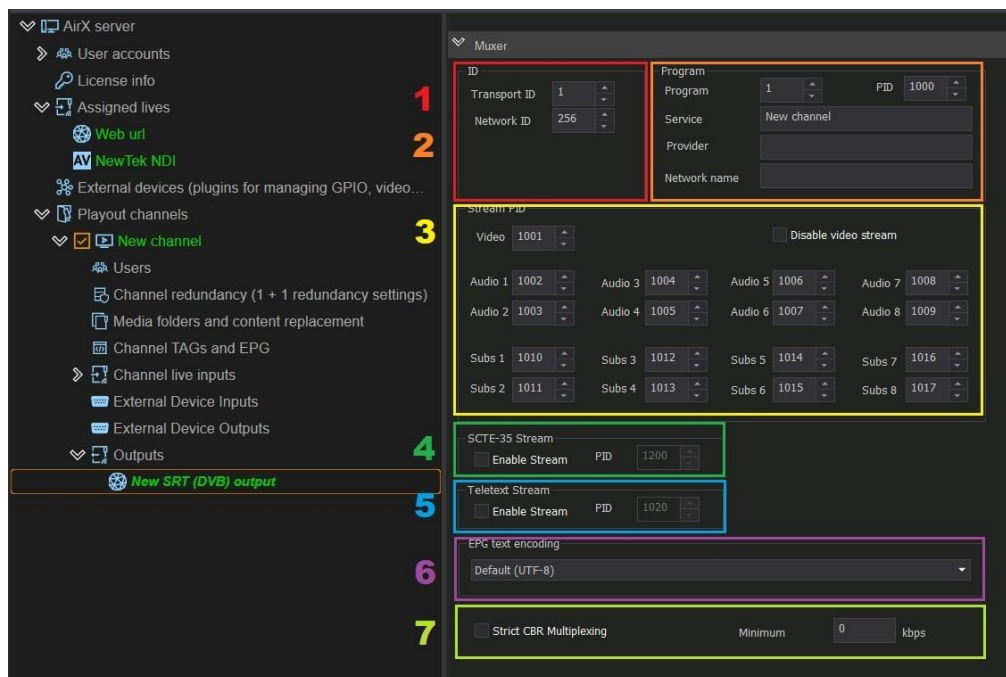


Figure 118. SRT Muxer settings

1. The **ID** pane contains the **Transport ID** field to identify the package and the **Network ID** field to identify the network.
2. The **Program** pane contains: the **Program** field for identifying the program number in the transport stream, the **PID** field, the **Service**, **Provider** and **Network name** editable text fields. You can modify these text fields.
3. The **Stream PID** pane contains the **Disable video stream** checkbox to disable video data transmission (to hold only audio and/or service data in the output stream), as well as fields for specifying the **PIDs with video data, audio data and subtitles**. Changing any settings in Stream PID pane requires a high level of user competence and experience with the transport stream structure! We strongly recommend you do not change the settings of the Stream PID pane.
4. The **SCTE-35 Stream** field contains the **Enable Stream** checkbox for insertion of SCTE-35 AD markers and a field to select the PID with SCTEs. We recommend do not change the default PID value.
5. The **Teletext Stream** field contains the **Enable Stream** checkbox to enable teletext insertion and a field to select the PID number containing the teletext data. We recommend do not change the default PID value.
6. The **EPG text encoding** field allows you to select the EPG encoding. The default value is UTF-8.
7. The **Strict CBR Multiplexing** checkbox allows you to set the multiplexing mode with a fixed bit rate and set the **Minimum** bit rate.

NDI Output

Call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **NDI** output stream type.

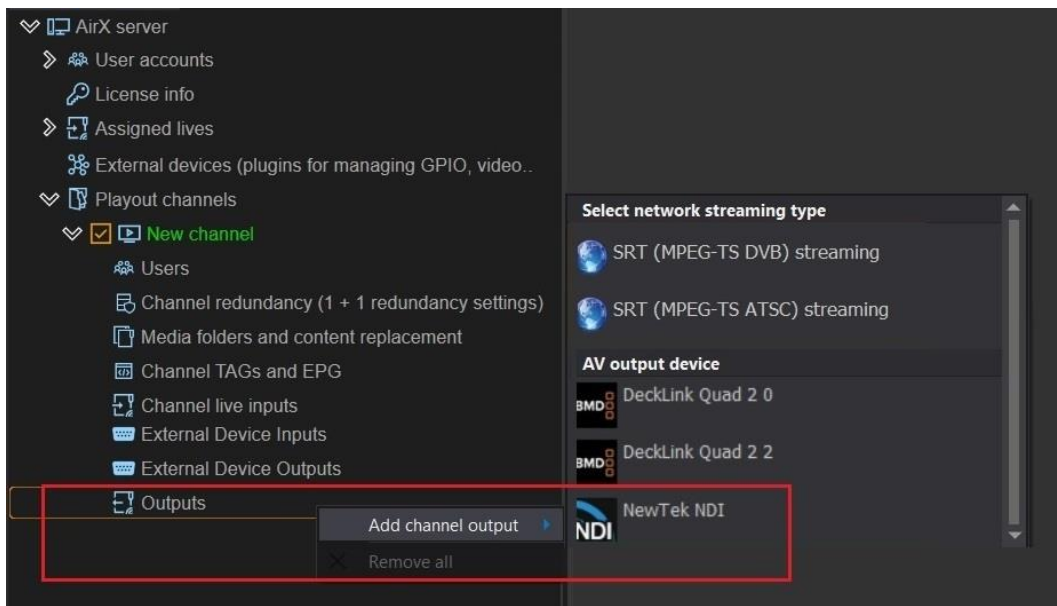


Figure 119. Add NDI channel output

After NDI is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

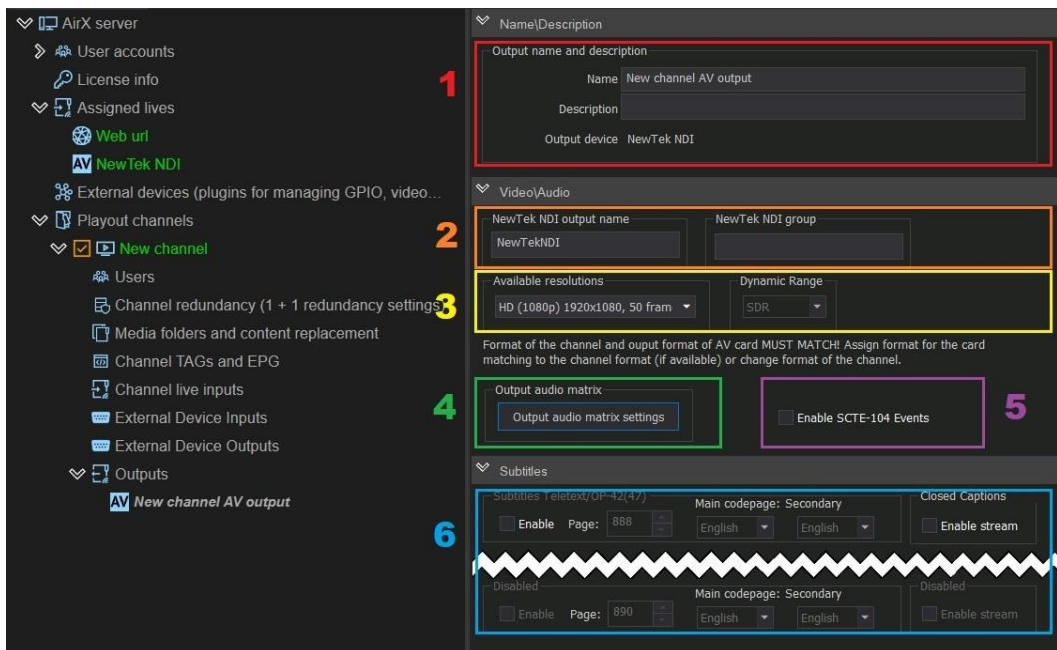


Figure 120. NDI Output settings

1. Editable **Name/Description** fields. The Name field is required; it has the “**New channel AV**” output” default value but can be changed manually. The field Description is optional.
2. The **NewTek NDI output name** and **NewTek NDI group** text fields are editable and can be changed manually.
3. In the **Available resolutions** pane you can select the output video encoding resolution from the drop-down list. You can remain the image size and fps unchanged or downscale them. The **Dynamic** option for color space selection

(SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.

- The **Output audio matrix** additional window is intended for customization of the output audio matrix. AirX software supports up to 24 audio tracks in output. Each track can be configured independently.

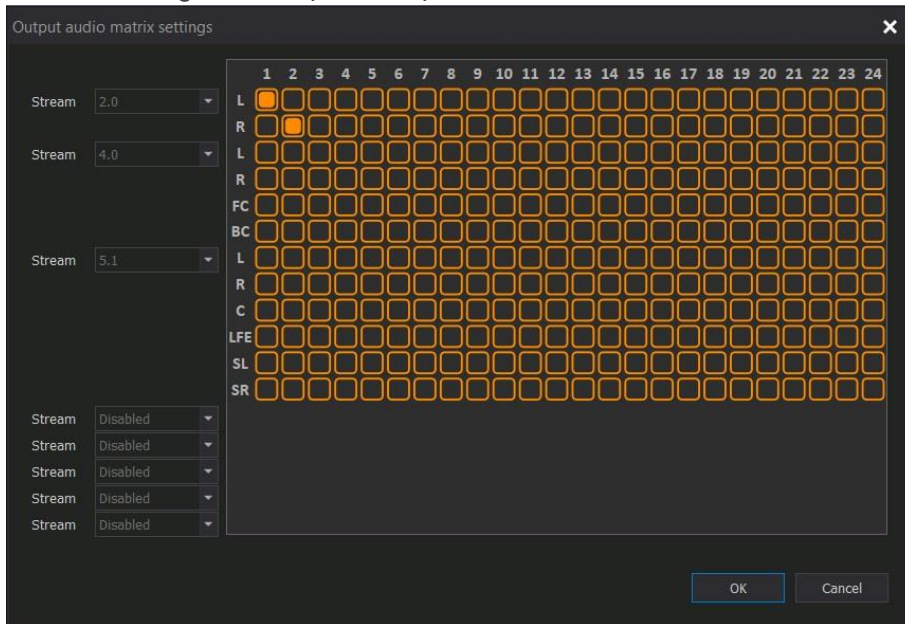


Figure 121. Output audio matrix settings

- The **Enable SCTE-104 Events** checkbox is intended for SCTE-104 AD markers insertion to the output stream.
- The **Subtitles** pane contains subtitle settings for the output stream. AirX software supports up to 8 multilingual subtitle streams for each channel output at the same time. The **Enable** checkboxes must be activated manually. Check the boxes you want to use. The number of subtitles streams available for activation depends on the basic settings of the playout channel.

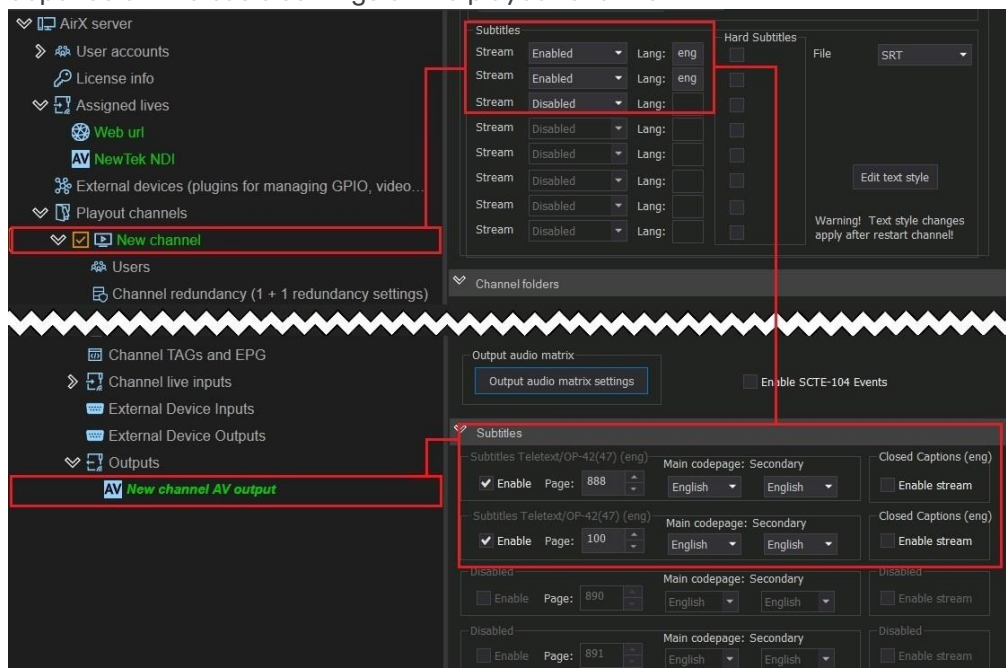


Figure 122. The subtitles output settings (NDI stream)

Check the boxes **Enable stream** in the **Closed Captions** pane for each stream, you want to use.

The enabling of teletext is similar: check the boxes **Enable** for the streams you need. After selecting the subtitles streams, you have to specify teletext pages in the **Teletext/OP-42(47)** field. The default value is 888, you can change it manually. And finally, select the Main and Secondary codepages languages from the drop-down lists.

SDI Output

If you have an AV capture card installed, you will see its outputs in the list of available AirX output devices.

Call the context menu of the **Outputs** branch of the Channel resource tree (left pane of the application window). Select **Add channel output** in the drop-down menu, and click the **SDI** output stream type. Select one of the installed AV capture cards and the output, you want to use.

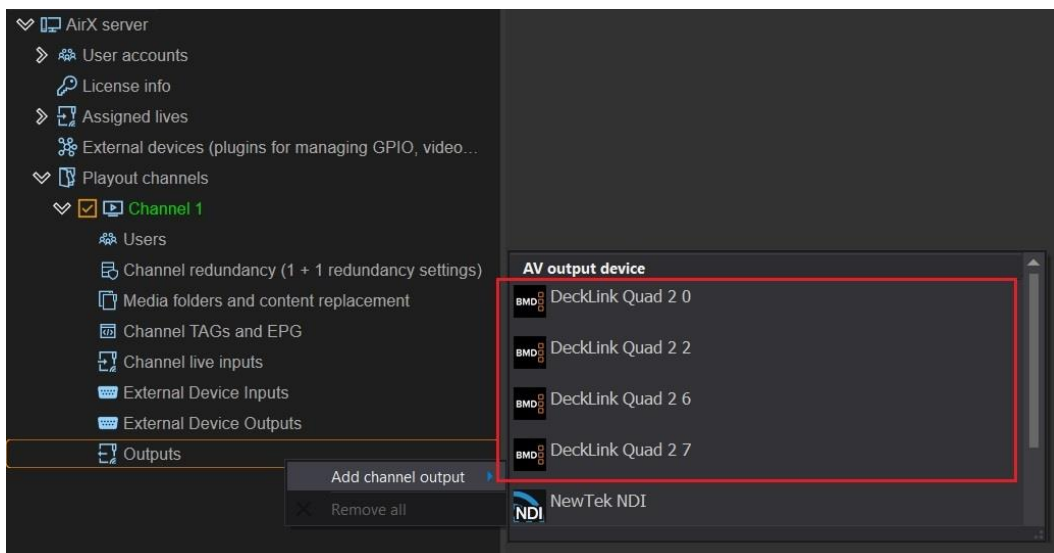


Figure 123. Add SDI channel output

After SDI is added to the Channel Outputs list, you have to configure the parameters of the output stream. Click the Output name in the Channel resource tree (left pane of the application window) to see the Settings pane on the right.

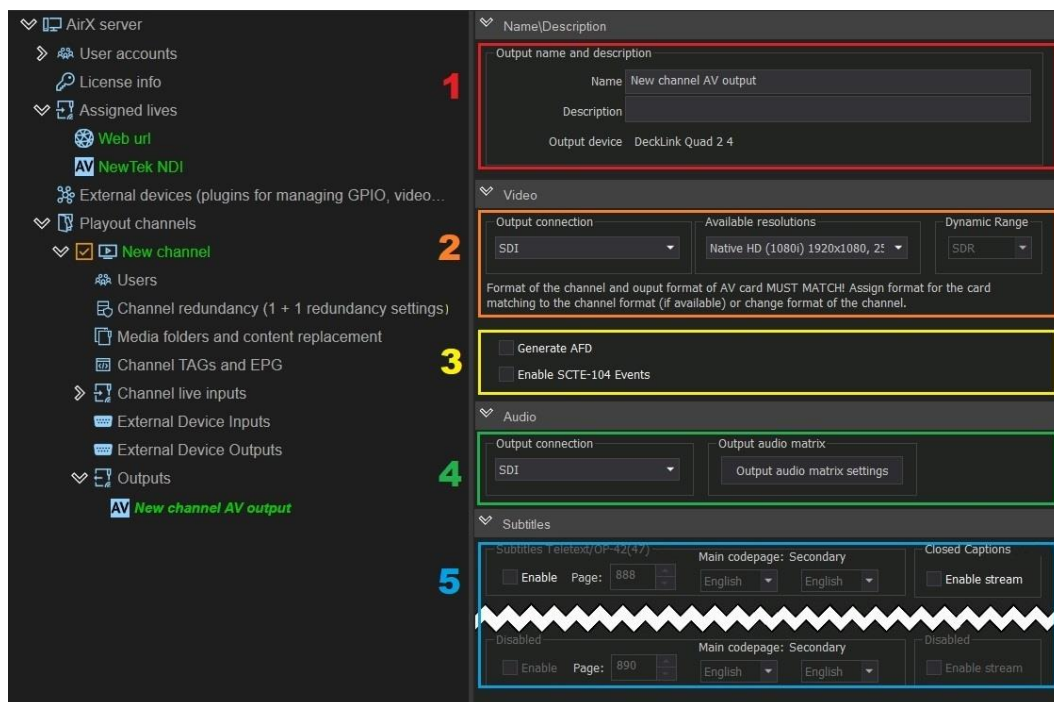


Figure 124. SDI Output settings

1. Editable **Name/Description** fields. The Name field is required; it has the “**New channel AV** output” default value, but can be changed manually. The field Description is optional. In addition, the Name/Description pane contains the information about the connected AV device.
2. The **Video** pane, the **Output connection** field contains the drop-down list that has the default value SDI.
 In the **Available resolutions** pane you have to select the output video encoding resolution from the drop-down list. Format of the playout channel and output format of AV card must match! Assign format for the card matching to the channel format (if available) or change format of the channel.
 The **Dynamic** option for color space selection (SDR, HDR HLG) becomes available only if the HDR HLG color space is selected in the playout channel settings.
3. The additional service data pane. The section contains a checkbox **Enable SCTE-104 Events**, enabling the SCTE-104 markers insertion to the output signal. The **Generate AFD** enables the AFD insertion to the output signal (Active Format Description (AFD) is a standard set of codes that can be sent in the baseband SDI video signal that carries information about the aspect ratio and other active picture characteristics.)
4. The **Audio** pane, the **Output connection** field contains the drop-down list that has the default value SDI.
 The **Output audio matrix** additional window is intended for customization of the output audio matrix. AirX software supports up to 24 audio tracks in output. Each track can be configured independently.

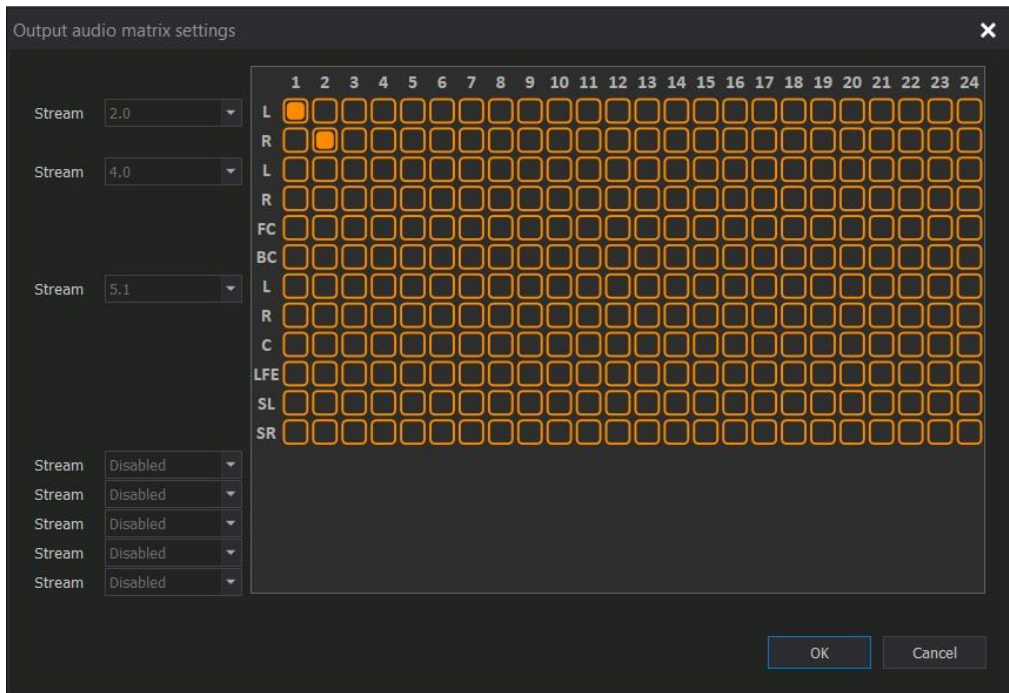


Figure 125. Output audio matrix settings

- The **Subtitles** pane contains subtitle settings for the output stream. AirX software supports up to 8 multilingual subtitle streams for each channel output at the same time. The **Enable** checkboxes must be activated manually. Check the boxes you want to use. The number of subtitles streams available for activation depends on the basic settings of the playout channel.

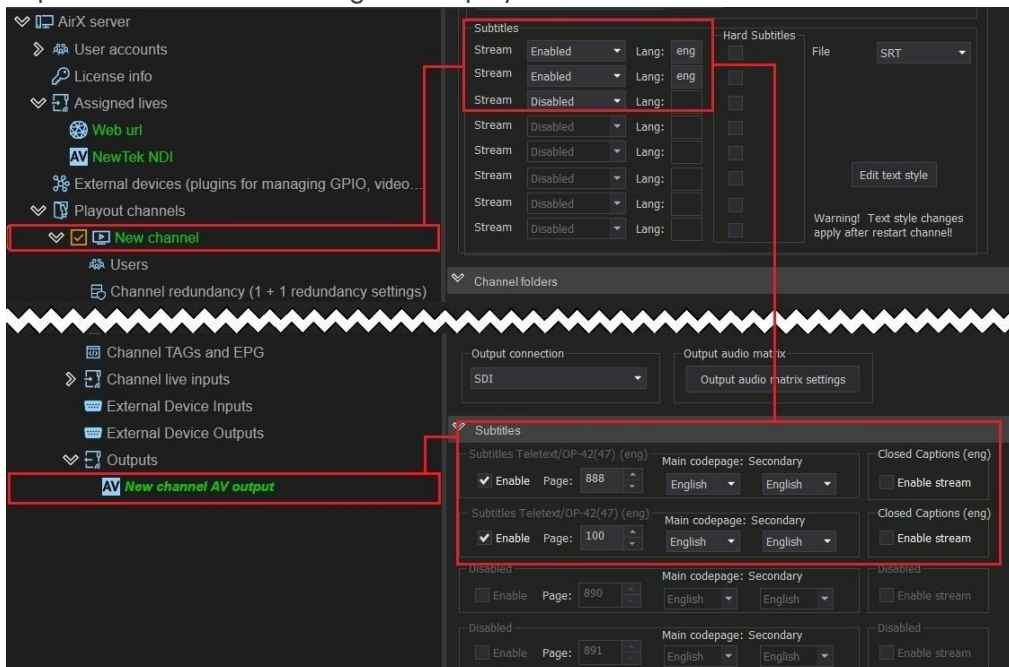


Figure 126. The subtitles output settings (SDI stream)

Check the boxes **Enable stream** in the **Closed Captions** pane for each stream, you want to use.

The enabling of teletext is similar: check the boxes **Enable** for the streams you need. After selecting the subtitles streams, you have to specify teletext pages in

the **Teletext/OP-42(47)** field. The default value is 888, you can change it manually. And finally, select the Main and Secondary codepages languages from the drop-down lists.

LOG files - definition & overview

How to: View and save log files

A log file is a computer-generated data file that contains information about system usage, activities, and operations within an AirX system and applications. Log files are the primary data source for the technical support.

The AirX broadcast automation system stores the log files in several locations:

1. Server logs are located in the folder, specified in the server settings.

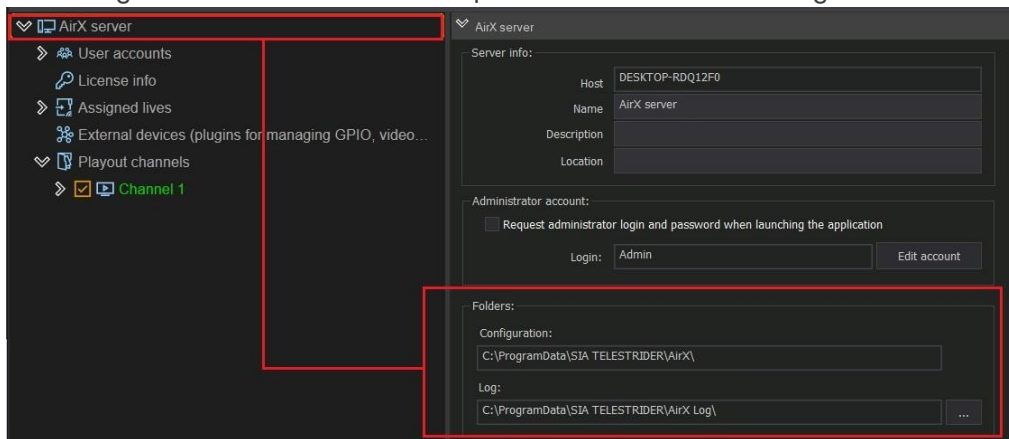


Figure 127. AirX server logs location

2. Channel logs are located in the folders, specified in the each playout channel settings.

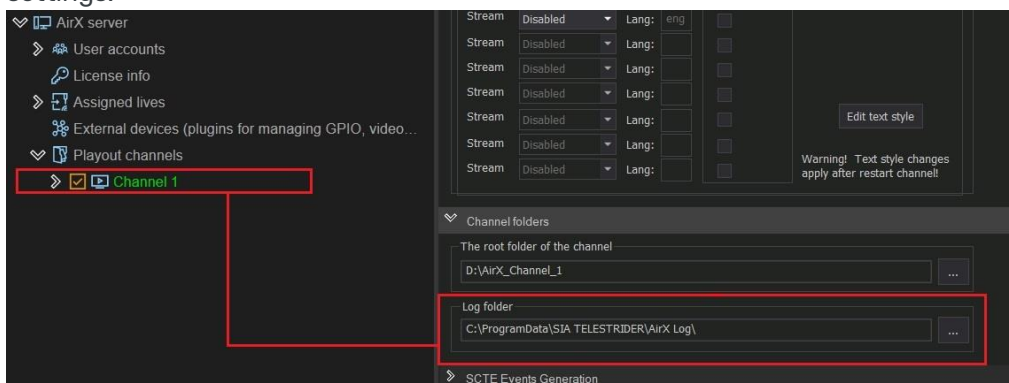


Figure 128. AirX channel logs location

Location of the each specified folder can be changed by the user.

Use the **Export** button in the main menu of AirX Control app to collect an archive with all log files:

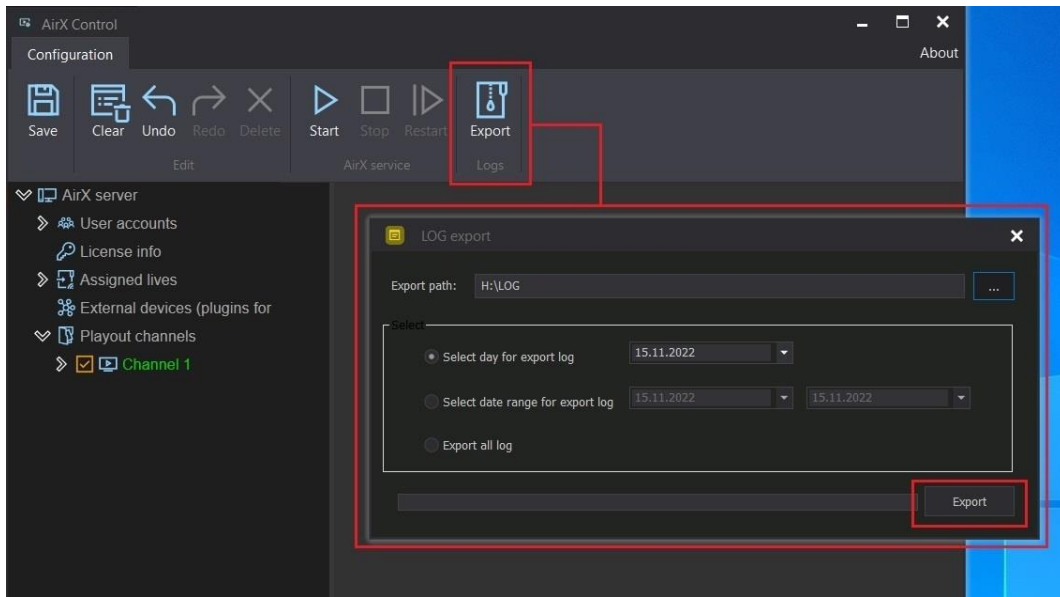


Figure 129. LOG export

Specify the folder to save an archive in the **LOG export** window. This window also provides the selection of a period for logs exporting: for the current day, for a date range, or export of all logs available on the server for the entire time. Check the box you need and click **Export** to save the archive file in the specified folder.

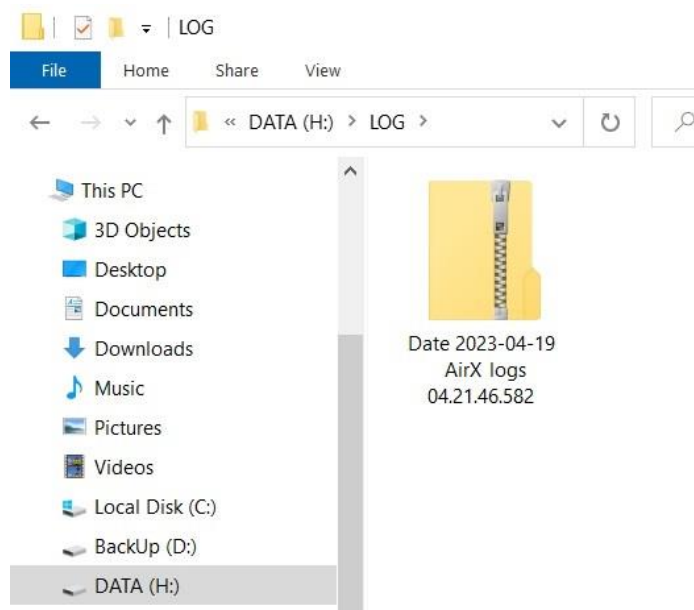


Figure 130. AirX logs archive

System monitoring tools

Troubleshooting and Initial Diagnosis

AirX broadcast automation has built-in initial diagnostic tools. First, you can start a **Preview** of any playout channel from the AirX Control app interface at any time.

Call the context menu of the playout channel in the Server resource tree (left pane of the application window) and select **Preview** from the drop-down list to open the preview in an additional window:

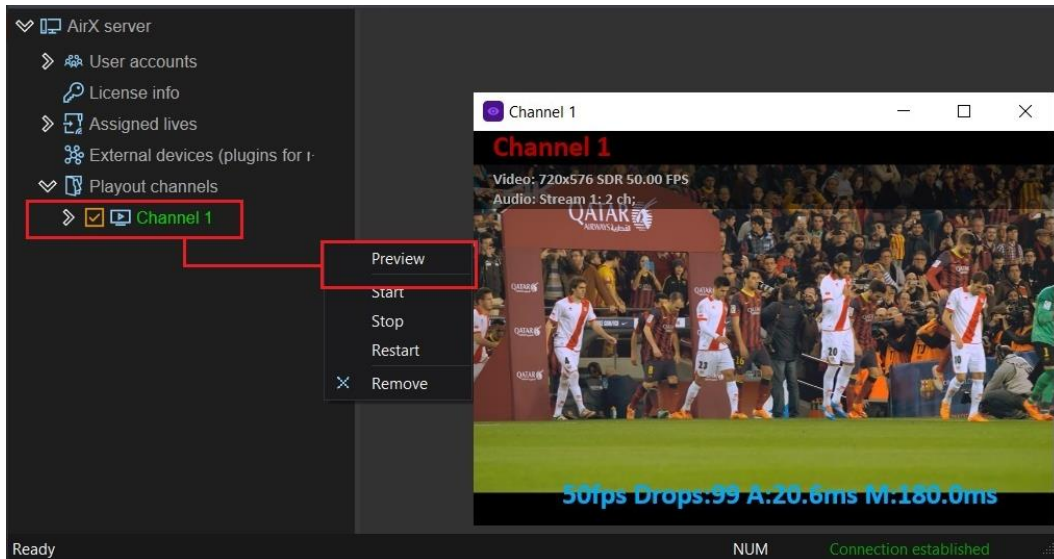


Figure 131. Channel preview

Press the keyboard shortcut **Ctrl+F7** to show the frame counter in the lower right corner of the screen. Counter will show the current stream status and the number of dropped frames. In the upper left corner of the preview window, you will see the characteristics of the channel stream: Channel name, video format, color space, fps, and number of audio tracks. Preview display and input stream monitoring are performed in real time.

In addition to previews, AirX playout channels are color-coded for channel status.

Color coding is a visual reminder system to alert and inform users. AirX broadcast automation assigns specific meanings to certain colours; therefore, colours can be a warning or give information.



Figure 132. Playout channels color codes

1. Green – The channel is ok, it works correctly.

2. Red – The channel is active but stopped (manually or due to an internal error). If the channel was stopped manually, you may try to start it. Call the context menu of the playout channel in the Server resource tree (left pane of the application window) and select **Start** from the drop-down list.
If the channel does not start, most likely there is an error in the channel settings. Try to check the configuration settings, connected live sources settings and output stream settings.
A channel can be stopped by many reasons like configuration error, lack or failure of the server hardware, expiration of a license, etc. If you cannot find the cause of the malfunction on your own, contact the Telestrider technical support service.
3. Orange – The channel is idle (inactive). You will see an orange color code in two cases: The channel is underconfigured (click **Save** in the main menu of AirX Control app to save the channel settings and start the channel services) or the channel is excluded from a playout configuration. In this case, there will be no activated check mark next to the channel name.

The same color indication is valid for the output streams. They can be color-coded with green (the output stream is ok, it works correctly) and red (troubleshooting is required).

Support

You can contact with Telestrider technical support team by email support@telestrider.com or phone [+371 6441 5364](tel:+37164415364) (Latvia)

If you prefer an email, summarize your request in the subject line. In the body of the email, please give the following information:

1. Your complete user info including name, company, email.
2. Name, version and edition of product. Example: AirX Play, product version: 5.6.89.48510
3. License Info: Key ID of your license key file and HW ID. This is required for our issue tracking system and enables us to provide prompt support.
4. OS Version & Platform including Service Pack: example: Windows 10 Pro - x64. SPx.
5. If your server was purchased as In-a-box from Telestrider, please include the server serial number. The number is the computer name, which you can find in the system properties (looks like SL50055) or on the server case.
6. Description of the problem: Include as much info as possible, especially steps to reproduce the issue. This will allow us to understand your problem more quickly.
7. Screenshots or videos illustrating the error may help a lot in troubleshooting!
8. LOG archive. When an error or malfunction occurs on your broadcast playout server, the details of it are recorded and saved to a log file. Logs can provide the support team enough information to diagnose and resolve the error. To share logs with the support team follow the instructions described in **LOG files - definition & overview** chapter.

Be ready to give a technical support specialist remote access to the server. Access options - RDP, AnyDesk, TeamViewer.

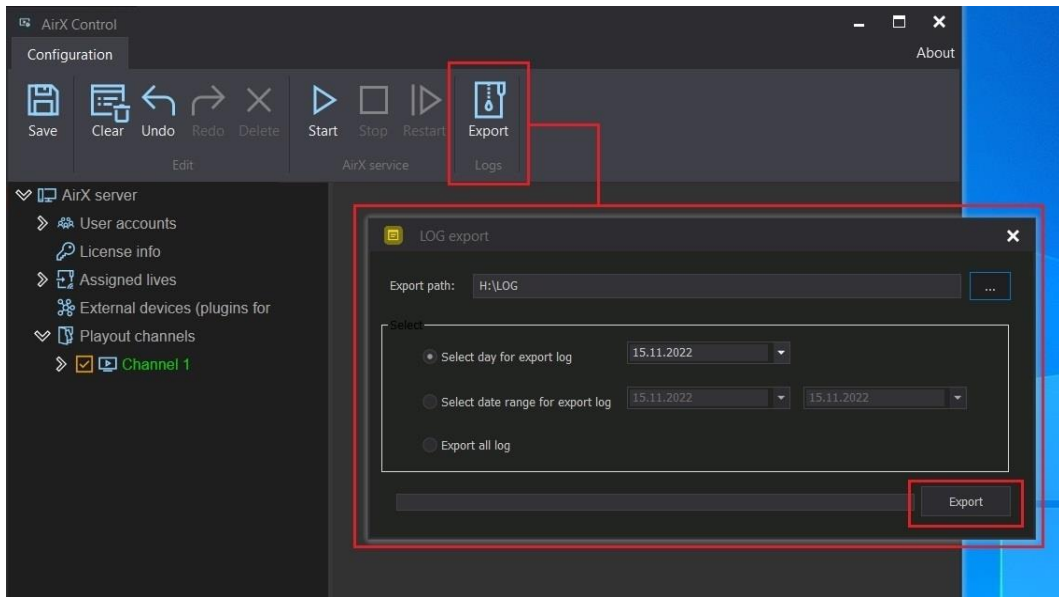


Figure 133. LOG export

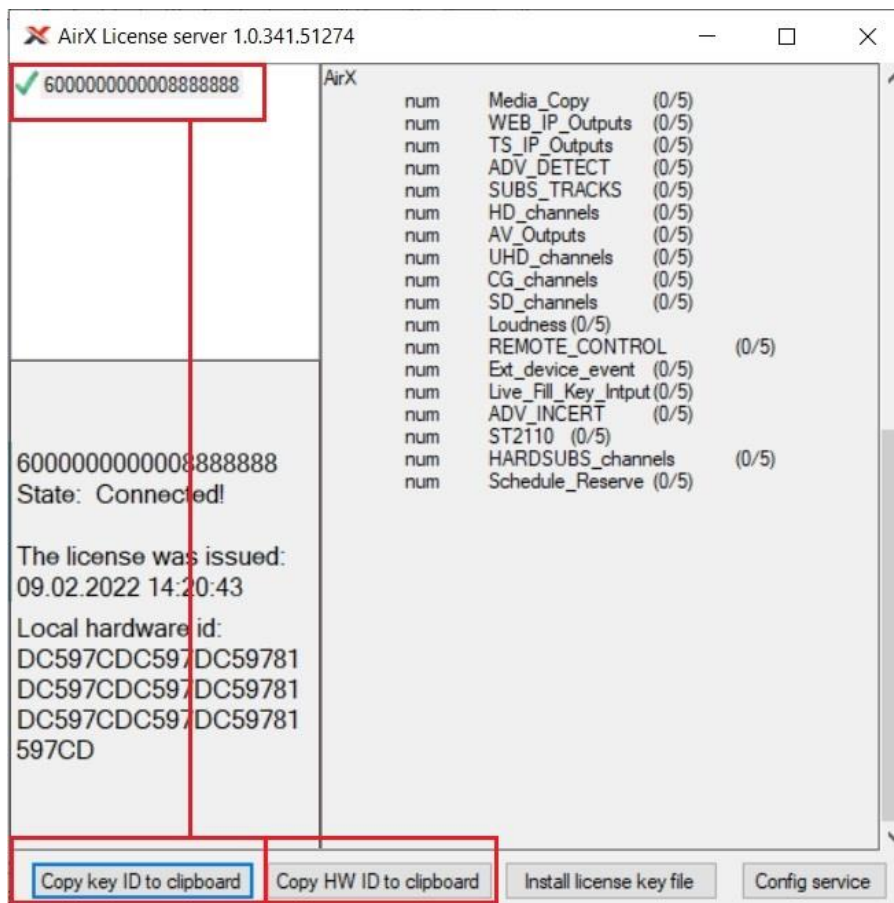


Figure 134. License key ID, HW ID

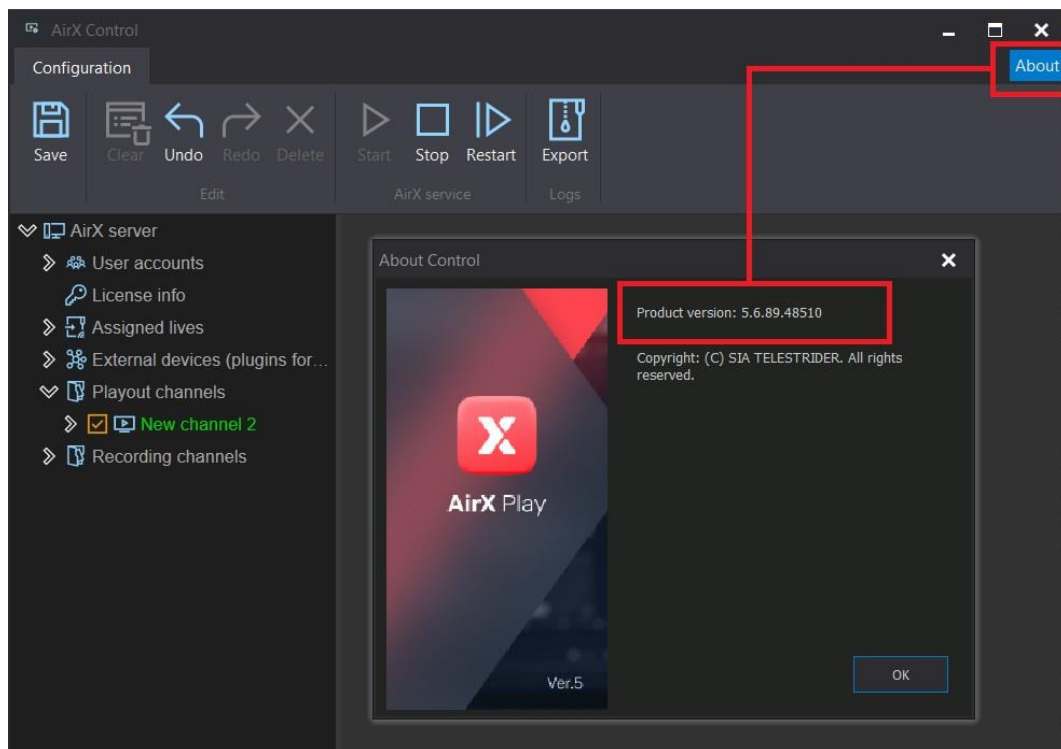


Figure 135. Product version

Client-side component installation

Since the AirX software has client-server architecture, the installer must be downloaded to both the broadcast playout server and the client workstation.

Preparing for installation (Client-side). Hardware requirements

Requirements for supported operating systems:

- "Windows 10" x64;
- "Windows Server 2019" x64;
- Local Admin Rights.

Minimum hardware requirements:

- "Intel Core i5 gen 8" or higher;
- At least 8 GB of RAM;
- "Intel UHD Graphics" or "NVIDIA" supporting "DirectX 11" or higher;
- Monitor with a screen resolution of 1920x1080 or more;
- Audio playback system.

Note: It is recommended to install two monitors: a monitor with a screen resolution of 1920x1080 or more for the client workplace, and SDI monitor to control the quality of live sources.

Client-side component installation

For installation of the AirX software, it is necessary to check the readiness of hardware and Login into PC's operating system with Admin rights

Then execute the AirX installer file, you received from Telestrider technical support team.

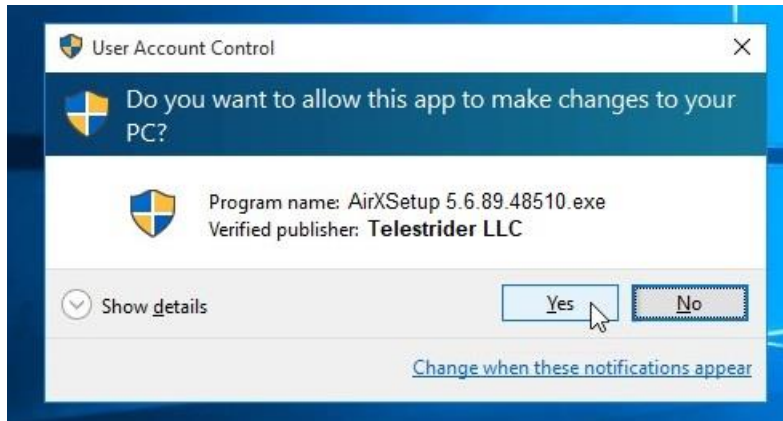


Figure 136. User Account Control

Next, the installation wizard window will open with the license agreement. Choose the language and read the Licence terms and conditions.

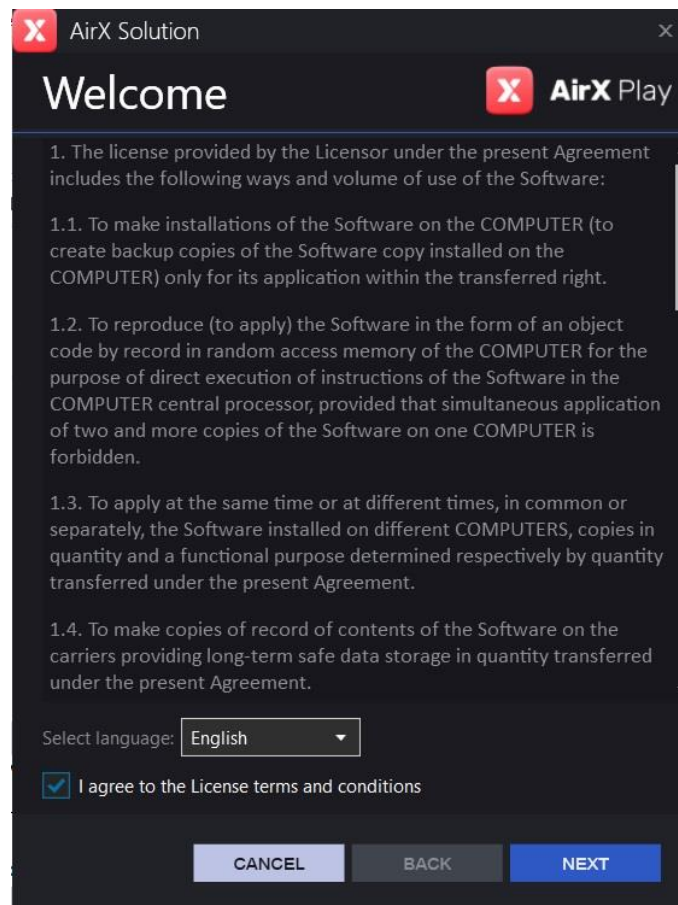


Figure 137. License terms and conditions

After reading, check the box to agree to the terms and click **Next**.

WARNING: if you do not agree with the License terms please terminate the installation by **Cancel** button.

The following interface will give you options to install the components.

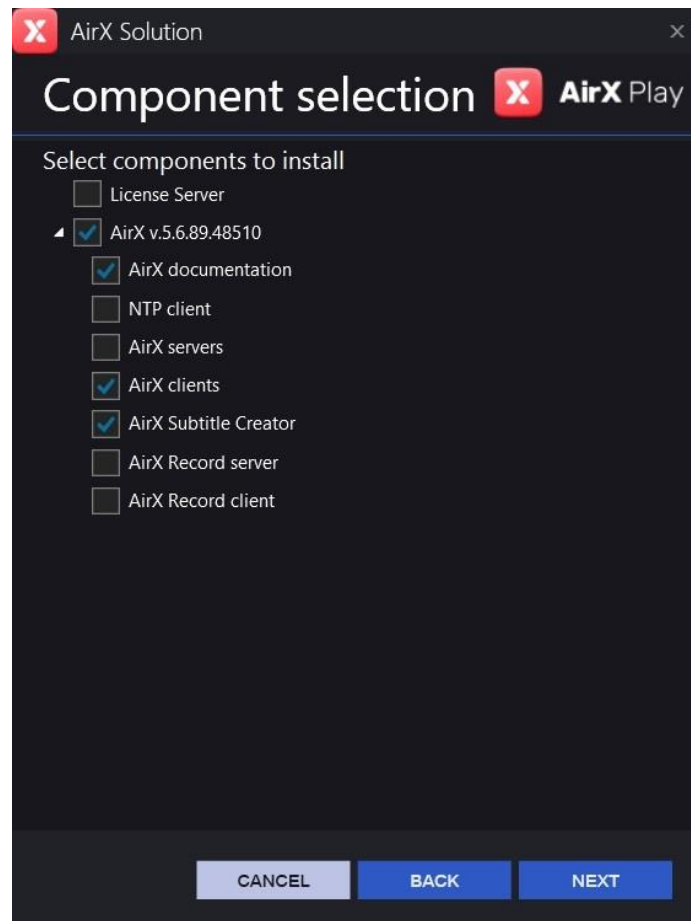


Figure 138. Component selection

License Server performs the operation of the software components in accordance with the purchased licenses. For the detailed description of setting up the License Server, see the **License** chapter.

AirX v.NN – broadcast automation system components, including:

- AirX documentation – self-explanatory
- NTP client – provides synchronization of the broadcast playout server and the client application with NTP server. By default, AirX is synchronized with system time of the server
- AirX servers – software components, necessary for the operation of the broadcast playout server
- AirX clients – software components for a remote client application.
- AirX Subtitle Creator – built-in subtitle creation tools
- AirX Record server – software components of the AirX recording server
- AirX Record client – software components for a remote recording client application

Check the boxes shown in Figure 138 to install AirX on a broadcast playout server: AirX documentation (optional), AirX clients and AirX Subtitle Creator. The AirX v.NN box will be checked automatically. Then click **Next**.

In next window you will see a list of components, selected for installation:

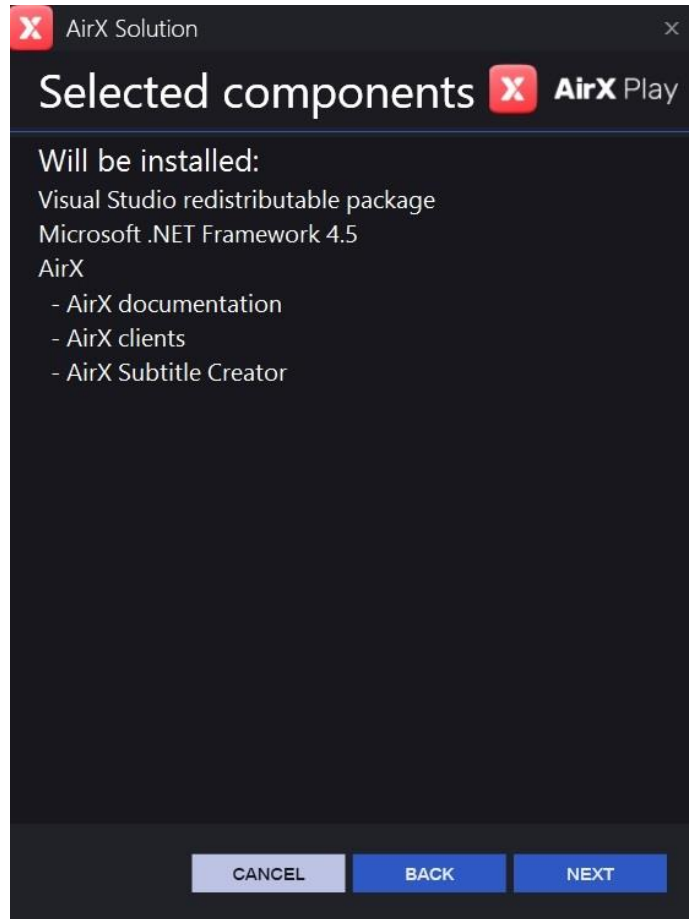


Figure 139. Selected components

Click **Back** to make changes to the list of components, Click **Next** to confirm the installation of the components. The installation progress will be shown in the same window.

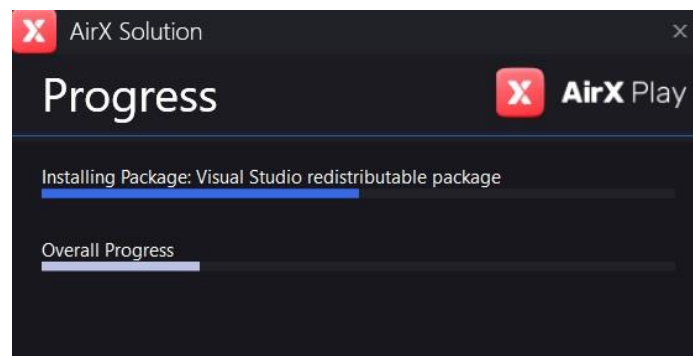


Figure 140. Installation progress

After the installation process is complete, you will be prompted to launch the AppLauncher application to configure services and close the installer window.

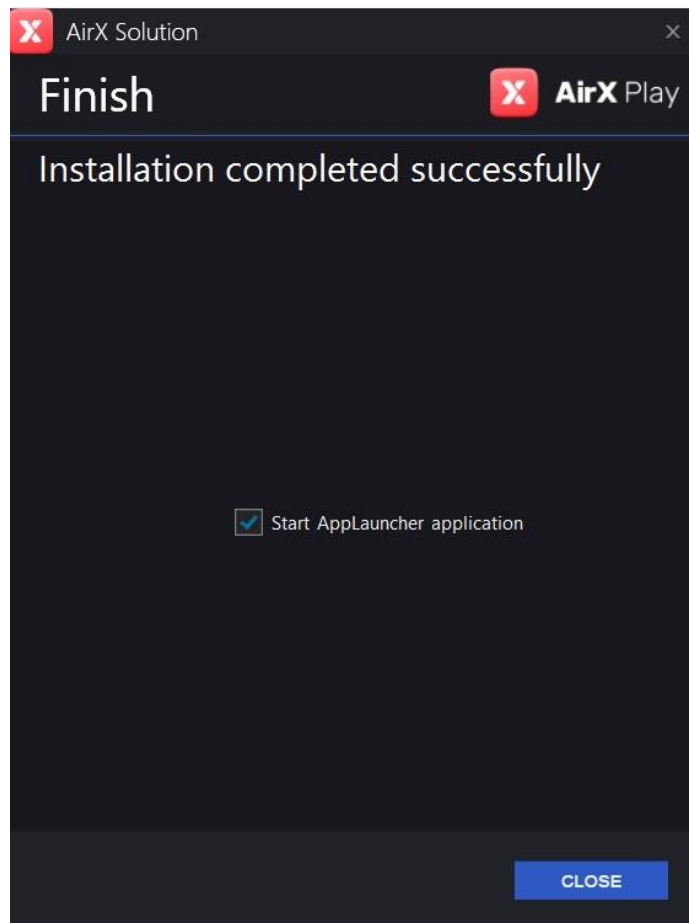


Figure 141. Installation completed

After closing the installation app, you will see desktop shortcuts:

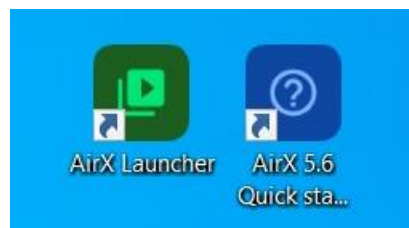


Figure 142. AirX shortcuts

User applications

AirX Launcher is a client workplace application for broadcast playout servers and playout channels addition and launching. This configurator allows you to launch the applications for the playout channel's schedule managing, for CG creation and for subtitles editing.

Channel Manager is the main scheduling application. It allows you to create an OnAir schedule manually or work with a schedule downloaded from a third-party source (broadcast traffic management system). Also, the Channel Manager allows the GC insertions and AD insertion markers processing.

Scene Editor is a built-in CG editor for creation of on-air graphic design scenes and/or graphics conversion to the internal graphic scene format for AirX software. It allows you to operate with CG of various levels of complexity from a simple overlay of a static logo to a multilayer dynamic design using PIP, FILL + KEY, RSS, etc.

Subtitles Creator - built-in subtitle editor

AirX Launcher

Authorization, launch, start interface

Double click on the AirX Launcher icon on your desktop to get started with AirX.

When you start the program, an authorization form will be opened. Enter the Login and Password you specified in the **User Accounts** branch of the Server resource tree (see the AirX Control app, **Users** chapter), or use the default Login and Password (Admin; 12345).

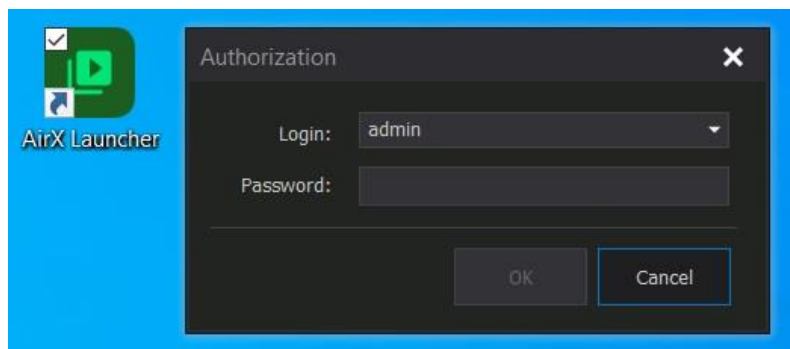


Figure 143. Authorization

In the new **vpAppLauncher** window you will see the only one (but important) settings button. Click this button to open the **User configuration** popup window.



Figure 144. User configuration

In addition you can change the user in the **vpAppLauncher** window (call the authorization form again). Right-click the main menu of the app window and select **Logout** in the drop-down list to disable the current user. Or select Login to change the user without disabling the current one.

The third item of the drop-down list (Edit user configuration) is similar to the settings button and will call the **User configuration** pop-up window

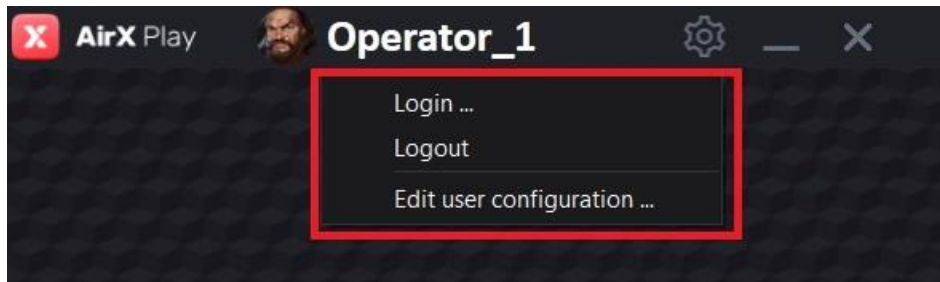


Figure 145. Change user

Another way to change the User is to click the avatar picture in the **vpAppLauncher** window and call the authorization form again.

If you want to change a user avatar, you have to open the User configuration window, select the **User: Username** line and call the context menu. In the drop-down list, select the **Set user avatar** item and assign the picture you want to use as the avatar.

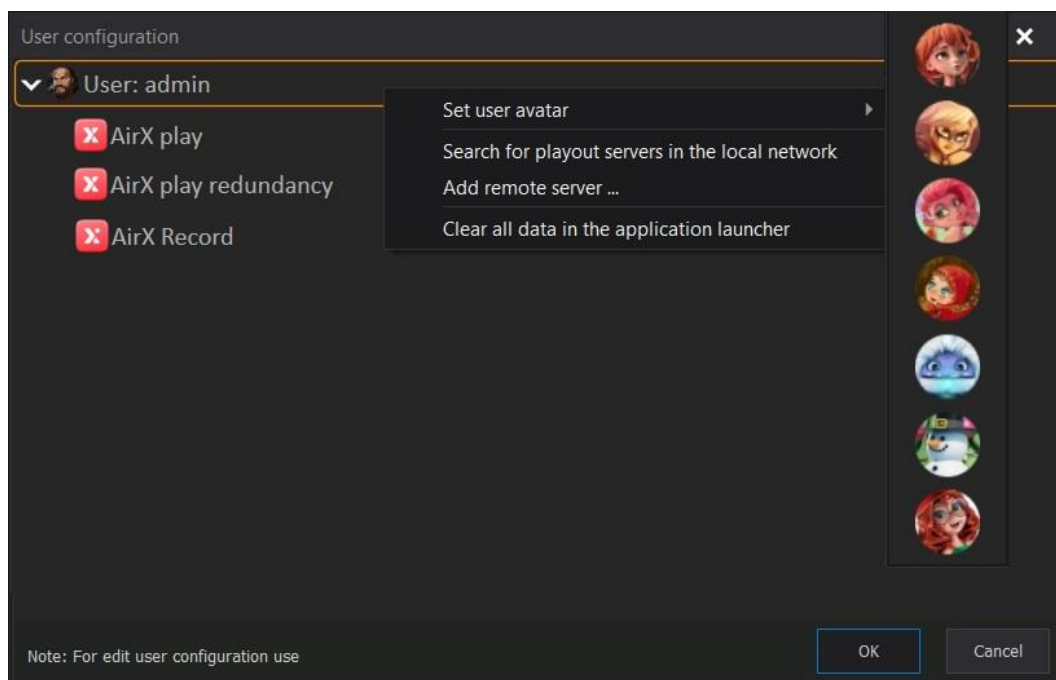


Figure 146. Set user avatar

AirX AppLauncher configuration and setup

There are two possible ways to add playout channels to the AirX Launcher interface.

Each playout channel is located on a particular broadcast playout server in the local network. Therefore, it is necessary to add the servers and channels to the configuration of the client workstation.

1. Automatic search for playout servers

Open the **User configuration** window and select the top line **User: Username**. Call the context menu and click the **Search for playout servers in the local network** item.

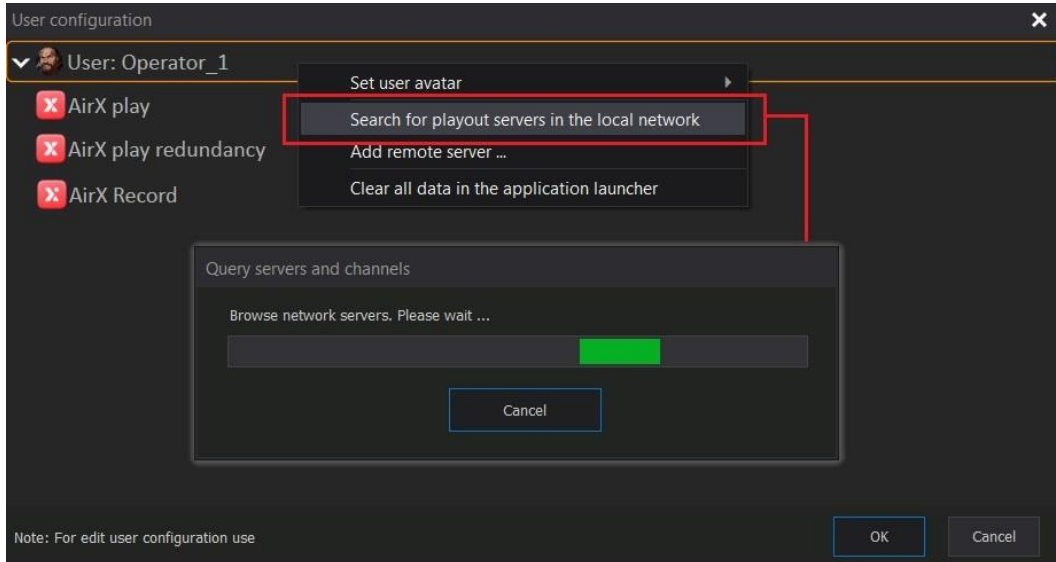


Figure 147. Search for playout servers in the local network

After the search is complete, you will see all the servers available on the local network in the User configuration window.

At the end of the search process, the application window will be changed:

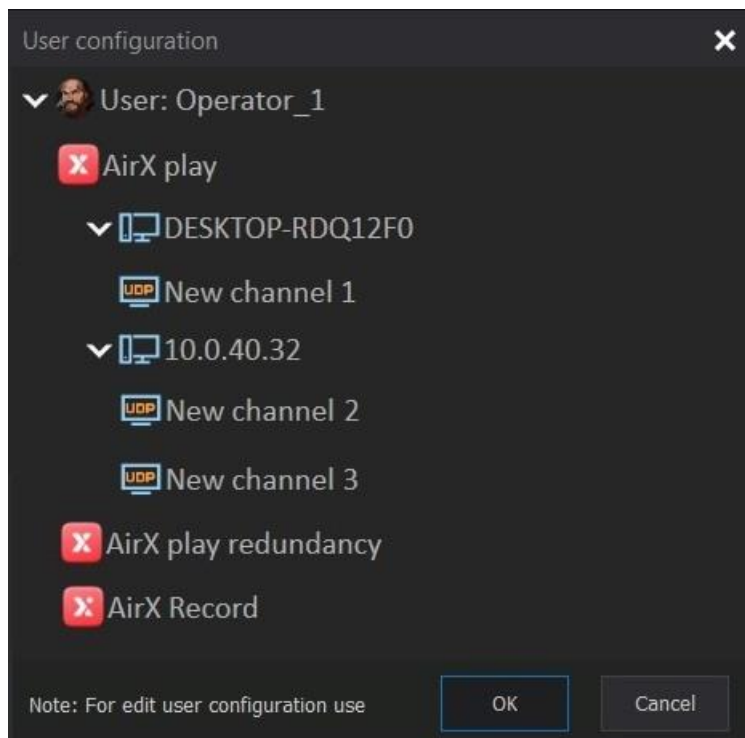


Figure 148. User configuration window with servers

In Figure 148 you can see the two servers found. Click OK to add all servers and channels located on them to the AirX Launcher interface.

If you do not want to manage all playout channels from one client workstation, you have to exclude channels from the configuration. Call the context menu by clicking on the name of the playout channel you want to exclude. Select **Enable / Disable channel for use in the application launcher**. Checkbox means the channel is enabled, unchecked means the channel is disabled.

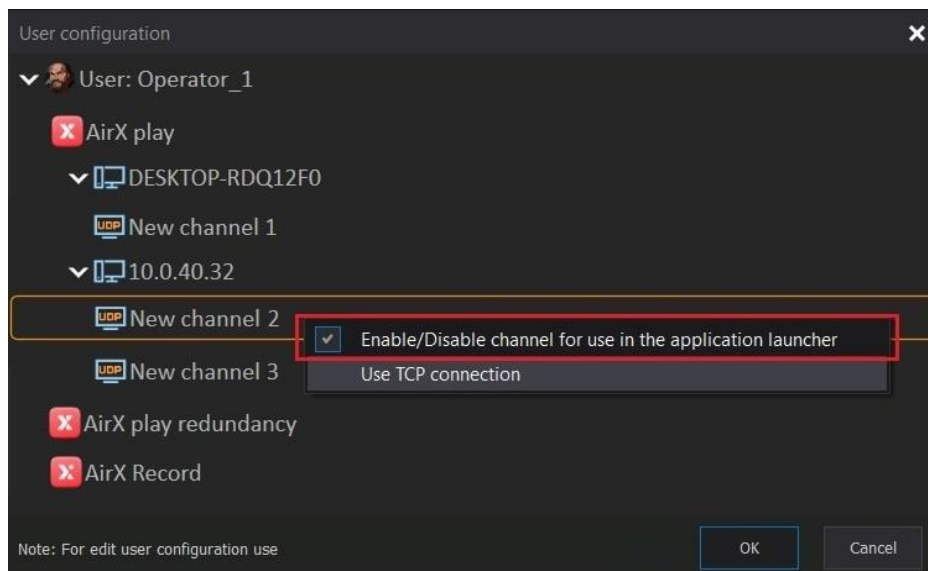


Figure 149. Enable / Disable channel for use in the application launcher

In addition, the AirX Launcher configurator allows you to manage not only playout channels but entire broadcast playout servers:

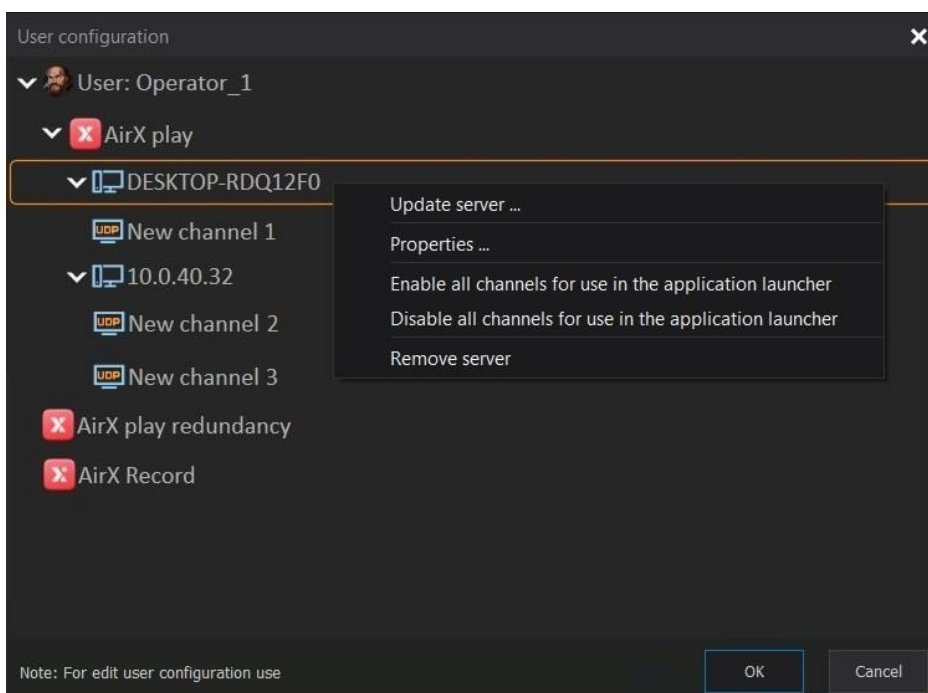


Figure 150. Enable / Disable all channels for use in the application launcher

The context menu of the server (name or IP) contains the following items:

- **Update server** - poll the server again, updating the channel configuration
- **Properties** - edit the **Name** or **IPs** of the server (for example, in case of error in server name)
- **Enable all channels for use in the application launcher** - all channels located on the selected server will be added to the AirX Launcher configuration.
- **Disable all channels for use in the application launcher** - all channels located on the selected server will be excluded from the AirX Launcher configuration but the server will not be removed.
- **Remove server** - the entire server will be removed from the configuration.

After configuration is complete, click OK to apply the changes.

ATTENTION: Use the **Clear all data in the application launcher** item of the user menu **User: Username** to clear the configuration.

2. Add remote servers manually

Open the **User configuration** window and select the top line **User: Username**. Call the context menu and click the **Add remote server** item.

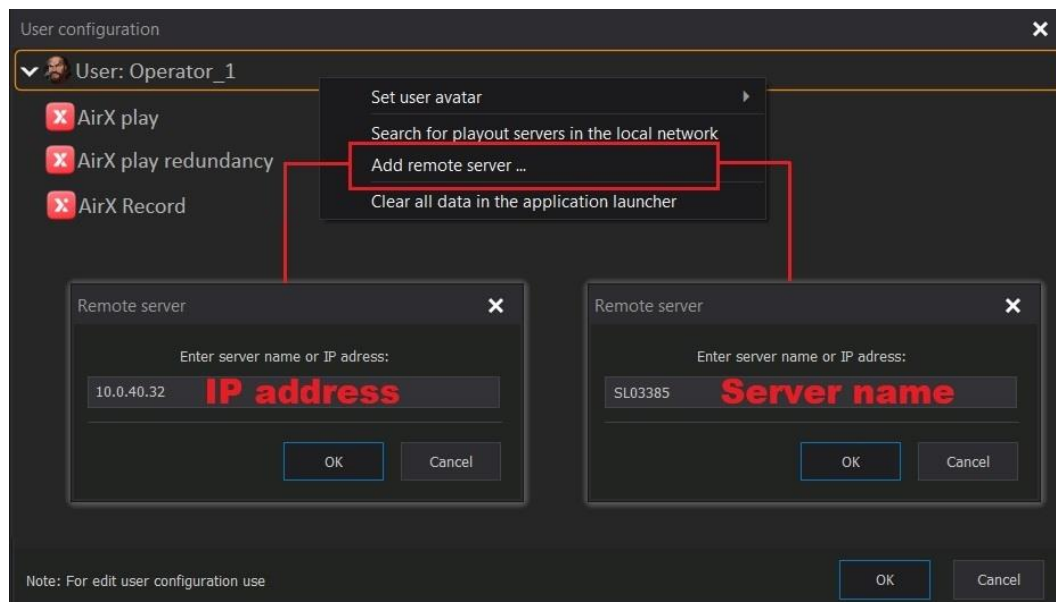


Figure 151. Add remote server manually

In the new **Remote server** window enter the server's system name or IP of the server you want to add. Then click Ok to start search.

At the end of the search process, the application window will be changed:

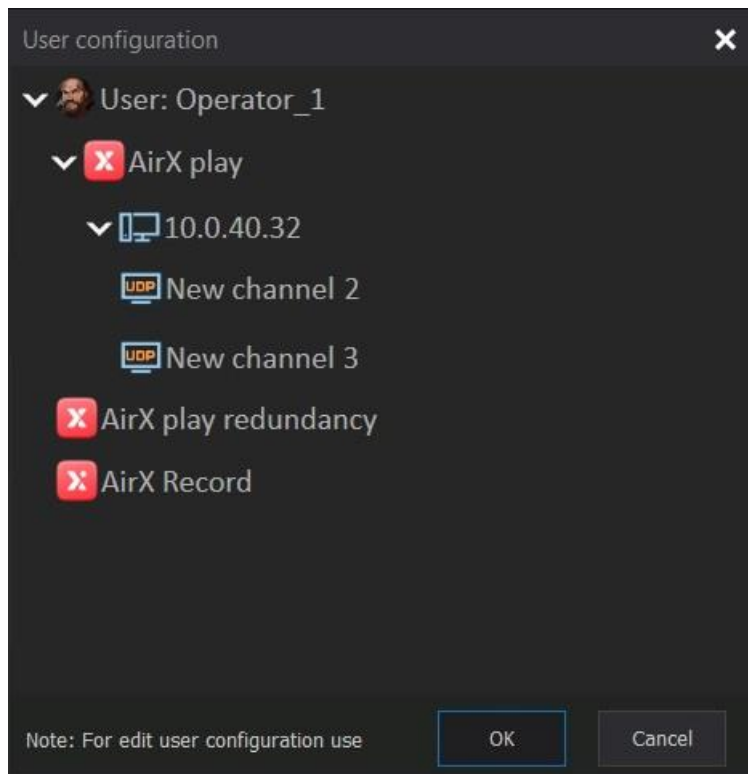


Figure 152. User configuration window with one server

Unlike the automatic search mode, you can only add one server at once in manual mode. You can also add or exclude channels located on this server in the AirX Launcher configuration as described above.

ATTENTION: Use the **Clear all data in the application launcher** item of the user menu **User: Username** to clear the configuration.

After configuration is complete, click OK to apply the changes. The initial interface of the AirX Launcher app will be changed as follows:

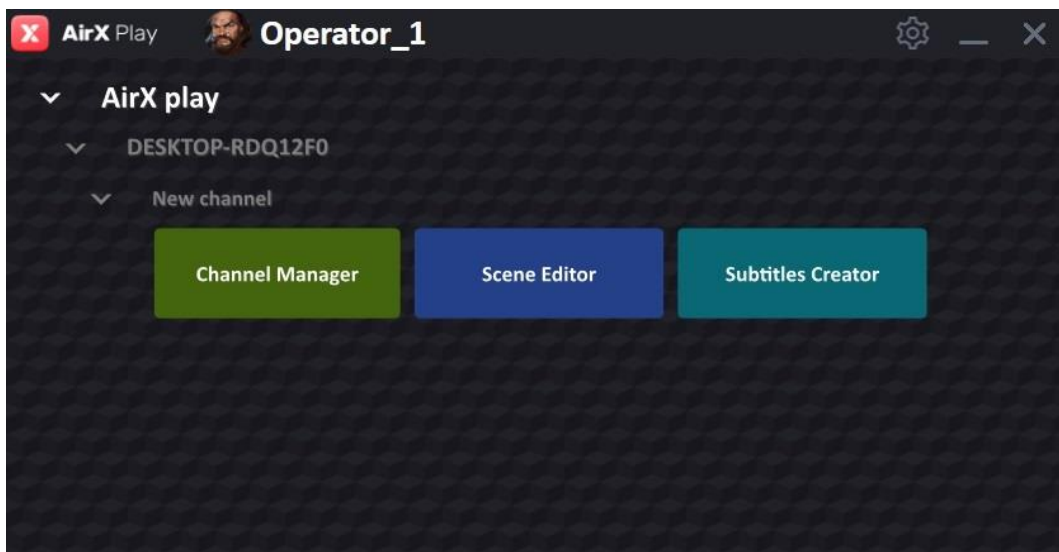


Figure 153. AirX Launcher window with one playout channel

AirX AppLauncher configuration and setup in Redundancy mode

To configure AirX AppLauncher in redundancy mode, use the same methods as described in **AirX AppLauncher configuration and setup** chapter:

1. Double click on the AirX Launcher icon on your desktop to get started with the authorization form. Enter the Login and Password you specified in the **User Accounts** branch of the Server resource tree (see the AirX Control app, **Users** chapter), or use the default Login and Password (Admin; 12345).

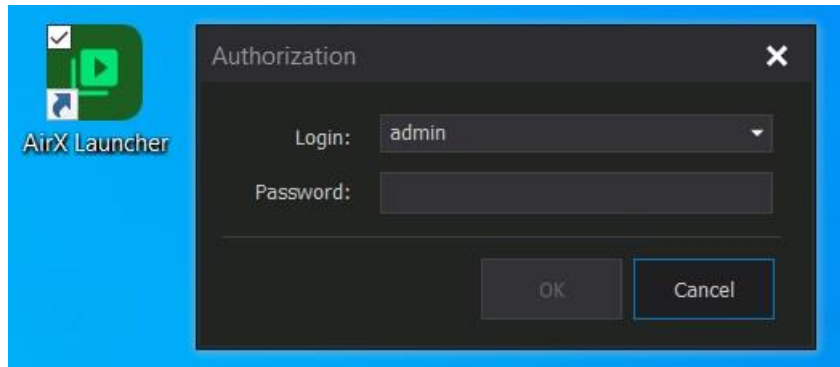


Figure 154. Authorization

2. In the new **vpAppLauncher** window you will see the only one (but important) settings button. Click this button to open the **User configuration** popup window.

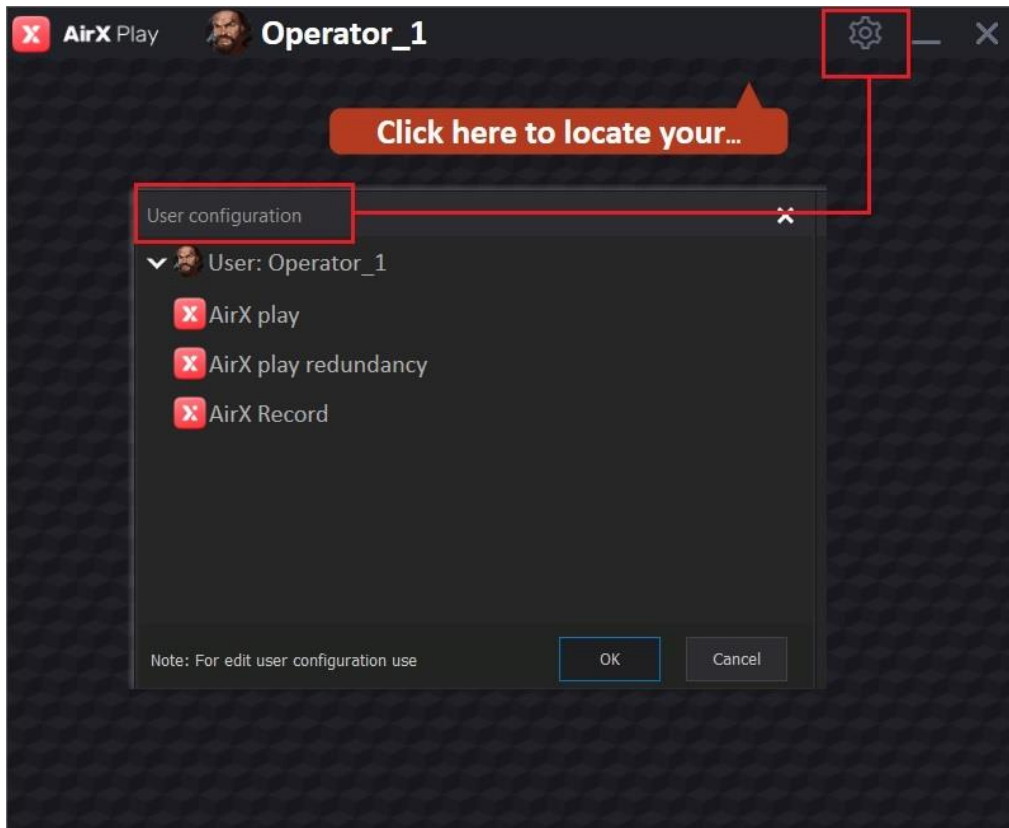


Figure 155. User configuration

3. Open the **User configuration** window and select the top line **User: Username**. Call the context menu and click the **Search for playout servers in the local network** item.

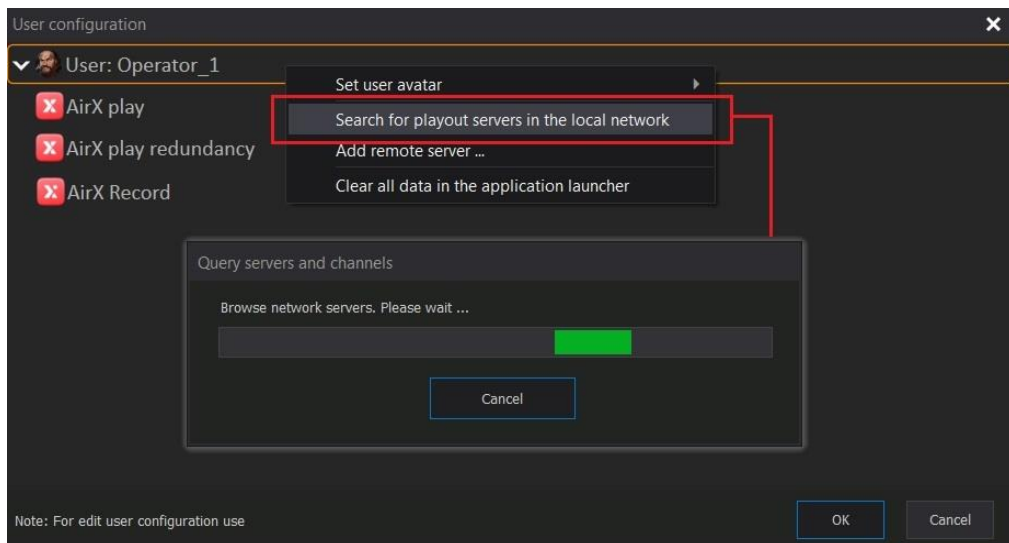


Figure 156. Search for playout servers in the local network

4. After the search is complete, you will see all the servers available on the local network in the User configuration window. At the end of the search process, the application window will be changed:

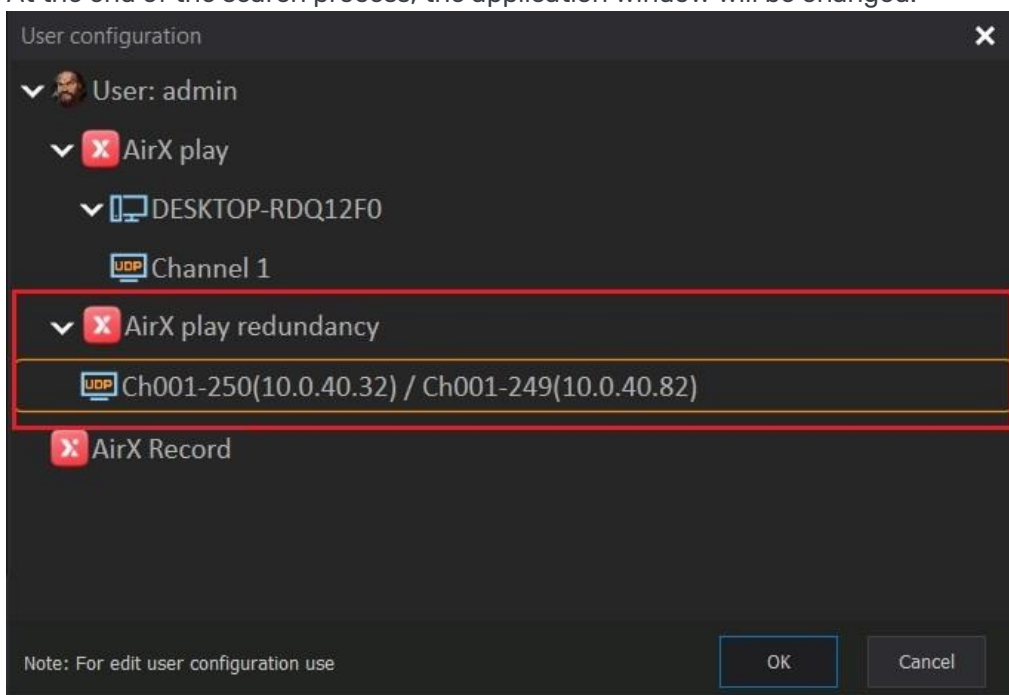


Figure 157. User configuration window with two servers in Redundancy mode

5. You can also add servers that are in redundancy to the AirX Launcher manually. Return to step 3 of the current list and select the upper line **User: Username** in the User configuration window. Call the context menu and select the **Add remote server** item. Enter the IP address of the first server configured in Redundancy mode and click OK.

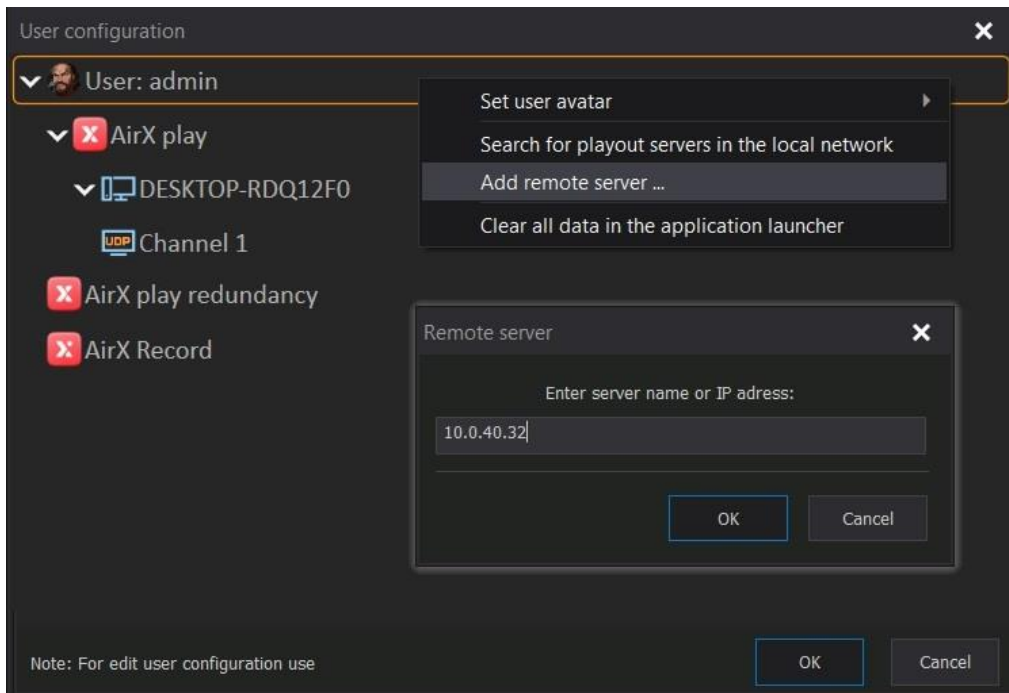


Figure 158. Add remote server manually

6. Repeat the actions described in step 5 of the current list to add a second server. **ATTENTION:** Until the second server is added, do not use the AirX Launcher to access the playout channel applications (especially the Channel Manager app) as this may cause the incorrect software behavior. After configuration is complete, click OK to apply the changes. The User configuration window will be changed:

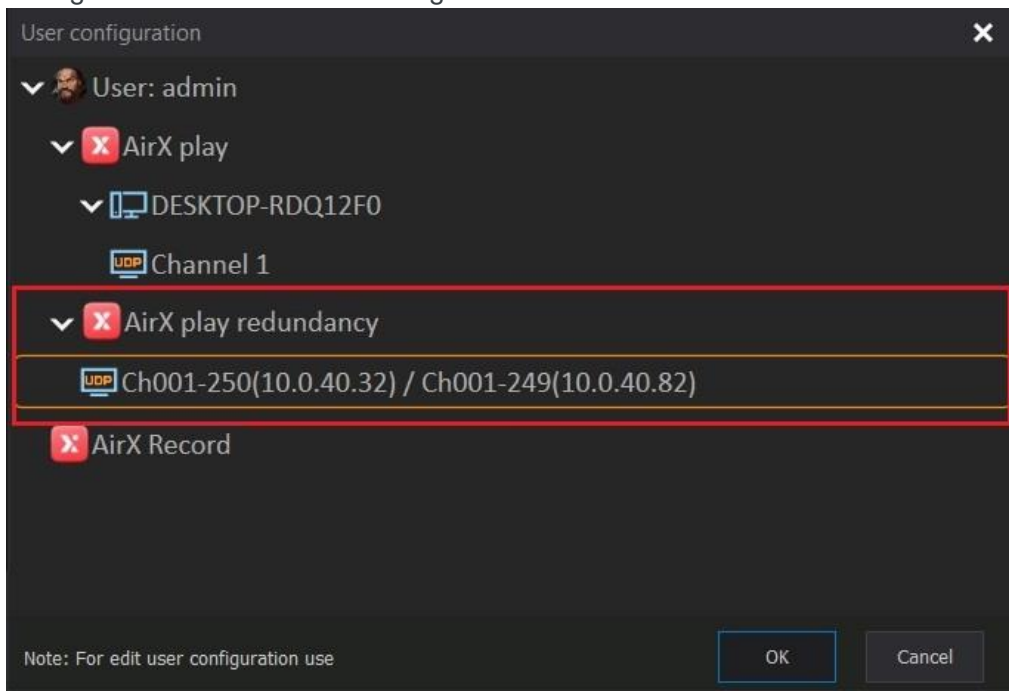


Figure 159. User configuration window with two servers in Redundancy mode

7. The servers added to the AirX Launcher in Redundancy mode are named A and B. This **does not mean** that server A is the main one, and server B is the backup

one. The servers are **completely equal** and the letters are assigned randomly. To switch servers A and B, select a pair of channels configured in redundancy mode, call the context menu and select **Switch [A] [B]** from the drop-down list.

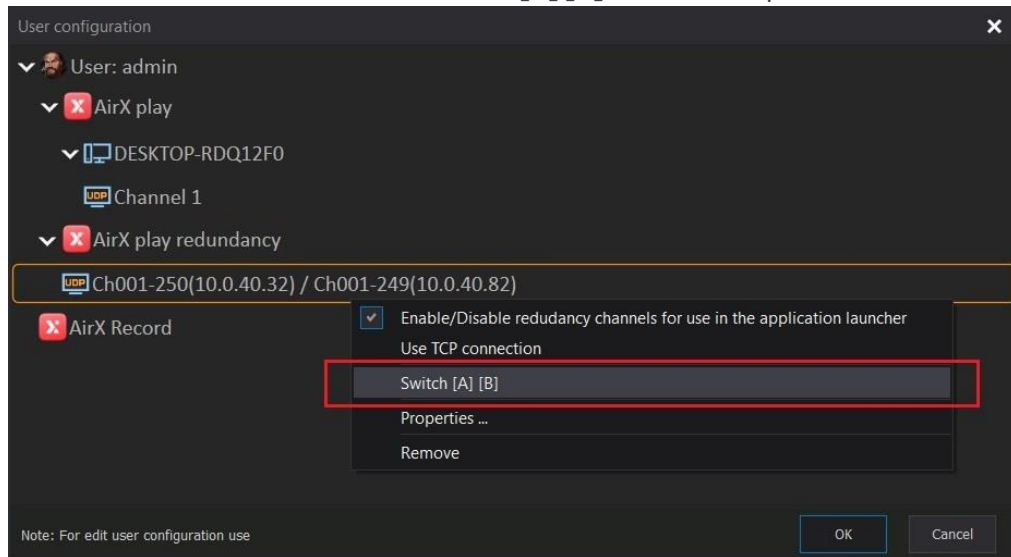


Figure 160. Switch [A] and [B] servers

8. Click OK to add all servers and channels located on them to the AirX Launcher interface.

If you do not want to manage all playout channels from one client workstation, you have to exclude channels from the configuration. Call the context menu by clicking on the name of the playout channel you want to exclude. Select **Enable / Disable channel for use in the application launcher**. Checkbox means the channel is enabled, unchecked means the channel is disabled.

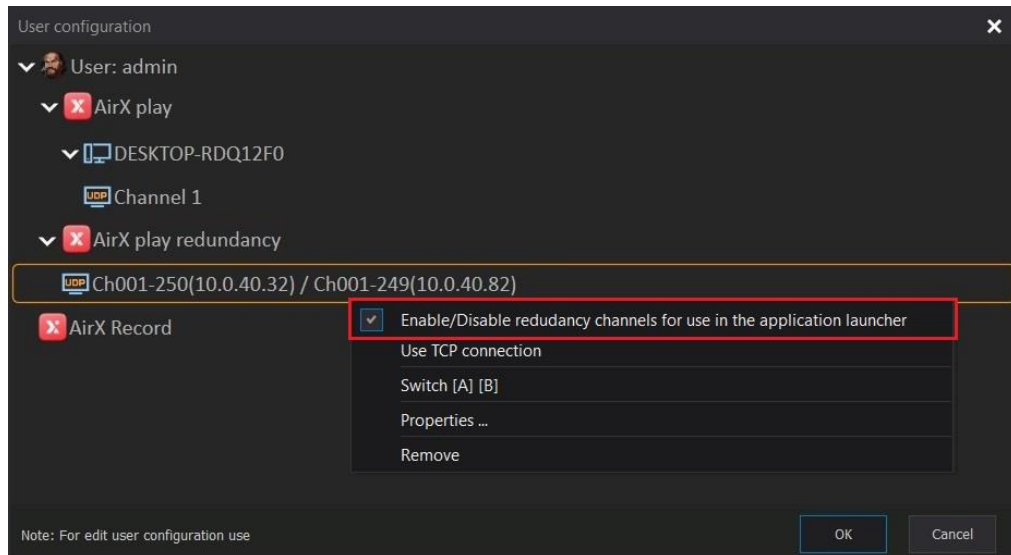


Figure 161. Enable / Disable redundancy channels for use in the application launcher

9. After configuration is complete, click OK to apply the changes. The initial interface of the AirX Launcher app with redundancy channels will change as follows:

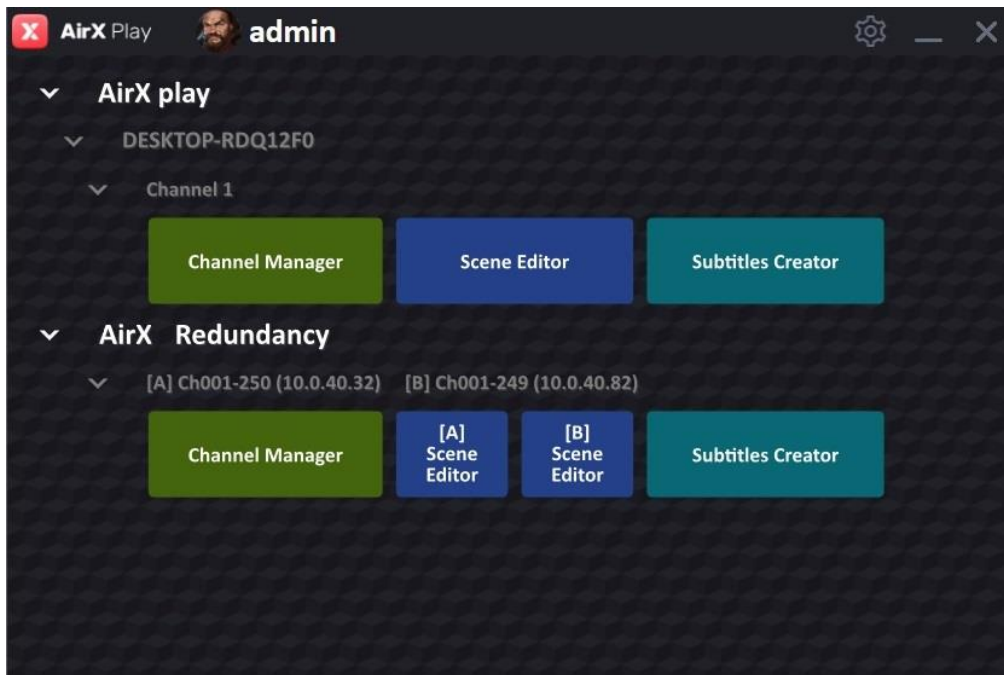


Figure 162. AirX Launcher window with one playout channel and a pair of redundancy

Changing the connection mode

It is not always possible to use a UDP connection due to network conditions. Although the data transfer rate (DTR) over the UDP is higher but in case of networks with an unstable connection, it is better to use a TCP which provides packets retransmission.

Select the playout channel in the User configuration window to change the connection mode from UDP to TCP and back. Call the context menu by right-clicking on the channel name and select **Use TCP connection** in the drop-down list. Checkbox means the TCP connection is enabled; unchecked means the UDP connection is enabled.

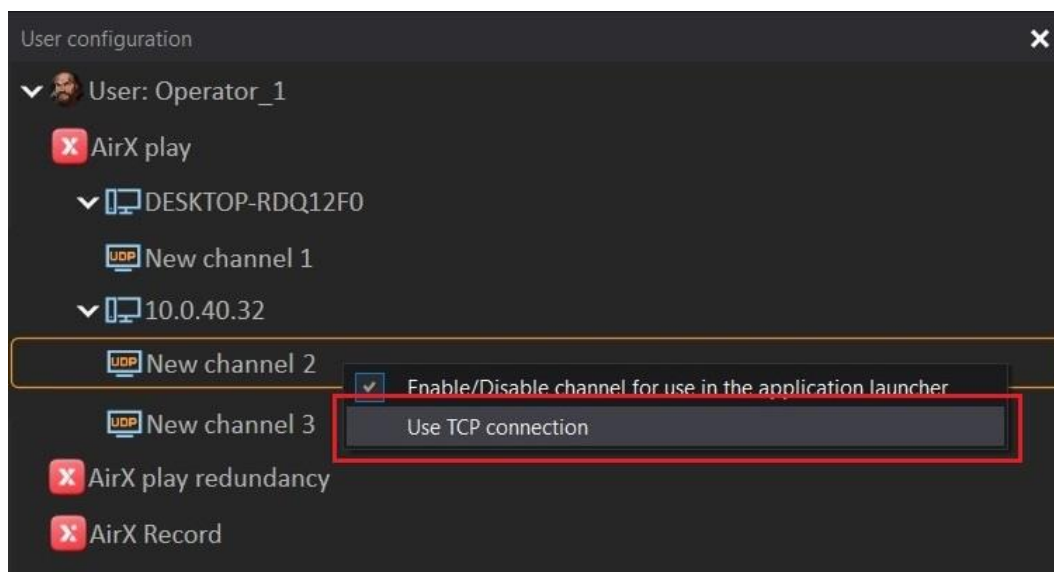


Figure 163. Use TCP / UDP connection

User applications, definition & overview

The main applications for the AirX user:

AirX Launcher is a client workplace application for broadcast playout servers and playout channels addition and launching. This configurator allows you to launch the applications for the playout channel's schedule managing, for CG creation and for subtitles editing.

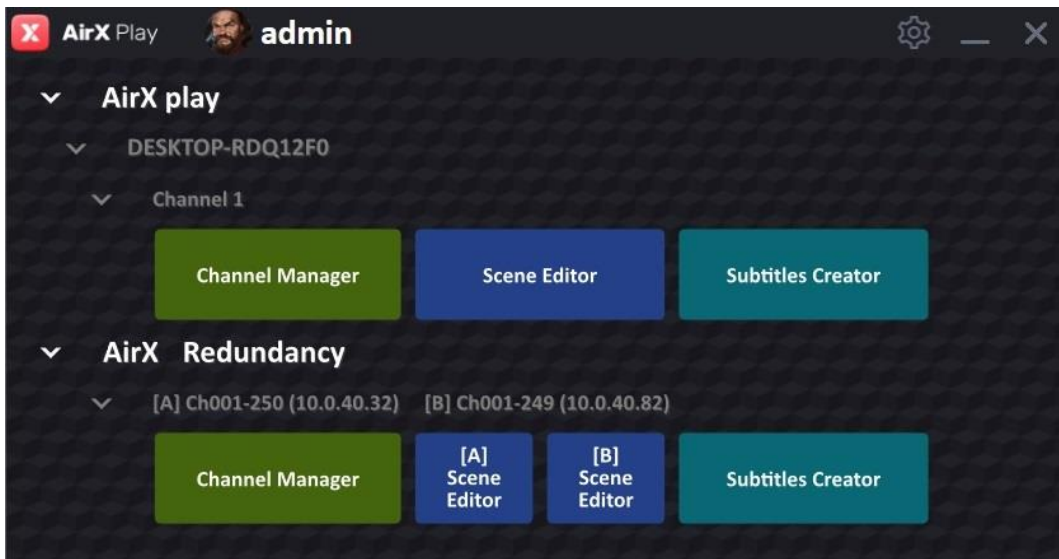


Figure 164. AirX Launcher interface

Channel Manager is the main scheduling application. It allows you to create an OnAir schedule manually or work with a schedule downloaded from a third-party source (broadcast traffic management system). Also, the Channel Manager allows the GC insertions and AD insertion markers processing.

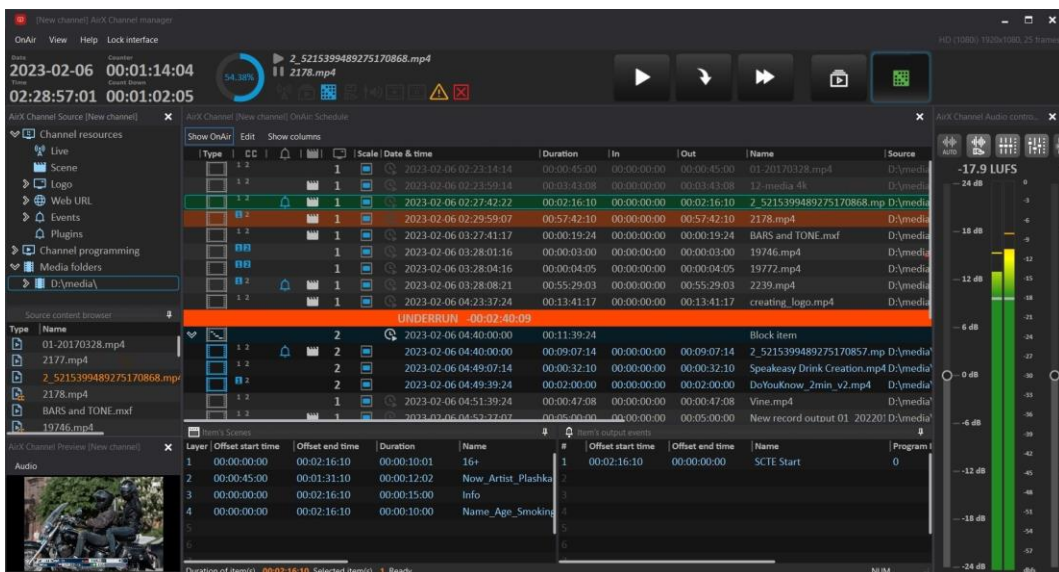


Figure 165. Channel Manager interface

Scene Editor is a built-in CG editor for creation of on-air graphic design scenes and/or graphics conversion to the internal graphic scene format for AirX software. It allows you to operate with CG of various levels of complexity from a simple overlay of a static logo to a multilayer dynamic design using PIP, FILL + KEY, RSS, etc.

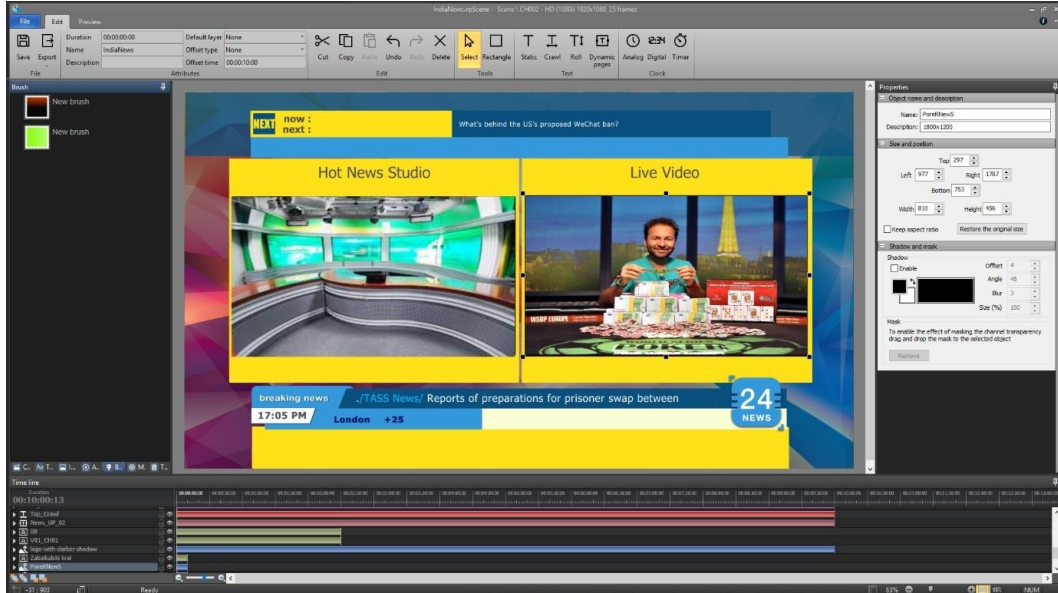


Figure 166. Scene Editor interface

Subtitles Creator is the built-in subtitle editor application for *.srt creation and express editing. AirX broadcast automation can create subtitles up to 8 languages per channel simultaneously.

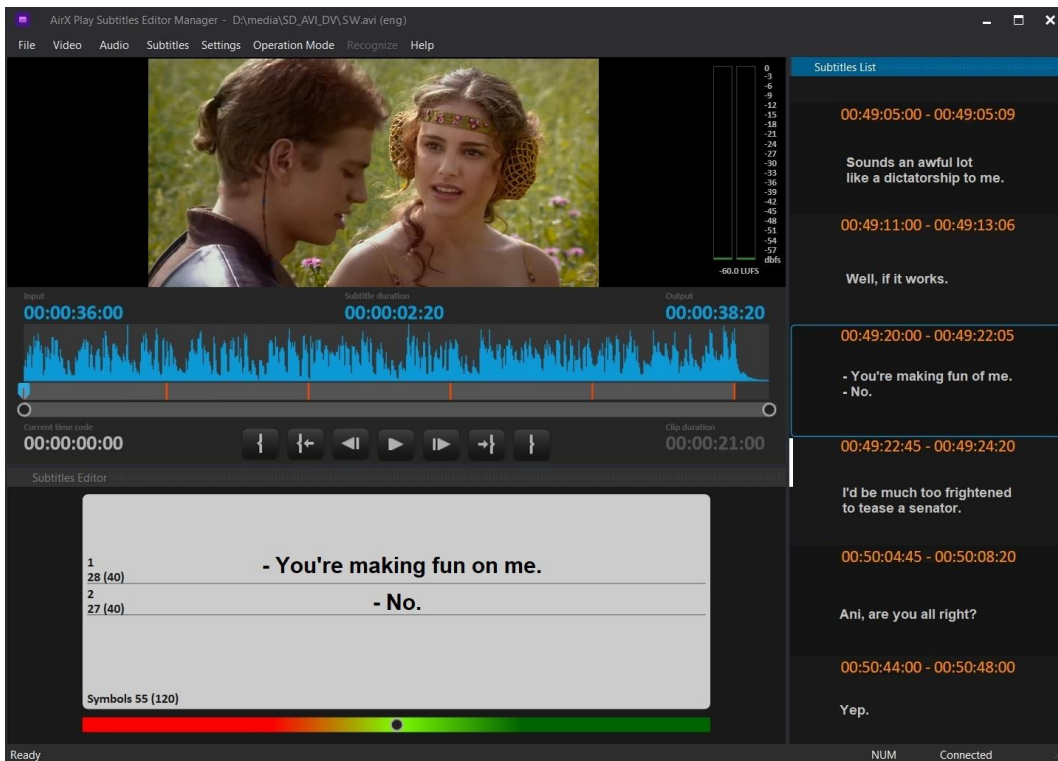


Figure 167. Subtitles Creator interface

User profiles and access

AirX broadcast automation allows you to create independent user profiles. This function allows differentiating the user's permissions to playout channels (services) configured in the system. Each user's profile have an access to the channels he assigned.

For detailed information see the following chapters:

- **Users**
- **User account interface**
- **Set up the user** permissions

You can set the personal permissions for each user:

- Allow channel authorization - general access to the channel
- OnAir control - air control (start broadcasting or forced changing of playback position)
- OnAir editor - access to editing the air schedule
- Schedule editor - access to editing the saved schedule
- Scene editor - access to editing scenes
- Spectator - spectator mode, any actions are prohibited.

It means that you can assign the permissions from a simple observer to a super-administrator.

Use the instructions described in the **AirX AppLauncher configuration and setup** chapter to create a custom configuration of available servers and channels for each user. Edit the list of channels available for a user's profile by changing the **Enable / Disable channel for use in application launcher** parameter.

AirX play (Client-side). Initial interface

Authorization. Launch. Redundancy mode

Double click on the AirX Launcher icon on your desktop to get started with AirX.

When you start the program, the authorization form will be opened. Enter the Login and Password you specified in the **User Accounts** branch of the Server resource tree (see the AirX Control app, **Users** chapter) or use the default Login and Password (Admin; 12345).

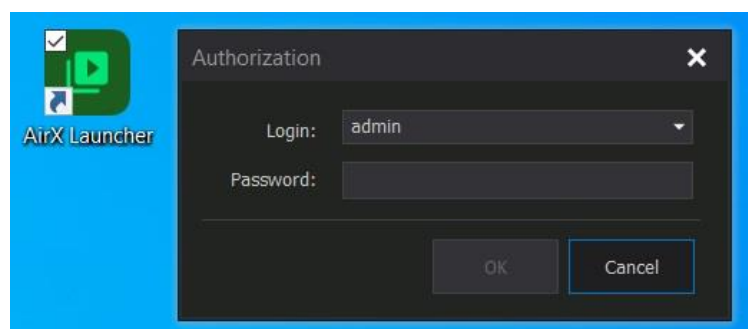


Figure 168. Authorization

In the new **vpAppLauncher** window you will see the initial AirX interface with playout channels, available for logged-in user.

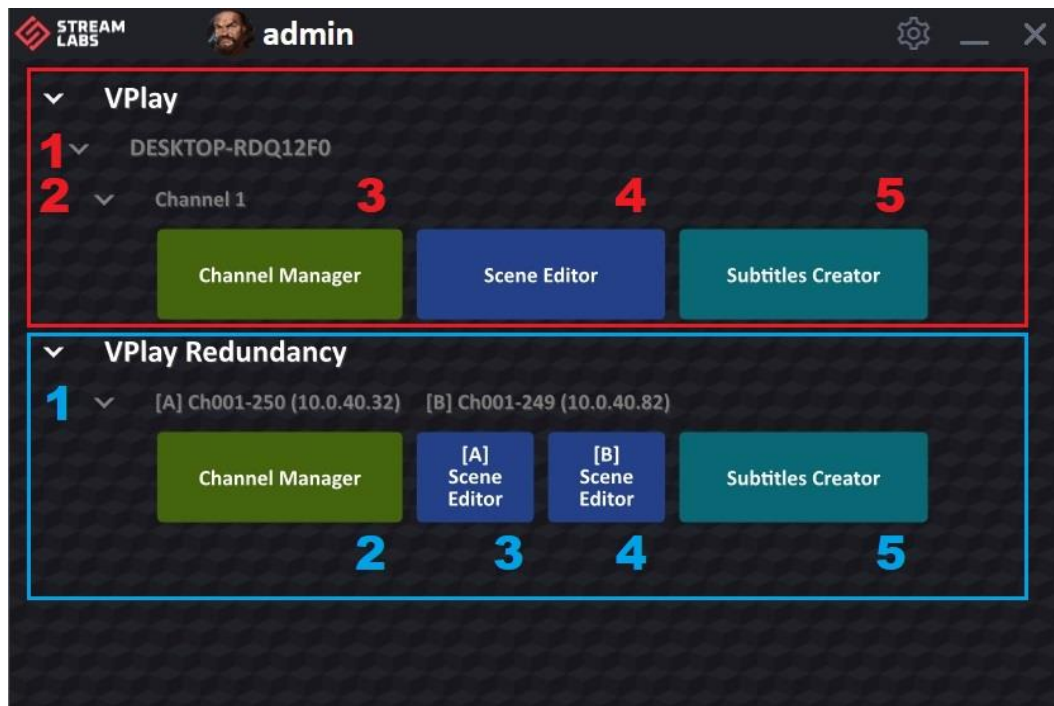


Figure 169. AirX Launcher window with one playout channel and a pair of redundancy

You can see two possible AirX modes in the Figure above: One single playout channel (outlined in red) and a pair of channels, working in Redundancy (outlined in blue).

Single playout channel attributes:

1. The name of the broadcast playout server where the channel is located
2. The name of the playout channel
3. Channel Manager scheduling application, associated with the channel
4. Scene Editor built-in CG editor, associated with the channel
5. Subtitle Creator built-in subtitle editor, associated with the channel

Each playout channel will launch its own instances of the Channel Manager, Scene Editor and Subtitle Creator applications. You cannot open schedules of several playout channels in one Channel Manager window!

A paired Redundancy channels attributes:

1. Location and name of each of the pair of channels. [A]Ch001-250(10.40.32) means: [Server A] Playout channel name (IP address of the server where the channel is located). The same for the second channel.
Letters A and B are assigned to playout channels at the moment they are added to the AirX Launcher application. This **does not mean** that server A is the main one, and server B is the backup (!) Servers and channels in 1+1 mode are completely equal and letters A and B are assigned randomly.
2. Channel Manager scheduling application for both channels. This allows you to manage the schedules of both channels and send control commands to both servers simultaneously.
3. Scene Editor built-in CG editor, associated with the channel A
4. Scene Editor built-in CG editor, associated with the channel B
5. Subtitle Creator built-in subtitle editor for both channels.

Channel Manager

User interface description

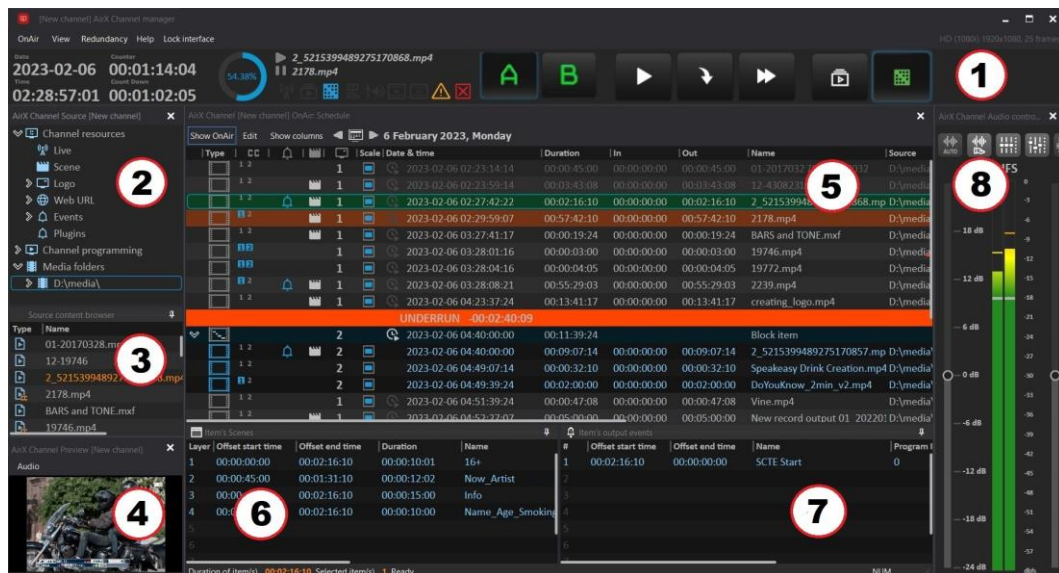


Figure 170. Channel Manager interface

Channel Manager Interface includes:

1. Channel Manager main window - Playout channel management, control menu
2. Channel Source window - All connected sources of any type
3. Source content browser window - File manager that contains all contents of folders connected to the channel
4. Channel Preview window - Visual preview of the processing schedule
5. Channel OnAir window - Playlist / Schedule window for scheduling
6. Item's Scenes window. Channel CG - CG overlay scheduling. Refers to the window 5
7. Item's Output Events window - Output Control events scheduling. Refers to the window 5
8. Channel Audio ctrl window - Channel sound settings
9. Channel Logo Slot window - Channel logo slots
10. Channel Manual GFX ctrl window - Overlay and launch of CG objects in manual mode
11. Channel Auto GFX ctrl window - Overlay and launch of CG objects in auto mode - control window
12. Channel Player window - Channel video player
13. Manual Events ctrl window - Manual control of the output of external events
14. Channel command pane - Quick command settings pane
15. Schedule Editor window - Additional window for editing schedules and playlists (off-the-air scheduling)
16. Countdown window - A countdown timer to a selected event in the schedule.

By the default, the interface of Channel Manager contains windows 1-8.

Channel Manager main window

The main window of Channel Manager application contains info fields and control elements.

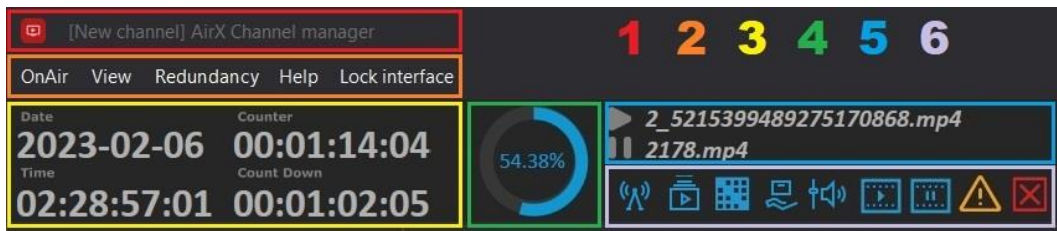


Figure 171. Channel Manager main window (part 1)

1. The title bar of the application window. The square brackets contain the name of the current playout channel.
2. Control menu includes the following submenu items:
 - **OnAir**. Click this menu to expand a drop-down to change the channel workflow (Playlist or a Schedule). This menu duplicates the command buttons in the upper right part of the app. window.



Figure 172. Playlist/Schedule modes

- **View**. Click this menu to expand a drop-down list of Channel Manager application windows and possible actions with them. This menu allows you to customize the order and location of windows on the screen, as well as save these location settings as presets. Checkboxes mark windows that open by default by the initial launch of the Channel Manager.

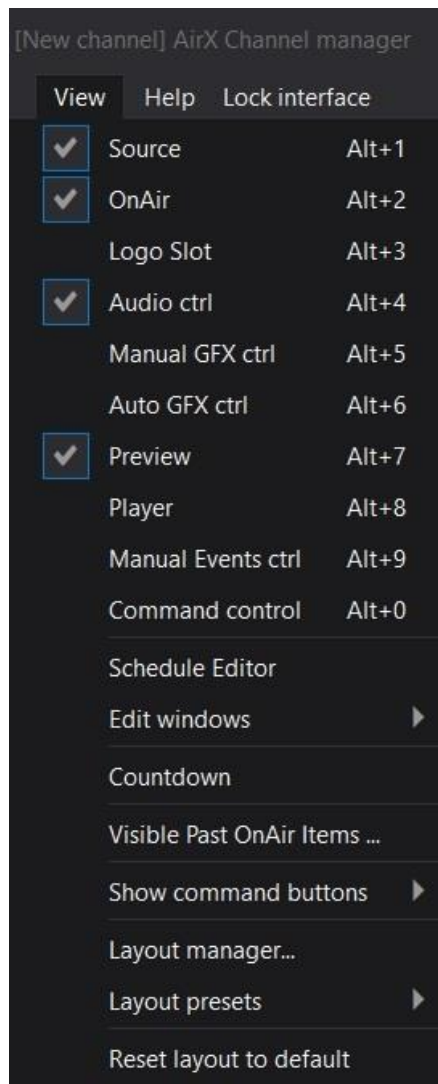


Figure 173. Channel Manager System menu. View submenu

Source - Enables the Channel Source and Source content browser windows containing the channel source tree. See the Channel Source window, Source content browser window chapters for details.

OnAir - Enables the Channel OnAir window containing the air schedule/playlist. See the Channel OnAir window chapter for details.

Logo Slot - Enables a window with available logo slots. See the Channel Logo Slot window chapter for details.

Audio Ctrl - Enables the channel's audio settings window. See the Channel Audio ctrl window chapter for details.

Channel Manual GFX ctrl - Enables a window for overlay and launch of CG objects in manual mode. See the Channel Manual GFX ctrl window chapter for details.

Channel Auto GFX ctrl - Enables a control window for overlay and launch of CG objects in auto mode. See the Channel Auto GFX ctrl window chapter for details.

Channel Preview - Turns on the visual preview of the current playout channel in additional window. See the Channel Preview window chapter for details.

Channel Player - Enables the channel's video player. See the Channel Player window chapter for details.

Manual Events ctrl - Enables a window that allows manual control of the output of external events. See the Manual Events ctrl window chapter for details.

Command control - Turns on the Quick command settings pane in additional window. See the Channel command pane chapter for details.

Schedule Editor - Turns on an additional window for editing schedules and playlists (off-the-air scheduling). See the Schedule Editor window chapter for details.

Edit windows - Navigation between schedules/playlists opened in the Schedule Editor window

Countdown - Turns on the forward / backward countdown additional window. See the Countdown window chapter for details.

Visible Past OnAir Items - a setting that allows you to specify how many rows passed in the on-air schedule will be displayed in the OnAir window. Here you can set any value. By default, AirX shows ten passed rows of the schedule but it stores information about the previous three days, so it can show as many rows, as necessary.

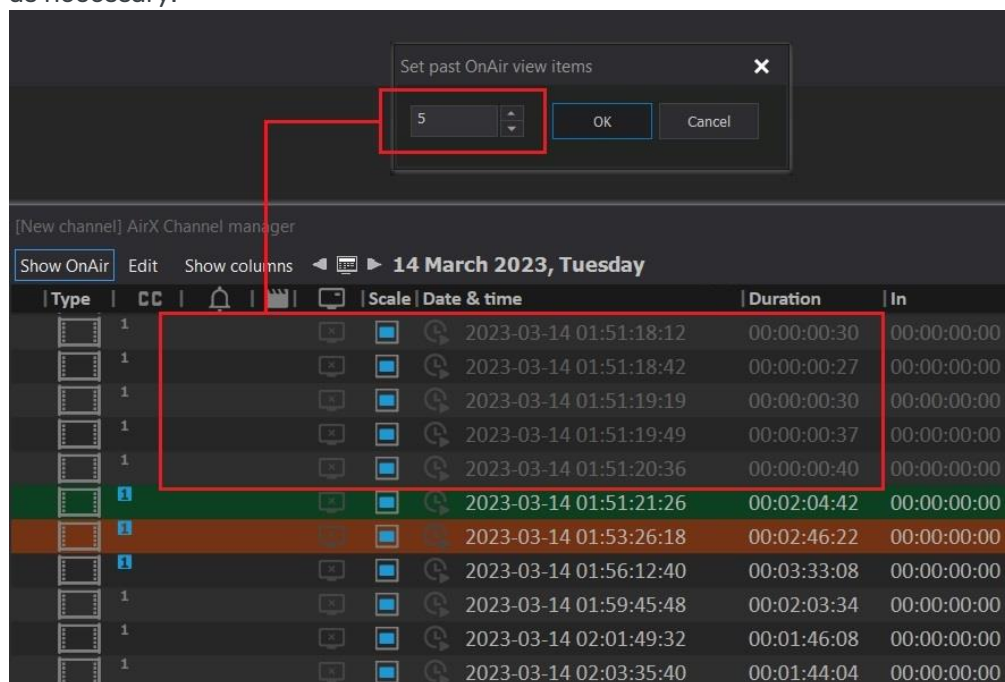


Figure 174. The passed schedule rows

Show command buttons - a setting that allows you to enable or disable the command buttons on the top bar of the main Channel Manager window.

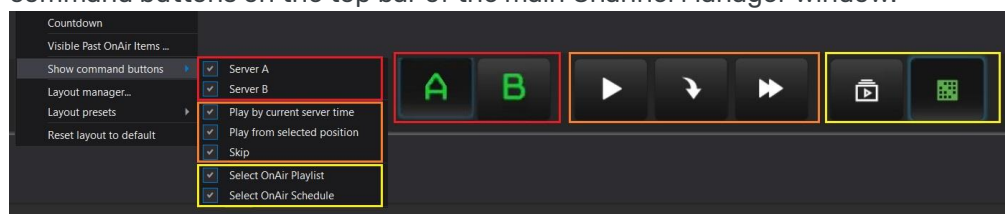


Figure 175. Enable/Disable command buttons

Layout manager and **Layout presets** allow you to create and save custom window layouts for the Channel Manager application. See the Creating a custom layout chapter for details.

Reset layout to default - A button that resets the layout of the interface windows to the initial state ("Return everything as it was" or "Bring everything back!").

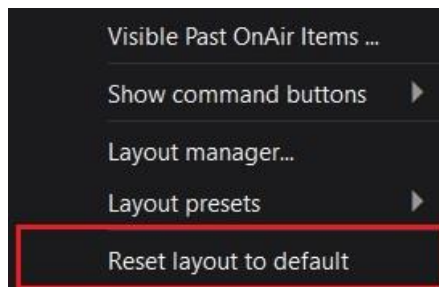


Figure 176. Bring everything back (reset layout to default)

- **Redundancy** setting allows you to synchronize playout channels that are in the redundancy mode.

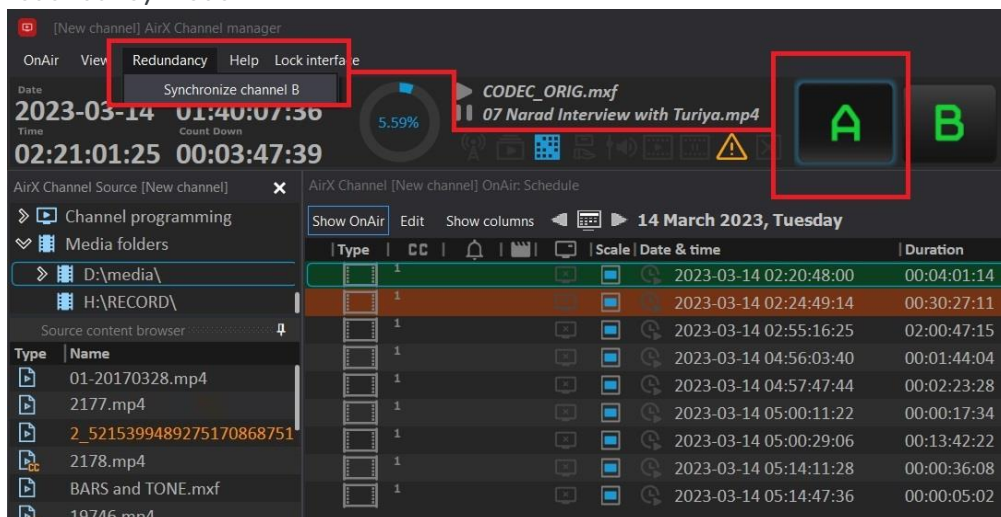


Figure 177. Synchronize channels

See the **Channel redundancy (1+1 redundancy settings)**, **AirX channel redundancy (1+1)** chapters for details.

- **Help.** Click this menu to open the About info window. In this window you can find the Name, version and edition of AirX Play product.

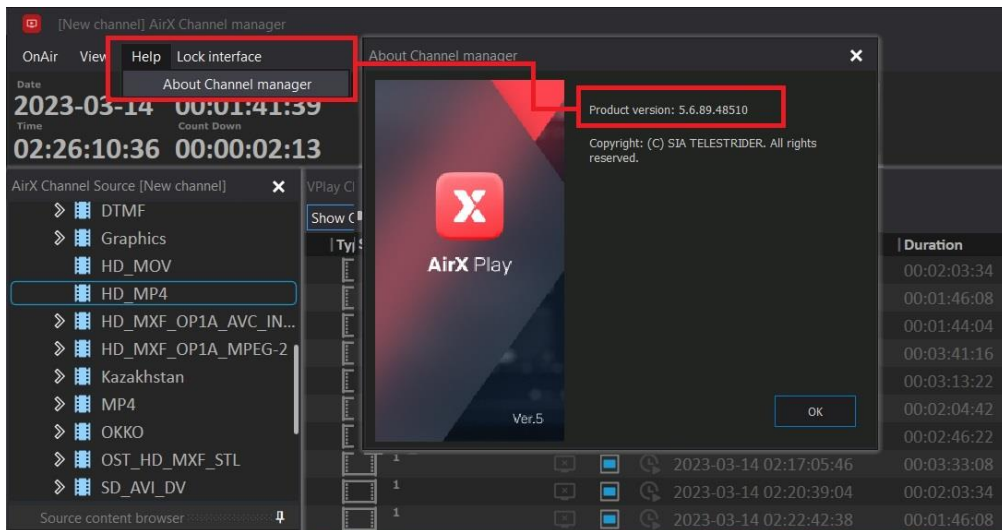


Figure 178. About Channel manager

- **Lock interface.** A control button to lock the Channel Manager interface. The program will stop responding to any user's actions until the interface is unlocked by pressing Lock Interface again.

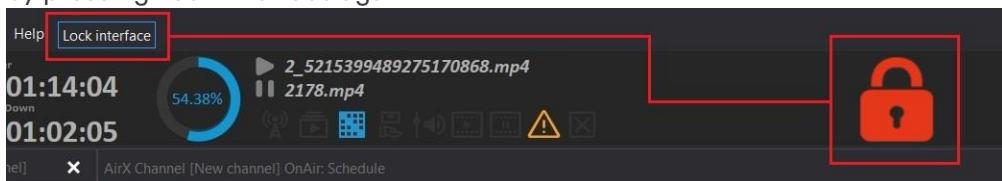


Figure 179. Lock interface

3. Time counters info pane. Contains four counters:

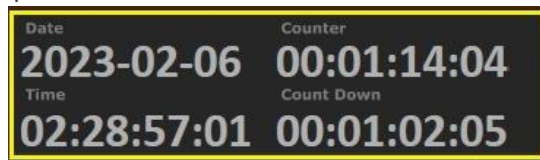


Figure 180. Time counters

- Date - current date, synchronized with the server date
 - Time - current time, synchronized with the server time
 - Counter - the time passed since the beginning of playback of the current schedule row
 - Count down - the remaining time until the end of playback of the current schedule row
4. Pie chart progress bar of the current schedule row, showing the progress both in graphical representation and in percent

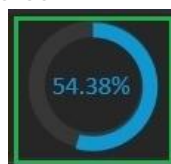


Figure 181. Pie chart progress bar

5. Info fields showing the names of active schedule rows:
 - On-air (currently playing clip)

- Ready for playback (next in the schedule)



Figure 182. Active schedule rows

6. Info icons, displaying the modes and current statuses of the channel



Figure 183. Info icons of the Channel Manager main window

- **Live onAir** - External Live source is on-air now
- **Playlist mode** - AirX is in the Playlist mode
- **Schedule mode** - AirX is in the Schedule mode
- **Manual logo** - Logo overlay in manual mode
- **Audio in manual mode** - Automatic loudness normalization is disabled.
- **Reserve clip in program** - The block scheduled as a reserve (see the **Media folders and content replacement** chapter for details) is on-air now
- **Reserve clip in preview** - The block scheduled as a reserve will be played next
- **Warning and Error** icons:



Figure 184. Warning and Error icons

Warning (yellow triangle) indicates that there are files in the schedule, whose parameters do not match the Playout channel settings (aspect ratio, fps, etc.). The files will be played according to the schedule and the broadcast will not be stopped. According to the "non-critical" status, such files are not highlighted in the schedule window by default. The highlighting of Warnings elements can be enabled from the Edit menu (see the **Channel OnAir window, Schedule mode** chapter for details).

Error (red cross) indicates that schedule contains files with critical errors. For example, the video files that there are in the schedule are missing from the broadcast playout server storage or corrupted. Such error rows (missing or corrupted video files, CG files, incorrectly filled service slots) will be highlighted in red in the schedule. In addition, their location will also be duplicated by a red mark in the scroll bar of the schedule window on the right.

If the schedule playback reaches the row marked in red, the behavior of AirX automation will depend on the reason that caused the Error status. For example: if an error is caused by a missing CG file on the server storage, the primary event (the video file) will be played without overlays. The broadcast will not be stopped. However, if the error is caused by a missing or critically corruption of a primary event (a video file in the schedule), you will see a black field on the air (or media file/live input, specified as a replacement instead of a black field). See the **Media folders and content replacement**, and the **Input redundancy** chapters for details.

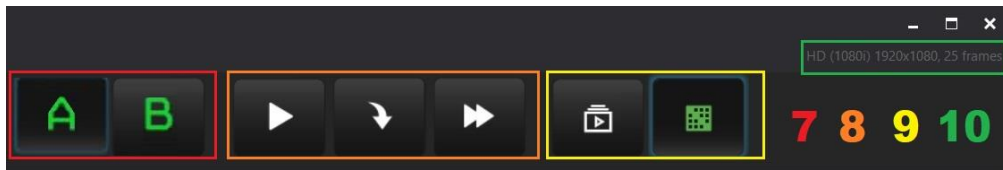


Figure 185. Channel Manager main window (part 2)

7. Control buttons for switching between the schedules of servers A and B, when working in redundancy mode. See the **AirX channel redundancy (1+1)** chapter for details.
8. Main function buttons to control the playback of the schedule in manual mode.
 - **Play by current server time** – click it to start the playback of a schedule according to the current server time.
 - **Play from the selected position** – click it to interrupt the currently playing clip and jump to the currently selected (highlighted) item in the schedule.
 - **Skip** – click it to interrupt the currently playing clip and jump to the next item in the schedule.
9. Control buttons to change the channel workflow (Playlist or a Schedule).
10. The info field contains the current channel format, resolution and fps.

Channel Source window

The Channel Source window contains the Channel source tree and indicates all the connected sources of any type, including File folders, Live sources, CG folders and files, External events etc.

In addition the Channel Source window provides the functionality for editing playlists and channel schedules (both the on-air and off-the-air scheduling).

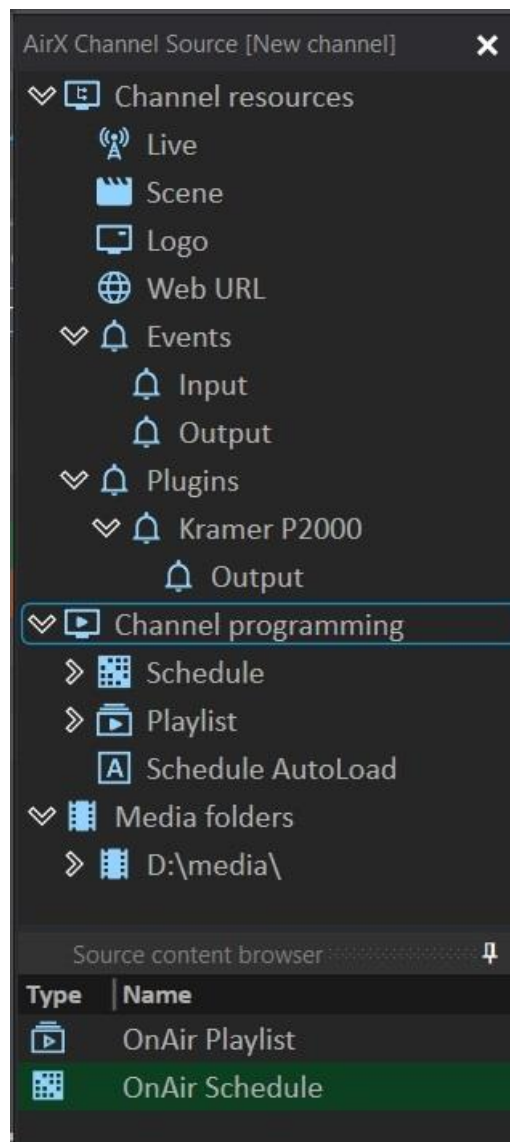


Figure 186. AirX Channel Source window

The Channel Resource tree contains the following branches:

- **Live** – contains all the connected Live sources, available for the current Playout channel (see the **Channel live inputs** and the **Live sources connection and distribution** chapters for details).
- **Scene** – contains all the CG scenes, available for the current Playout channel. CG scenes are stored in the broadcast playout server storage in folders associated to the channel format (for example: D:\Ch1\Scenes\1920x1080). Folders are created automatically in the moment of a playout channel creation; changing the folder path is not possible.
- **Logo** – contains all the logos, available for the current Playout channel. Logos are stored in the broadcast playout server storage in folders associated to the channel format (for example: D:\Ch1 \Logo\1920x1080). Folders are created automatically in the moment of a playout channel creation; changing the folder path is not possible.
- **Web URL** – URLs of WEB resources that can be used as schedule elements. All sources in this section have to be added manually from the client application interface. See the **WEB URL mode** chapter for details.

- **Events** – contains branches **Input** and **Output** for different types of external events. The **Input** branch contains external events that can be detected by AirX in input streams. For example, the SCTE-35 markers from the incoming satellite stream. The **Output** branch contains external events that AirX can send in its output stream. For example, the ad markers generated by the playout channel. See the **AD insertion (DAI) workflow** chapter for details.
- **Plugins** – contains branches, associated with the connected external devices, available for the current playout channel. You can see the connected Kramer matrix switcher as an example in the Figure 186. See the **External devices** chapter for details.
- **Channel Programming.** Expand the branch to see the following items:
 - Schedule** – Edit the channel schedules,
 - Playlist** – Edit the channel playlists,
 - Schedule Autoload** – Edit the auto-loaded schedules.
 All these branches are actually file folders on the broadcast playout server. These folders contain schedule files of different types. Therefore, each of the schedules stored in these folders can be edited. For a detailed description of how to work with different types of schedules, see the following chapters:
 - Scheduling of Simple TV channels**
 - Live streams and frequently changing schedules. Live video workflow.**
 - Live streams and additional playlists. Prescheduling workflow.**
 - AD insertion (DAI) workflow**
 - AirX channel redundancy (1+1)**

In addition the Channel Programming branch allows you the on-air scheduling for both the on-air schedule and on-air playlist.

Click the **Channel Programming** branch to open the OnAir Playlist and the OnAir Schedule in the **Source content browser** window.

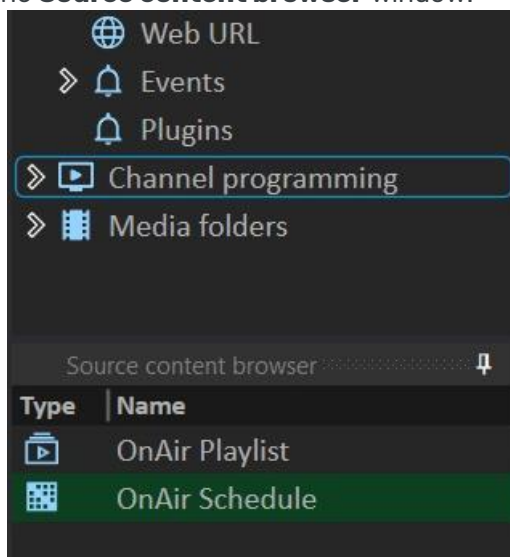


Figure 187. OnAir Playlist and OnAir Schedule

There are the playlist and the schedule that are currently active (OnAir). If the AirX is in the Schedule mode, the OnAir Schedule file will be highlighted in green. This means that the editing is available only from the workspace of the **Channel OnAir** window. At the same time, you can open the active OnAir Playlist (not highlighted in green) in an additional window and edit it.

The same works with the Playlist mode - you can simultaneously edit the active schedule (during the playback of the playlist), opening it in an additional window.

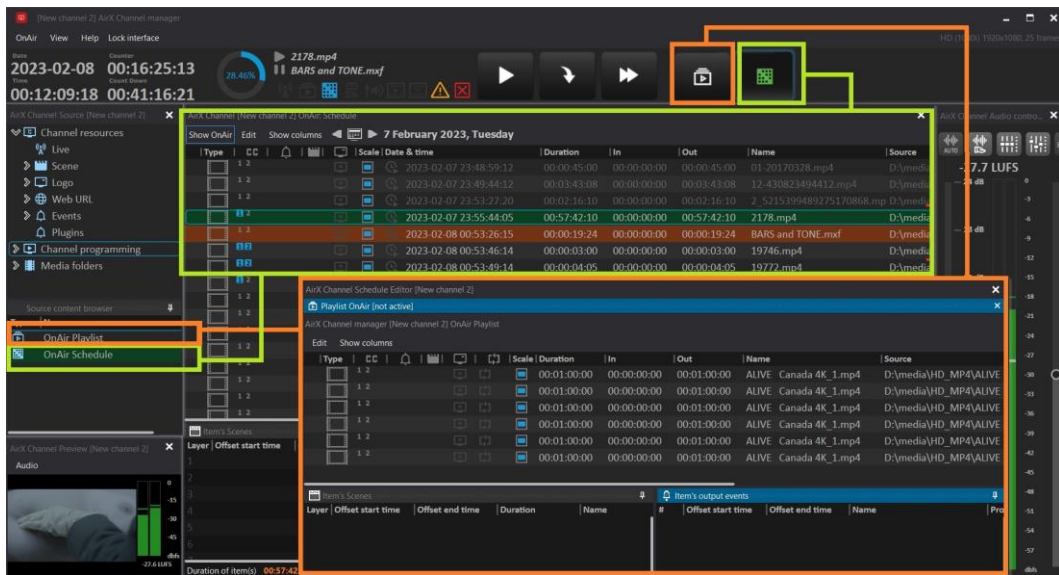


Figure 188. OnAir Playlist and OnAir Schedule

- **Media folders** – contains all the file folders, available for the current Playout channel. See the **Media folders and content replacement** chapter for details.

Source content browser window

The Source content browser window is intended to show the contents of the **Channel Source menu** branches of the Channel resource tree.

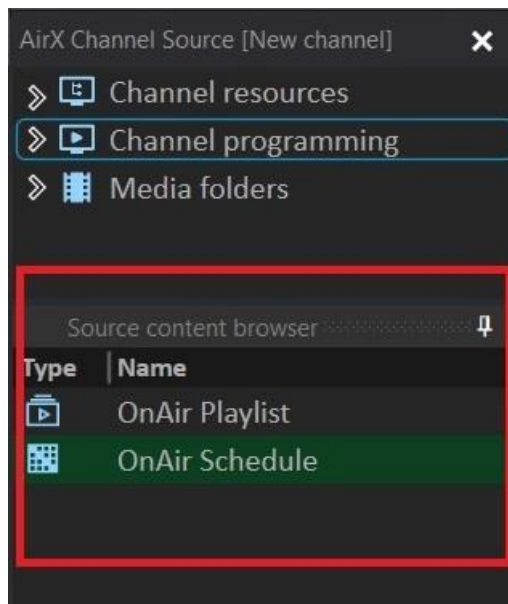


Figure 189. Source content browser window

1. The **Live** branch of the Channel resource tree contains all the connected Live sources, available for the current Playout channel.

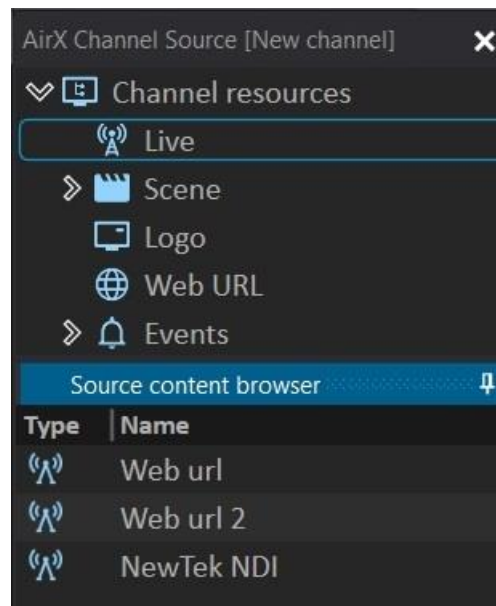


Figure 190. Live branch of the Channel resource tree

All sources in the Live branch must be configured as Live inputs in the AirX Control app on the broadcast playout server (see the **Channel live inputs** chapter for details).

The Source content browser window contains the following columns for the **Live** branch:

Type – Content type icon

Name – The names of the Live sources

Duration – The scheduled playback time of the Live source. Normally this column shows the actual duration of each video file but in case of the Live input the default value is 01:00:00:00. You can change this value to make your source playback shorter.

The context menu allows you to search through the list of sources.

2. The **Scene** branch of the Channel resource tree contains a file manager of all CG files and subfolders available for the current Playout channel.

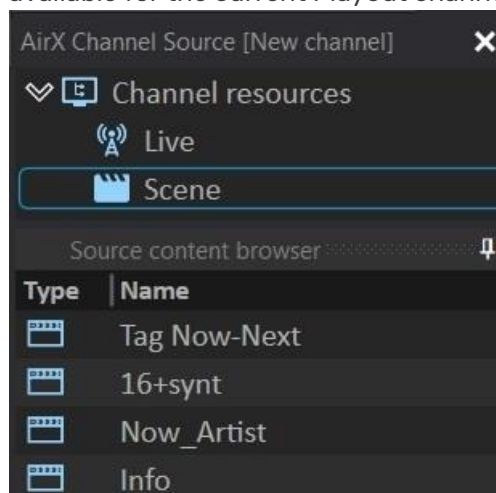


Figure 191. Scene branch of the Channel resource tree

All the CG scenes, available for the current Playout channel are stored in the broadcast playout server storage in folders associated to the channel format (for example: D:\Ch1\Scenes\1920x1080) as *.vpScene files. Folders are created

automatically in the moment of a playout channel creation; changing the folder path is not possible. AirX broadcast automation supports subfolders within the defined channel folder.

The Source content browser window contains the following columns for the **Scene** branch:

Type – Content type icon

Name – The names of the *.vpScene CG files

Duration – The scheduled playback time of the *.vpScene CG files. This column shows the actual duration of each CG file.

Def. Layer – The layer for on-air CG overlay. Scenes have def.layer = 0 by default

Def. Duration – The duration of CG scenes, set automatically based on the duration of the longest scene element.

The context menu allows you to search through the list of Scenes.

If you select one of the Scenes in the Source content browser window, the **Show Media Info** context menu item will be activated. The Media Info will be opened in an additional window.

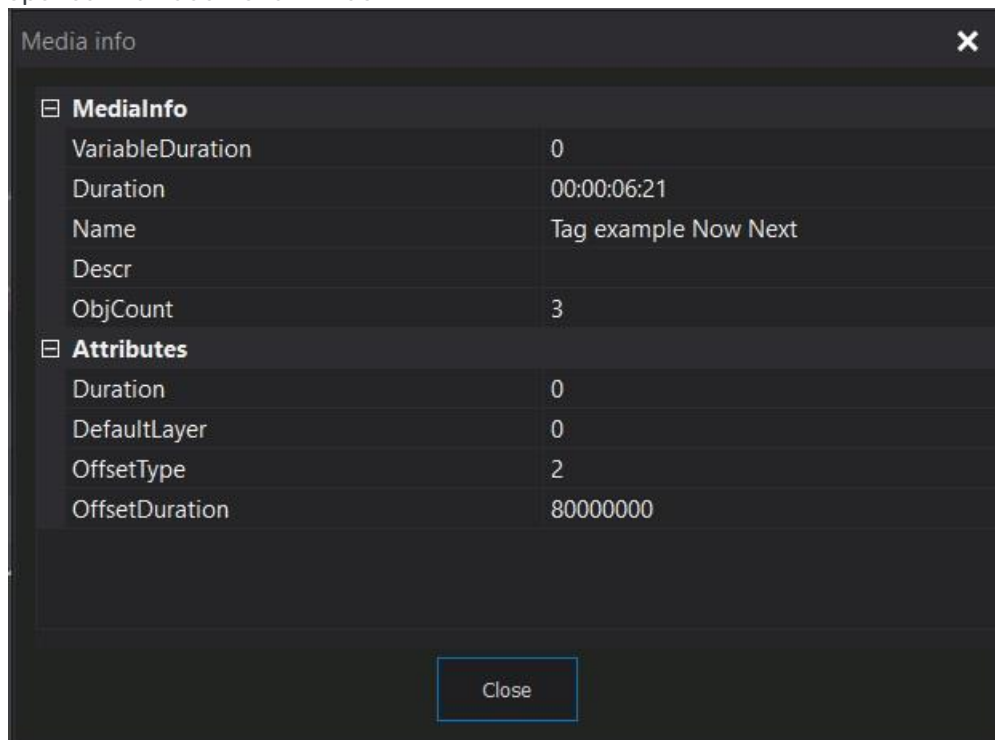


Figure 192. Media Info of the *.vp.Scene file

- The **Logo** branch of the Channel resource tree contains a file manager of all Logo (*.vpScene) files and subfolders available for the current Playout channel. All the Logos, available for the channel are stored in the broadcast playout server storage in folders associated to the channel format (for example: D:\Ch1\Logo\1920x1080) as *.vpScene files. Folders are created automatically in the moment of a playout channel creation; changing the folder path is not possible. AirX broadcast automation supports subfolders within the defined channel folder.

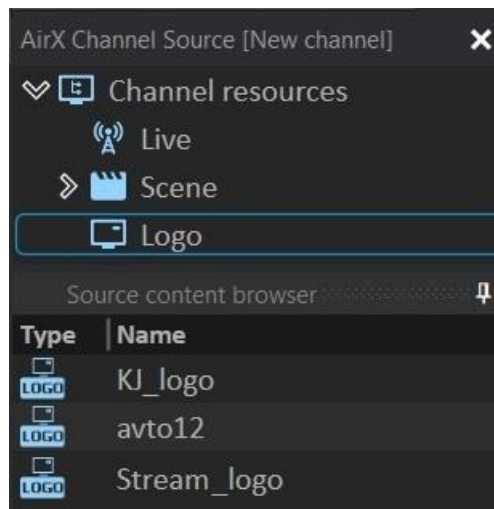


Figure 193. Logo branch of the Channel resource tree

The Source content browser window contains the following columns for the **Logo** branch:

Type - Content type icon

Name - The names of the *.vpScene Logo files

The context menu allows you to search through the list of Logos.

If you select one of the Logos in the Source content browser window, the **Show Media Info** context menu item will be activated. The Media Info will be opened in an additional window.

4. The **Web URL** branch of the Channel resource tree contains a list of WEB resources that can be used as schedule elements. All sources in this section have to be added manually. See the **WEB URL mode** chapter for details.

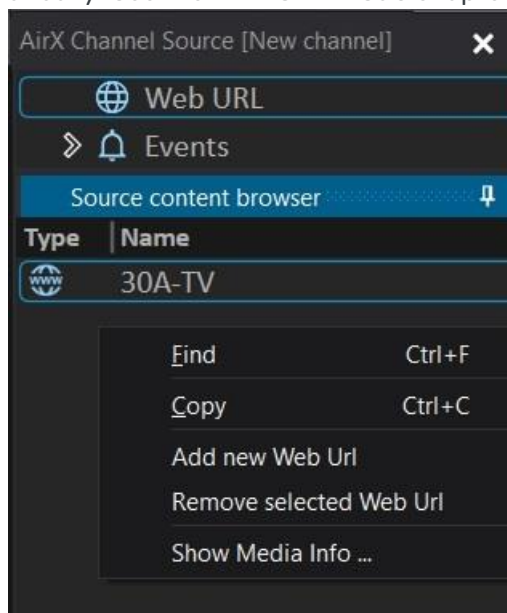


Figure 194. Web URL branch of the Channel resource tree

The Source content browser window contains the following columns for the **Web URL** branch:

Type - Content type icon

Name - The names of the WEB resources

Description - The descriptions of the WEB resources

The context menu allows you to search through the list of WEB resources, and also you can add or delete the source from the list.

If you select one of the WEB sources in the Source content browser window, the **Show Media Info** context menu item will be activated. The Media Info will be opened in an additional window.



Figure 195. Media Info of the Web URL

5. The **Events** branch of the Channel resource tree contains a list of available external events that can be used as schedule elements.

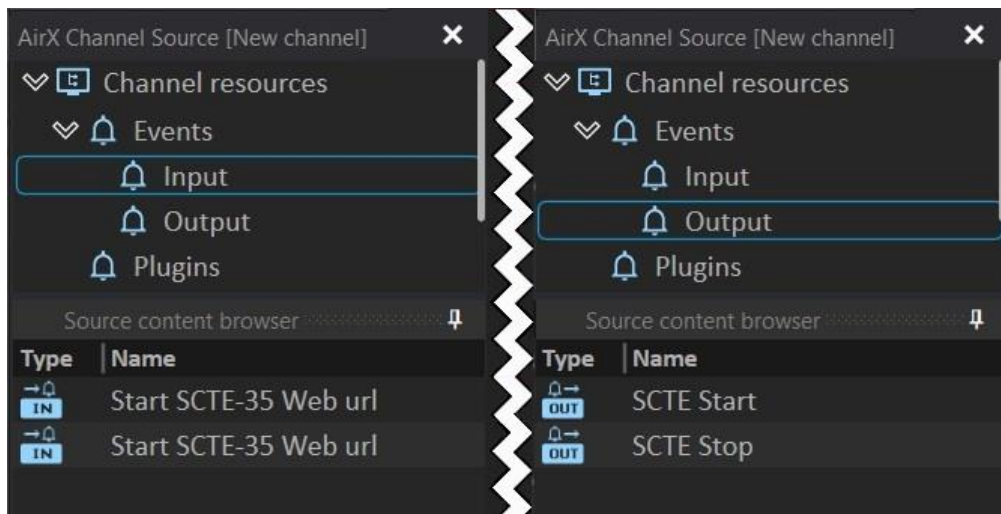


Figure 196. Events branch of the Channel resource tree

As you can see in the figure above, the Events branch has two sub-branches **Input** and **Output** for different types of external events. The **Input** branch contains external events that can be detected by AirX in input streams. For example, the SCTE-35 markers from the incoming satellite stream. The **Output** branch contains external events that AirX can send in its output stream. For example, the ad markers generated by the playout channel. See the **AD insertion (DAI) workflow** chapter for details.

The Source content browser window contains the following columns for the **Events** branch:

Type - Content type icon

Name - The names of the external events

There is no context menu in the Source content browser window for the Events branch

6. The **Plugins** branch of the Channel resource tree contains sub-branches, associated with the connected external devices, available for the current playout channel. The **Output** sub-branch contains external events that AirX can send in its output stream. The **Input** events that can be detected by AirX in input streams must be configured in the workspace of the **Channel OnAir** window.

You can see the connected Kramer matrix switcher as an example in the Figure 197. See the **External devices** chapter for details.

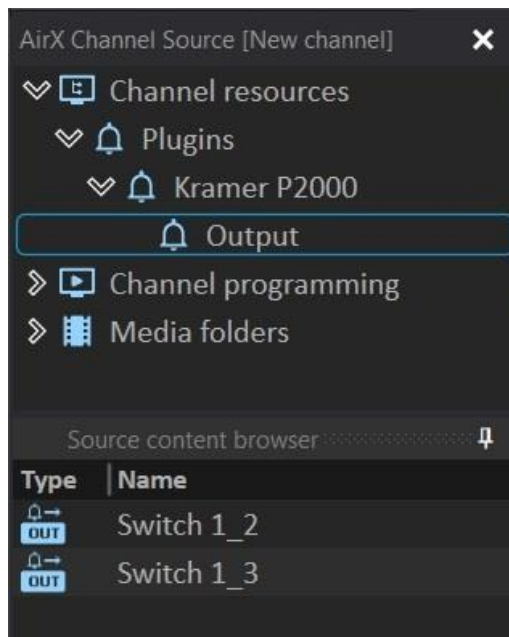


Figure 197. Plugins branch of the Channel resource tree

The Source content browser window contains the following columns for the **Plugins** branch:

Type – Content type icon

Name - The names of the external events

There is no context menu in the Source content browser window for the Plugins branch

7. The **Channel programming** branch of the Channel resource tree contains two schedules: OnAir Playlist and OnAir Schedule. They are predefined elements of the AirX broadcast automation.

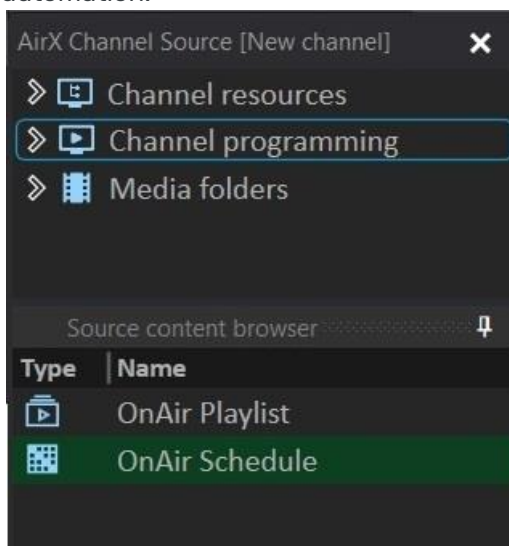


Figure 198. Channel programming branch of the Channel resource tree

There are the playlist and the schedule that are currently active (OnAir). If the AirX is in the Schedule mode, the OnAir Schedule file will be highlighted in green. This means that the editing is available only from the workspace of the **Channel OnAir** window. At the same time, you can open the active OnAir Playlist (not highlighted in green) in an additional window and edit it.

The same works with the Playlist mode - you can simultaneously edit the active schedule (during the playback of the playlist), opening it in an additional window.

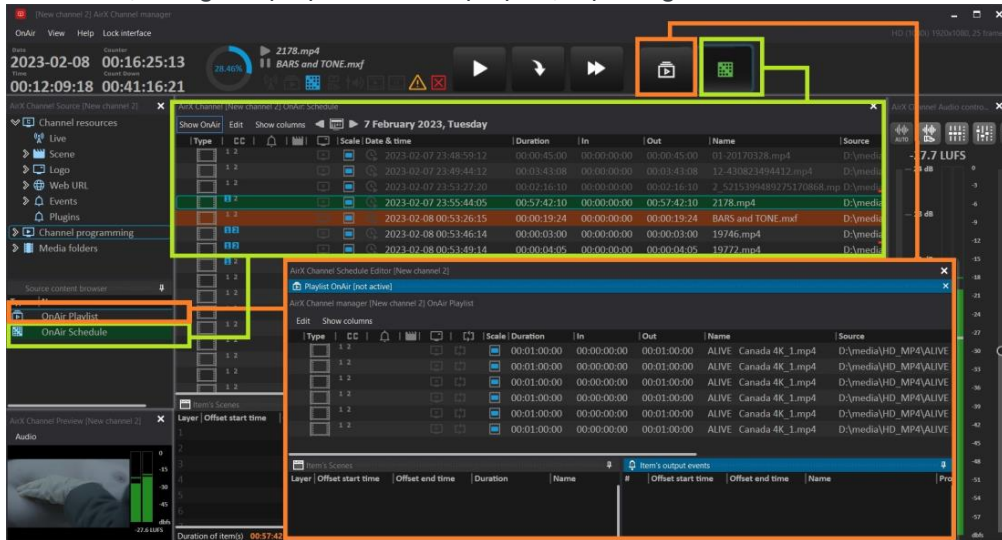


Figure 199. OnAir Playlist and OnAir Schedule

In fact, OnAir Playlist and OnAir Schedule are *.xml files stored in the broadcast playout server storage in folders associated to the channel. Folders are created automatically in the moment of a playout channel creation; changing the folder path is not possible.

ATTENTION! Manual modification of these files is strictly prohibited due to the risk of schedule corruption by human error.

The context menu of the Channel Programming branch contains the only **Open for Edit** item for the OnAir Playlist and OnAir Schedule.

You can **expand** the Channel programming branch of the Channel resource tree to make the sub-branches available.

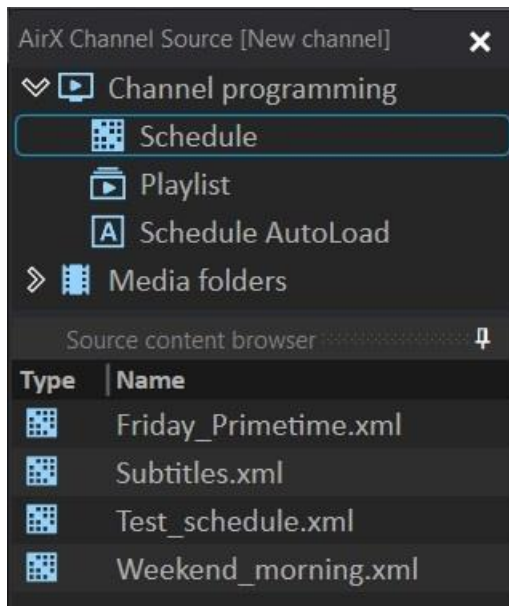


Figure 200. Channel programming sub-branches

Schedule - Edit the channel schedules,

Playlist - Edit the channel playlists,

Schedule Autoload – Edit the auto-loaded schedules is available only if the auto loading of schedules and integration with external broadcast traffic management systems is allowed and the **Enable auto import schedule** checkbox is checked in the channel settings.

All these branches are actually file folders on the broadcast playout server. These folders contain schedule files of different types. Therefore, each of the schedules stored in these folders can be edited. The folders are associated to the channel. Folders are created automatically in the moment of a playout channel creation; changing the folder path is not possible (except the Schedule Autoload folder). AirX broadcast automation supports subfolders within all the schedule folders.

Channel programming file folders contain the schedule files of different types:

Schedules are chronologically organized and time-accurate playlists of content. Each schedule row has a specific Date&time field. The names of .xml files of schedules can be any.

Playlists are ordinary playlists of content which are sequenced of video files with secondary events like CG, and control commands. The names of .xml files of schedules can be any.

Autoloaded schedules are the schedules created by any third-party software, which supports the playlist format, used by AirX. The auto schedule is loaded automatically at an assigned day and time. Auto schedules require specific naming structure in order to be played on the desired date and time automatically. The structure is: **YYYY.MM.DD**, where YYYY stands for year, MM-month, DD-date. **EXAMPLE:** If the name of the schedule is “2022.06.14.xml”, it will be loaded on June 14th, 2022 exactly. See the **Schedule automatic import** chapter for details.

The Source content browser window contains the following columns for the **Channel programming** sub-branches:

Type – Content type icon

Name – The names of the schedules or playlists

The context menu of each sub-branch contains the following items:

Find – allows you to search through the list of schedules

Open for edit – open the schedule in an additional window for editing

Create new – self-explanatory

Remove, Rename, Cut, Copy and Paste are standard menu items and are self-explanatory.

Set as active playlist – the menu item, available only for **playlists**. This item allows you to set the selected playlist as the OnAir Playlist in one single click.

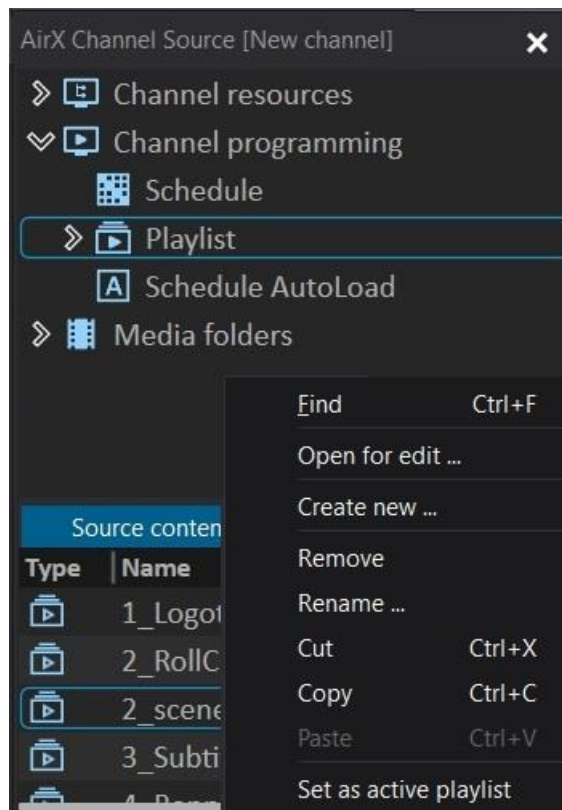


Figure 201. Channel programming sub-branches context menu

- The **Media folders** branch of the Channel resource tree contains a file manager of all video files and subfolders available for the current Payout channel. See the **Media folders and content replacement** chapter for details.

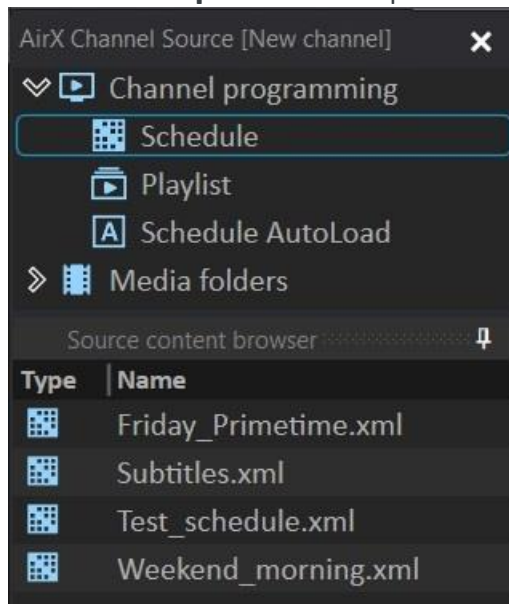


Figure 202. Media folders branch of the Channel resource tree

AirX broadcast automation supports subfolders within the Media folders directory.

The Source content browser window contains the following columns for the **Media folders** branch:

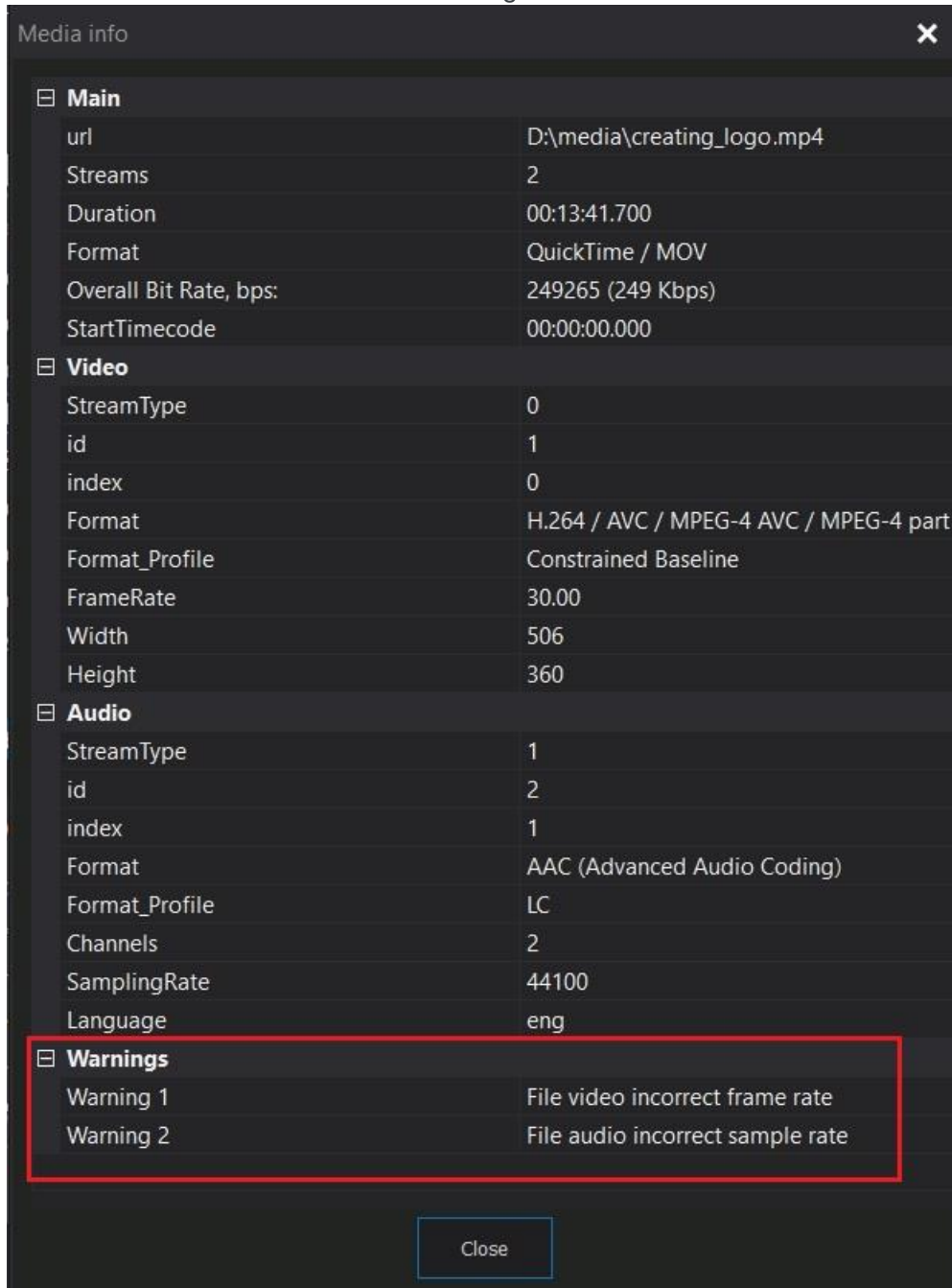
Type – Content type icon

Name - The names of the video files

Duration - The scheduled playback time of the video files. This column shows the actual duration of each video file. You can change this value to make the file playback shorter.

The context menu allows you to search through the list of video files.

If you select one of the files in the Source content browser window, the **Show Media Info** context menu item will be activated. The Media Info will be opened in an additional window. The useful feature of the Media Info is the **Warnings** pane that contains information about all warnings and errors of a video file.



The screenshot shows a 'Media info' window with a dark background and a close button (X) in the top right corner. The window is organized into several expandable sections:

- Main**:

url	D:\media\creating_logo.mp4
Streams	2
Duration	00:13:41.700
Format	QuickTime / MOV
Overall Bit Rate, bps:	249265 (249 Kbps)
StartTimecode	00:00:00.000
- Video**:

StreamType	0
id	1
index	0
Format	H.264 / AVC / MPEG-4 AVC / MPEG-4 part 1
Format_Profile	Constrained Baseline
FrameRate	30.00
Width	506
Height	360
- Audio**:

StreamType	1
id	2
index	1
Format	AAC (Advanced Audio Coding)
Format_Profile	LC
Channels	2
SamplingRate	44100
Language	eng
- Warnings** (highlighted with a red border):

Warning 1	File video incorrect frame rate
Warning 2	File audio incorrect sample rate

A 'Close' button is located at the bottom center of the window.

Figure 203. Media Info of the video file

Channel Preview window

The **Channel Preview** window provides a visual preview of the OnAir Playout channel including a real-time monitoring of the currently playing video with CG overlay.



Figure 204. AirX Channel preview

ATTENTION: Please note that this is not an output stream of a playout channel, but a visual preview of the current channel being generated within the broadcast playout server. Each of the channel outputs is encoded separately with the specified settings.

The window contains the **Audio** item, which, when selected, expands a drop-down menu containing the following items:

Peakmeter - visual preview of audio levels

Mute - turn off the sound

Audio device - menu for selecting an output device for the audio stream

Audio stream - audio stream selection menu.

Channel OnAir window

The Channel OnAir window allows scheduling and additional actions with the playlists of content both in the Playlist and the Schedule mode.

You must set the Schedule/Playlist mode during the initial setup of the Playout channel and you can change it later at any time (see the **Playout channel addition and setup** chapter for details).

You can also switch the Schedule/Playlist mode directly from the client workplace application if you have the relevant user permissions (see the Users chapter for details). Use the **OnAir** item of the Channel Manager **Control menu** to switch the mode.



Figure 205. Playlist/Schedule modes

The interface of the Channel OnAir window depends on the selected mode.

Channel OnAir window, Playlist mode

If the Playlist mode is selected, the Channel OnAir window contains the following blocks and menus:

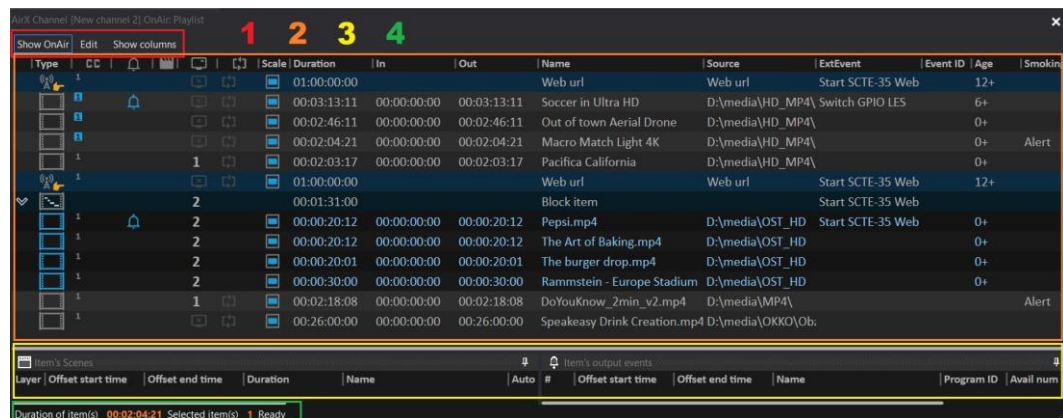


Figure 206. Channel OnAir window, Playlist mode

1. Control menu

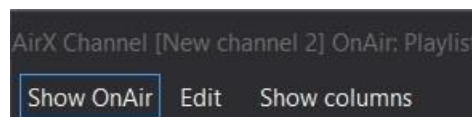


Figure 207. Control menu of the Channel OnAir Playlist window

The title bar of the Channel OnAir window contains the name of the current playout channel in the square brackets. Here you can also see that the **Playlist** mode is selected.

- Click the **Show OnAir** button to jump to the currently playing schedule row.
- Click the **Edit** button to expand the Channel playlist editor drop-down list.

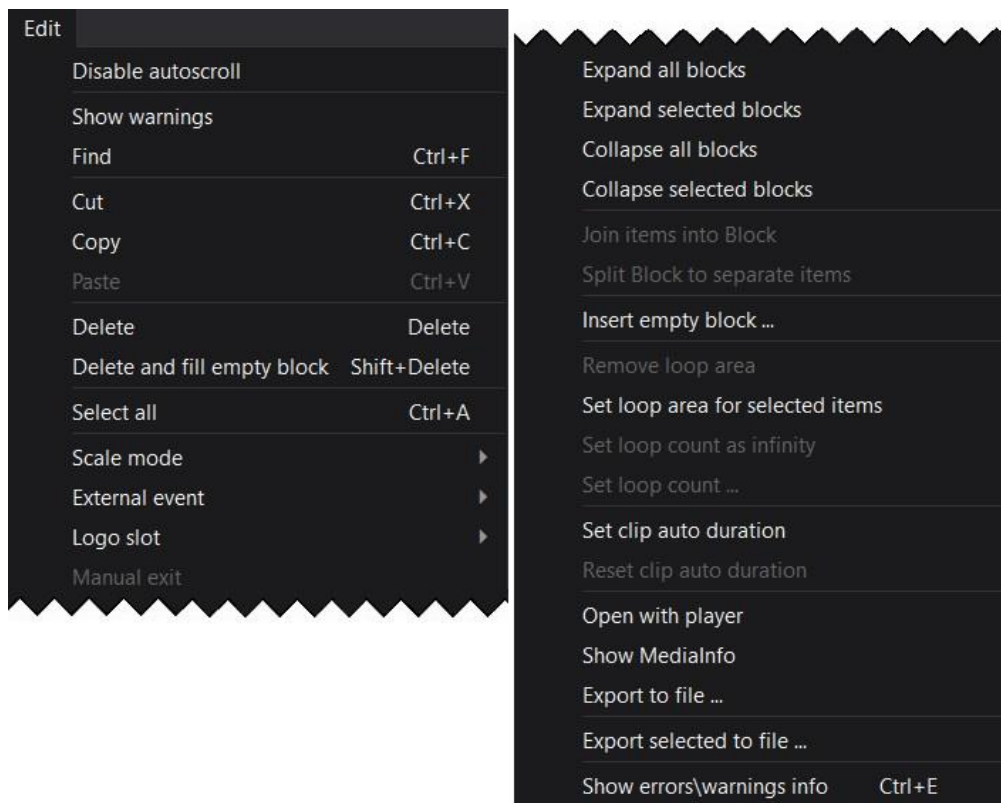


Figure 208. Channel playlist editor drop-down list

The list contains the following items:

Disable autoscroll - disable automatic scrolling of the schedule in the workspace of the Channel OnAir: Playlist window during the playback. If this box is unchecked, the currently playing schedule row (green line) will always be at the top of the window.

Show warnings - enable playlist warning messages (yellow lines)

Find - find a particular character or word in the window's workspace

Cut - cut the element (or group of elements) selected in the workspace of the window

Copy - copy the element (or group of elements) selected in the workspace of the window to the clipboard

Paste - paste an element (or a group of elements) from the clipboard into the workspace of the window

Delete - delete an element (or a group of elements) selected in the workspace of the window

Delete and fill empty block - delete the element (or group of elements) selected in the workspace of the window and fill the deleted elements with the Empty block (Dummy clip) element

Select all - select all schedule rows

Scale mode - set the video display mode of the element: LetterBox, Pan & Scan or Anamorph

External event - assign an external event to the element (or group of elements) selected in the workspace window:

- Turn event OFF - turn off the event

- Start SCTE-35 - trigger external event **Start**

- Stop SCTE-35 - trigger external event **Stop**

Logo slot - assign a logo to the selected element (or group of elements) from the corresponding Logo slot:

- Turn logo OFF - turn off the logo for the element
- Logo slot 1 - assign a logo from slot 1 to the element
- Manual exit** - wait for the incoming external event (for example: incoming SCTE-35) or user's action to switch the playback position. Manual exit is only available for **Live** playlist items.
- Expand all blocks** - expand all block items in the playlist to show the clips included in the blocks
- Expand selected blocks** - expand only the selected block (or blocks)
- Collapse all blocks** - collapse all blocks
- Collapse selected blocks** - collapse only the selected block (or blocks)
- Join items into block** - assemble the selected clips into one block
- Split block to separate items** - split the block into separate clips
- Insert empty block** - add an Empty block element (Dummy clip) to the schedule
- Remove loop area** - cancel the looped playback of selected element (group of elements). Only available in Playlist mode
- Set loop area for selected items** - set the looped playback for the selected element (group of elements). The number of playback cycles has to be set by the user. Only available in Playlist mode
- Set loop count as infinity** - set the selected element (group of elements) to play infinitely. Only available in Playlist mode
- Set loop count ...** - set the number of times the selected element (group of elements) will be played. Only available in Playlist mode
- Set clip auto duration** - set the duration of the primary event (video clip) automatically, when the content is automatically replaced. Only available in Playlist mode (see the **Media folders and content replacement** chapter for details)
- Reset clip auto duration** - disable the automatic assignment of the duration of the primary event during automatic content replacement. Only available in Playlist mode
- Open with player** - open the selected element with the built-in video player
- Show MediaInfo** - open an additional window containing the MediaInfo of the selected element (video file)
- Export to file ...** - save the current channel playlist as an .xml file
- Export selected to file ...** - save the selected schedule items as a separate playlist as an .xml file. Saving is available only for a group of elements selected with Shift.
- Show errors/warnings info** - open an additional window, listing errors of the schedule item.
- **Show columns** menu contains a list of columns of the OnAir window workspace. The columns can be enabled/disabled by checking and unchecking the corresponding checkboxes. All columns in the list below the Event ID item are custom and must be configured in AirX Control app (see the **Channel TAGs and EPG** chapter for details).

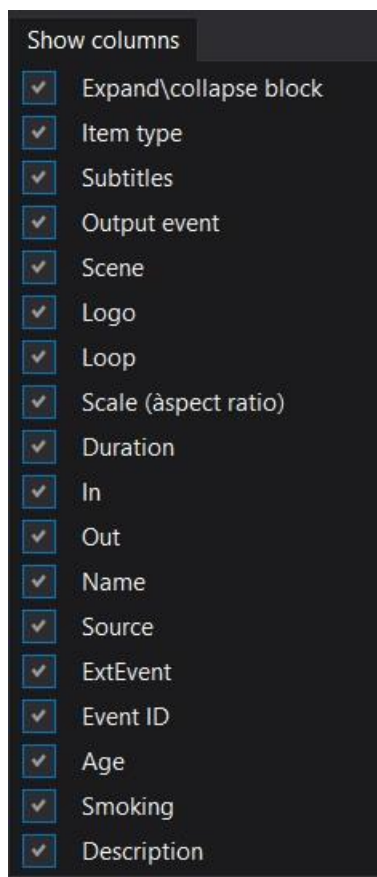


Figure 209. Show columns menu

2. Chanel OnAir window workspace

This is the main part of the AirX interface, dedicated to the playlist (play order) visualization.

When you launch AirX Channel Manager, depending on your startup settings, you will see an empty window, and you will have to load (create) a playlist or you will see the opened playlist.

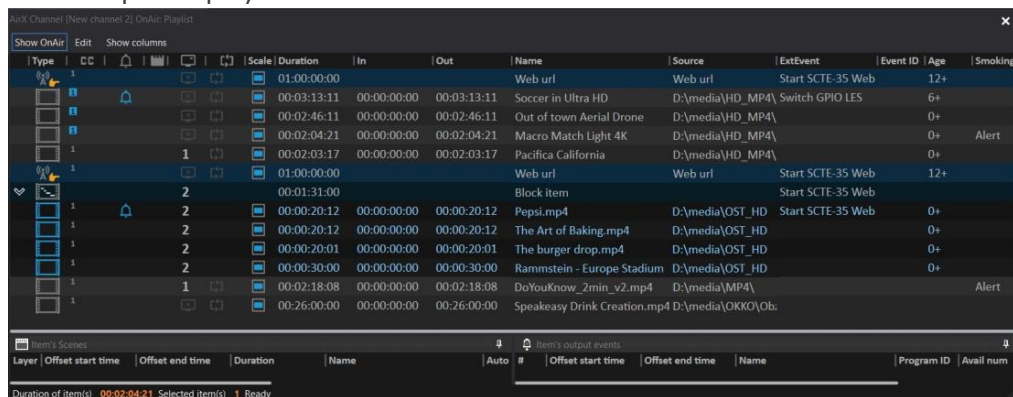


Figure 210. Channel OnAir workspace

If there is a playlist, loaded in AirX, you will see information about the clips in different columns:

Type - Shows the type of the playlist element (video clip, block, Live source).

CC - Indicates the existing of subtitle tracks configured for the current playout channel and subtitle files located in the media folder of the broadcast playout server storage (see the **Playout channel addition and setup** chapter for

details). Gray indicates the number of available tracks, blue indicates the available subtitle files.

External event – the bell icon means that the external event (control command) will be generated during the playback of a primary event of the playlist (video file).

Item's scene – the clapperboard icon means that the primary event of the playlist (video file) has the assigned CG file.

Logo slot – the number in the Logo slot column indicates the Logo slot selected for the primary event.

Playlist loop area – indicates the looped playback for the selected element (group of elements). The number of playback cycles has to be set by the user. Only available in Playlist mode.

Scale – indicates the video display mode of the element: LetterBox, Pan & Scan or Anamorph.

Duration – shows the actual duration of each clip. If a clip has been trimmed, its actual duration will be reduced. The duration of the part to be shown will be displayed in the playlist and will be used for calculation of the starting times of all following clips.

In – displays the In point timecode

Out – displays the Out point timecode

The Duration, IN and OUT points are also editable as well as the Date & time value.

Name – the editable field that contains the name of a schedule primary event.

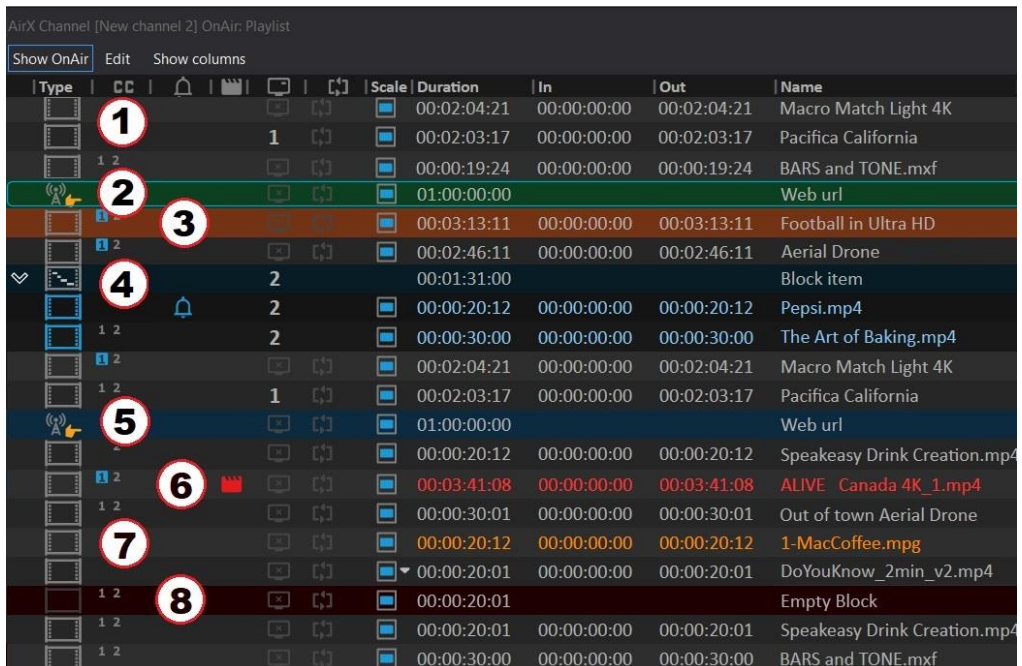
Source – the video file location in the storage of the broadcast playout server.

ExtEvent – an incoming external event that triggers the playback of the associated schedule row

Event ID – the ID of the schedule element (video clip, block, Live source)

The rest of the columns are custom and have to be configured in AirX Control app (see the **Channel TAGs and EPG** chapter for details).

The color-coding of the playlist's rows provides additional information to the user:

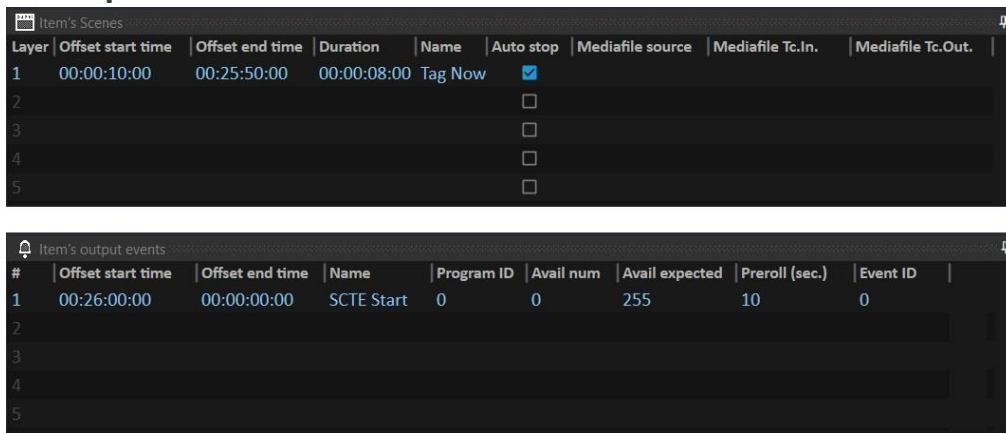


Type	CC	Logo slot	Scale	Duration	In	Out	Name
1		1	LetterBox	00:02:04:21	00:00:00:00	00:02:04:21	Macro Match Light 4K
1 2			LetterBox	00:02:03:17	00:00:00:00	00:02:03:17	Pacifica California
1 2			LetterBox	00:00:19:24	00:00:00:00	00:00:19:24	BARS and TONE.mxf
1 2			LetterBox	01:00:00:00			Web url
1 2			LetterBox	00:03:13:11	00:00:00:00	00:03:13:11	Football in Ultra HD
1 2			LetterBox	00:02:46:11	00:00:00:00	00:02:46:11	Aerial Drone
1 2			LetterBox	00:01:31:00			Block item
1 2			LetterBox	00:00:20:12	00:00:00:00	00:00:20:12	Pepsi.mp4
1 2			LetterBox	00:00:30:00	00:00:00:00	00:00:30:00	The Art of Baking.mp4
1 2			LetterBox	00:02:04:21	00:00:00:00	00:02:04:21	Macro Match Light 4K
1 2			LetterBox	00:02:03:17	00:00:00:00	00:02:03:17	Pacifica California
1 2			LetterBox	01:00:00:00			Web url
1 2			LetterBox	00:00:20:12	00:00:00:00	00:00:20:12	Speakeasy Drink Creation.mp4
1 2			LetterBox	00:03:41:08	00:00:00:00	00:03:41:08	ALIVE_Canada 4K_1.mp4
1 2			LetterBox	00:00:30:01	00:00:00:00	00:00:30:01	Out of town Aerial Drone
1 2			LetterBox	00:00:20:12	00:00:00:00	00:00:20:12	1-MacCoffee.mpg
1 2			LetterBox	00:00:20:01	00:00:00:00	00:00:20:01	DoYouKnow_2min_v2.mp4
1 2			LetterBox	00:00:20:01			Empty Block
1 2			LetterBox	00:00:20:01	00:00:00:00	00:00:20:01	Speakeasy Drink Creation.mp4
1 2			LetterBox	00:00:30:00	00:00:00:00	00:00:30:00	BARS and TONE.mxf

Figure 211. Color-coding of the playlist's rows

1. Grey - standard Schedule Item, video file, primary event.
2. Green - the currently playing video file. OnAir playback position.
3. Orange - the element that will be played after the current. Ready for playback position (next in the schedule).
4. Blue - several elements of the schedule combined into one group - a block.
5. Light blue - Live source or Web URL.
6. Red - schedule row with Error status. Missing or corrupted primary event, missing secondary event, inactive Live input, etc.
7. Yellow - schedule row with Warning status. Video file format mismatch with playout channel format (incorrect resolution, fps, etc.)
8. Brown - Empty Block (Dummy clip).

3. Events pane



The screenshot shows two panels. The top panel, titled 'Item's Scenes', has a table with columns: Layer, Offset start time, Offset end time, Duration, Name, Auto stop, Mediafile source, Mediafile Tc.In., and Mediafile Tc.Out. Row 1 shows 'Tag Now' with a checked 'Auto stop' box. The bottom panel, titled 'Item's output events', has a table with columns: #, Offset start time, Offset end time, Name, Program ID, Avail num, Avail expected, Preroll (sec.), and Event ID. Row 1 shows 'SCTE Start' with Program ID 0, Avail num 0, Avail expected 255, Preroll 10, and Event ID 0.

Figure 212. Item's Scenes and Item's output events tabs

The Events pane contains the following tabs:

Item's Scenes - CG files assigned to the selected schedule row (see the **Item's Scenes window. Channel CG** chapter for details).

Item's output events - external events assigned to the selected schedule row. For example, the ad markers generated by the playout channel. See the **Item's Output Events window** chapter for details.

4. Status bar

The status bar is located at the bottom of the AirX Channel Manager window.

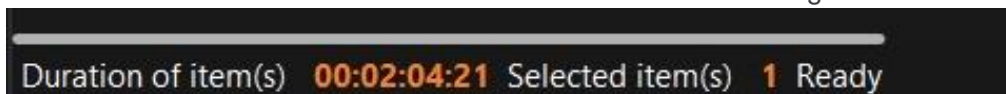


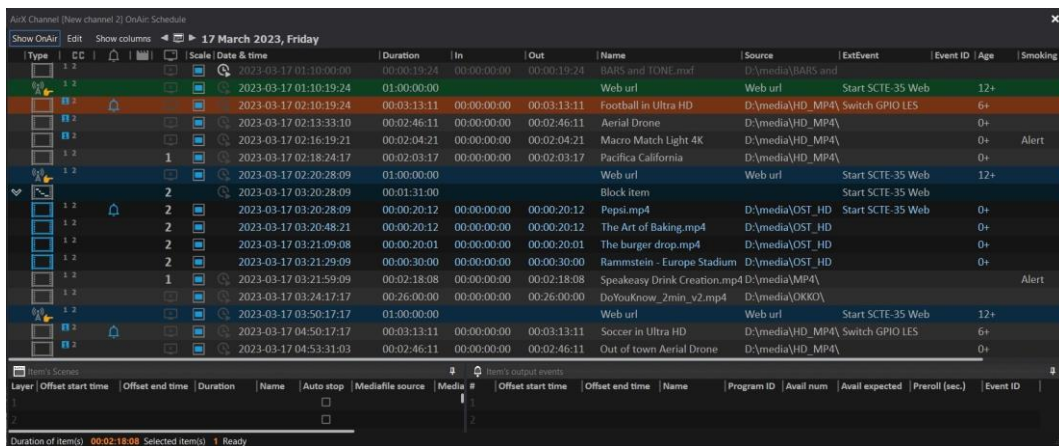
Figure 213. The AirX Channel Manager Status bar

The **Duration of item(s)** field shows the total playlist duration

The **Selected item(s)** field shows the number of simultaneously selected schedule rows.

Channel OnAir window, Schedule mode

The Channel OnAir window contains the following blocks and menus, if the Schedule mode is selected:



Type	CC	Scale	Date & time	Duration	In	Out	Name	Source	ExtEvent	Event ID	Age	Smoking
			2023-03-17 01:10:00:00	00:00:19:24	00:00:00:00	00:00:19:24	BARS and TONE.maf	D:\media\BARS and				
			2023-03-17 01:10:19:24	01:00:00:00			Web url	Web url	Start SCTE-35 Web		12+	
			2023-03-17 02:10:19:24	00:03:13:11	00:00:00:00	00:03:13:11	Football in Ultra HD	D:\media\HD_MP4\	Switch GPIO IES		6+	
			2023-03-17 02:13:33:10	00:02:46:11	00:00:00:00	00:02:46:11	Aerial Drone	D:\media\HD_MP4\			0+	
			2023-03-17 02:16:19:21	00:02:04:21	00:00:00:00	00:02:04:21	Macro Match Light 4K	D:\media\HD_MP4\			0+	Alert
			2023-03-17 02:18:24:17	00:02:03:17	00:00:00:00	00:02:03:17	Pacifica California	D:\media\HD_MP4\			0+	
			2023-03-17 02:20:28:09	01:00:00:00			Web url	Web url	Start SCTE-35 Web		12+	
			2023-03-17 03:20:28:09	00:01:31:00			Block item		Start SCTE-35 Web			
			2023-03-17 03:20:28:09	00:00:20:12	00:00:00:00	00:00:20:12	Pepsi.mp4	D:\media\OST_HD	Start SCTE-35 Web		0+	
			2023-03-17 03:20:48:21	00:00:20:12	00:00:00:00	00:00:20:12	The Art of Baking.mp4	D:\media\OST_HD			0+	
			2023-03-17 03:21:09:08	00:00:20:01	00:00:00:00	00:00:20:01	The burger drop.mp4	D:\media\OST_HD			0+	
			2023-03-17 03:21:29:09	00:00:30:00	00:00:00:00	00:00:30:00	Ramstein - Europe Stadium	D:\media\OST_HD			0+	
			2023-03-17 03:21:59:09	00:02:18:08	00:00:00:00	00:02:18:08	Spaakany Drink Creation.mp4	D:\media\MP4\			0+	Alert
			2023-03-17 03:24:17:17	00:26:00:00	00:00:00:00	00:26:00:00	DoYouKnow_2min_v2.mp4	D:\media\OKKO\			0+	
			2023-03-17 03:50:17:17	01:00:00:00			Web url	Web url	Start SCTE-35 Web		12+	
			2023-03-17 04:50:17:17	00:03:13:11	00:00:00:00	00:03:13:11	Soccer in Ultra HD	D:\media\HD_MP4\	Switch GPIO IES		6+	
			2023-03-17 04:53:31:03	00:02:46:11	00:00:00:00	00:02:46:11	Out of town Aerial Drone	D:\media\HD_MP4\			0+	

Figure 214. Channel OnAir window, Schedule mode

1. Control menu

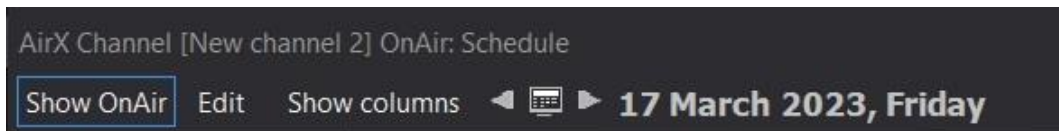


Figure 215. Control menu of the Channel OnAir Schedule window

The title bar of the Channel OnAir window contains the name of the current playout channel in the square brackets. Here you can also see the **Schedule** mode is selected.

- Click the **Show OnAir** button to jump to the currently playing schedule row.
- Click the **Edit** button to expand the Channel schedule editor drop-down list. The most of list items are similar to the Channel playlist editor drop-down list; see the **Channel OnAir window, Playlist mode** chapter and the **Figure 208. Channel playlist editor drop-down list** for details.

Schedule-specific menu items:

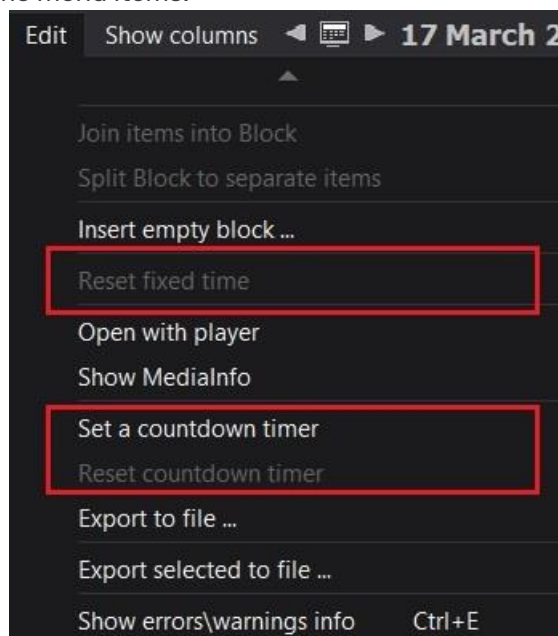


Figure 216. Channel schedule editor drop-down list's items

- **Reset fixed time** – reset the Fixed time flag, set on the selected schedule row. If there is an **Underrun** block before Fixed time, resetting Fixed time will also reset the Underrun block.
- **Set a countdown timer** – set a countdown timer showing the remaining time until the start of playback of the selected schedule row.
- **Reset countdown timer** – reset the previously set countdown.
- **Show columns** menu contains a list of columns of the OnAir window workspace. The columns can be enabled/disabled by checking and unchecking the corresponding checkboxes. All items in the list below the Event ID are custom and must be configured in AirX Control app (see the **Channel TAGs and EPG** chapter for details).

The Channel Schedule list of the columns is similar to the Channel Playlist Show columns list.

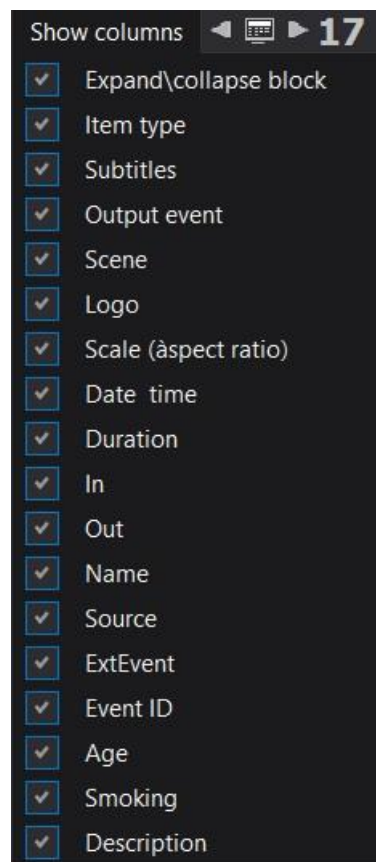


Figure 217. Show columns menu

- **Date picker**

Date picker allows you to open the channel schedule for the selected date in the workspace of the OnAir window

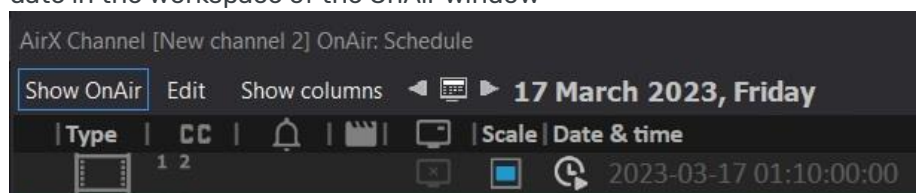


Figure 218. Date picker

Use the **Forward** and **Back** icons next to the selected date to scroll through the channel's schedules by day. You can select a schedule for any date using the **Calendar** tool next to the selected date.

2. Channel OnAir window workspace

This is the main part of the AirX interface, dedicated to the Schedule (dated playlist) visualization.

When you launch AirX Channel Manager, depending on your startup settings, you will see an empty window, and you will have to load (or create) a schedule. Otherwise you will see the opened schedule.

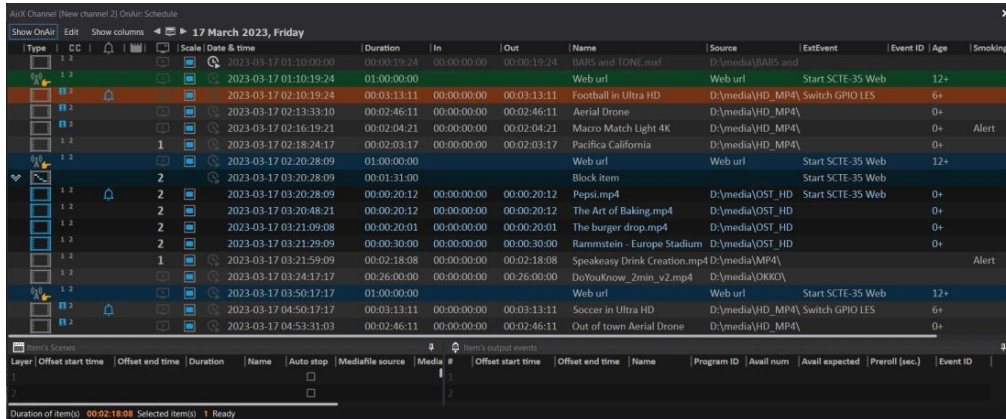


Figure 219. Channel OnAir workspace

The columns of the Schedule grid are mostly similar to the Channel Playlist OnAir window. See the **Channel OnAir window, Playlist mode** chapter and **Figure 210. Channel OnAir workspace** for details.

The difference in the workspace columns is due to the fundamental architectural difference between the Schedule and the Playlist.

Schedules are chronologically organized and time-accurate playlists of content with secondary events like CG, and control commands. Each schedule row has a specific Date&time field. The Schedule playback is executed sequentially and once.

Playlists are ordinary lists of content which are sequenced of video files with secondary events like CG, and control commands. The Playlist playback is looped.

Thus, the Channel OnAir window has additional columns in the Schedule mode:

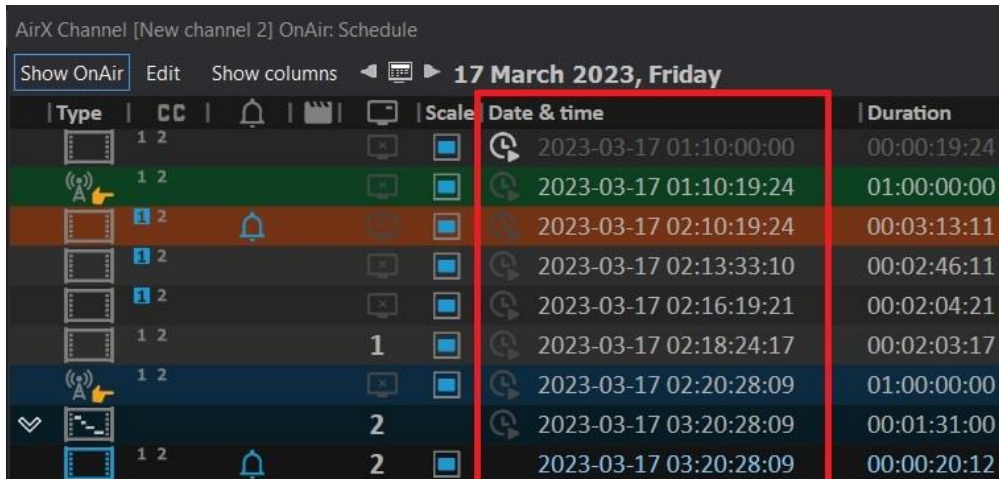


Figure 220. Channel OnAir workspace in the Schedule mode

- **Date & time** - this column shows the actual starting date and time for each clip. The following clips hold positive times calculated according to the current time and the duration of the preceding clips. If there has been a Jump or Skip command or a clip has been trimmed, the starting times of the following clips will be recalculated accordingly. Date & time column is only available in Schedule mode.
- The Date & time column contains an additional **Set fixed time** element that allows fixing the starting time of the selected clip. If the Set fixed time flag is set, the selected schedule row will keep the Date & time value, regardless of editing the preceding rows.

The color-coding of the Schedule rows is similar to the Channel Playlist OnAir window and provides additional information to the user. See the **Channel OnAir window, Playlist mode** and **Figure 211. Color-coding of the playlist's rows** for details.

In addition to the color-coding options described above, the OnAir schedule (due to its chronological order) has a color-coding of Underrun and Overrun conditions.

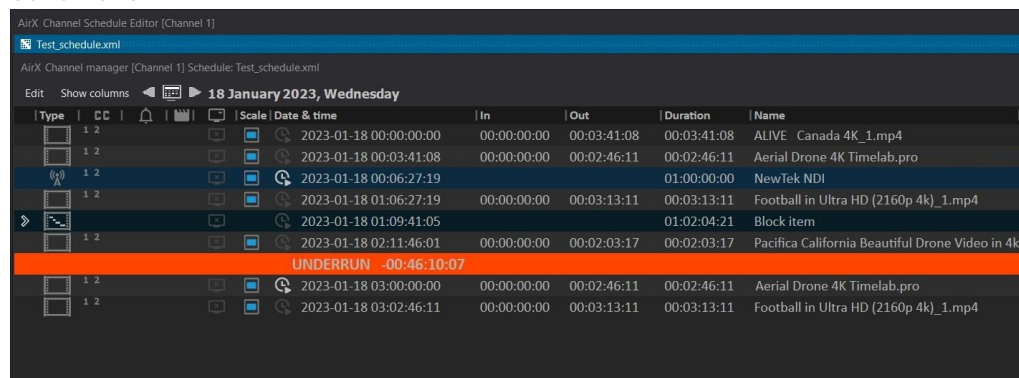


Figure 221. Underrun

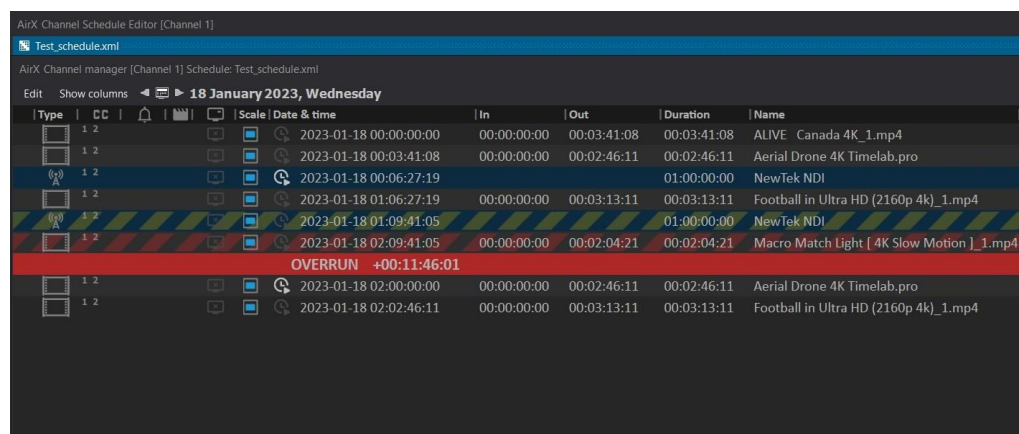
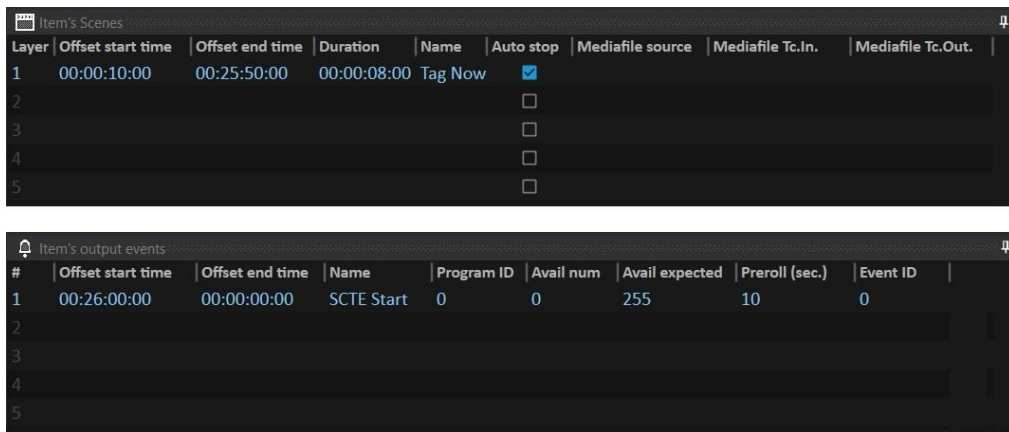


Figure 222. Overrun

For a detailed description of the Underrun and Overrun conditions, see the **Live streams and frequently changing schedules. Live video workflow.** chapter.

3. Events pane



Layer	Offset start time	Offset end time	Duration	Name	Auto stop	Mediafile source	Mediafile Tc.In.	Mediafile Tc.Out.
1	00:00:10:00	00:25:50:00	00:00:08:00	Tag Now	<input checked="" type="checkbox"/>			
2					<input type="checkbox"/>			
3					<input type="checkbox"/>			
4					<input type="checkbox"/>			
5					<input type="checkbox"/>			

#	Offset start time	Offset end time	Name	Program ID	Avail num	Avail expected	Preroll (sec.)	Event ID
1	00:26:00:00	00:00:00:00	SCTE Start	0	0	255	10	0
2								
3								
4								
5								

Figure 223. Item's Scenes and Item's output events tabs

The Events pane contains the following tabs:

Item's Scenes – CG files assigned to the selected schedule row (see the **Item's Scenes window. Channel CG** chapter for details).

Item's output events – external events assigned to the selected schedule row. For example, the ad markers generated by a playout channel. See the **Item's Output Events window** chapter for details.

4. Status bar

The status bar is located at the bottom of the AirX Channel Manager window.

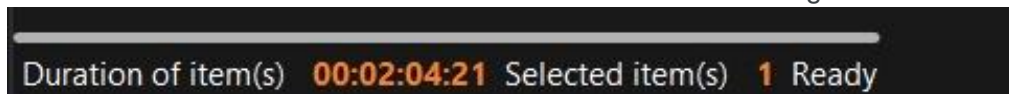


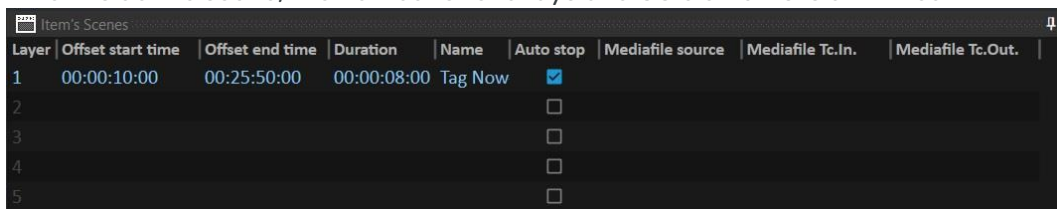
Figure 224. The AirX Channel Manager Status bar

The **Duration of item(s)** field shows the total playlist duration

The **Selected item(s)** field shows the number of simultaneously selected schedule rows.

Item's Scenes window. Channel CG

The Item's Scenes is a window of CG scenes assigned to the selected schedule row. Up to eight multi-layer dynamic scenes can be assigned to each row at the same time. Inside the scene, the number of overlays and CG elements is unlimited.



Layer	Offset start time	Offset end time	Duration	Name	Auto stop	Mediafile source	Mediafile Tc.In.	Mediafile Tc.Out.
1	00:00:10:00	00:25:50:00	00:00:08:00	Tag Now	<input checked="" type="checkbox"/>			
2					<input type="checkbox"/>			
3					<input type="checkbox"/>			
4					<input type="checkbox"/>			
5					<input type="checkbox"/>			

Figure 225. Item's Scenes window

You can work with the Channel CG in the **Scene Editor** app that is a built-in CG editor for creation of on-air graphic design scenes and/or graphics conversion to the internal graphic scene format for AirX software. It allows you to operate with CG of various levels of complexity from a simple overlay of a static logo to a multilayer dynamic design using PIP, FILL + KEY, RSS, etc.

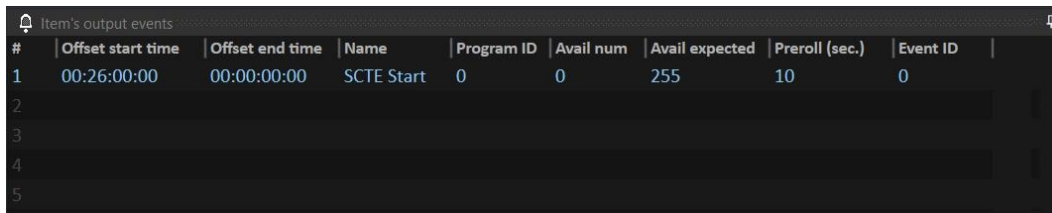
The Item's Scenes window contains the following columns:

- **Layer** – the layer number

- **Offset start time** - the start time of the CG element relative to the start of the primary event
- **Offset end time** - the end time of the CG element relative to the end of the primary event
- **Duration** - the duration of the CG element
- **Name** - the name of the CG element
- **Auto stop** - the checkbox that stops the playback of the CG element simultaneously with the end of the primary event. If the box is unchecked, the secondary event (graphic scene) will be played to the end, even if its duration is longer than the duration of the primary event.
- **Mediafile source** - the location of the Scene file in the server storage
- **Mediafile Tc.In.** - the In timecode of the Scene
- **Mediafile Tc.Out.** - the Out timecode of the Scene

Item's Output Events window

The Item's Output Events is a window of output events assigned to the selected schedule row. Up to eight output events or plugins can be assigned to each row at once (Events - SCTE or Plugins - GPO). See the **AD insertion (DAI) workflow** chapter for details.



#	Offset start time	Offset end time	Name	Program ID	Avail num	Avail expected	Preroll (sec.)	Event ID
1	00:26:00:00	00:00:00:00	SCTE Start	0	0	255	10	0
2								
3								
4								
5								

Figure 226. Item's Output Events window

The Item's Output Events window contains the following columns:

- **#** - the event number
- **Offset start time** - the start time of the output event relative to the start of the primary event
- **Offset end time** - the end time of the output event relative to the end of the primary event
- **Name** - the name of the output event
- **Program ID** - the ID of the selected program
- **Avail num** - the advertising slot identifier among the program slots
- **Avail expected** - the total number of ad slots inside the program
- **Preroll (sec.)** - the time interval from the arrival of the command to the execution of the splicing event. The recommended value is 4 sec.
- **Event ID** - event identifier

Channel Audio ctrl window

The **Channel Audio ctrl window** is intended for visualization and control of the channel sound settings.

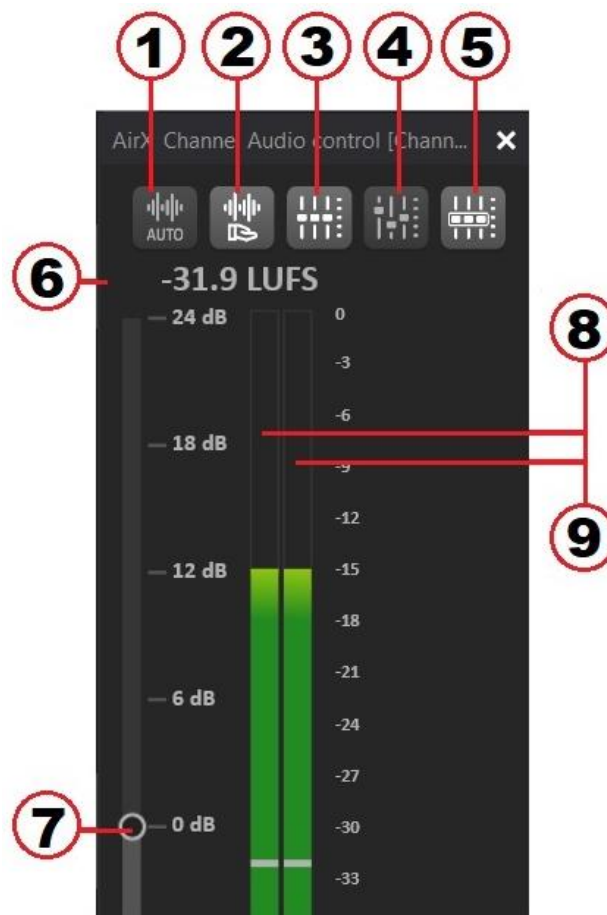


Figure 227. Channel Audio ctrl window

The window contains the following indicators and control buttons:

1. **Set enable auto audio gain** button – automatic normalization of the sound volume. In auto mode the volume adjusting with slider 7 is not available.
2. **Set enable manual audio gain** button – manual normalization of the sound volume. In manual mode the sound volume can be changed with slider 7.
3. **Set normal gain for all audio streams** button - reset the manual audio volume settings for all audio streams. When you click this button, slider 7 will automatically move to a value of 0 dB
4. **Set gain edit for one stream** button – manual normalization of the sound volume of selected audio stream.
5. **Set gain synchro edit for all stream** button - enable or disable audio volume synchronization for all audio streams
6. Volume meter – an indicator that displays the current value of the sound volume level (in LUFS).
7. Volume slider
8. Left channel sound volume scale
9. Right channel sound volume scale

Channel Logo Slot window

The Channel Logo Slot window is intended to control and manage the display modes of the channel logo.

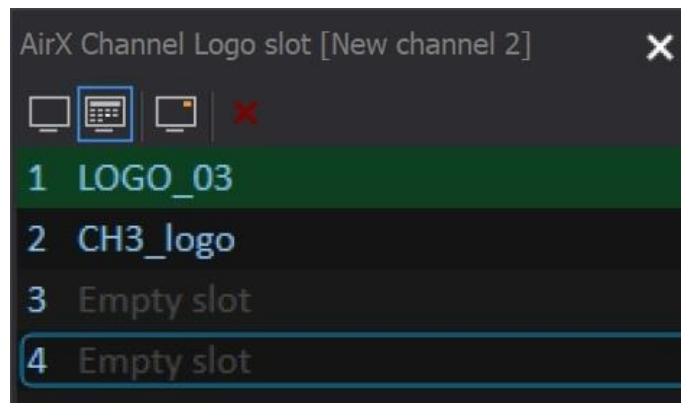


Figure 228. Channel Logo Slot window

The system menu of the window contains the following buttons:

Turn logo OFF – self-explanatory

Logo by schedule (default mode) – turn on the logo according to the channel schedule.

Start selected logo – start logotype from the selected slot

Clear selected logo slot – clear the selected logo slot

When you turn on the logo in the selected slot, the logo line will be highlighted in green (see the figure above).

You can call the context menu that duplicates the system menu of the window by right-clicking on the window's workspace.

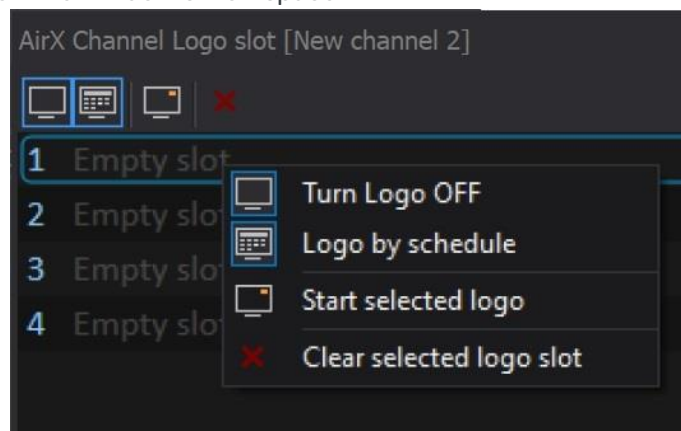


Figure 229. Channel Logo Slot context menu

Channel Manual GFX ctrl window

The Channel Manual GFX ctrl window allows you to launch CG objects in manual mode. This can be useful for launching the additional CG scenes in manual mode on top of auto-played scenes.

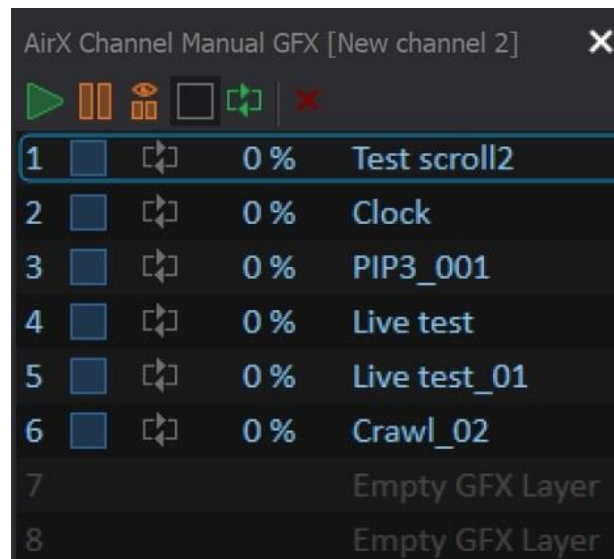


Figure 230. Channel Manual GFX ctrl window

The system menu of the window contains the following buttons:

- **Start selected manual GFX** – start playback of CG objects selected in the window's workspace
- **Pause selected manual GFX** – pause playback and also disable the CG objects selected in the window's workspace
- **Pause selected manual GFX and set visible** – pause the playback of CG objects selected in the window's workspace. Show the current freeze frame of the selected object
- **Stop selected manual GFX** – stop playback of CG objects selected in the window's workspace
- **Set selected manual GFX Loop mode** – start looping playback of CG objects selected in the window's workspace
- **Remove selected manual GFX** – remove CG objects selected in the window's workspace

The Channel Manual GFX ctrl window contains the following columns:

1. CG object number
2. Status indicator of a CG object: CG object playback status (Play, Stop, Pause)
3. The looped playback of CG objects selected in the window's workspace indicator
4. CG object playback percentage (progress bar, in percent)
5. Name of the CG object

If you right-click on the window's workspace, a context menu will show you the only **Stop selected auto GFX** item.

Channel Auto GFX ctrl window

The Channel Auto GFX window allows you to control and forcibly stop scheduled CG objects. That is, its only function is the forced manual stop of on-air graphics.

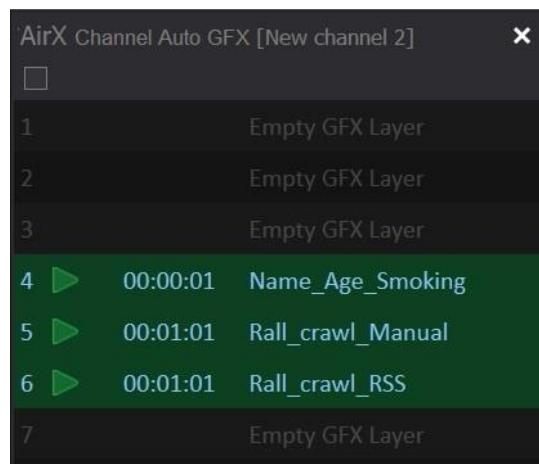


Figure 231. Channel Auto GFX window

As you can see in the figure above, the system menu of the window contains the only button **Stop selected auto GFX** to immediately stop the playback of CG objects selected in the window's workspace.

The Channel Auto GFX ctrl window contains the following columns:

1. CG object number
2. Status indicator of a CG object (Play, Stop)
3. The duration of the CG object
4. Name of the CG object

If you right-click on the window's workspace, a context menu will show you the only **Stop selected auto GFX** item.

Channel Player window

The Channel Player window allows previewing, non-destructive trimming, and exporting parts of the currently selected clip back to the schedule.

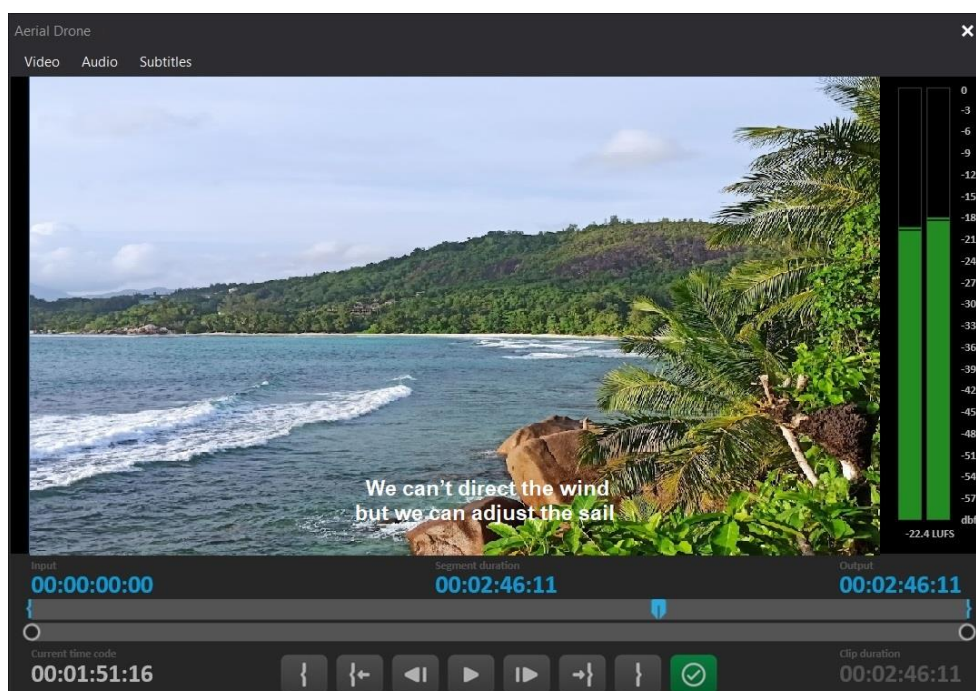


Figure 232. Channel Player window

The Player window contains the following elements:

- The system menu with tabs;

Video

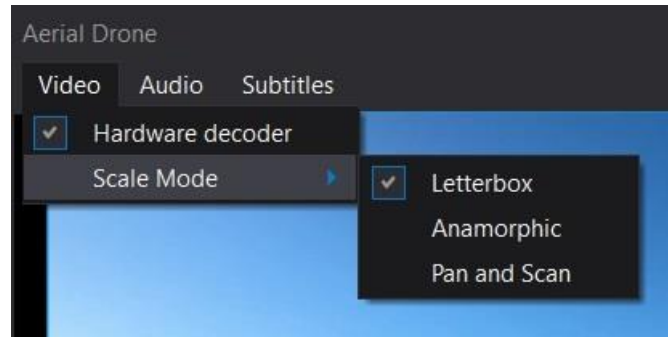


Figure 233. Video tab menu items

The **Video** tab contains a **Hardware decoder** item to enable hardware accelerated video decoding and a **Scale mode** drop-down list to select the video Scale mode.

ATTENTION: When changing the Scale mode, the video will not only be played in the player with the specified parameter, but will also be added to the schedule and broadcast with the value set in the player.

Audio

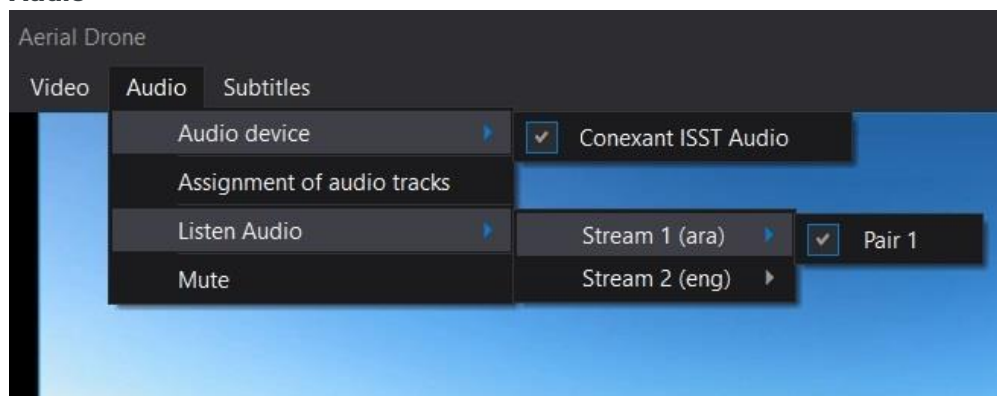


Figure 234. Audio tab menu items

The **Audio** tab contains an **Audio device** drop-down list of available audio playback devices. The **Listen Audio** drop-down allows you to select the audio stream to play. **Mute** turns off the sound in the current video.

In addition, the Audio tab contains the **Assignment of audio tracks** item, clicking on which opens an additional window of the built-in audio mixer:

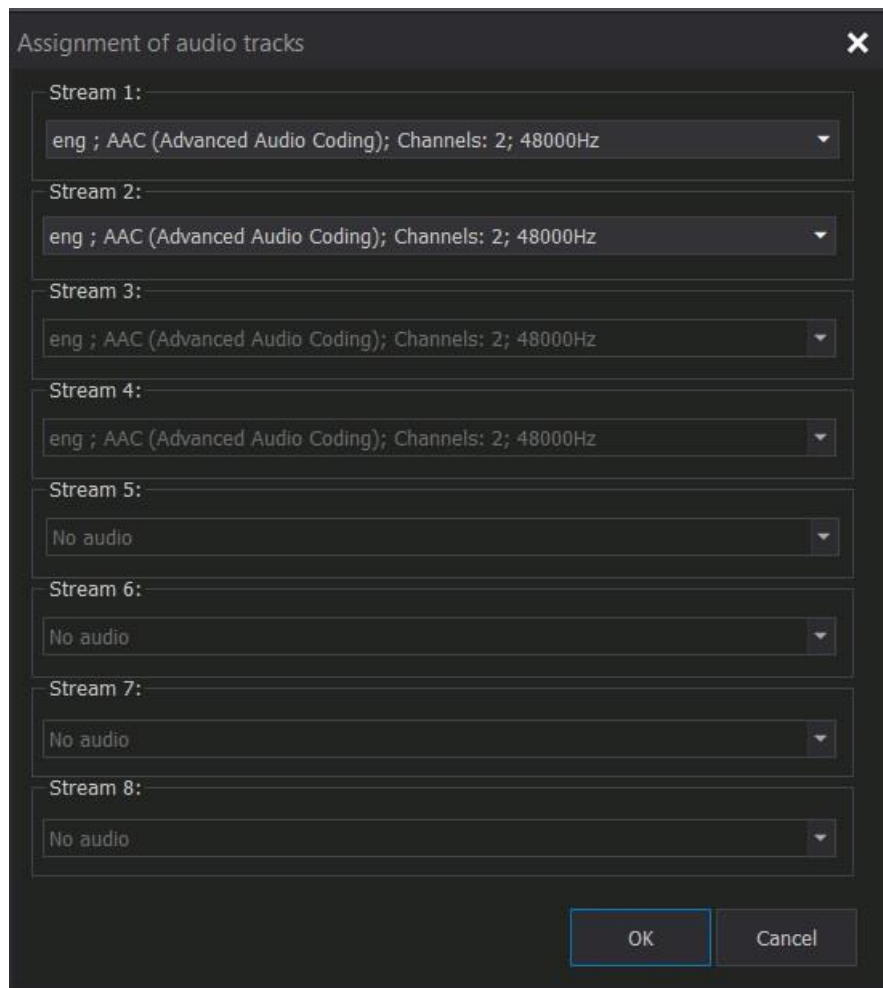


Figure 235. Assignment of audio tracks

The assignment of audio tracks is rational when the video contains several different audio tracks.

Subtitles

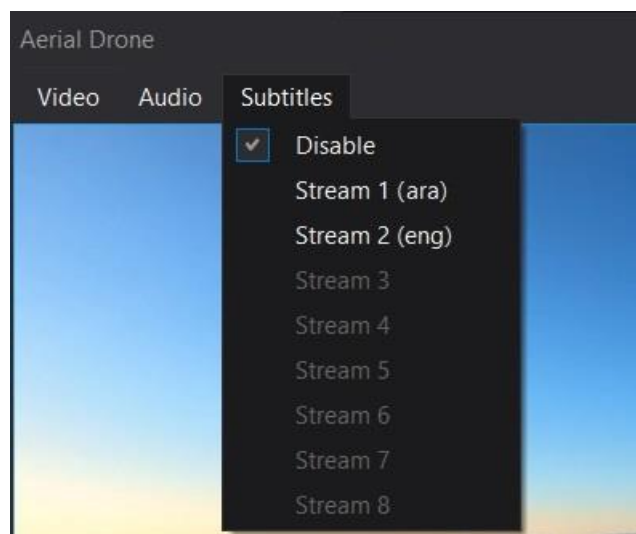


Figure 236. Subtitles tab menu items

The **Subtitles** tab contains a list of subtitle streams available for playback and a **Disable** button to turn them off.

ATTENTION: The list does not show the subtitle *.srt or *.stl files for a specific video in the server storage, but the subtitle language streams configured as Enabled in AirX Channel app.

- The **Preview** window (the main window of the Channel Player)
- Left and right channel **volume meters**

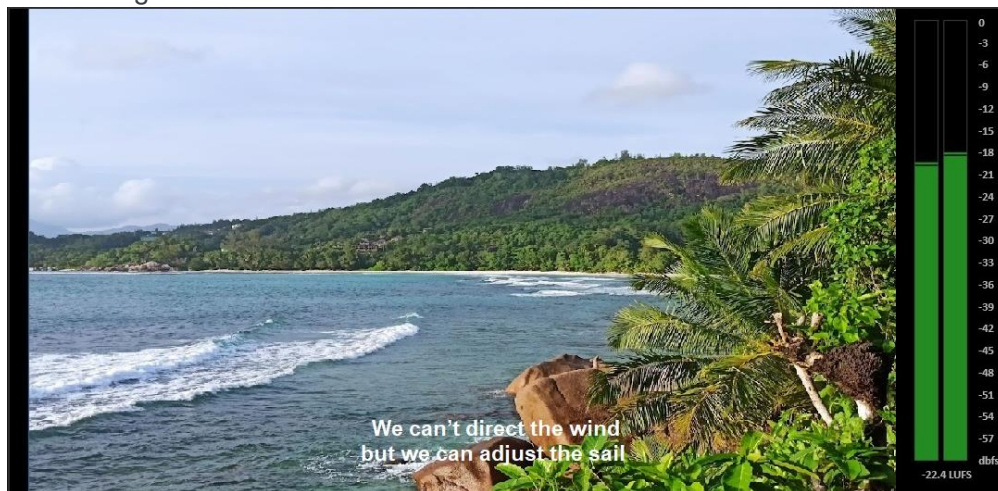


Figure 237. The Preview window and volume meters

- Timeline and Channel Player control buttons

The **video player timeline** consists of two bars:

The timecode bar (upper) is used to set the **In** and **Out** points for video playback, as well as to show a current frame.

The timecode zoom bar (bottom) is for scaling the time segment selected on the timecode bar. Move the round markers to scale.

Timecode counters:



Figure 238. Timecode counters

1. **Input** - the In point timecode of the selected video segment (Trim In)
2. **Segment duration** - the duration of the selected video segment (Trim)
3. **Output** - the Out point timecode of the selected video segment (Trim Out)
4. **Current time code** - current video playback time code
5. **Clip duration** - full video duration

Channel Player **control buttons:**



Figure 239. Channel Player control buttons

- Set marker timecode In
- Go to marker timecode In
- Step previous - go to the previous frame of the video
- Play - start video playback
- Step next - go to the next frame of the video
- Go to marker timecode Out
- Set marker timecode Out
- Apply changes to item

Manual Events ctrl window

The **Manual Events ctrl** window is intended for manual launch of the external events. Here you can operate with SCTE markers and GPO commands.

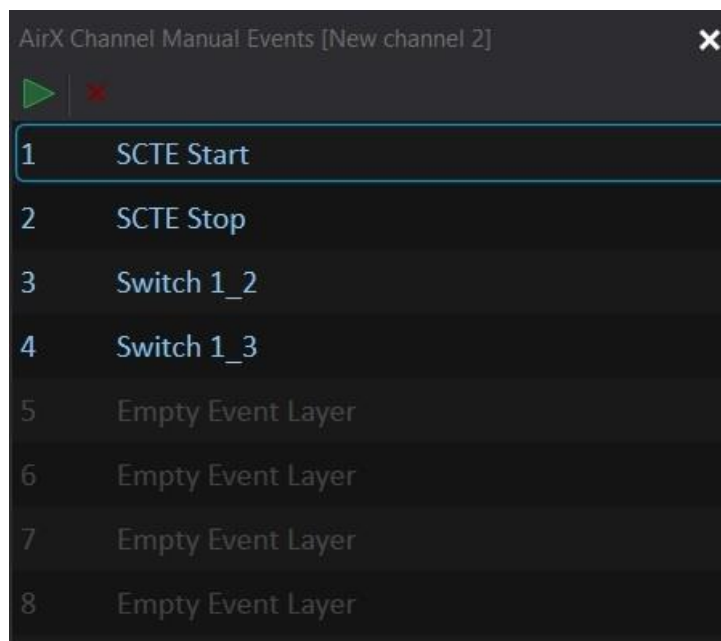


Figure 240. The Manual Events ctrl window

This window will allow you to launch the external event at any time, without the reference to the executable OnAir schedule,

Use Drag & Drop to add the external events to the Manual events window from the Channel resource tree (Events or Plugins branches). AirX broadcast automation allows you to add and manage up to 16 manual events simultaneously.

After the events are added, you can select any of them and click Play in the top menu of the window.

Channel command pane

The **Channel command** pane allows you to create a custom layout for the quick command control. You can manage the playback of the AirX schedule, the external events or channel CG. The Channel command pane is an additional app window, so the custom layout can be located on a separate touch-panel and used as an external control device.

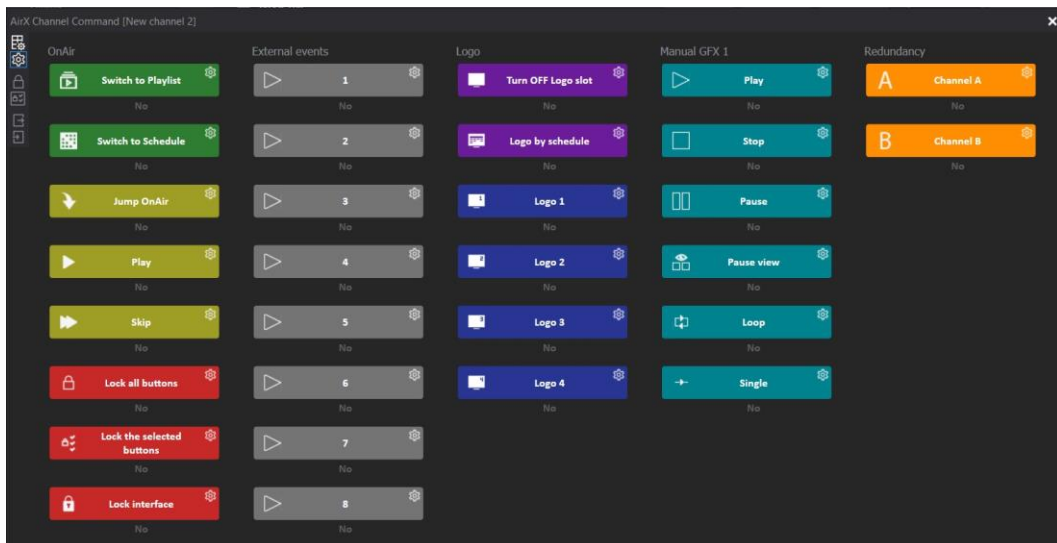


Figure 241. AirX Channel Command pane

The figure above shows an example of customizing the user pane with several groups of control commands. When first launched, the window will only contain the control menu on the left:

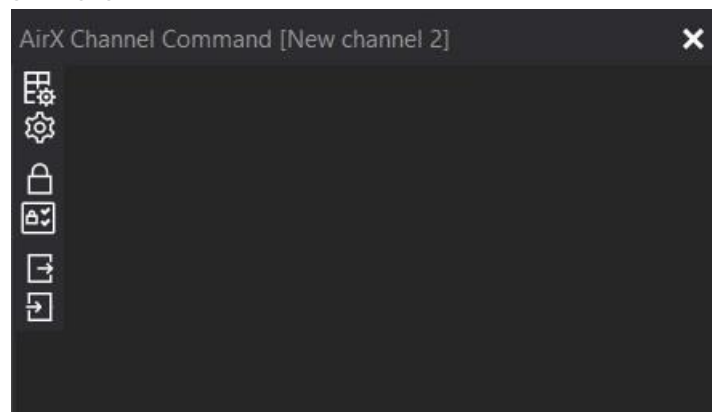


Figure 242. AirX Channel Command initial window, control menu

- **Show settings dialog** – opens an additional Command control settings window for creating and editing groups of commands. This settings window allows you to create a custom layout of buttons that will be located on the Command control pane
- **Set or unset editor mode** – activates the setting mode of the buttons created before. Allows you to assign a specific action to every button
- **Lock all command** - locks all user-created control buttons
- **Lock custom selected command** - locks only those buttons that have the corresponding flag (it can be set when creating the button)
- **Export current command layout to file** – allows you to export the created custom layout to an external *.xml file
- **Import and change current command layout from file** – allows you to load the previously created layout from the *.xml file into the Channel Command window. If there are any buttons in the pane, all current buttons will be lost.

How to: create a custom layout:

1. Open the initial window of the AirX Channel Command. Open the Command control settings window by pressing a **Show settings dialog** button.

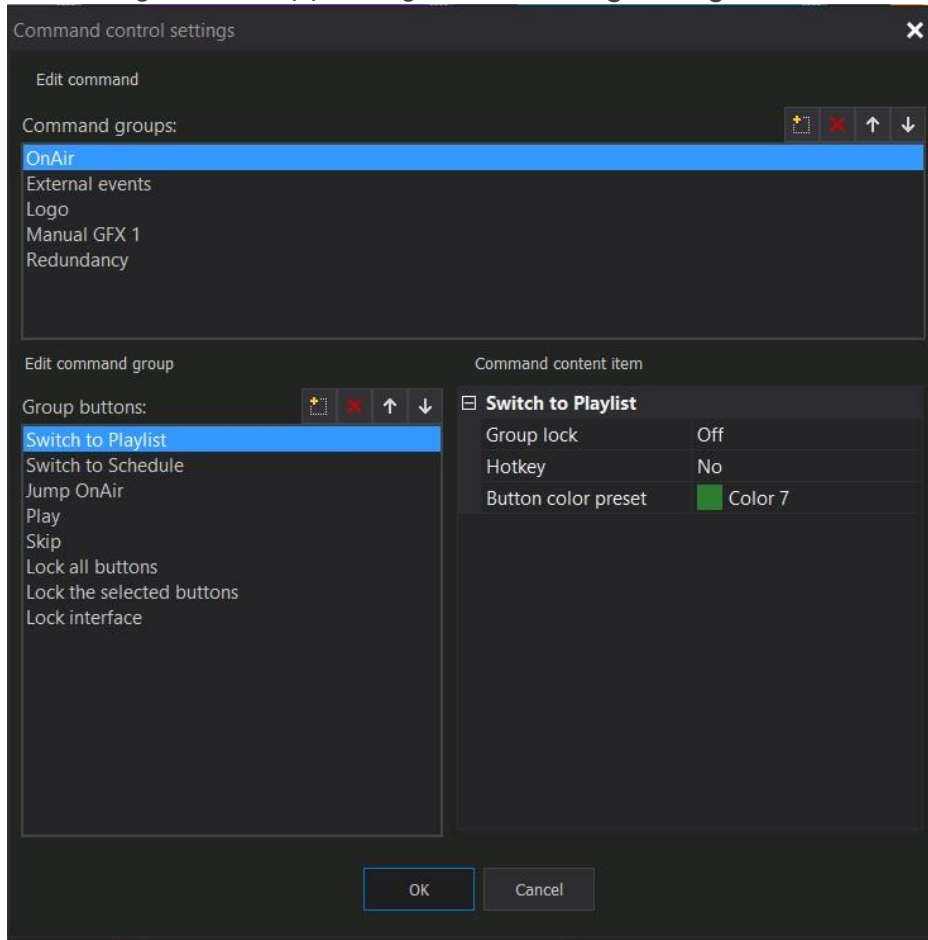


Figure 243. Command control settings

The window contains three blocks:

Edit command – Create a group of control commands

- **New** – create a new group of commands
- **Delete** – delete a selected group
- **Move Up** – move the group higher in the list
- **Move Down** – move the group lower in the list

Edit command group – Create the buttons in the group of control commands

- **New** – create a new button
- **Delete** – delete a selected button
- **Move Up** – move the button higher in the list
- **Move Down** – move the button lower in the list

Command content item – Edit the button properties

- **Group lock** – assign a GroupLock flag to the button. All buttons in the layout that have the lock flag can be disabled by pressing Lock all command in the main window of the Channel Command window.
- **Hotkey** – assign the hotkey (duplicate keyboard input) for each button in the layout
- **Button color preset** – assign a color for each button in the layout. Color customization provides maximum usability of the Quick Commands bar.

Use the top **Edit command** block to create groups of commands. Add a group by pressing New or delete it by pressing Delete.

2. Select the group of commands with the mouse and go to the **Edit command group** block. Create control buttons inside the Group buttons window. Creating and deleting separate buttons is similar to creating groups.
3. For each button created in the previous step, configure the operation and display settings: select the button and assign the color to the button, set hotkey and GroupLock flag if necessary in the right Command content item block.
4. When the configuration is done, click **OK** to save it.

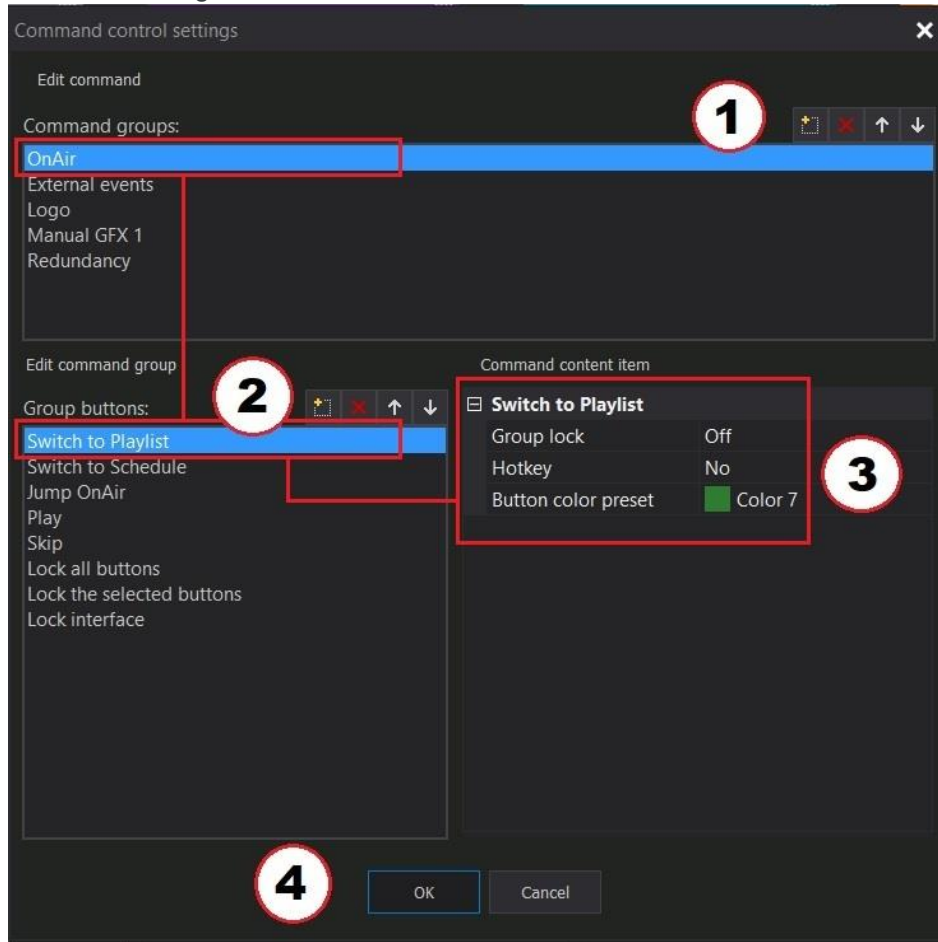


Figure 244. Command control settings

5. In the main window of the AirX Channel command pane you will see the custom layout you created. Click **Show settings dialog** again to make changes. If no changes are required, start the editor mode to assign a specific action to every button.
6. Click **Set or unset editor mode** in the left menu. You will see a gear icon on all buttons. This icon opens the context menu for the actions assignment. The menu contains the following items:
Command button property - does not assign any action but allows you to assign/change the color of the button and the GroupLock flag.

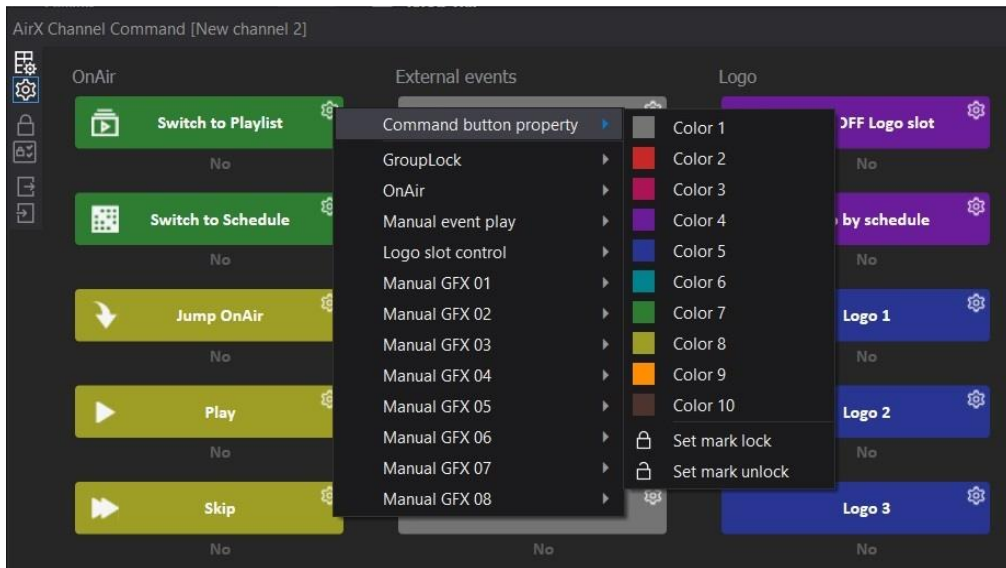


Figure 245. Command button property

Group Lock – assigns the GroupLock flag to the selected button:

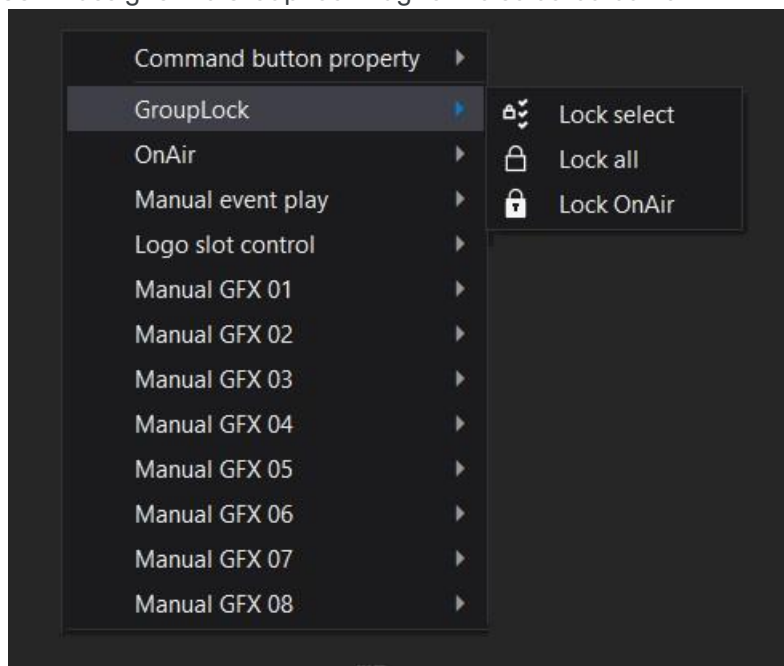


Figure 246. GroupLock

- **Lock select** - locks only those buttons that have the corresponding flag set
- **Lock all** - locks all user-created control buttons
- **Lock OnAir** - locks the AirX Play Channel Manager interface

OnAir – duplicates the control buttons of the Channel Manager main window (see the Figure 185. Channel Manager main window (part 2)).

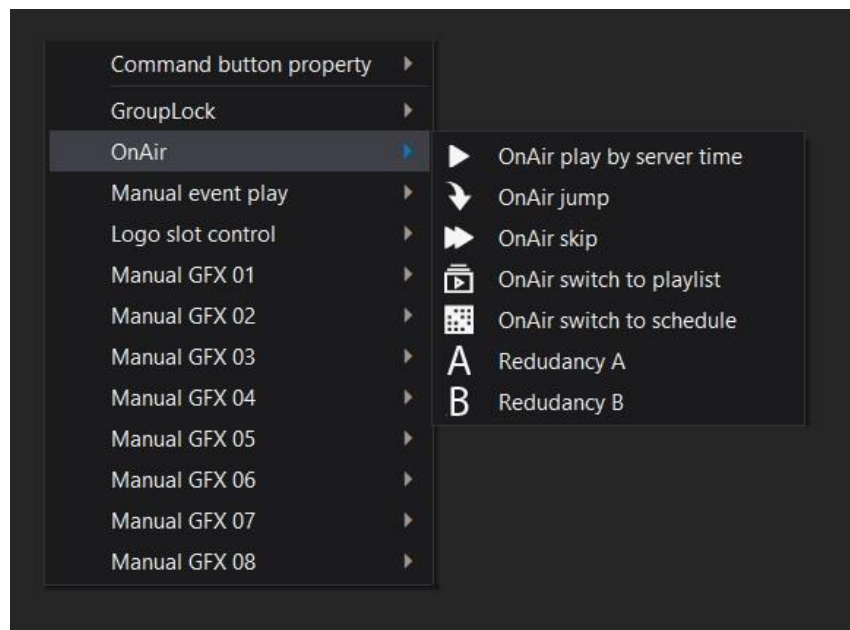


Figure 247. OnAir

- **OnAir play by server time** –start the playback of a schedule according to the current server time.
- **OnAir jump** - interrupt the currently playing clip and jump to the currently selected (highlighted) item in the schedule.
- **OnAir skip** - interrupt the currently playing clip and jump to the next item in the schedule.
- **OnAir switch to playlist** - switch the channel mode from the Schedule to the Playlist
- **OnAir switch to schedule** - switch the channel mode from the Playlist to the Schedule
- **Redudancy A** - control button for switching between the schedules of servers A and B when working in redundancy mode. Switch to the server A schedule
- **Redudancy B** - control button for switching between the schedules of servers A and B when working in redundancy mode. Switch to the server B schedule

Manual event play – triggers the external event assigned to the corresponding slot in the Manual events ctrl window (see the **Manual Events ctrl window** chapter for details).

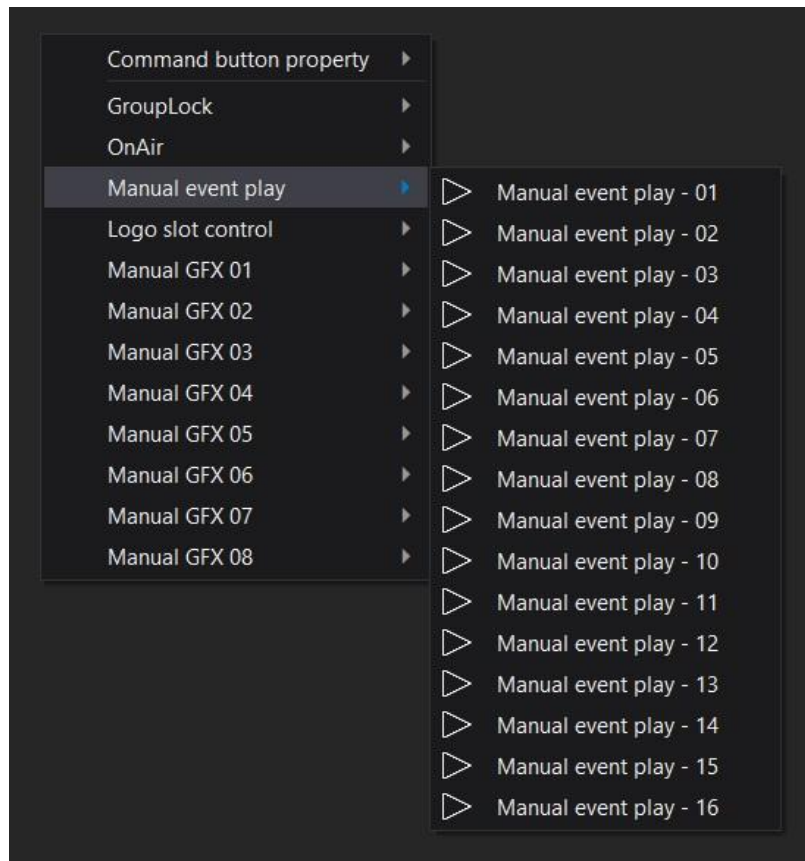


Figure 248. Manual event play

Logo slot control - assigns the following actions with the channel logo to the selected button:

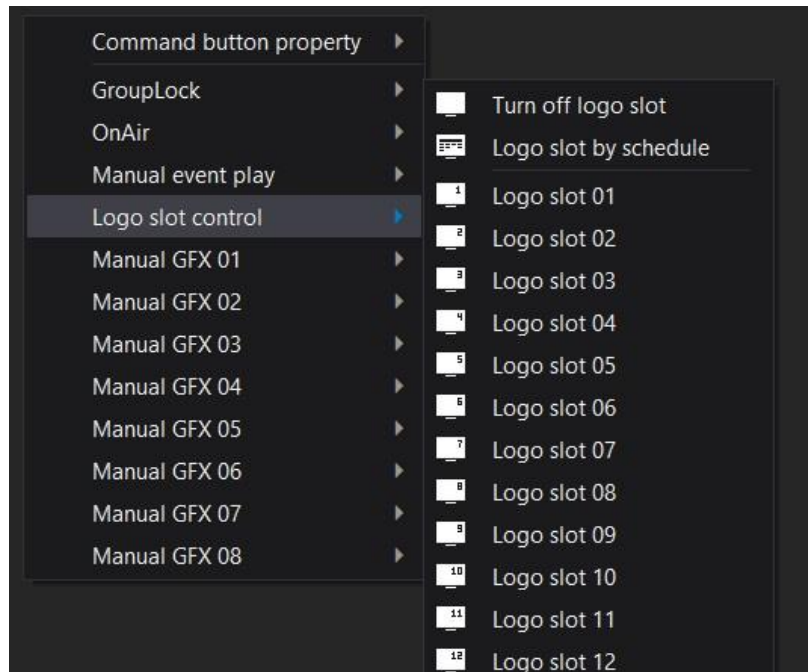


Figure 249. Logo slot control

- **Turn off logo slot** - self-explanatory

- **Logo slot by schedule** - turn on the logo according to the channel schedule.
- **Logo slot 01-16** - enable the logo assigned to the corresponding slot in the Channel Logo slot window (see the **Channel Logo Slot window** chapter for details).

Manual GFX 01-08 assigns the following actions with a CG scene assigned to the corresponding slot in the Manual GFX ctrl window to the selected button (see the **Channel Manual GFX ctrl window** chapter for details)

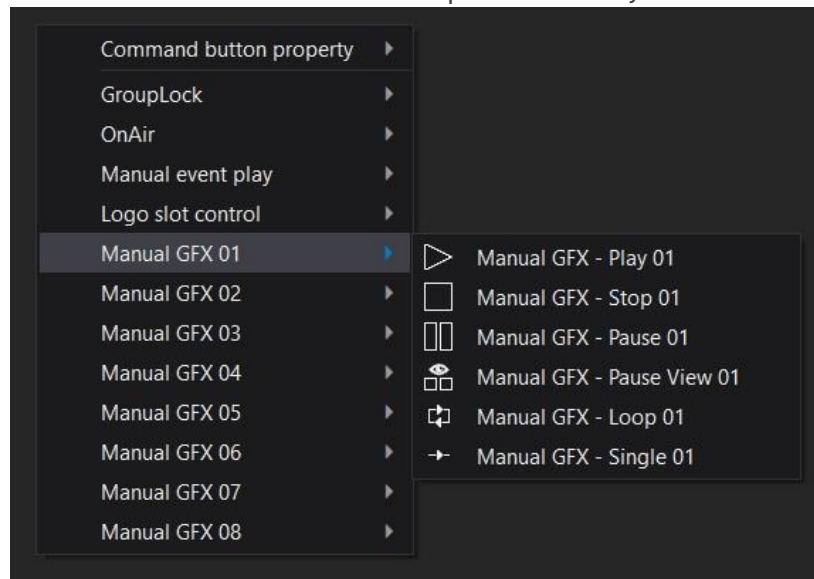


Figure 250. Manual GFX 01-08

- **Manual GFX - Play** - start playback of CG object
 - **Manual GFX - Stop** - stop playback of CG object
 - **Manual GFX - Pause** - pause playback and also disable the CG object
 - **Manual GFX - Pause View** - pause the playback of CG object, show the current freeze frame of the selected object
 - **Manual GFX - Loop** - start looping playback of CG object
 - **Manual GFX - Single** - start playback of CG object. Play the CG object once, regardless of its settings.
7. After all buttons are configured and actions are assigned, exit the editor mode by clicking again on **Set or unset editor mode** in the left menu. The Channel command pane is set up and ready to go.

Schedule Editor window

Schedule Editor is the additional window for editing Schedules and Playlists.

Open the schedule for editing in the Schedule Editor window using the **Open for edit** item of the context menu or by double-clicking on the schedule name.

The Schedule Editor window differs from the current air schedule by its title bar: it contains the name of the current channel and the name of the schedule file you are currently working with.

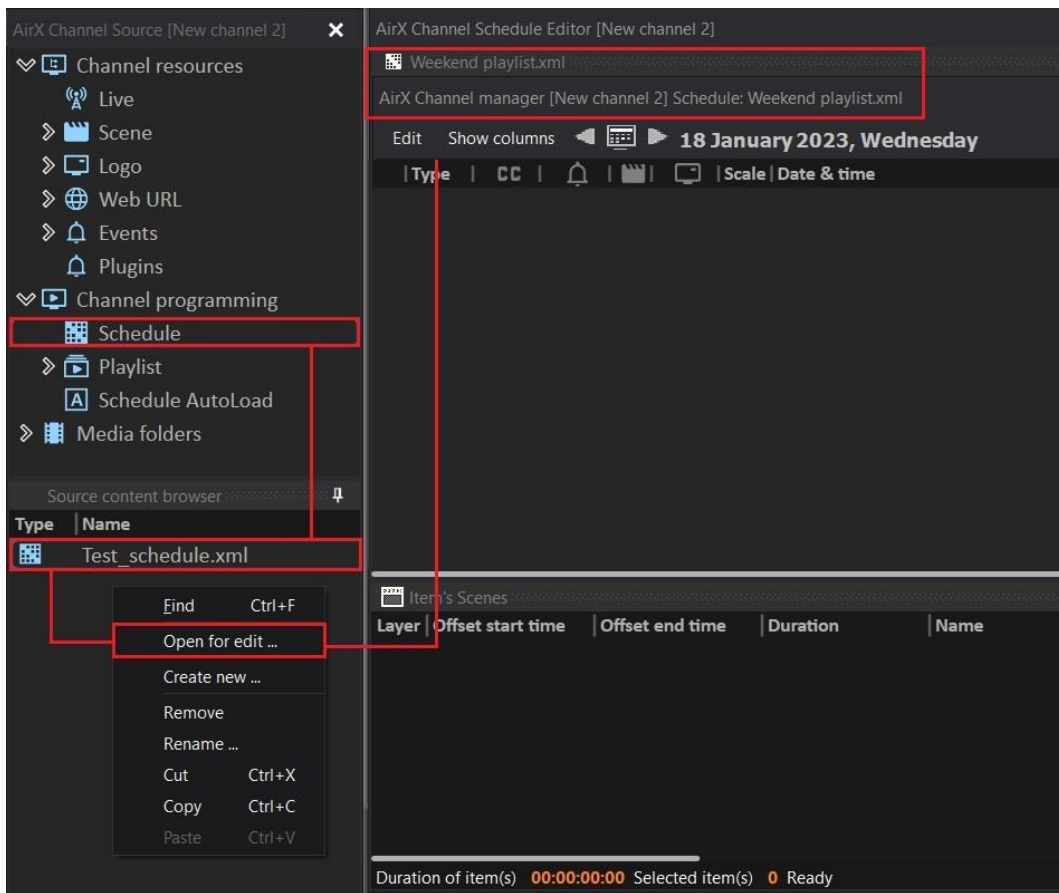


Figure 251. The additional Schedule Editor window

You can open several schedules and playlists at the same time and work with them in one window with the simple navigation. You can move and group windows as you wish:

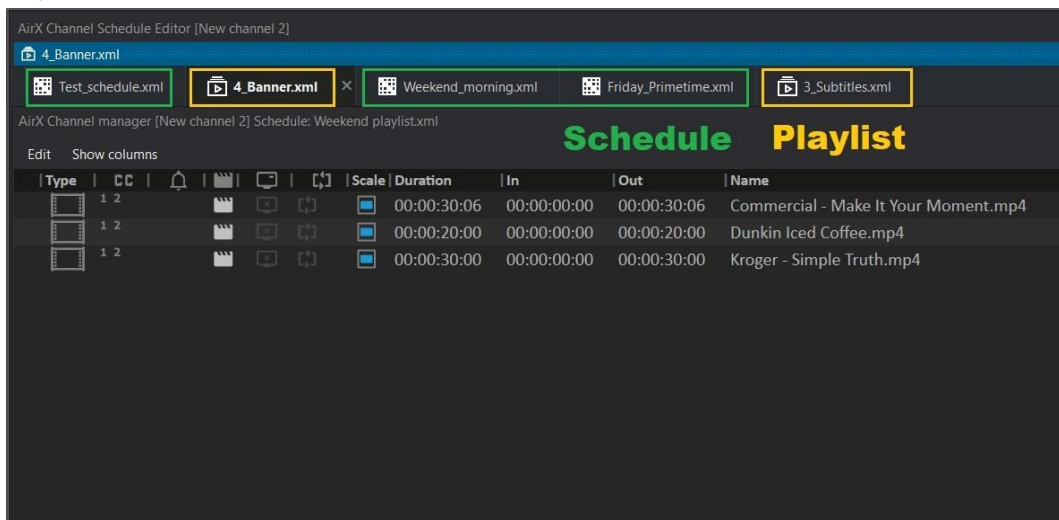


Figure 252. Navigating the Schedule and Playlist tabs in the Schedule Editor window

Edit windows context menu

It is not a separate window. It is the context menu of the **View** item of the system menu in the Channel Manager window. It is activated only if there are opened schedules/playlists in the Schedule Editor additional window.

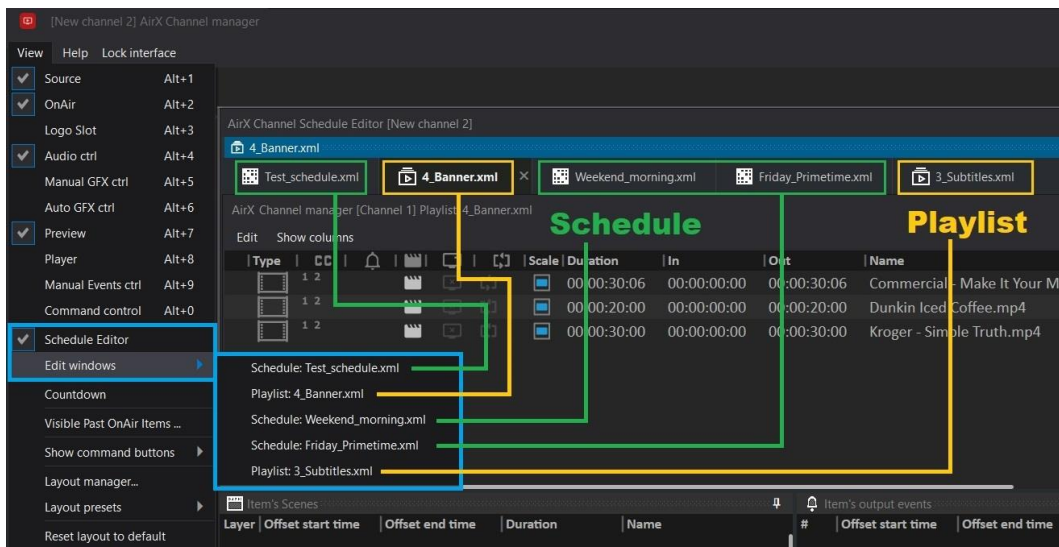


Figure 253. Schedule Editor navigation by the Edit windows context menu

Countdown window

In the countdown window you can see a countdown timer showing the remaining time until the start of playback of the selected schedule row. This window is only available in the Schedule mode.

To start the countdown, select the schedule row below the executed one at the time of the schedule playback and call the context menu. Select the Set a countdown timer item:

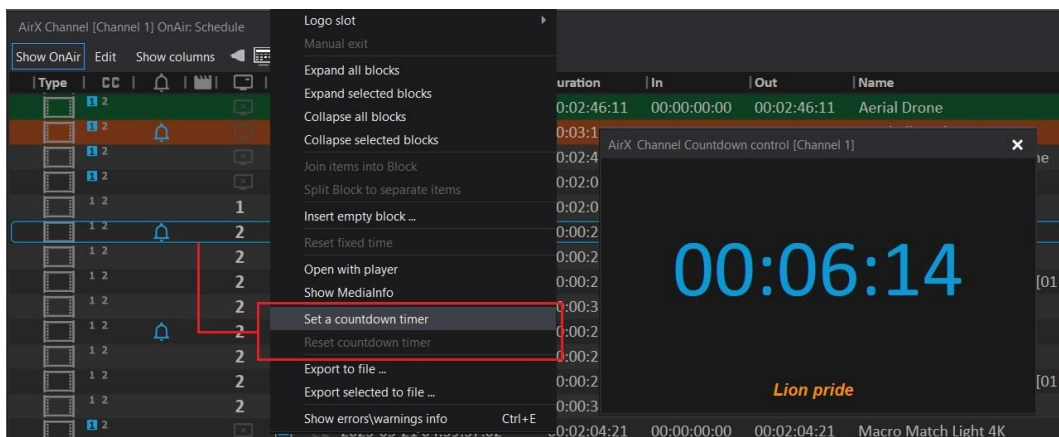


Figure 254. Countdown timer

Select the Reset countdown timer in the context menu to reset the timer.

Creating a custom layout

The AirX broadcast automation allows you to create individual custom Channel Manager window layouts, save them as *.xml files, transfer them between workstations and restore layouts from a backup.

By default, when you launch the Channel Manager application, the interface windows are arranged as follows:

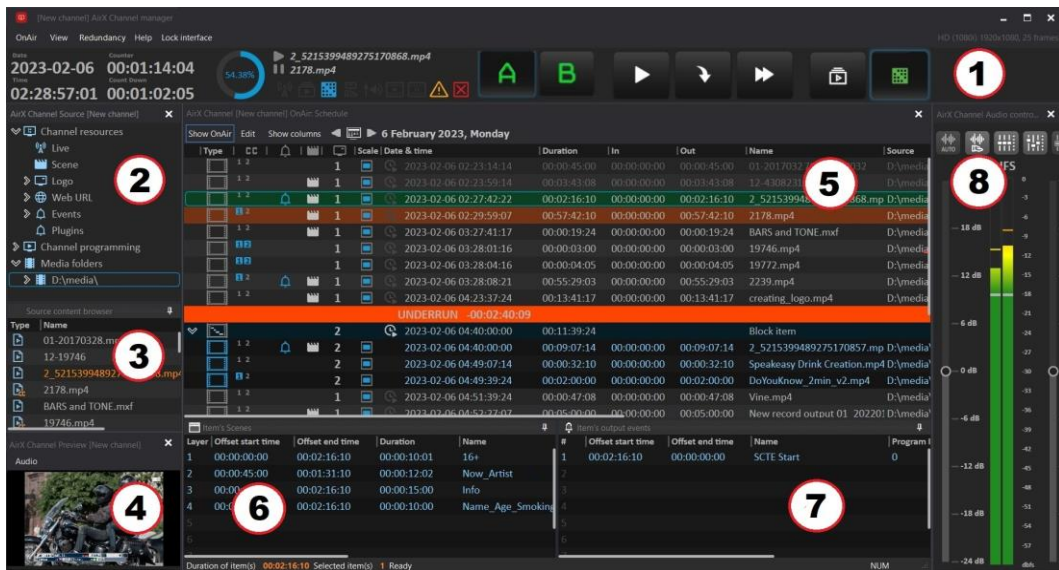


Figure 255. Channel manager default interface

Channel Manager default Interface includes:

1. Channel Manager main window - Playout channel management, control menu
2. Channel Source window - All connected sources of any type
3. Source content browser window - File manager that contains all contents of folders connected to the channel
4. Channel Preview window - Visual preview of the processing schedule
5. Channel OnAir window - Playlist / Schedule window for scheduling
6. Item's Scenes window. Channel CG - CG overlay scheduling. Refers to the window 5
7. Item's Output Events window - Output Control events scheduling. Refers to window 5
8. Channel Audio ctrl window - Channel sound settings

All windows can be moved. The figure below shows an example of a layout with a custom window order:

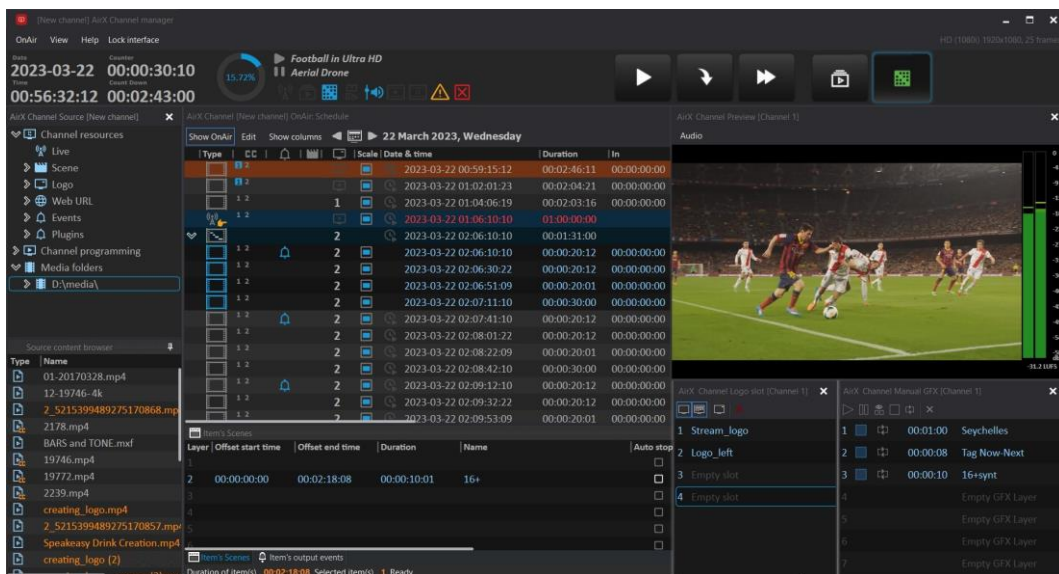


Figure 256. Channel manager custom interface

To make a custom layout, you may create a preset of interface windows location (Layout preset).

1. Expand the **View** item of the Channel Manager application system menu. Select the **Layout manager** item in the dropdown list.

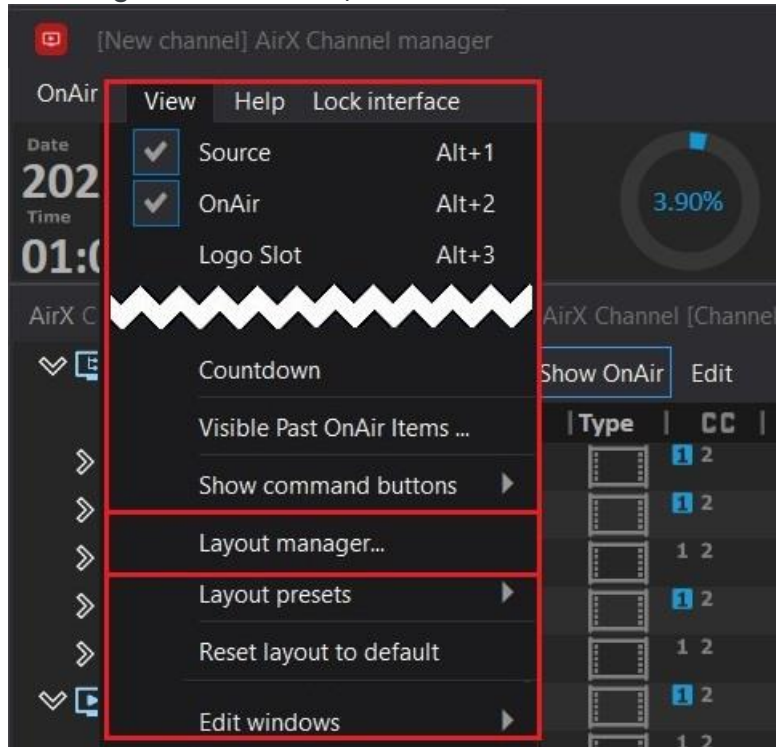


Figure 257. Layout manager item

2. In the additional Layout Manager window you can create and save up to 50 unique custom layouts (presets).

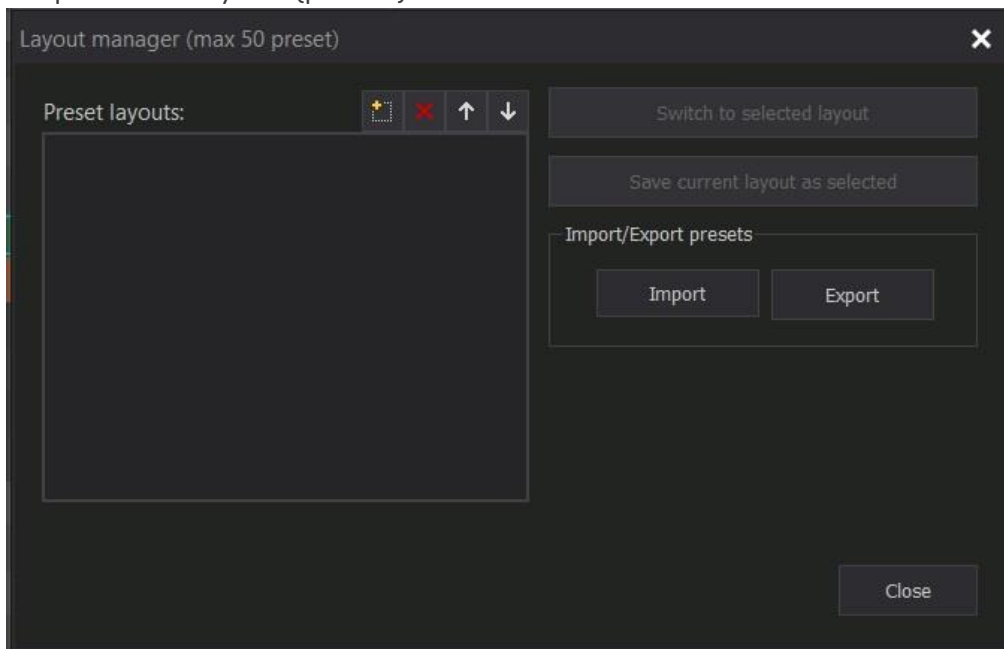


Figure 258. Layout Manager window

The Layout Manager window contains the following blocks:

Preset layouts – a list of preset layouts

Control buttons of the Preset layouts field:

- **New** - create a new layout
- **Delete** - delete the selected layout
- **Move Up** - move the selected layout higher in the list
- **Move Down** - move the selected layout lower in the list

Switch to selected layout button - switch to the selected layout. The button is active only if there are layouts in the list.

Save current layout as selected button - save the current layout of the Channel Manager application windows as the selected layout (from the list). The button is active only if there are layouts in the list.

Import/Export presets field:

- **Import** - import layouts saved as *.xml file into the Channel Manager interface
- **Export** - export existing layouts to *.xml file

The **Close** button closes the Layout manager window.

3. Click **New** in the Preset layouts field to create a preset. Enter the name of the layout, which will be saved as the current location of the Channel Manager windows. Click **Save current layout as selected**. Confirm saving the layout in the pop-up window.

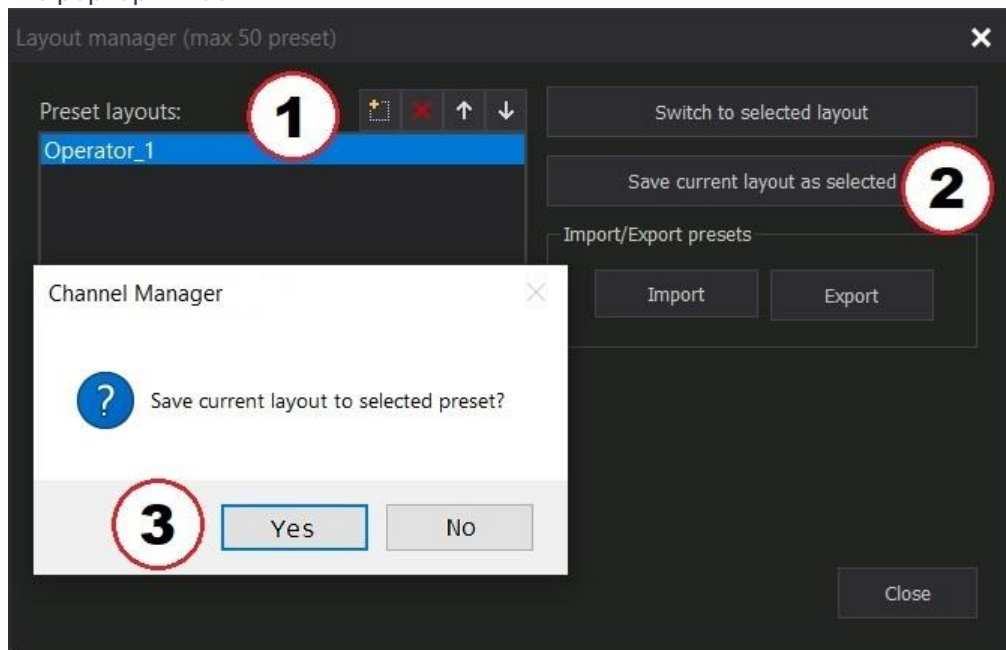


Figure 259. Save current layout to selected preset

4. Click **Export** to export layouts to *.xml file. In the **Export layout** window select the layouts you want to export (for multiple selection, hold down Ctrl on the keyboard) and click **Export Selected**. To export all available layouts, click **Export all**.

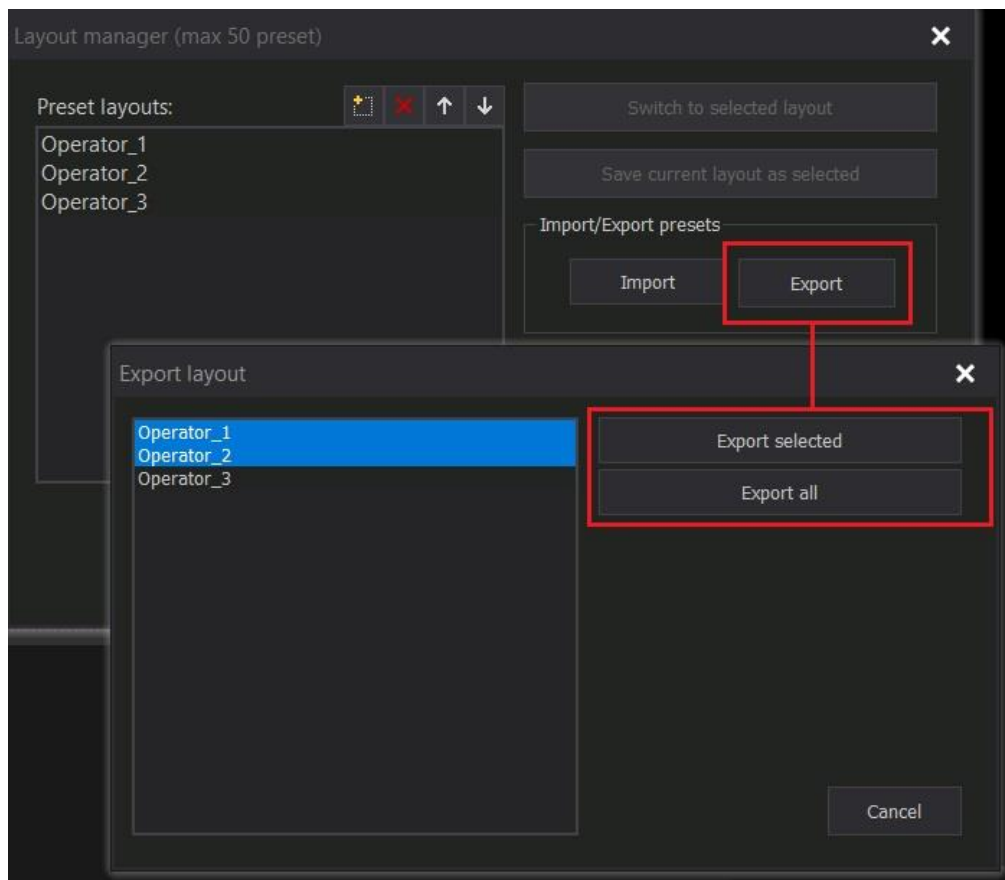


Figure 260. Export layouts

5. **Save** *.xml file using a standard Windows file manager.
6. Use the **Import** button to import a previously saved layout (or layouts) into the Channel Manager interface.
7. If you want to switch to a custom layout, select the layout in the Preset layouts list and click **Switch to selected layout**.

ATTENTION: When you click this button, the layout will be changed to the selected one, the current window layout will be reset! It is not possible to undo the **Switch to selected layout** action. Be careful not to reset an unsaved layout.

Once the Channel Manager window layout has been saved to custom layouts, the Layout manager window can be closed. Navigation through the saved layouts is available directly from the Channel Manager window:

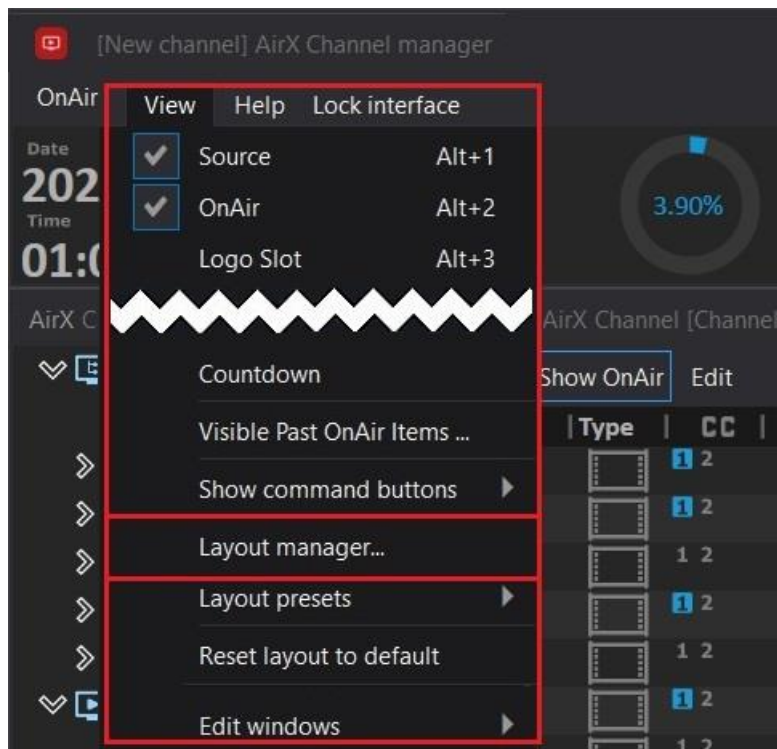


Figure 261. Navigation through the saved layouts

Schedule Fields

The AirX window workspace is a customizable dynamic visualization of schedule playback.

The schedule **rows** contain primary events (video clips), the schedule **columns** contain the data fields belonging to the primary events.

AirX broadcast automation supports two types of schedules:

Playlists: regular playlists of content which are sequenced of video files with secondary events like CG and control commands. The names of xml files of playlists can be any.

Schedules: chronologically organized and time-accurate playlists of content. Each schedule row has a specific Date&time field. The names of xml files of schedules can be any.

In addition, AirX supports the **Autoloaded schedules**, created by a third-party software, which supports the playlist format compatible with AirX. The auto schedule is loaded automatically at an assigned day and time. These schedules differ from the regular AirX schedules by naming structure in order to be played on the desired date and time automatically. The structure is: **YYYY.MM.DD**, where YYYY stands for year, MM-month, DD-date. **EXAMPLE:** If the name of the schedule is "2022.06.14.xml", it will be loaded on June 14th, 2022 exactly. But in other parameters they are the regular Schedule files.

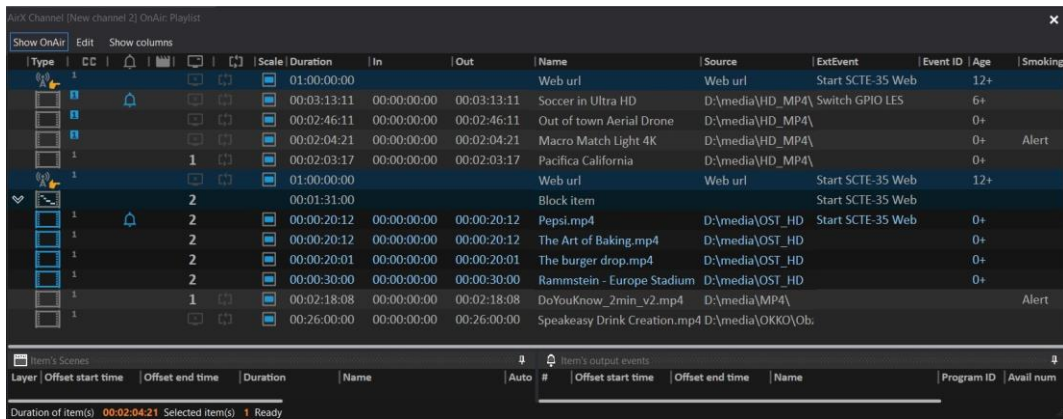


Figure 262. AirX Channel Playlist workspace

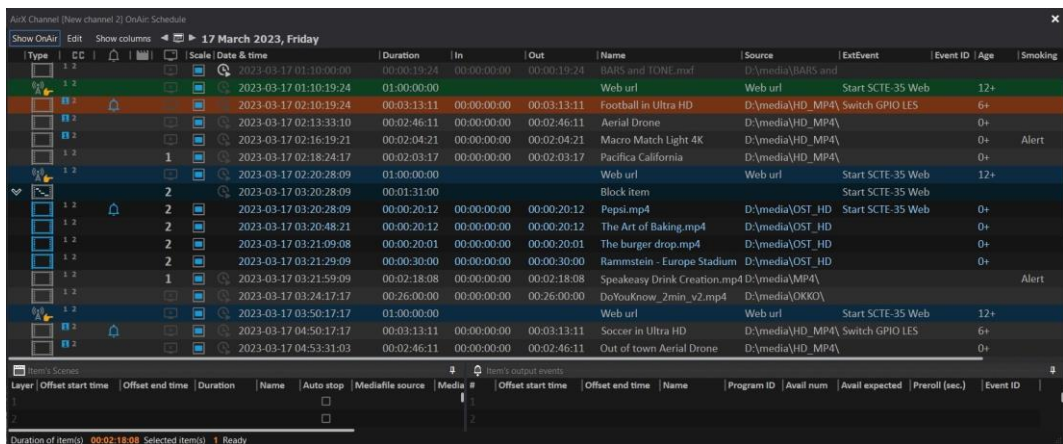


Figure 263. AirX Channel Schedule workspace

The title bar of the Channel OnAir window contains the name of the current playout channel in the square brackets. Here you can also see the Playlist/Schedule mode that is selected.

- Click the **Show OnAir** button to jump to the currently playing playlist row.
- Click the **Edit** button to expand the Channel playlist editor drop-down list (see the **Channel OnAir window** chapter for details).
- The **Show columns** menu contains a list of columns of the OnAir window workspace. The columns can be enabled/disabled by checking and unchecking the corresponding checkboxes. All items in the list below the Event ID are custom and must be configured in AirX Control app (see the **Channel TAGs and EPG** chapter for details).

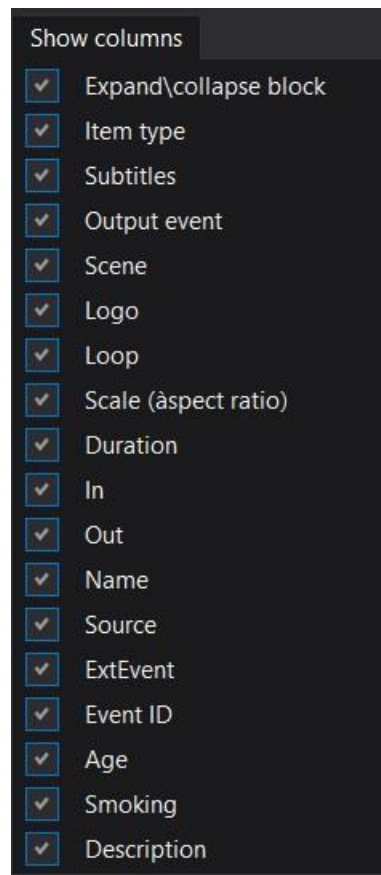


Figure 264. Show columns menu

See the **Channel OnAir window** chapter for detailed description of the columns.

Channel Manager Control buttons

Channel Manager is the main scheduling application that allows you to create an OnAir schedule manually or work with a schedule downloaded from a third-party source (broadcast traffic management system). Also, the Channel Manager is the main AirX application for the playback control.

The Channel Manager Control buttons are located on top of the app window.

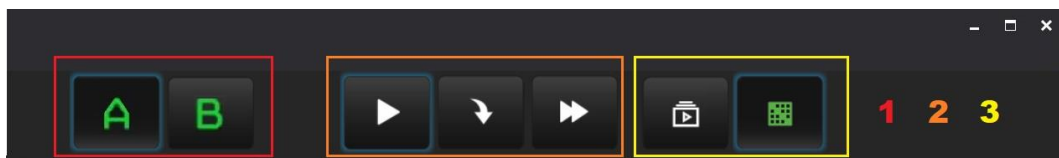


Figure 265. Channel Manager Control buttons

1. Control buttons for switching between the schedules of servers A and B, when working in redundancy mode. See the **AirX channel redundancy (1+1)** chapter for details.
2. Main function buttons to control the playback of the schedule in manual mode.
 - **Play by current server time** – click it to start the playback of a schedule according to the current server time.
 - **Play from the selected position** – click it to interrupt the currently playing clip and jump to the currently selected (highlighted) item in the schedule.

- **Skip** – click it to interrupt the currently playing clip and jump to the next item in the schedule.
3. Control buttons to change the channel workflow (Playlist or a Schedule).
- Switch to playlist mode
 - Switch to schedule mode

You can enable or disable any of Control buttons using the **View** -> **Show command buttons** drop-down list:

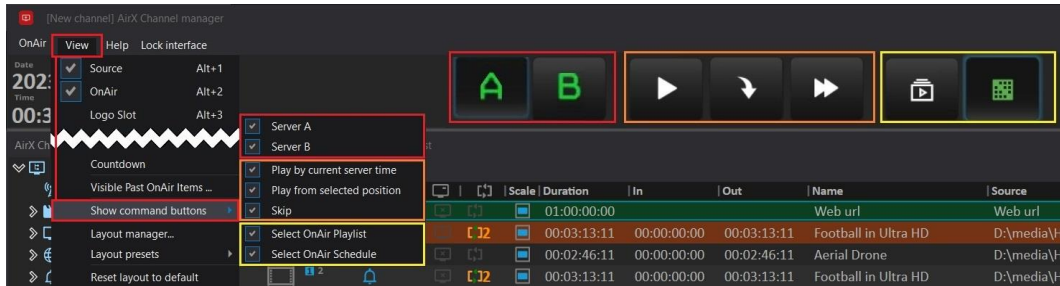


Figure 266. Enable/Disable the Control buttons

All the Control buttons are enabled by default.

States of the schedule elements. The color-coding and navigation.

Each Channel Manager Schedule row contains the primary event (video clip) supplemented with data fields belonging to that event (such as CG, tags or output events), as well as info icons (presence of subtitles, input events, loop playback parameters in the Playlist, Fixed time in the Schedule).

The AirX Channel Manager supports the color-coding of the schedule rows, including the states of the schedule elements, various types of primary events and Error/Warning messages.

The color-coding provides additional information:

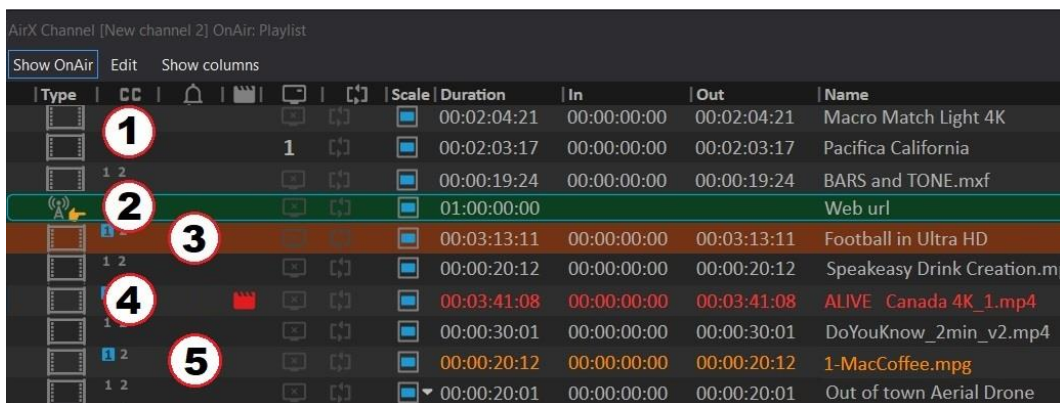


Figure 267. Color-coding of the schedule rows

1. Grey - standard Schedule Item, video clip, primary event.
2. Green - the currently playing clip. OnAir playback position.
3. Orange - the element that will be played after the current. Ready for playback position (next in the schedule).
4. Red - schedule row with Error status. Missing or corrupted primary event, missing secondary event, inactive Live input, etc.

5. Yellow – schedule row with Warning status. Video file format mismatch with playout channel format (incorrect resolution, fps, etc.)

If there are schedule rows containing errors, warning icons will be indicated in the main window of the Channel Manager:



Figure 268. Warning and Error icons

Warning (yellow triangle) indicates that there are files in the schedule, whose parameters do not match the Playout channel settings (aspect ratio, fps, etc.). The files will be played according to the schedule and the broadcast will not be stopped. According to the "non-critical" status, such files are not highlighted in the schedule window by default. The highlighting of Warnings elements can be enabled from the Edit menu (see the **Channel OnAir window, Schedule mode** chapter for details).

Error (red cross) indicates that schedule contains files with critical errors. For example, the video files that there are in the schedule are missing from the broadcast playout server storage or corrupted. Such error rows (missing or corrupted video files, CG files, incorrectly filled service slots) will be highlighted in red in the schedule. In addition, their location will also be duplicated by a red mark in the scroll bar of the schedule window on the right.

If the schedule playback reaches the row marked in red, the behavior of AirX automation will depend on the reason that caused the Error status. For example: if an error is caused by a missing CG file on the server storage, the primary event (the video file) will be played without overlays. The broadcast will not be stopped. However, if the error is caused by a missing or critically corruption of a primary event (a video file in the schedule), you will see a black field on the air (or media file/live input, specified as a replacement instead of a black field). See the **Media folders and content replacement**, and the **Input redundancy** chapters for details.

If you click on the Error icon, you will jump to the nearest schedule row containing an error. Clicking the icon again will move the pointer to the next error, and so on. This is how you can navigate through elements with an error status.

If you want to see the detailed description of the error or warning, select the schedule row containing an error with the mouse. Then right-click it to expand the context menu (Figure 208. Channel playlist editor drop-down list) and select the lower **Show errors/warnings info** item to open an additional window listing errors of the schedule item.

Underrun/Overrun conditions

In addition to the above service options, the OnAir schedule (due to its chronological structure) has a color-coding of Underrun and Overrun conditions (only available in the Schedule mode).

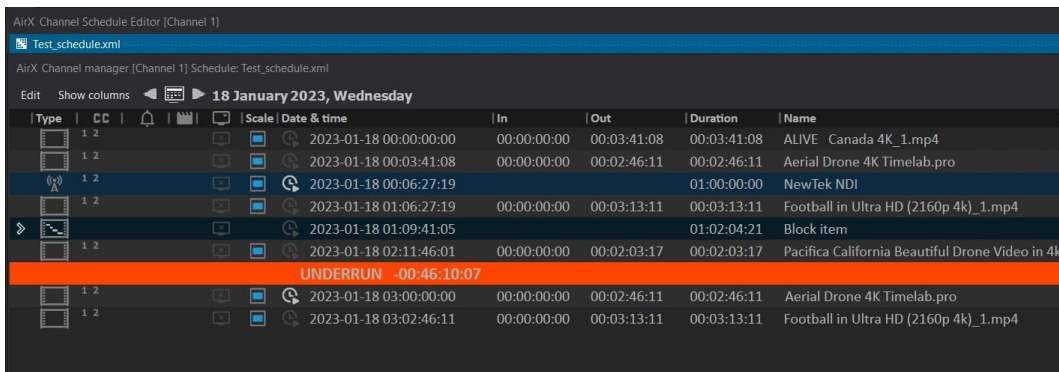


Figure 269. Underrun

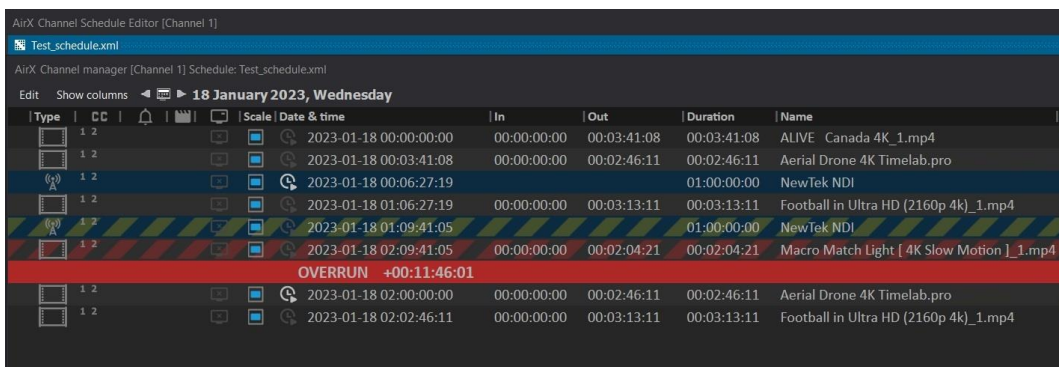


Figure 270. Overrun

See the **Live streams and additional playlists. Prescheduling workflow.** chapter for the detailed description of Underrun and Overrun conditions.

ATTENTION: The Underrun and Overrun conditions in the schedule are considered as an error and cause the Error icon.

The different types of primary events

There are several types of primary events, supported by the AirX broadcast automation:

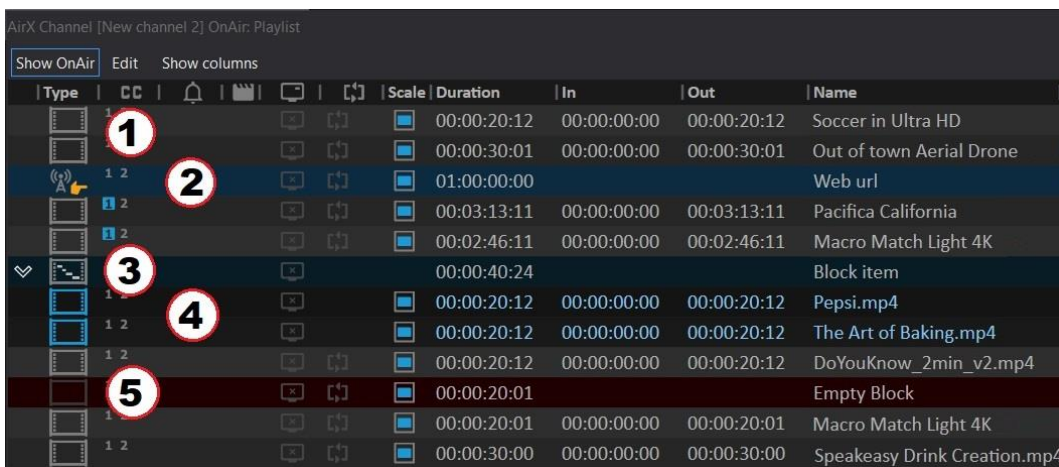


Figure 271. Different types of primary events

1. Grey - standard Schedule Item, video clip, primary event.
2. Light blue - Live source or Web URL.

3. Dark blue – a block header
4. Light blue with the dark gray background – several elements of the schedule combined into one group – a block.
5. Brown – Empty Block (Dummy clip).

Scheduling of Simple TV channels

The scheduling of Simple TV channels performs basic operations with content files – videos and CG files – without including Live inputs, studio signals, live broadcasts or prompt (on-the-fly) schedule editing.

How to: Prepare the schedule

Unlike the workflows described in the chapters below, the scheduling of Simple TV channels can be implemented either with the Playlist (a simple cyclic playlist of files) or with the Schedule (chronologically organized and time-accurate playlists of content). The sequence of actions in both cases will be the same.

How to: Make the simple schedule of files

By the time you are ready to prepare your first schedule, you should already have a Playout channel configured on the broadcast playout server and client components installed at the operator's workstation.

1. Launch the **Channel Manager** application from the AirX Launcher window. Select a Playout channel to work with.

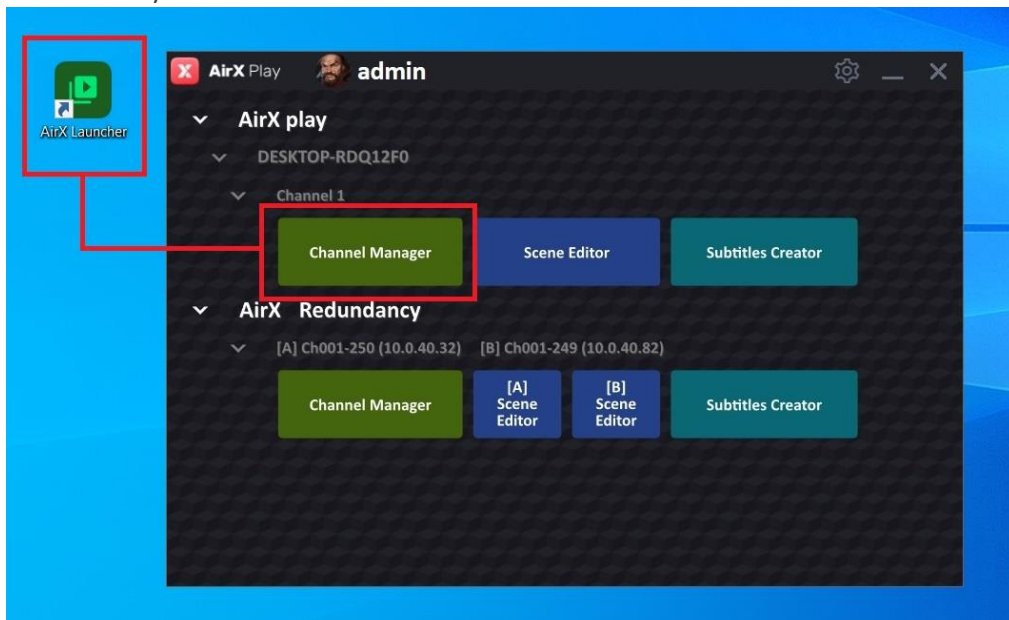


Figure 272. Launch the Channel Manager app

The first time you launch the Channel Manager application, it will look the follows:

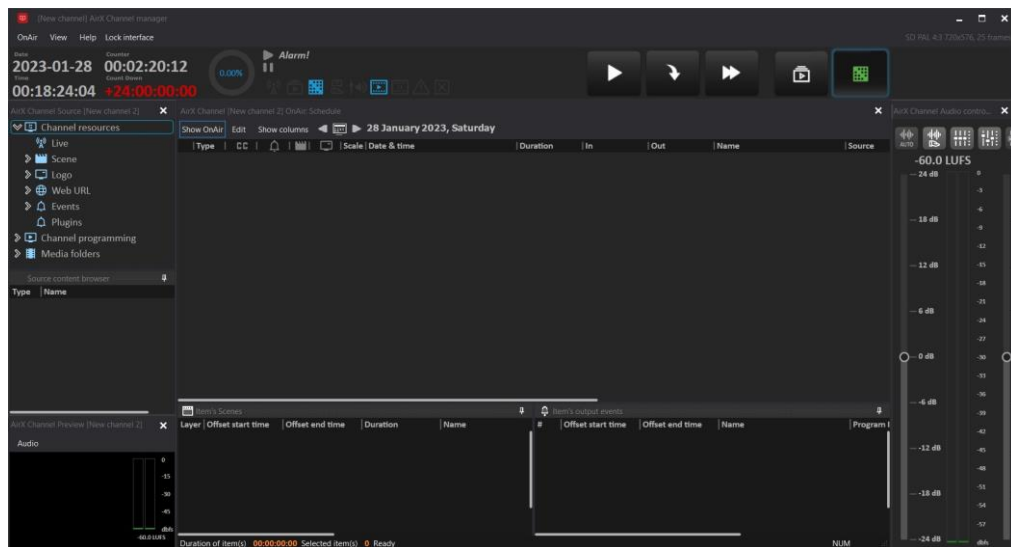


Figure 273. Channel Manager initial interface

Please notice that we are using the Schedule mode as an example!

- On the left side of the application window you can see the **AirX Channel Source [Channel name]** pane. This is the Channel resource tree; you can find the detailed description of its branches in this guide.

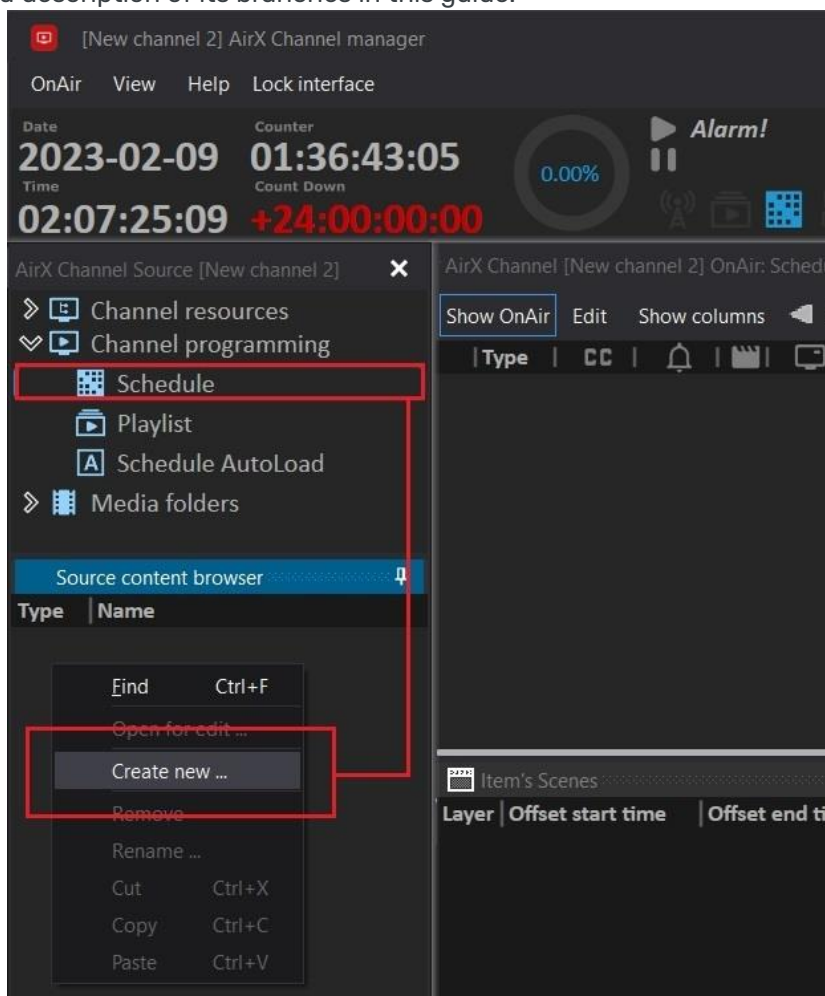


Figure 274. Schedule folder

In the figure above, you can see a part of the Channel Manager interface and the **Schedule** folder located in the channel resource tree.

Select the Schedule folder with the mouse. If you already have some earlier created schedules, they will be displayed in the **Source content browser** window (right under the channel resource tree). But for the first launch the folder will be empty.

Right-click on an empty space of the Source content browser window to call the context menu. In this menu please select the **Create new...** item.

Next enter the name of the schedule in the **Schedule Name** window and click **Ok**.

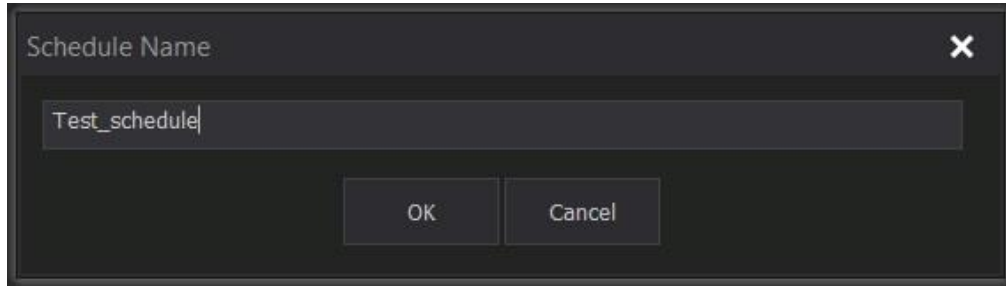


Figure 275. Schedule Name window

After you click Ok, you will see the created schedule in the Source content browser window.

ATTENTION: In fact, Schedules and Playlists are *.xml files stored in the broadcast playout server storage in folders associated to the channel. Folders are created automatically in the moment of a playout channel creation; changing the folder path is not possible. Manual modification of these files is prohibited due to the risk of schedule corruption by human error.

After you add a first schedule, you can work with the drop-down list of the Source content browser context menu. It will become available for every schedule in the folder.

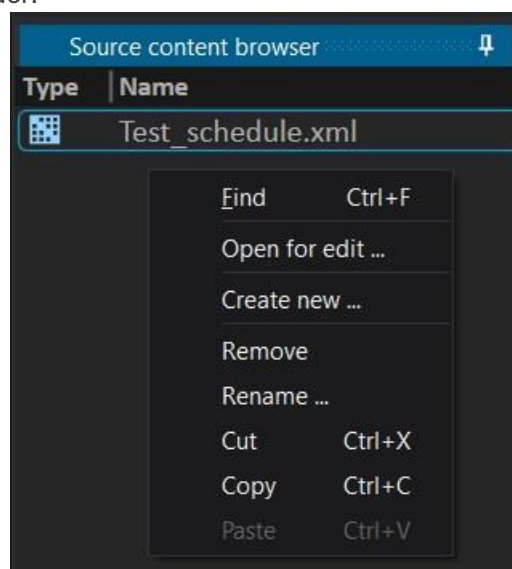


Figure 276. Source content browser context menu

This context menu will help you to **find** a schedule through the list of schedules, **open** the schedule in an additional window **for editing**, **delete** the schedule, **remove** or **rename** it. And also this menu has standard **Cut**, **Copy** and **Paste** options.

- Open the schedule in an additional **Schedule Editor** window using the **Open for edit** item of the context menu, or by **double-clicking** on the schedule name. The Schedule Editor window differs from the current air schedule by its title bar: it contains the name of the current channel and the name of the schedule file you are currently working with.

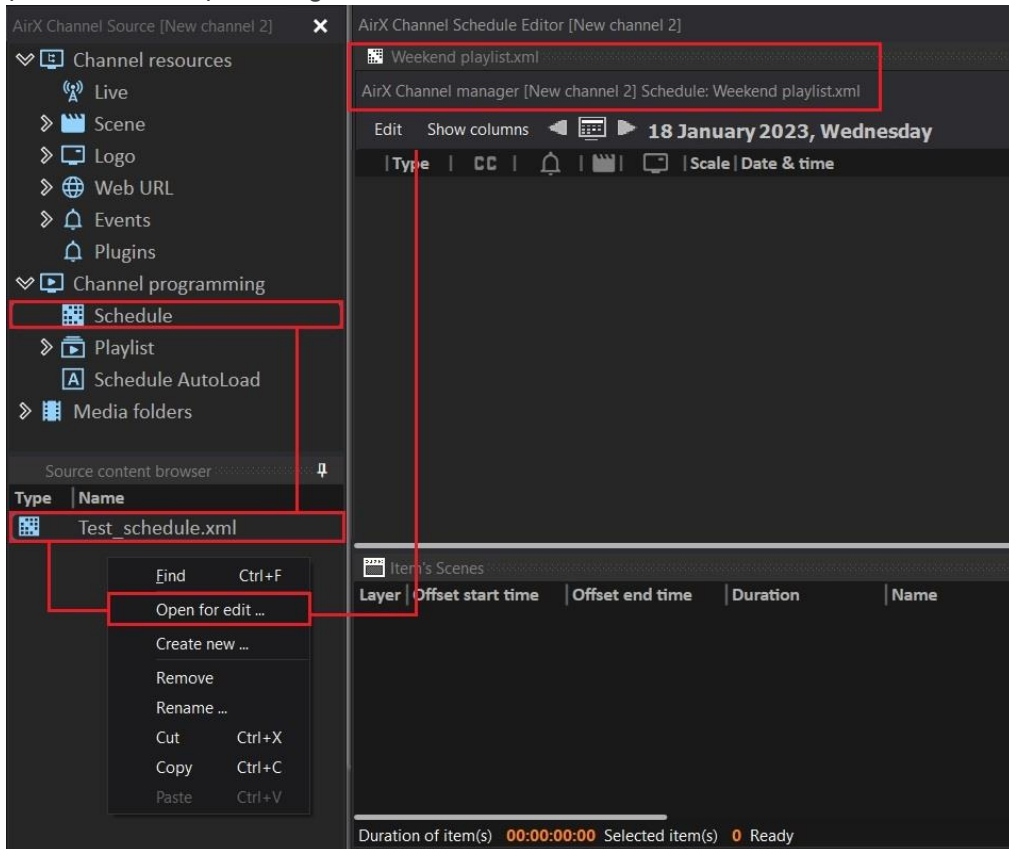


Figure 277. The additional Schedule Editor window

You can open several schedules and playlists at the same time and work with them in one window with the simple navigation. You can move and group windows as you wish:

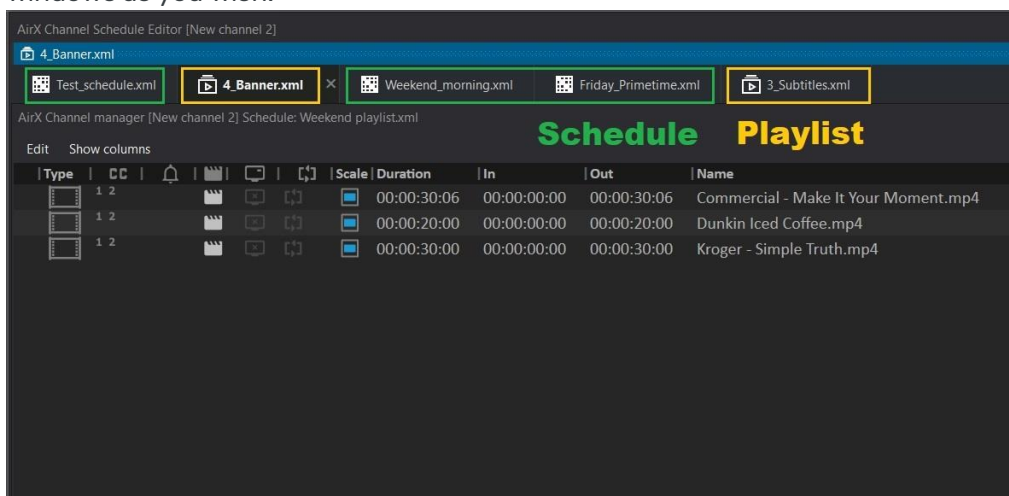


Figure 278. Navigating the Schedule and Playlist tabs in the Schedule Editor window

- In the left side of the Channel Manager app window, expand the Media Folders branch of the Channel resource tree and select the desired folder with video files (see the **Media folders and content replacement** chapter for details). You will see the list of available video files in the **Source content browser** window right below the channel resource tree. This list will contain only the video files that can be played in AirX (see the **Table of codecs** chapter for details).

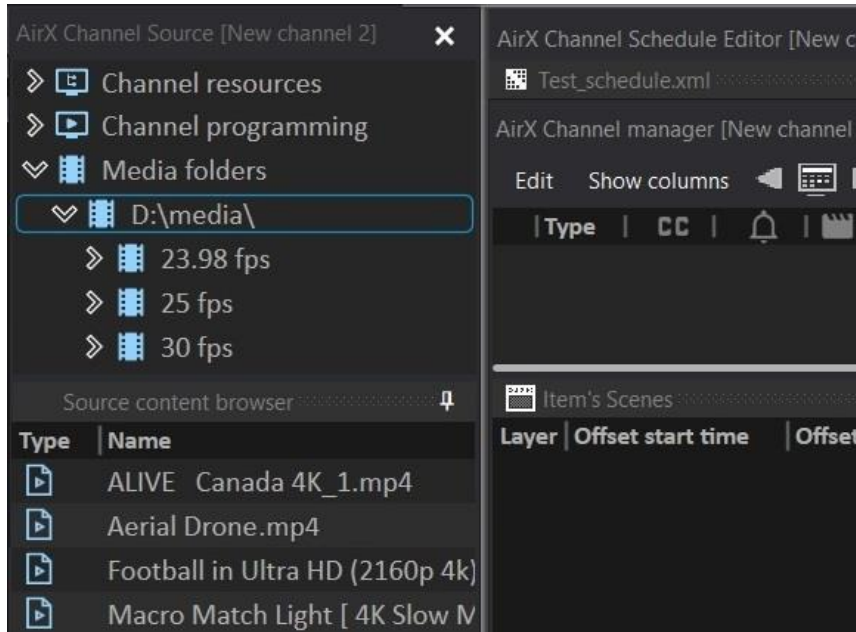


Figure 279. AirX Media folders

AirX broadcast automation supports subfolders within the channel Media folders, so you can create the most convenient file structure.

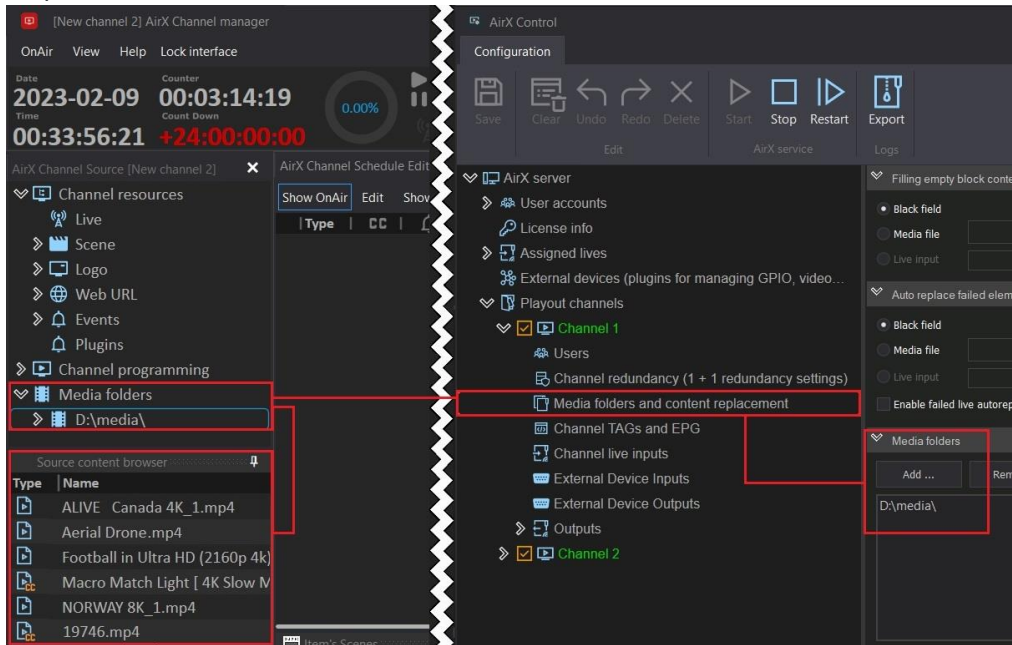


Figure 280. Media folders location - Channel Manager and AirX Control apps

The figure shows the connection of the Media folders in the Channel Manager interface (on the left) and in the AirX Control interface (on the right). See the

Configuring a Playout channel and Media folders and content replacement chapters for details.

- Open a Media folder in the Source content browser window and then create a Schedule manually, by dragging and dropping files onto the AirX Play grid.

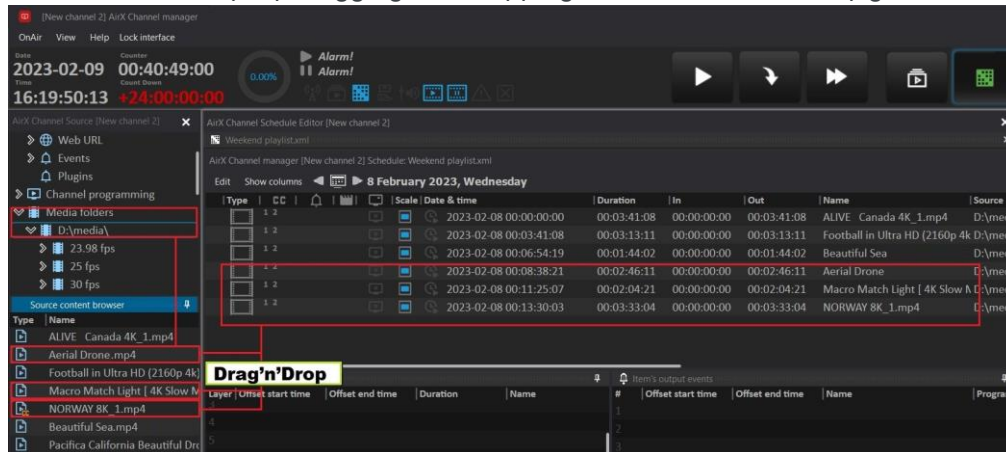


Figure 281. Creating the Schedule

You can add several files from a folder to the schedule at once using the standard multiple selection tool. Hold down **Ctrl** on your keyboard and select several video files with the mouse. Then, with a simple drag'n'drop, move them to the schedule.

Video files can be added to any place in the schedule as well as to the end of the schedule.

You can add a **Set fixed time** flag to any primary event (video file) in the schedule. See the **Live streams and frequently changing schedules. Live video workflow.** chapter for details.

Once you create the schedule, you need to move it to the Channel OnAir window. After this action the playback will start automatically. See the **Schedule playback** chapter for details.

ATTENTION: Scheduling and editing is also possible directly from the Channel OnAir window. But the method, described above, reduces the risk of schedule corruption by human error.

How to: Edit a file duration (trim)

The AirX Play has several tools for trimming the primary event (video file) or splitting it into parts:

- You can edit the values of the **In**, **Out** and **Duration** schedule fields manually. Double-click the value in the **Duration** field (it will turn orange) and edit it. The **Out** value will be changed automatically, the **In** value will remain. The playback will start from the beginning of the video file and will play exactly up to the specified duration.

This is the best way for Intro, for splash screens or to fill in the empty blocks (dummy clips).

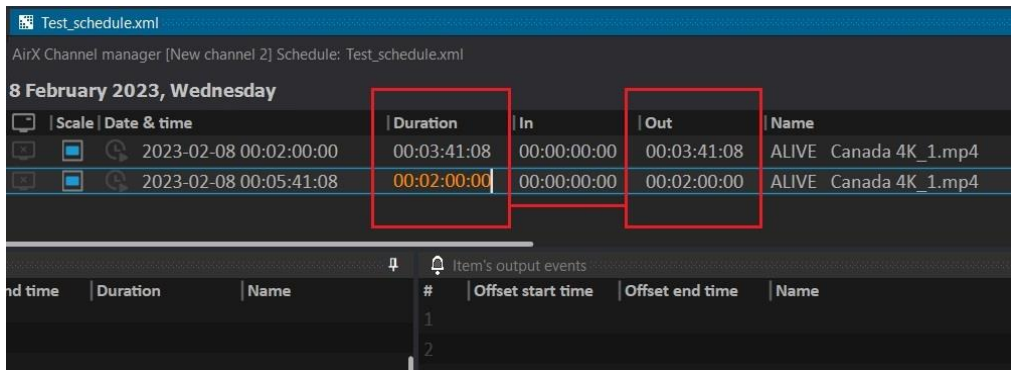


Figure 282. Edit the Duration field

You can change the duration using the **In** and **Out** schedule fields in the same way.

If you want to manually split a video file, add the file to the schedule multiple times and edit the **In** and **Out** fields for each file insertion.

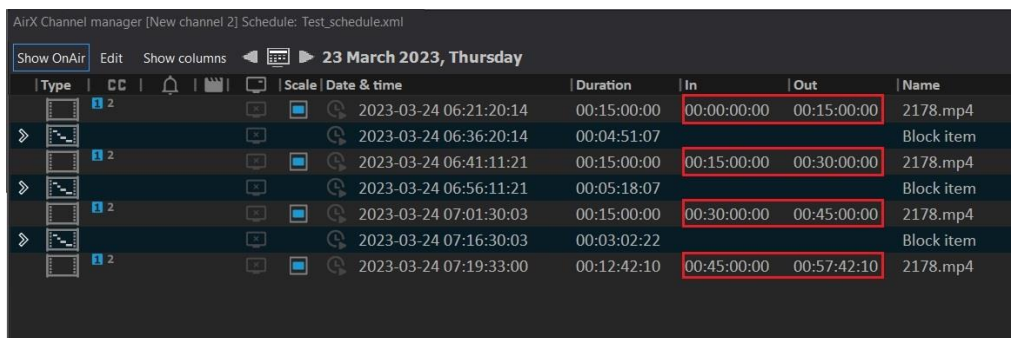


Figure 283. Split a video file

2. You can edit the file duration using a built-in Channel player. On the left side of the schedule window you can see the **Type** column. Select the video file (schedule row) with the mouse. Double-click the "frame" icon in the Type column. The Channel player will be opened in an additional window. Use the timeline slider and control buttons to edit the In point and the Out point timecodes of the video. Save the changes with the **Apply changes to item** button (green button with a check mark).

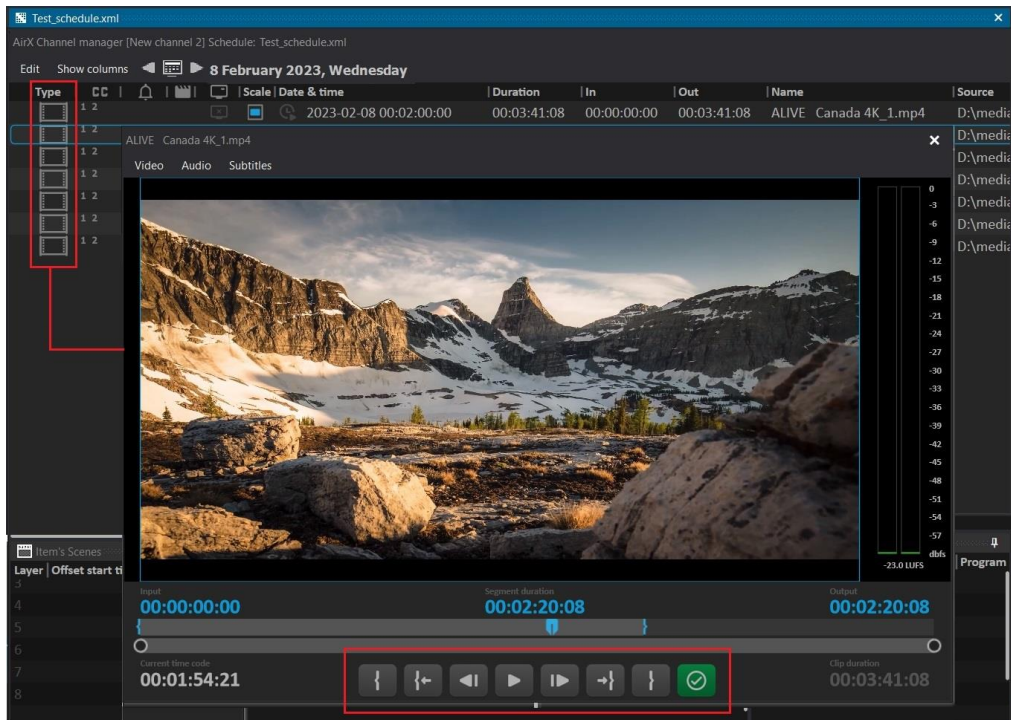


Figure 284. Channel player. In, Out, Duration fields.

The same way you can split the file into parts using the built-in Channel player. Add the file to the schedule multiple times, open the player and edit the duration parameters for each file insertion.

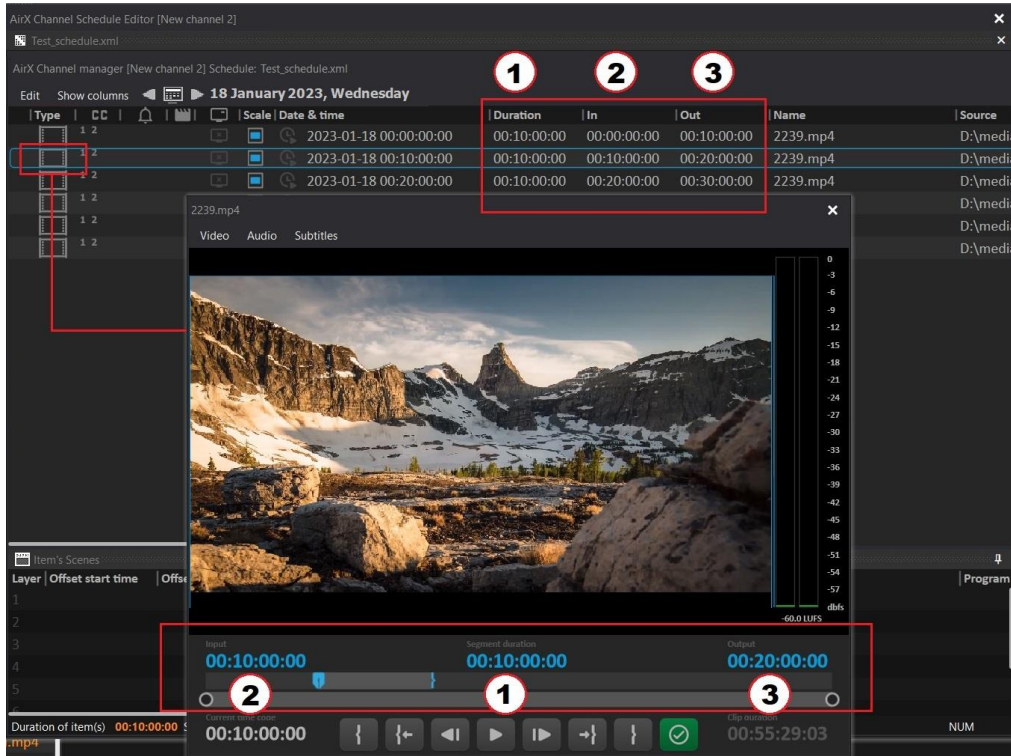


Figure 285. Channel player. Split a video file.

How to: Rename a video file

You can rename the primary event in the schedule by changing the **Name** field. Double-click on the title of the video file and switch to edit mode (the title will turn orange). After changing the name, press Enter.

Please note that this action will not rename the video file located in the folder on the broadcast playout server. Only the name of the element in the *.xml file of the schedule will be changed and, accordingly, the Name field in the Channel Manager application. If you have the several inclusions of the file in the schedule, only one schedule row will be renamed.

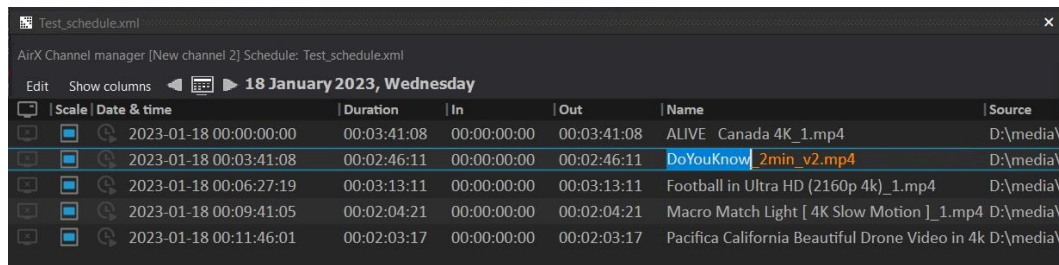


Figure 286. Rename a video file

How to: Add and edit a Block

In the AirX Play Channel Manager application you can work not only with separate video files in the schedule, but you can also combine them into blocks and work with a group of files as a single element of the schedule.

For example, you can assign a common logo, move the block in the schedule or trigger the block playback using the external events.

If you want to combine several files into a block, select these files with the mouse while holding down the Shift button on the keyboard. And then right-click to call the context menu and select the **Join Items Into Block** item.

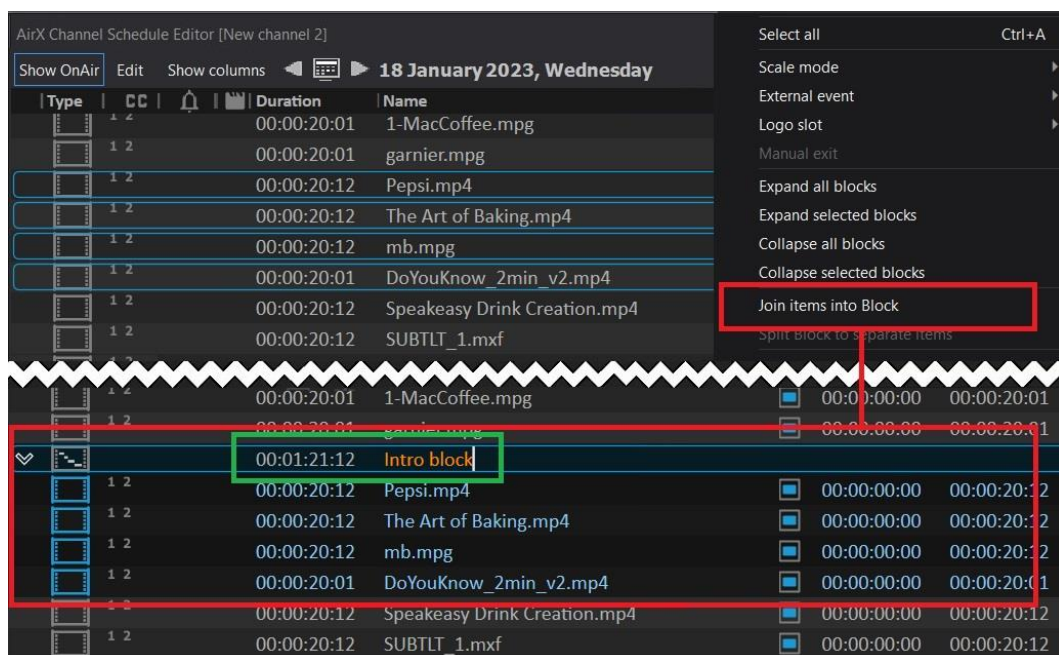


Figure 287. Join Items Into Block

As you can see in the figure above, the following group commands are available for blocks:

- **Expand all blocks** - expand all blocks in the schedule to display the clips included in the blocks
- **Expand selected blocks** - expand only selected blocks
- **Collapse all blocks** - collapse all blocks in the schedule
- **Collapse selected blocks** - collapse only selected blocks
- **Join clips into block** - assemble selected clips into one block
- **Split block to separate clips** - self-explanatory

After making a block, you can rename it (**Block item** by default). The Duration field will display the total duration of the block (outlined with a green frame). You can add (or delete) as many files inside the block as you wish. And also you can assign CG and logo to all files included in the block at once or just to the selected ones.

How to: Control the CG from the schedule

The AirX broadcast automation has the built-in CG **Scene Editor** for creation of on-air graphic design scenes and/or graphics conversion to the internal graphic scene format for AirX software.

It allows you to work with CG of various levels of complexity from a simple overlay of a static logo to a multilayer dynamic design using PIP, FILL + KEY, RSS, etc.

You can assign up to eight multi-layer dynamic CG scenes to each schedule row at the same time. Inside the scene, the number of overlays and CG elements is unlimited.

All the CG scenes available for the current Playout channel are stored in the broadcast playout server storage in folders associated to the channel format (for example: D:\Ch1\Scenes\1920x1080) as ***.vpScene** files. All the CG files you want to use must be converted to ***.vpScene** file format.

There are two types of CG elements, supported by AirX Play: **Logos** and **Scenes**:

- The **Scene** always has its own duration, not depending on the duration of the primary event in the schedule. A Scene may have duration longer than the primary event - in this case the playback of the Scene will not be interrupted when the primary event (video clip or Live) is finished. The only exception is when the corresponding **Auto stop** checkbox is checked (see the **Item's Scenes window. Channel CG** chapter for details). Each Scene will be played once, and the Scene cannot be looped. Scenes can be placed on multiple overlay layers and cover one another.
- The **Logo** is always depends on the duration of the primary event. It will be played exactly as long as the primary event (video clip, Live or Block) is playing. If the duration of the Logo is less than the primary event, the Logo will be looped. The logo is always on the top layer and cannot be covered by another CG element.

Logo overlay

1. Launch the **AirX Config** server application. Make sure your license includes CG - expand the Server resource tree and go to the **License info** branch. In the **CG Channels** line, the value must be 1 or more.

2. Launch the **Channel Manager** client application. Expand the **View** drop-down list of the system menu in the application window. Check the **Logo Slot** checkbox or press the Alt + 3.

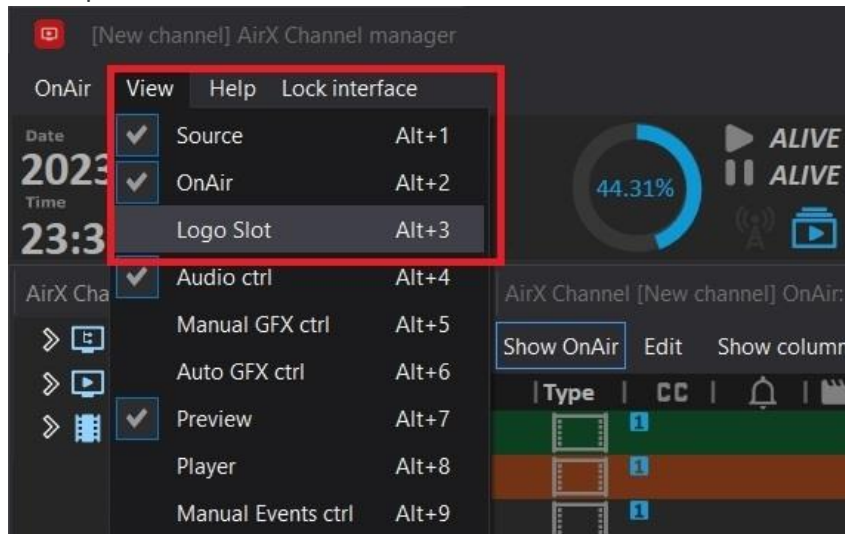


Figure 288. Turn on the Logo Slot window

3. The additional **Channel Logo Slot** window is intended to control and manage the display modes of the channel logo.

The system menu of the window contains the following buttons:

- **Turn logo OFF** - self-explanatory
- **Logo by schedule** - turn on the logo according to the channel schedule. Default mode
- **Start selected logo** - start logotype from the selected slot
- **Clear selected logo slot** - clear the selected logo slot

When you turn on the logo in the selected slot, the logo line will be highlighted in green.

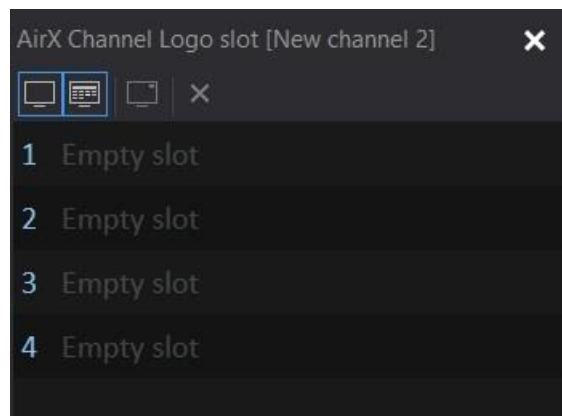


Figure 289. Channel Logo Slot window

4. Now you must add a Logo in one of the slots of the Channel Logo slot window. Expand the Channel resource tree in the left side of the Channel Manager application window and select the **Logo** branch. The Source content browser window will display all logos available for the channel. Select the desired Logo and drag it to the Channel Logo slot window.

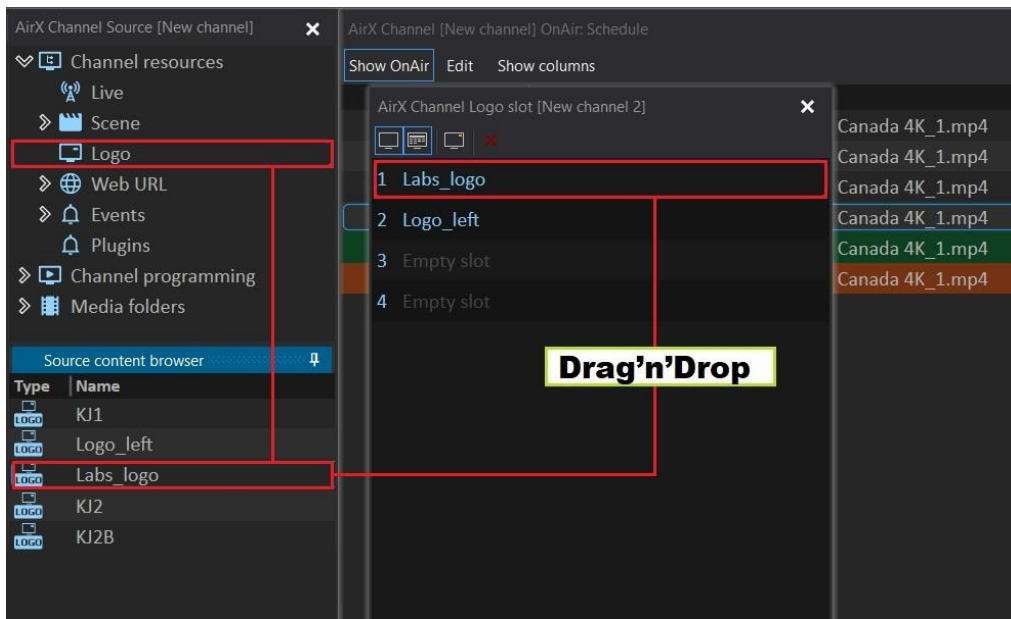


Figure 290. Fill in the Logo slots

5. After you add Logos to the Channel Logo slots, close the Channel Logo slot window.
6. Next you have to attach the logo to the schedule row (primary event). The type of the primary event does not matter; it can be a video file, Live or Block. Select the desired primary event with the mouse and click the **Logo** field to expand a drop-down list of available logo slots. Select the logo slot you want to use. The 'screen' icon in the Logo column will then change to the logo slot number. If you want to turn off the logo, select **Turn logo OFF** from the drop-down list.

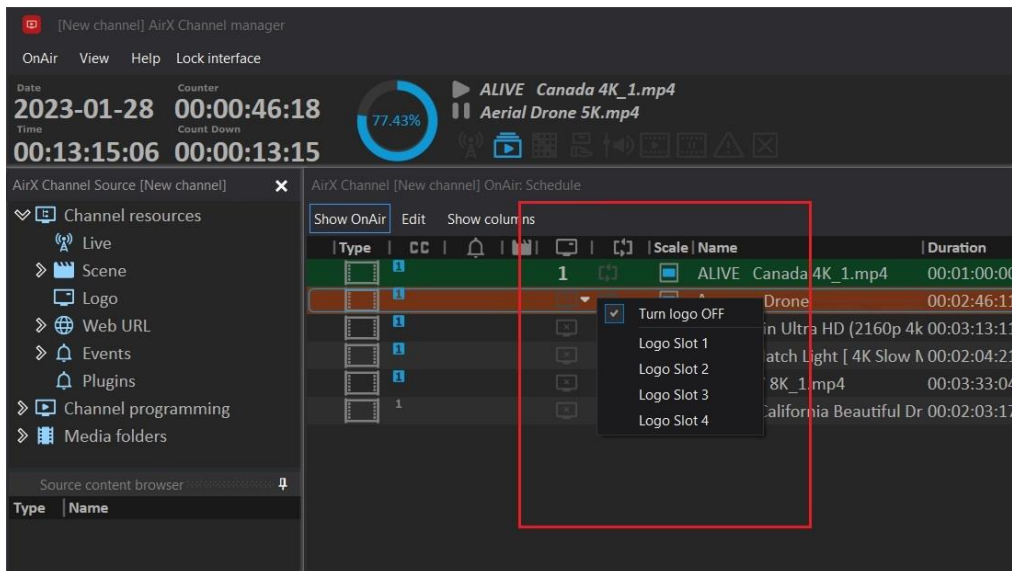


Figure 291. Turn Logo On/Off

If the Logo file that is located in the Channel Logo slot window is deleted from the server or damaged, all schedule rows containing this logo will be highlighted in red (see the **States of the schedule elements. The color-coding and navigation.** chapter for details).

Scene overlay

1. Launch the **AirX Config** server application. Make sure your license includes CG - expand the Server resource tree and go to the **License info** branch. In the **CG Channels** line, the value must be 1 or more.
2. Launch the **Channel Manager** client application. Select the schedule row (primary event) you want to work with.
3. Expand the Channel resource tree in the left side of the Channel Manager application window and select the **Scene** branch. The Source content browser window will display all Scenes available for the channel. Select the desired Scene and drag it to the **Item's Scenes** window. If necessary, edit the Offset start time of the Scene and other parameters (see the **Item's Scenes window. Channel CG** chapter for details).

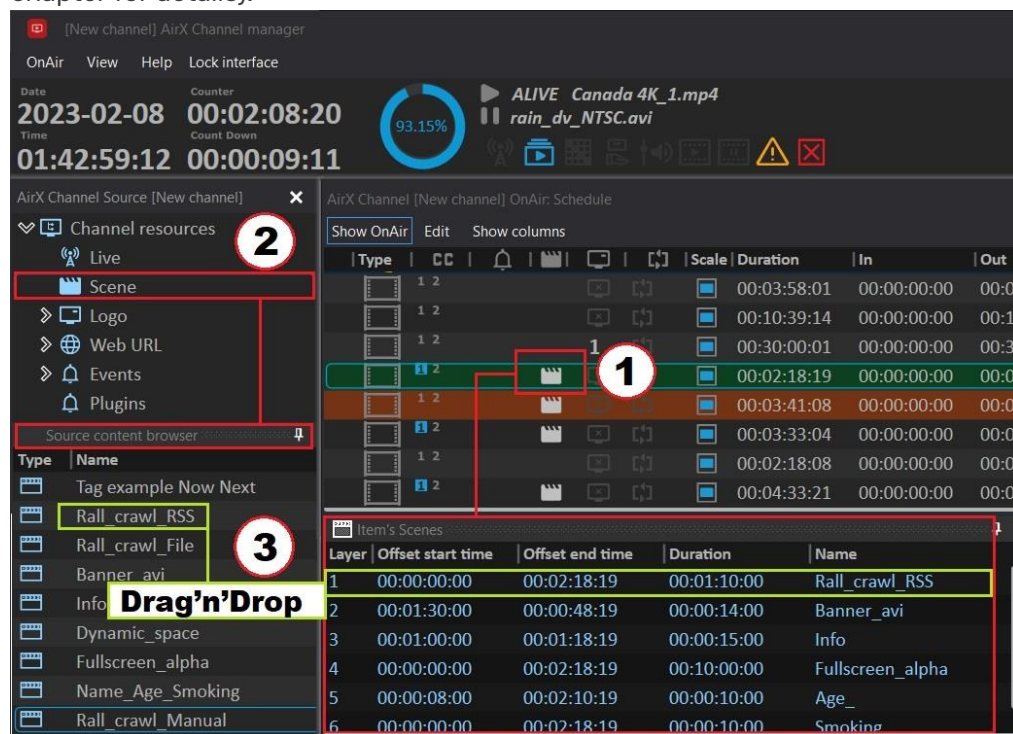


Figure 292. Scene overlay

If the Scene file was deleted from the server or damaged, all schedule rows containing this Scene will be highlighted in red (see the **States of the schedule elements. The color-coding and navigation.** chapter for details).

Subtitling

The AirX broadcast automation allows using subtitles together with your running clips. The subtitle files must be prepared by the third-party software but you can edit them in the built-in Subtitle Creator application if necessary.

1. Launch the **AirX Config** server application. Make sure your license includes subtitling - expand the Server resource tree and go to the **License info** branch. In the **Subtitles Tracks** line, the value must be 1 or more. At the moment AirX allows simultaneous work with 8 subtitle streams. Each subtitle language stream requires an additional license for a channel.

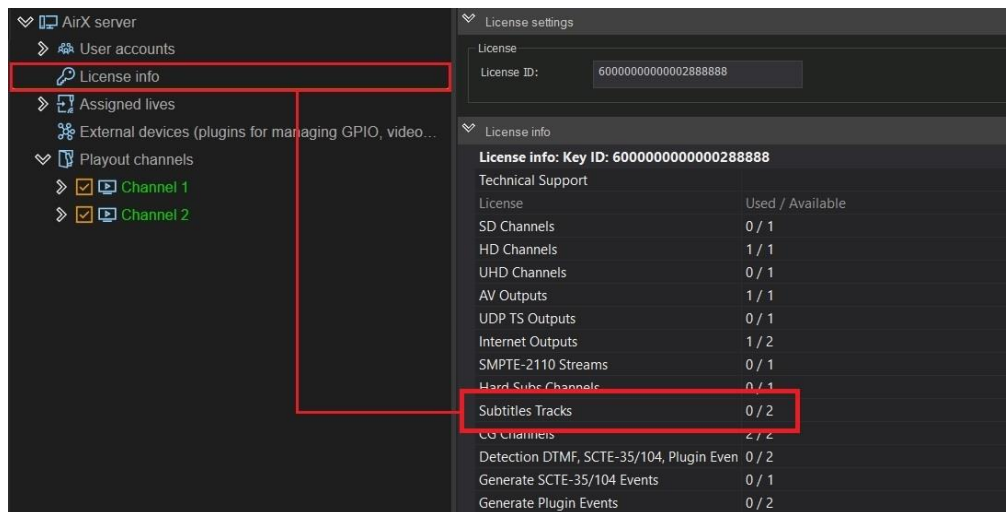


Figure 293. Subtitles Tracks license

- Open the Channel Settings pane (click the Channel name with the mouse). You will see the settings in the right side of the app window. Find the **Subtitles** section. Subtitle streams must be activated one-by-one by changing the value from Disabled (subtitles are prohibited) to **Enabled** (subtitles are allowed). The language code for each subtitle track must be entered into the **Lang** box manually. For example, eng or es.

The **Hard Subtitles** checkbox allows embedding (“burning”) the subtitle track into the video. The **File** drop-down contains the subtitle file formats, available for the channel. Options: SRT, SRT+STL, SRT+TSB4, SRT+TTML. The **Edit text style** button opens new window for editing the subtitle text styles.

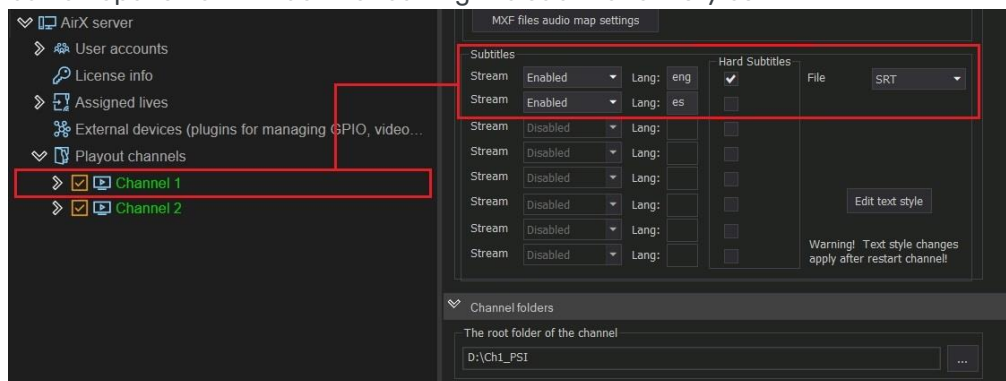


Figure 294. Subtitles settings

- Expand the Channel Recourse tree and then expand the **Outputs** branch and click the desired output to open the settings on the right.
- Now you have to add the subtitles for the SRT output. If you have another type of output, find the description in the **Outputs** chapter.
- Select the **Subtitle Format** in the drop-down list (None, DVB, EBU-TT) to enable DVB subtitles. The **Enable** checkboxes will be automatically activated. Check the boxes you want to use. The number of subtitles streams available for activation depends on the basic settings of the playout channel.

Check the box **Enable Closed Captions** if you want to use them. The **Enable** checkboxes will be automatically activated for all the available subtitles streams. Check the boxes you need.

The enabling of **teletext** is similar: check the box **Enable Teletext** and select the streams you need, as described above. After selecting the subtitles streams, you

have to specify teletext pages in the **Teletext/OP-42(47)** field. The default value is 888, you can change it manually. And finally, select the Main and Secondary codepages languages from the drop-down lists.

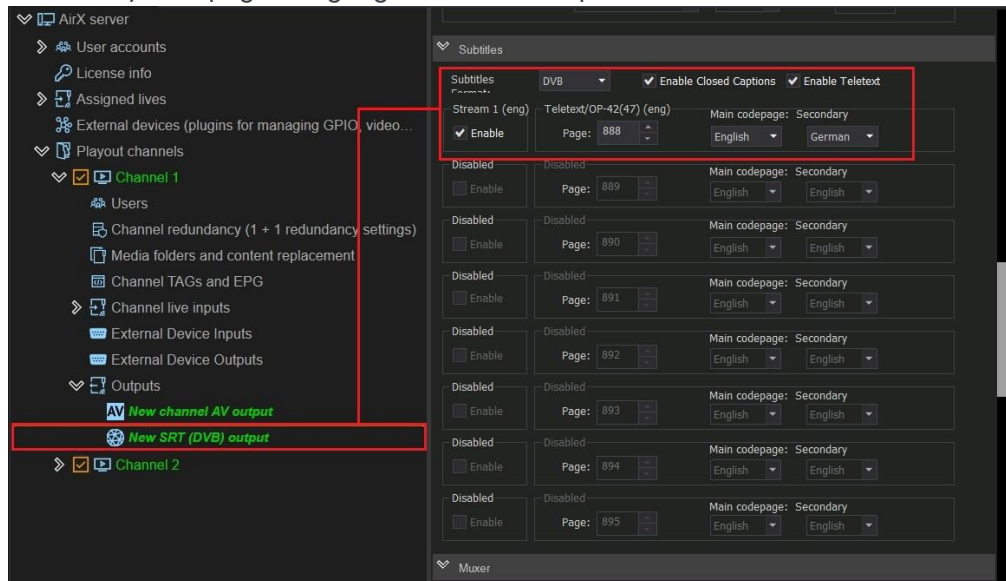


Figure 295. Subtitles settings in the SRT output

6. Click **Save** and **Restart** in the main menu of AirX Control app to save the subtitling settings.
7. Return to the **License** branch of the Server resource tree and verify the number of licenses. Now it must be 1/1 (or more).
8. Open your file storage connected to AirX as a content source in the **Media folders and content replacement** branch of the Channel resource tree. Add subtitle files to the folder with video files.

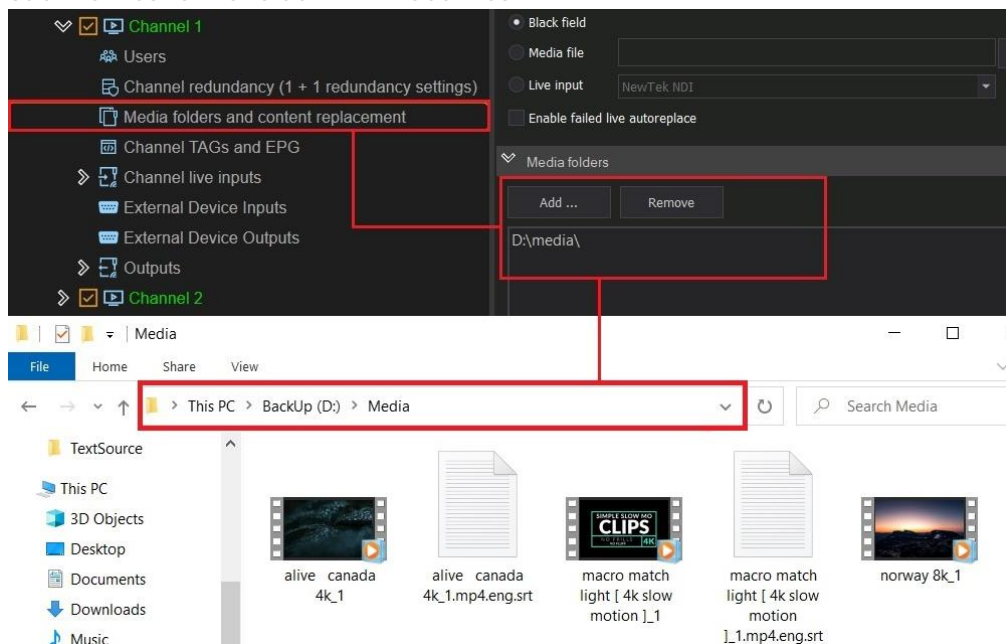


Figure 296. Subtitles files location

ATTENTION: The subtitle files require specific naming structure in order to be played with the primary event (video clip) automatically. The structure is: **Video file Name.Video file extension.Language.Subtitle file format**

EXAMPLE: If the name of the video file is “New York 2023.mp4”, the name of the English subtitle file must be “**New York 2023.mp4.eng.srt**” exactly. And the subtitle file must be located in the same folder as the video.

9. Launch the **Channel Manager** client application. Open the schedule in the **Schedule Editor** additional window or create a new schedule.

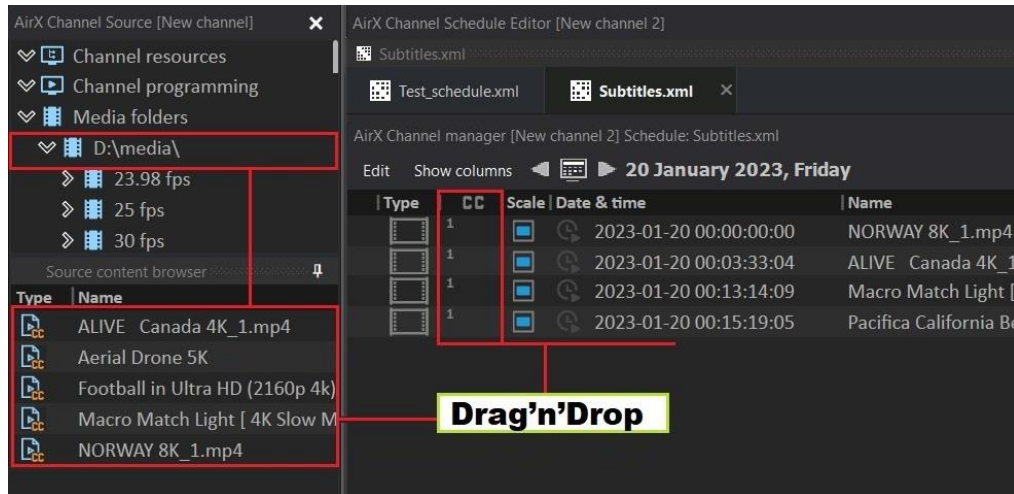


Figure 297. AirX Play scheduling

In the Schedule Editor window you can see the CC column. Here you can check the number of available subtitle tracks. In the example above there is only one subtitle track.

10. Take the schedule you made in the Schedule Editor window and move it to the OnAir window. Pay attention that some of subtitle tracks in the schedule have turned blue. This means that there is a subtitle file in the content folder that is corresponding to the video file in the schedule.

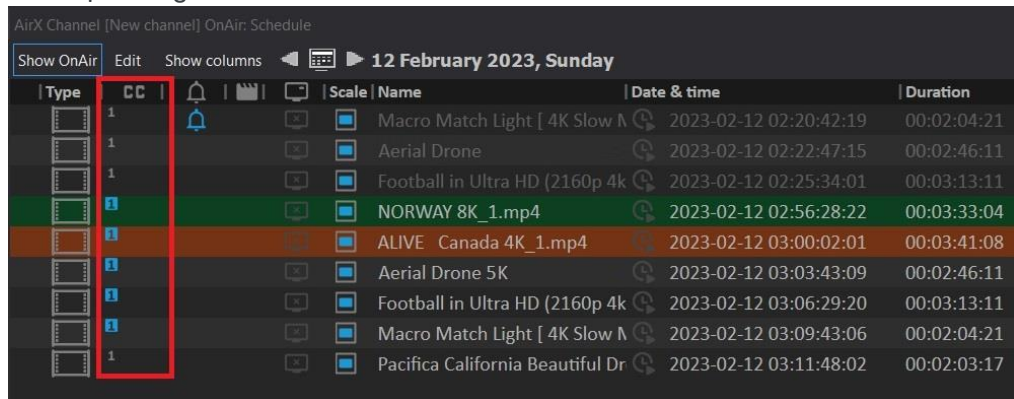


Figure 298. Subtitle files in the OnAir schedule

Schedule automatic import

AirX, as a broadcast automation system, can be integrated into the infrastructure you already have.

The AirX software supports the automatic import functionality to get schedules and media files from external storage systems and to interact with external broadcast traffic management systems.

The schedules created by any third-party software, which supports the playlist format used by AirX, can be imported. The auto schedule is loaded automatically at the assigned day and time. Auto schedules require specific naming structure in order

to be played on the desired date and time automatically. The structure is: **YYYY.MM.DD**, where YYYY stands for year, MM-month, DD-date. **EXAMPLE:** If the name of the schedule is “2022.06.14.xml”, it will be loaded on June 14th, 2022 exactly.

If you want to use the Autoload feature, first you have to enable Schedule automatic import settings in the AirX Config application.

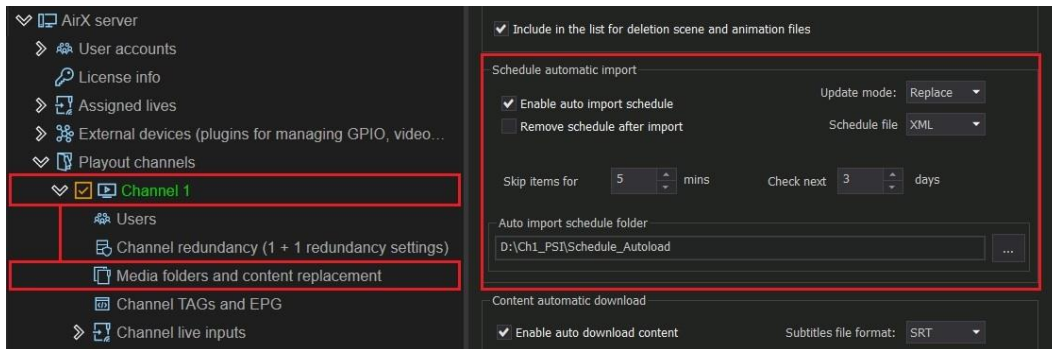


Figure 299. Schedule automatic import settings

You must enable these settings for each Playout channel you want to integrate.

1. **Schedule automatic import** section of the Channel settings is intended for configuring auto loading of schedules and integration with external broadcast traffic management systems. The section fields are active when **Enable auto import schedule** checkbox is checked.
2. The main field is **Auto import schedule folder**. The field specifies an intermediary folder between AirX and an external traffic system. The broadcast schedule created by third-party software must be saved to this folder. At the same time the AirX service constantly checks the folder for updates. As soon as a new schedule is uploaded to the folder, AirX moves it to the Channel Manager's on-air schedule according to the settings.

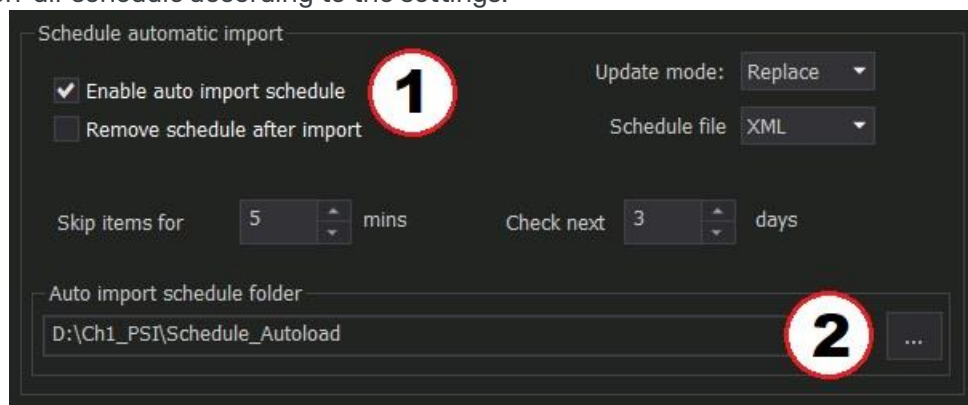


Figure 300. Schedule automatic import - Enable and Folder

Unlike the **Schedule** and **Playlist** folders, which are automatically created on the server when a channel is created, the **Schedule Autoload** folder must not be created automatically but set by the user. The folder name can be any.

3. After the folder is set, you have to adjust the autoimport settings. The main setting is the **Schedule file** drop-down, containing the available extensions of the schedule files. Available extensions are XML, XLS, CSV. The default extension is XML.

Update mode – the mode of a schedule modifying.

- The **Replace** mode means that when a new schedule is uploaded into the autoload folder, the AirX service moves it into the Channel Manager, replacing the existing on-air schedule. The old schedule will be deleted.
- **Append** mode means that the new schedule will not replace the current on-air schedule, but it will be added to the Channel Manager after the current one, below the last row. The old schedule will not be deleted: all positions already available in the Channel Manager will remain in their places. By default, Update mode is set to **Replace**. Append mode have to be used with caution as it is intended for highly specialized tasks.

Check next ... days - adjustable parameter, intended to set the number of days AirX will search for a schedule in the Auto import schedule folder. The default value is 3. This means that when checking a folder, AirX will check for updated schedules for the current day and two days ahead.

Remove schedule after import - a checkbox to automatically remove the schedule from the autoload folder after it is loaded into the Channel Manager.

Skip items for ... mins - adjustable parameter. As described above, when a new schedule is uploaded into the autoload folder, the AirX service moves it into the Channel Manager, replacing the existing on-air schedule. The Skip items... parameter shows how many minutes of the current (already-playing) on-air schedule will be guaranteed to broadcast before switching to a new schedule. The default value is 5 minutes. This setting allows quickly editing of the old schedule and smooth transition to the updated schedule.

Finally Click **Save** and **Restart** in the main menu of AirX Control app to save the autoload settings.

After you save the settings, you will see the Autoload folder in the Channel Manager client application:

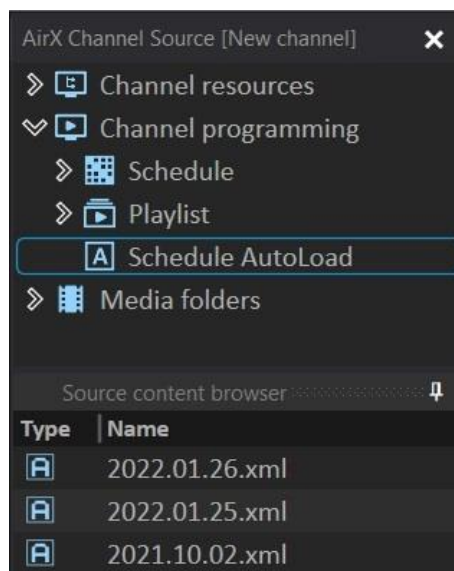


Figure 301. Schedule AutoLoad folder in the Channel Manager app

In addition to integration with external traffic systems, AirX allows you to use the Autoload function in manual mode.

You can manually create schedules in the **Source content browser** window of the Channel Manager application. All user settings described above are the same in the manual mode - **Check next ... days, Skip items for ... mins**, etc.

If you create the schedules in the Source content browser window, schedule files will have an internal structure that is compatible to AirX by default.

The naming rules are the same both in the auto and manual modes: schedules require specific naming structure in order to be played on the desired date and time automatically. The structure is: **YYYY.MM.DD**, where YYYY stands for year, MM-month, DD-date. **EXAMPLE:** If the name of the schedule is “2022.06.14.xml”, it will be loaded on June 14th, 2022 exactly.

In manual mode, you can create schedule files for unlimited days in advance. All created schedules will be automatically uploaded to the on-air schedule upon reaching the specified date without any additional actions.

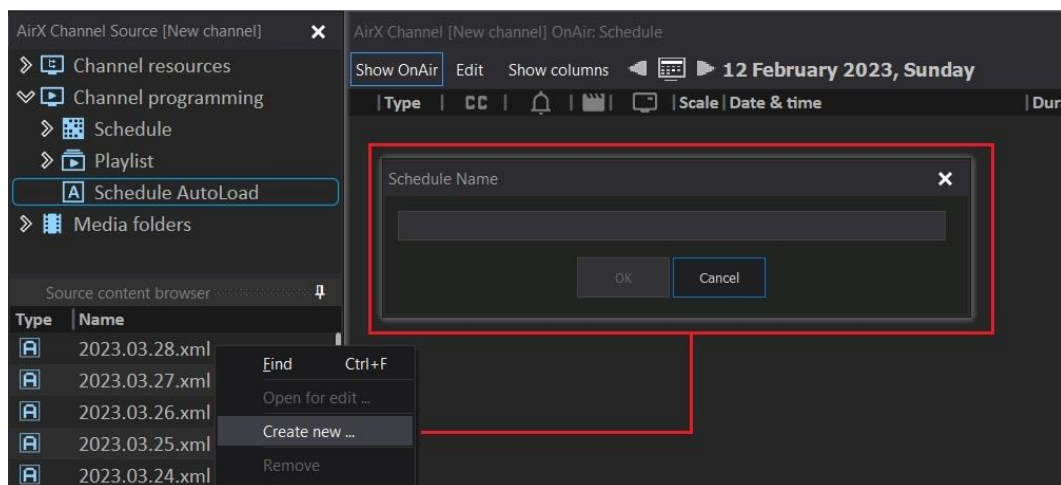


Figure 302. Create new schedule in the Source content browser window

Schedule playback

Once you have created a schedule, you can add it to the Channel OnAir window of the Channel Manager app to start broadcasting.

Launch the Channel Manager client application and expand the Channel resource tree (**AirX Channel Source** window on the left side of the app window). Select the **Channel programming -> Schedule** branch and click the **Schedule** item. You will see all available schedules in the **Source content browser** window right below.

Select the schedule from the list and drag it to the Channel OnAir window.

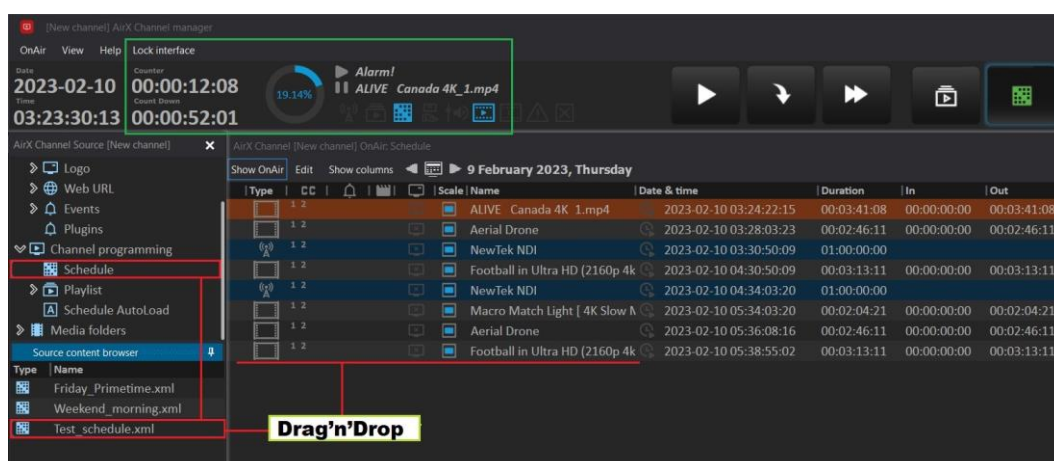


Figure 303. Start broadcasting

The first time you add a Schedule or Playlist to the Channel OnAir window, AirX waits one minute before starting the playback. This is an additional protection that allows you to make sure that everything was added correctly.

In the Figure above the green frame outlines the information fields indicating the broadcast starting process:

- In the **Counter** field you can see a direct countdown of the minute of waiting. It is duplicated by a pie chart of the current position completed.
- The **Count Down** field shows the time left before the broadcast starts.
- In the right part of the information field you can see the current running position (**Alarm!** Designation of the service process – a minute of waiting) and the position after.

After one minute, AirX Play will start broadcasting.

Live streams and frequently changing schedules. Live video workflow.

This chapter describes the Schedule mode only. The functionality is not available in the Playlist mode, since the playlist is looped and not organized chronologically.

The Live video workflow can be described as the inclusion of external sources in the schedule.

1. In a simple case, the timing (duration) of the **Live** event is known in advance. So the workflow is quite similar to Scheduling of Simple TV channels. A Live event in a schedule is just a static object like a video file. The date and time of the broadcast of each event is fixed.

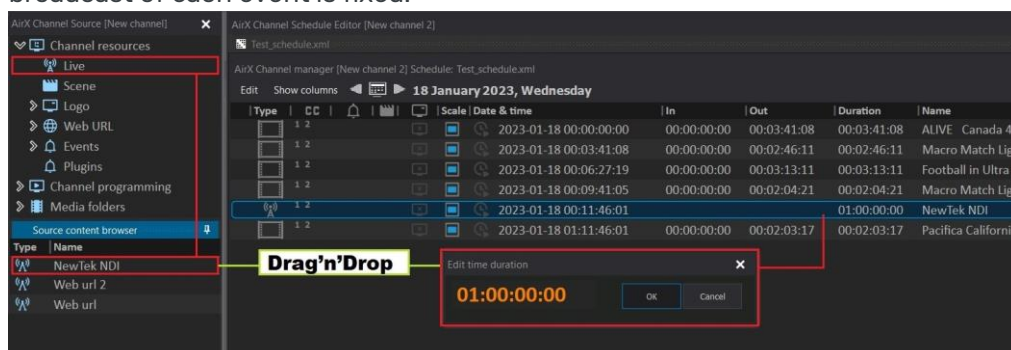


Figure 304. A Live event with the fixed duration

- Select the **Live** branch of the Channel Source resource tree. You will see the list of external sources connected to the Playout channel in the **Source content browser** window.
- Click on the desired Live in the list and move it to the schedule using drag'n'drop.

- In the **Edit time duration** window enter the duration of the Live stream inclusion and click OK.

You will see the Live schedule row, highlighted as a blue line. The **Type** field will have a **Live signal transmission** icon.

Almost all the same actions can be applied either to Live or to video file. You can copy it, delete it, change its duration, add it to a block or assign a Logo and CG.

2. In the case of working with studio signals, live broadcasts, sports broadcasts and other events with flexible timing (duration), AirX have the **Overrun** function, which allows to control the execution of the schedule in real time. You can quickly fix overlays of playback events. See the **Overrun and frequently changing schedules** chapter for details.

Fixed time

Fixed time must be used to set the playback time of the schedule item. In the simplest case, this is the beginning of the on-air day. In the case of more complex channel programming, this may be a scheduled event with a fixed playback time (for example, a news block). Fixed time is necessary to avoid the schedule row displacement when editing other elements in the schedule above it.

1. Double-click the **clock icon** in the **Date & time** column to fix the **current time** of the schedule item. The schedule row will be switched to edit mode - the date and time will turn orange. Do not change these parameters, click anywhere in the schedule to exit the edit mode. The clock icon will become active, the schedule row playback time will be fixed and the element will be protected from the accidental displacement.

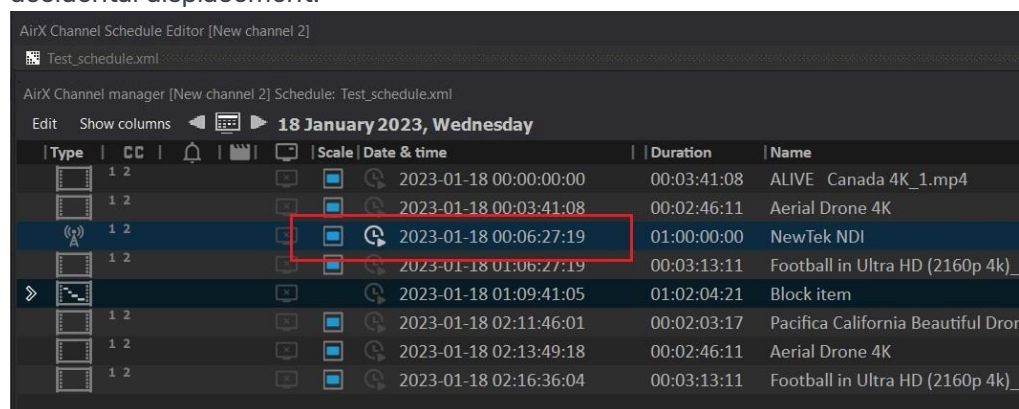


Figure 305. Set Fixed time

2. If you want to set a **specific playback time** for the schedule row, different from the current one, you also need to double-click the clock icon in the Date & time column. The schedule row will be switched to edit mode - the date and time will turn orange. In this case, you need to change the value of the parameter. Then click anywhere in the schedule to exit the edit mode.

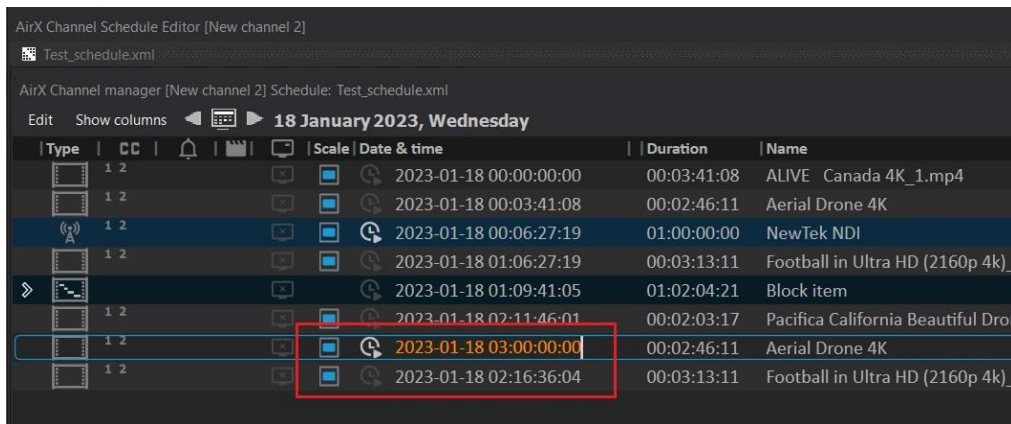


Figure 306. Edit Fixed time

In the figure above, you can see that the playback time of the schedule row (outlined in red) will be changed and shifted by 46 minutes. The playback time of all schedule rows below the Fixed time will be changed automatically.

After you change the Fixed time parameter, you can get two different results: **Underrun** or **Overrun**.

To reset Fixed time, select the schedule row with the mouse, right-click to expand the context menu and click **Reset fixed time**

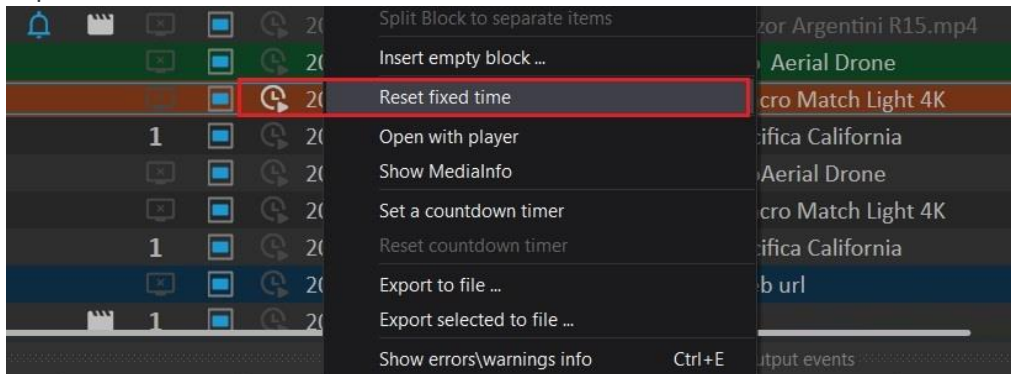
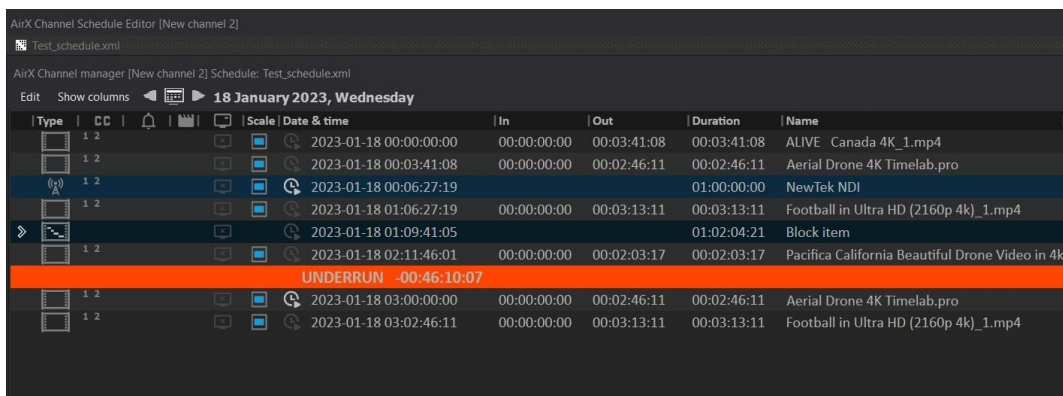


Figure 307. Reset Fixed time

Underrun

You will see the Underrun when you change the playback time of the schedule row to a later time. This is a system alert indicating that there is an empty block in the AirX schedule, with the duration shown in the orange line. This empty block must be filled with content.

When you add files to the schedule (at the position before the Underrun line), the duration of the empty block will be changed dynamically. When the empty block is completely filled with content, the orange warning line will disappear.



Type	Scale	Date & time	In	Out	Duration	Name
1 2		2023-01-18 00:00:00:00	00:00:00:00	00:03:41:08	00:03:41:08	ALIVE Canada 4K_1.mp4
1 2		2023-01-18 00:03:41:08	00:00:00:00	00:02:46:11	00:02:46:11	Aerial Drone 4K Timelab.pro
1 2		2023-01-18 00:06:27:19			01:00:00:00	NewTek NDI
1 2		2023-01-18 01:06:27:19	00:00:00:00	00:03:13:11	00:03:13:11	Football in Ultra HD (2160p 4k)_1.mp4
1 2		2023-01-18 01:09:41:05			01:02:04:21	Block item
1 2		2023-01-18 02:11:46:01	00:00:00:00	00:02:03:17	00:02:03:17	Pacifica California Beautiful Drone Video in 4k
UNDERRUN -00:46:10:07						
1 2		2023-01-18 03:00:00:00	00:00:00:00	00:02:46:11	00:02:46:11	Aerial Drone 4K Timelab.pro
1 2		2023-01-18 03:02:46:11	00:00:00:00	00:03:13:11	00:03:13:11	Football in Ultra HD (2160p 4k)_1.mp4

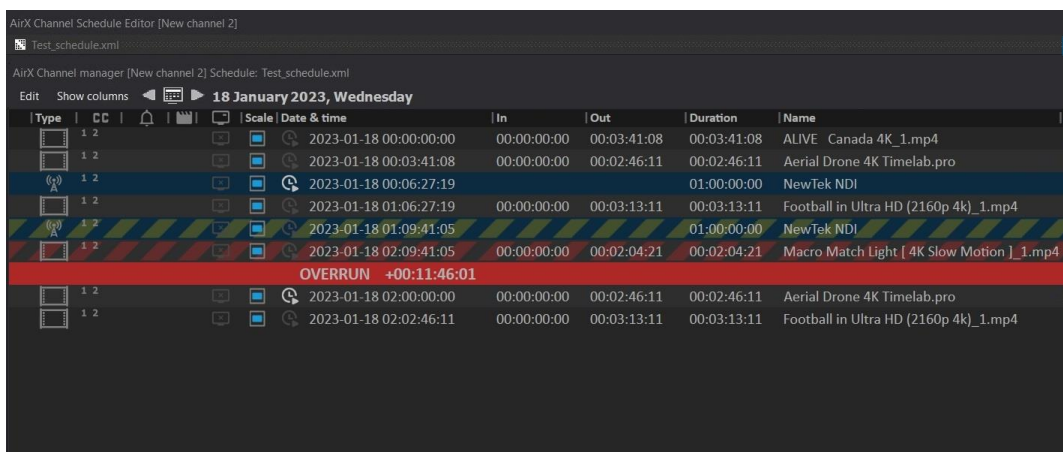
Figure 308. Underrun

If Underrun is not fixed and AirX broadcast automation reaches the row containing the Underrun, during the execution of the OnAir schedule, it will use the autoreplacement settings to show:

- Black field if **Black field** is selected. This is the default value for auto-replacement.
- The media file, such as the splash screen, if **Media file** is selected.
- The Live source (Input signal) connected to the Playout channel if the **Live input** is selected. (See the **Media folders and content replacement** chapter for details)

Overrun and frequently changing schedules

You will see the Overrun when you change the playback time of the schedule row to an earlier time. This is a system alert indicating that the airtime of different blocks of content is overlapped. In this case, Overrun is a **schedule error**.



Type	Scale	Date & time	In	Out	Duration	Name
1 2		2023-01-18 00:00:00:00	00:00:00:00	00:03:41:08	00:03:41:08	ALIVE Canada 4K_1.mp4
1 2		2023-01-18 00:03:41:08	00:00:00:00	00:02:46:11	00:02:46:11	Aerial Drone 4K Timelab.pro
1 2		2023-01-18 00:06:27:19			01:00:00:00	NewTek NDI
1 2		2023-01-18 01:06:27:19	00:00:00:00	00:03:13:11	00:03:13:11	Football in Ultra HD (2160p 4k)_1.mp4
1 2		2023-01-18 01:09:41:05			01:00:00:00	NewTek NDI
1 2		2023-01-18 02:09:41:05	00:00:00:00	00:02:04:21	00:02:04:21	Macro Match Light [4K Slow Motion]_1.mp4
OVERRUN +00:11:46:01						
1 2		2023-01-18 02:00:00:00	00:00:00:00	00:02:46:11	00:02:46:11	Aerial Drone 4K Timelab.pro
1 2		2023-01-18 02:02:46:11	00:00:00:00	00:03:13:11	00:03:13:11	Football in Ultra HD (2160p 4k)_1.mp4

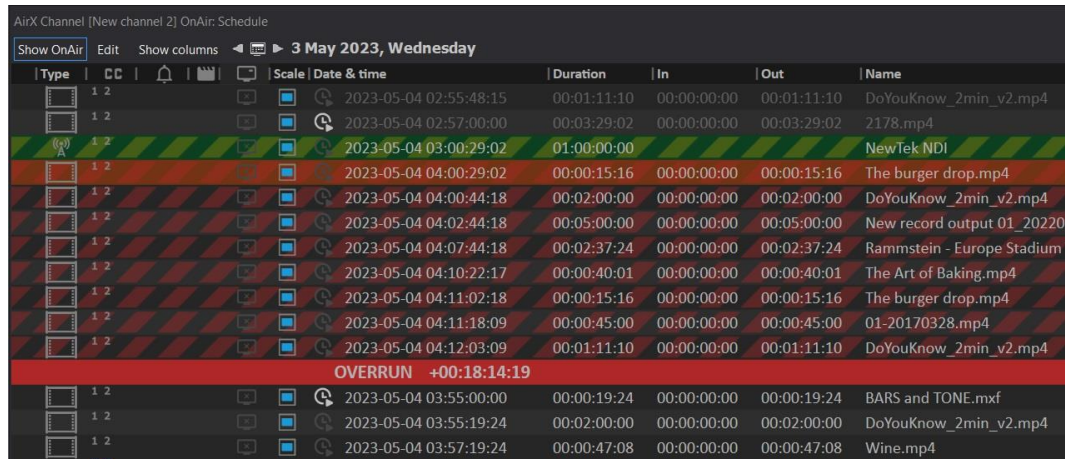
Figure 309. Overrun

The red Overrun bar shows the duration of the overrun. In the example above, you can see an overlay for 11 minutes, 46 seconds.

In our example, there are two positions marked with a warning before the Overrun line. A red warning means that the file is completely overlaid and will not be played. A yellow warning means that the file is partially overlaid and its fragment will be played until reaching the time specified in Fixed time field.

The schedule must be fixed to remove the Overrun.

In Live video workflow (in case of working with studio signals, live broadcasts, sports broadcasts and other events with flexible duration) the Overrun mode is normal but requires user's actions with the schedule.



Type	CC	Scale	Date & time	Duration	In	Out	Name
1.2			2023-05-04 02:55:48:15	00:01:11:10	00:00:00:00	00:01:11:10	DoYouKnow_2min_v2.mp4
1.2			2023-05-04 02:57:00:00	00:03:29:02	00:00:00:00	00:03:29:02	2178.mp4
1.2			2023-05-04 03:00:29:02	01:00:00:00	00:00:00:00	00:00:00:00	NewTek NDI
1.2			2023-05-04 04:00:29:02	00:00:15:16	00:00:00:00	00:00:15:16	The burger drop.mp4
1.2			2023-05-04 04:00:44:18	00:02:00:00	00:00:00:00	00:02:00:00	DoYouKnow_2min_v2.mp4
1.2			2023-05-04 04:02:44:18	00:05:00:00	00:00:00:00	00:05:00:00	New record output 01_20220
1.2			2023-05-04 04:07:44:18	00:02:37:24	00:00:00:00	00:02:37:24	Rammstein - Europe Stadium
1.2			2023-05-04 04:10:22:17	00:00:40:01	00:00:00:00	00:00:40:01	The Art of Baking.mp4
1.2			2023-05-04 04:11:02:18	00:00:15:16	00:00:00:00	00:00:15:16	The burger drop.mp4
1.2			2023-05-04 04:11:18:09	00:00:45:00	00:00:00:00	00:00:45:00	01-20170328.mp4
1.2			2023-05-04 04:12:03:09	00:01:11:10	00:00:00:00	00:01:11:10	DoYouKnow_2min_v2.mp4
OVERRUN +00:18:14:19							
1.2			2023-05-04 03:55:00:00	00:00:19:24	00:00:00:00	00:00:19:24	BARS and TONE.mxf
1.2			2023-05-04 03:55:19:24	00:02:00:00	00:00:00:00	00:02:00:00	DoYouKnow_2min_v2.mp4
1.2			2023-05-04 03:57:19:24	00:00:47:08	00:00:00:00	00:00:47:08	Wine.mp4

Figure 310. Overrun, part 1

The example above shows a fragment of the OnAir schedule with a Fixed time for the schedule row located in the bottom of the screen.

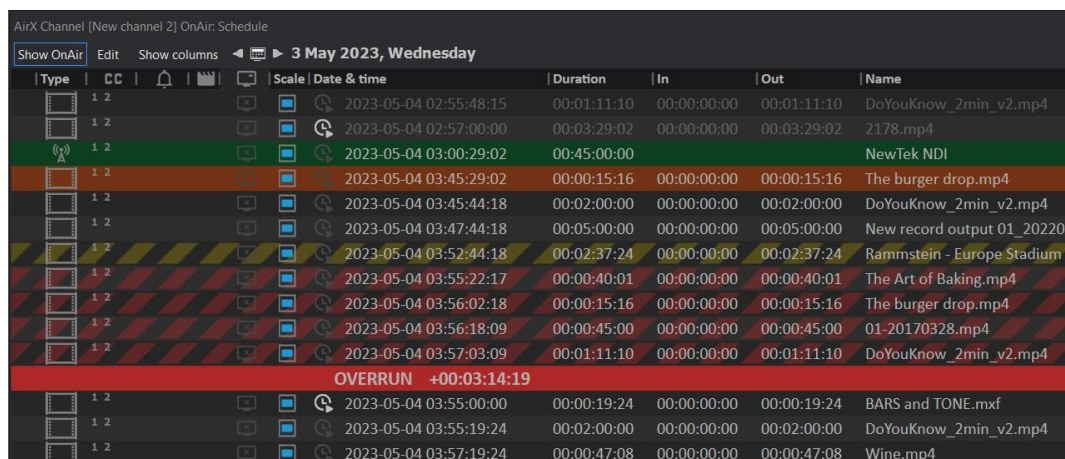
The schedule row marked in yellow contains a Live event. The duration of Live is one hour and obviously exceeds the time remaining until the Fixed Time.

Yellow color means that Live will not be played in full; the Live playback will be interrupted at the moment of Fixed time.

This situation is normal, for example, for studio Live - the duration cannot be precisely set in advance. Therefore, the duration of the Live event is set with a reserve.

The schedule row marked with Fixed time, contains the event with previously known playback time. For example, news block.

Schedule rows between Live and Fixed time are marked in red. This means that none of the events will be played. However, since the duration of the Live event is so long, it can be changed down directly during Live playback.



Type	CC	Scale	Date & time	Duration	In	Out	Name
1.2			2023-05-04 02:55:48:15	00:01:11:10	00:00:00:00	00:01:11:10	DoYouKnow_2min_v2.mp4
1.2			2023-05-04 02:57:00:00	00:03:29:02	00:00:00:00	00:03:29:02	2178.mp4
1.2			2023-05-04 03:00:29:02	00:45:00:00	00:00:00:00	00:00:00:00	NewTek NDI
1.2			2023-05-04 03:45:29:02	00:00:15:16	00:00:00:00	00:00:15:16	The burger drop.mp4
1.2			2023-05-04 03:45:44:18	00:02:00:00	00:00:00:00	00:02:00:00	DoYouKnow_2min_v2.mp4
1.2			2023-05-04 03:47:44:18	00:05:00:00	00:00:00:00	00:05:00:00	New record output 01_20220
1.2			2023-05-04 03:52:44:18	00:02:37:24	00:00:00:00	00:02:37:24	Rammstein - Europe Stadium
1.2			2023-05-04 03:55:22:17	00:00:40:01	00:00:00:00	00:00:40:01	The Art of Baking.mp4
1.2			2023-05-04 03:56:02:18	00:00:15:16	00:00:00:00	00:00:15:16	The burger drop.mp4
1.2			2023-05-04 03:56:18:09	00:00:45:00	00:00:00:00	00:00:45:00	01-20170328.mp4
1.2			2023-05-04 03:57:03:09	00:01:11:10	00:00:00:00	00:01:11:10	DoYouKnow_2min_v2.mp4
OVERRUN +00:03:14:19							
1.2			2023-05-04 03:55:00:00	00:00:19:24	00:00:00:00	00:00:19:24	BARS and TONE.mxf
1.2			2023-05-04 03:55:19:24	00:02:00:00	00:00:00:00	00:02:00:00	DoYouKnow_2min_v2.mp4
1.2			2023-05-04 03:57:19:24	00:00:47:08	00:00:00:00	00:00:47:08	Wine.mp4

Figure 311. Overrun, part 2

In the figure above, the duration of the Live event has been shortened (45 minutes instead of an hour).

As a result, red highlighting was removed from several schedule rows. This means that these rows are between the end of Live and the Fixed time event. That is, they will be played.

Manual GC/Events

You can manage the CG overlay manually, using the **AirX Channel Manual GFX ctrl** window of the Channel Manager client application. This can be useful for launching the additional CG scenes in manual mode on top of auto-played scenes.

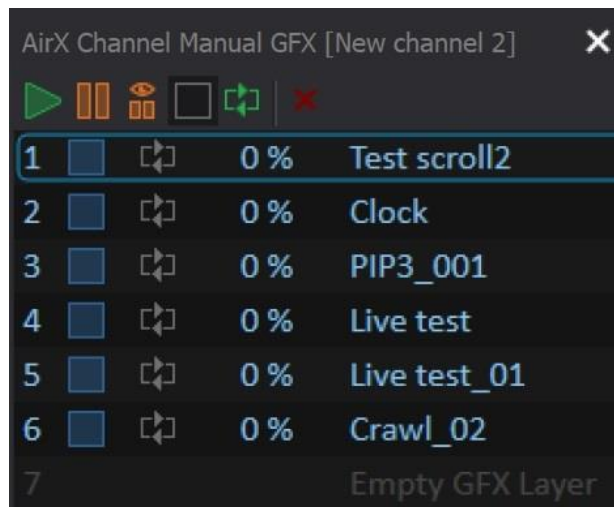


Figure 312. Channel Manual GFX ctrl window

You can add CG scenes to empty slots of the Manual GFX window at any time (up to 8 slots at a time) and control the playback of selected scenes manually. See the **Channel Manual GFX ctrl window** chapter for details.

And also you can manage the external control signals using the additional **AirX Channel Manual Events ctrl** window, described in the corresponding chapter of the current document.

The window contains 16 slots for external events to control the execution of the AirX schedule, the AirX Record recording schedule, as well as any external devices connected to the broadcast playout server (see the **External devices** chapter for details).

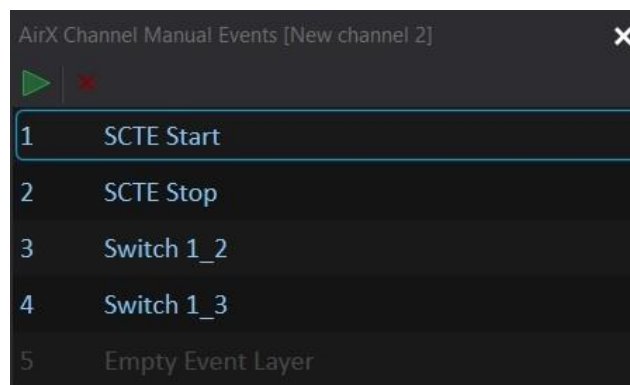


Figure 313. Channel Manual Events window

Command control pane

Command control pane allows you to create a custom layout for the quick command control. You can control the execution of the AirX schedule, the external events or channel CG. The Channel command pane is an additional app window, so the custom layout can be located on a separate touch-panel and used as an external control device.

Please see the **Channel command pane** chapter for detailed description.

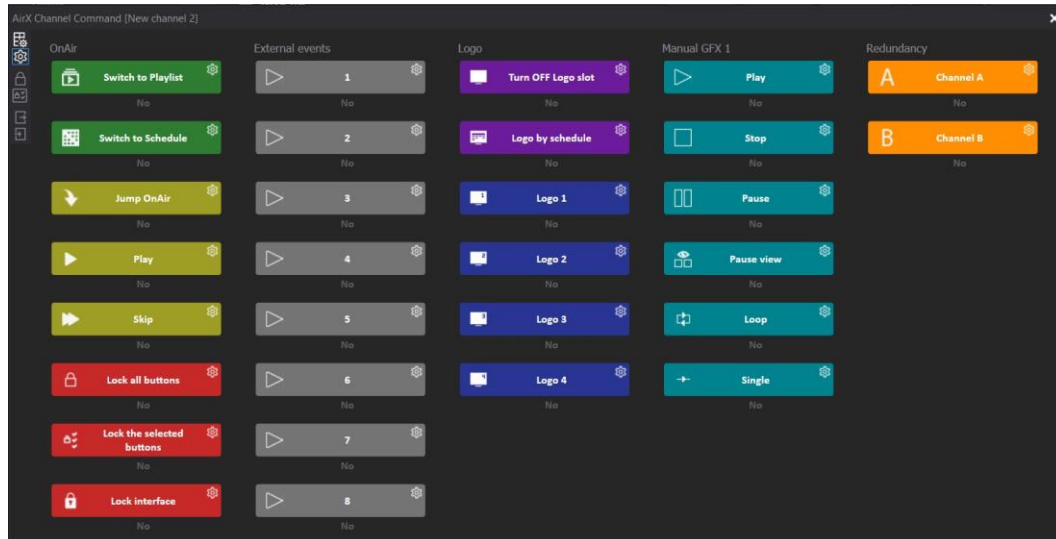


Figure 314. Channel command pane

Live streams and additional playlists. Prescheduling workflow.

This chapter describes both the Schedule and the Playlist modes.

The Prescheduling workflow can be described as the inclusion of additional playlists in the OnAir schedule. You can switch the Schedule/Playlist modes to edit the active on-air schedule without interrupting the channel playback.

Schedule/Playlist modes

AirX broadcast automation has two predefined workflows: "Schedule" – on-air playback according to a dated schedule and "Playlist" – according to a looped playlist. You can find the detailed description in the **Channel OnAir window, Playlist mode** and **Channel OnAir window, Schedule mode** chapters.

You must set the Schedule/Playlist mode during the initial setup of the Playout channel but you can change it later in any time (see the **Playout channel addition and setup** chapter for details).

You can also switch the Schedule/Playlist mode directly from the client workplace application, if you have the relevant user permissions (see the **Users** chapter for

details). Use the **OnAir** item of the Channel Manager **Control menu** to switch the mode.



Figure 315. Playlist/Schedule modes

The interface of the Channel OnAir window depends on the selected mode.

You can edit the on-air schedule right during its execution (playback) by using additional playlists. Please follow the instruction:

1. Initial state: The Playout channel is set to the Schedule mode (Figure 316, point 1), the on-air schedule is played normally, the Live event is at the playback position – green schedule row. You can find the description of Live video workflow in the **Live streams and frequently changing schedules. Live video workflow.** chapter of this Document.
2. At the moment, you already have additional playlist that will be on-air after switching the mode. You have to prepare it in advance. Please look the **How to: Make the simple schedule of files** chapter for details.
3. Click the **Channel Programming** branch of the Channel resource tree and you will see two items in the Source content browser window: OnAir Playlist and OnAir Schedule. Please check that OnAir Schedule item is green.

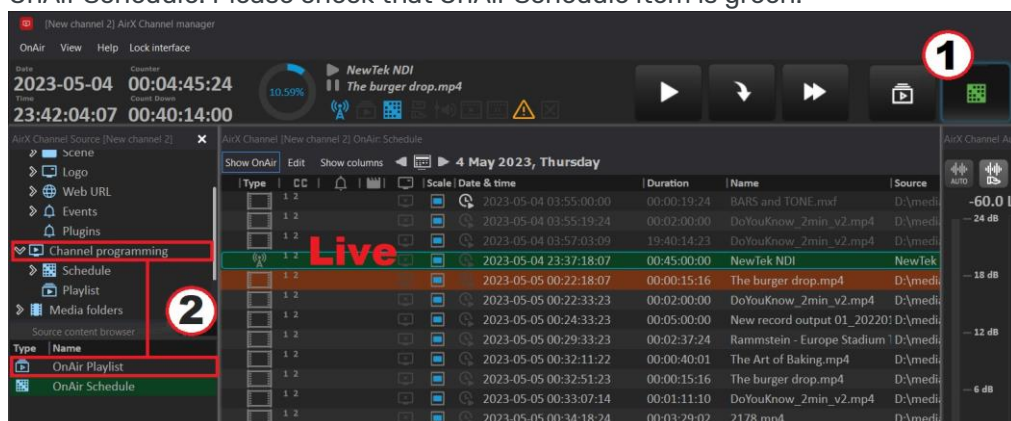


Figure 316. Prescheduling workflow part 1

Double-click the **OnAir Playlist** item (Figure 316, point 2). This action will open the OnAir playlist in an additional window.

4. Before you start editing the playlist please verify that OnAir playlist is not active (Figure 317, point 3). Then click the **Playlist** item of the Channel programming branch in the Channel resource tree (Figure 317, point 4). You will see a list of available playlists in the Source content browser window. Select the playlist from the list and drag it to the Playlist OnAir window.

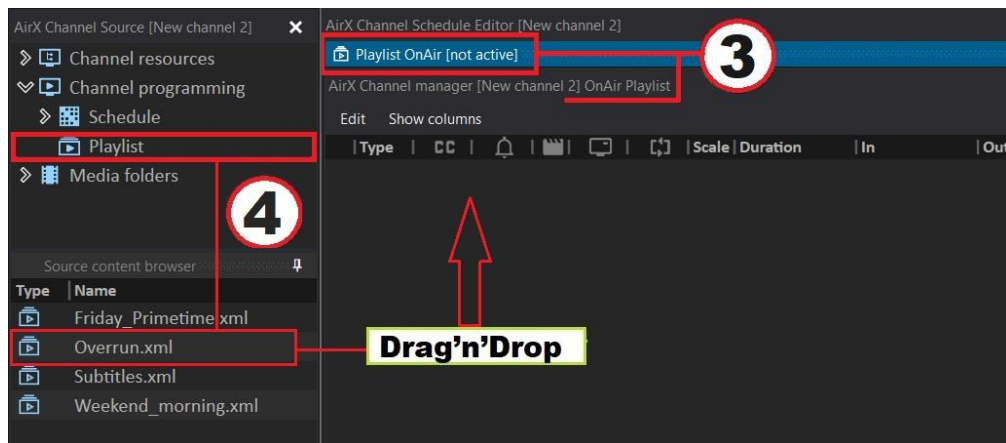


Figure 317. Prescheduling workflow part 2

5. If you do not have a previously prepared playlist, you can make it manually right in the OnAir Playlist window.

Open the OnAir Playlist in an additional window as described above. Before you start editing the playlist please verify that OnAir playlist is not active (Figure 318, point 5) and then expand the **Media folders** branch of the Channel resource tree. Select the folder you want to use. You will see a list of available video files in the Source content browser window (Figure 318, point 6). Select files from the list and drag them to the Playlist OnAir window.

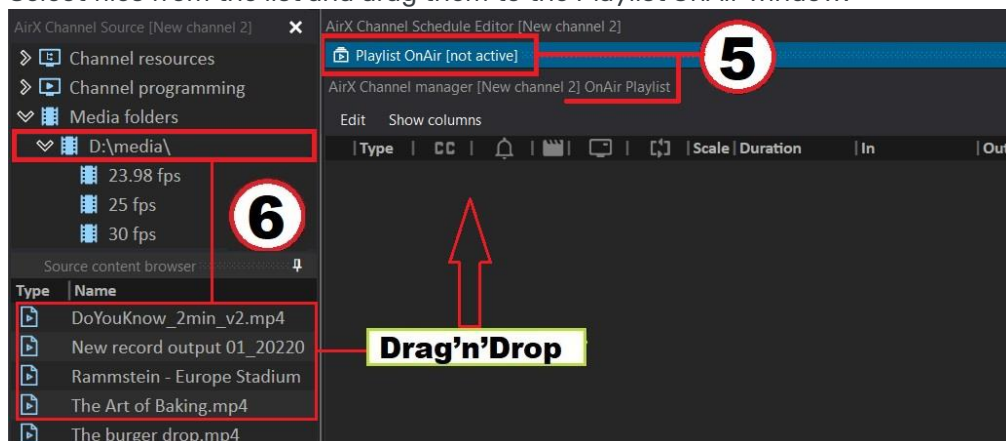


Figure 318. Prescheduling workflow part 3

6. **ATTENTION:** Now your pre-prepared playlist is an OnAir Playlist!
Close the additional window you worked with and return to your OnAir Schedule. All the time you worked with the Playlist, your OnAir Schedule was playing. Now you have to wait for the time you want to switch the OnAir Schedule to the OnAir Playlist.
7. Switch the mode when you are ready, using the **OnAir** item of the Channel Manager **Control menu** or the control buttons.
8. While the OnAir Playlist is playing, you can edit the OnAir Schedule in an additional window, just like you edited the OnAir Playlist before. For example, you can trim the Live event in the Schedule.
9. When the OnAir Schedule is ready and the editing is complete, switch the mode back.

The described workflow allows you to avoid the Overrun conditions in the schedule, but note, that this workflow requires a **high level** of user competence.

If you want to use additional playlists, please read the **Scheduling of Simple TV channels** chapter for details and “How to” instructions.

And also, the **Overrun and frequently changing schedules** and **Fixed time** chapters may be useful.

Manual GC/Events

In the Prescheduling workflow you can also manage the CG overlay manually, using the **AirX Channel Manual GFX ctrl** window of the Channel Manager client application. This can be useful for launching the additional CG scenes in manual mode on top of auto-played scenes.

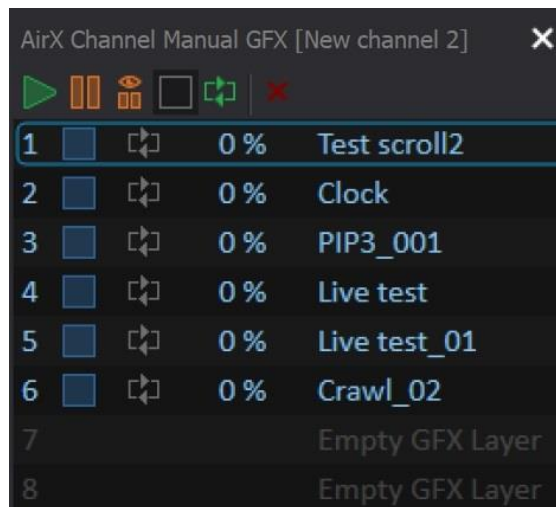


Figure 319. Channel Manual GFX ctrl window

You can add CG scenes to empty slots of the Manual GFX window at any time (up to 8 slots at once) and control the playback of selected scenes manually. See the **Channel Manual GFX ctrl window** chapter for details.

And also, you can manage the external control signals using the additional **AirX Channel Manual Events ctrl** window, described in the corresponding chapter of the current document.

The window contains 16 slots for external events to control the execution of the AirX schedule and the AirX Record recording schedule, as well as any external devices connected to the broadcast playout server (see the **External devices** chapter for details).

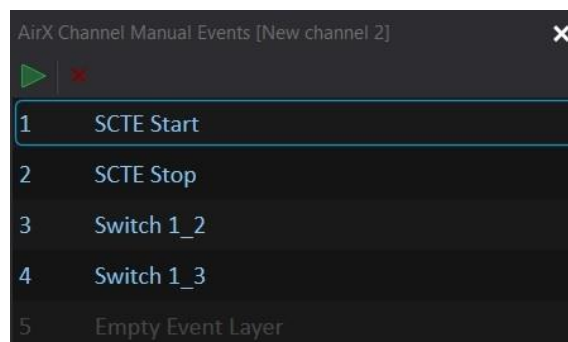


Figure 320. Channel Manual Events window

Command control pane

Command control pane allows you to create a custom layout for the quick command control. You can control the execution of the AirX schedule, the external events or channel CG. The Channel command pane is an additional app window, so the custom layout can be located on a separate touch-panel and used as an external control device.

Please see the **Channel command pane** chapter for detailed description.

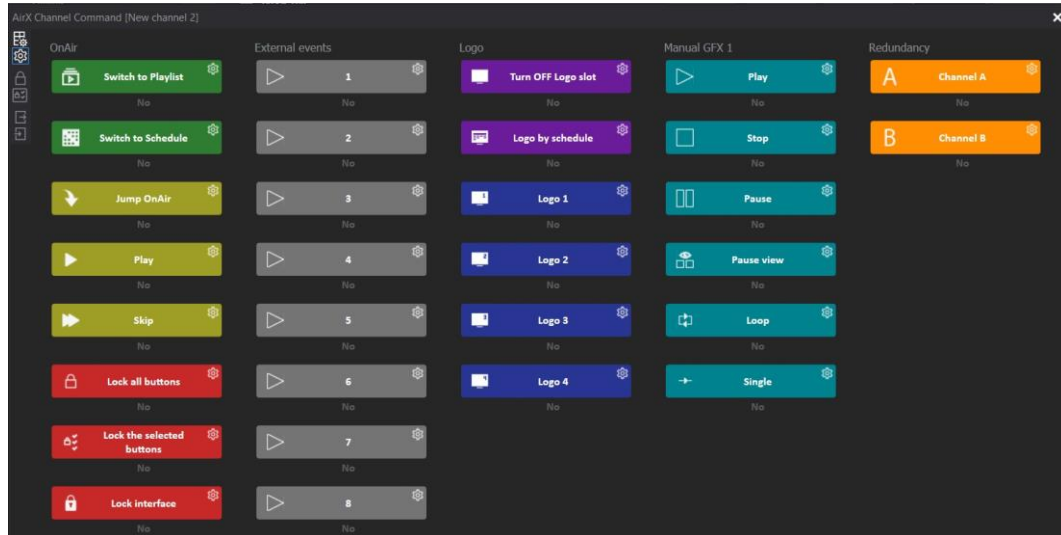


Figure 321. Channel command pane

AD insertion (DAI) workflow

The dynamic ad insertion (DAI) technique is used for adding commercials into linear live streams, such as TV broadcasts. Using DAI, a regional TV provider can embed "local" advertising into a broadcast.

Schedule automatic import

In the AD insertion mode, the most of the airtime falls on the rebroadcasting of an external signal. Usually you have to receive a broadcast schedule with marked AD slots from the head channel. The AirX software has the auto-import functionality to get schedules created by any third-party software from external sources. Please see the **Schedule automatic import** chapter for details.

The schedules created by any third-party software must support the playlist format used by AirX to be imported.

Auto schedules require specific naming structure in order to be played on the desired date and time automatically. The structure is: **YYYY.MM.DD**, where YYYY stands for year, MM-month, DD-date. **EXAMPLE:** If the name of the schedule is "2023.05.07.xml", it will be loaded on May 7th, 2023 exactly.

You can import schedule files for unlimited days in advance. All schedules will be automatically uploaded to the on-air schedule upon reaching the specified date without any additional actions.

AD insertion markers

The dynamic ad insertion method uses ad insertion markers to prepare a stream for ad insertion. Markers are stream's metadata that indicates the ad insertion event. This event means that you can embed a commercial of certain duration in certain place of a video stream. This place (a cue splice point) in a stream allows smooth switching to another stream (such as a commercial) and back to the main video.

Ad insertion markers are created according to various standards. The most popular standard is SCTE-35 but AirX broadcast automation also supports DTMF and SCTE-104.

AD insertion markers detection

1. Operation with DTMF and SCTE-35/104 requires the additional license for each channel. Launch the **AirX Config** server application. Make sure your license includes AD insertion markers detection - expand the Server resource tree and browse to the **License info** branch. In the **Detection DTMF, SCTE-35/104, Plugin Events** line the value must be 1 or more.

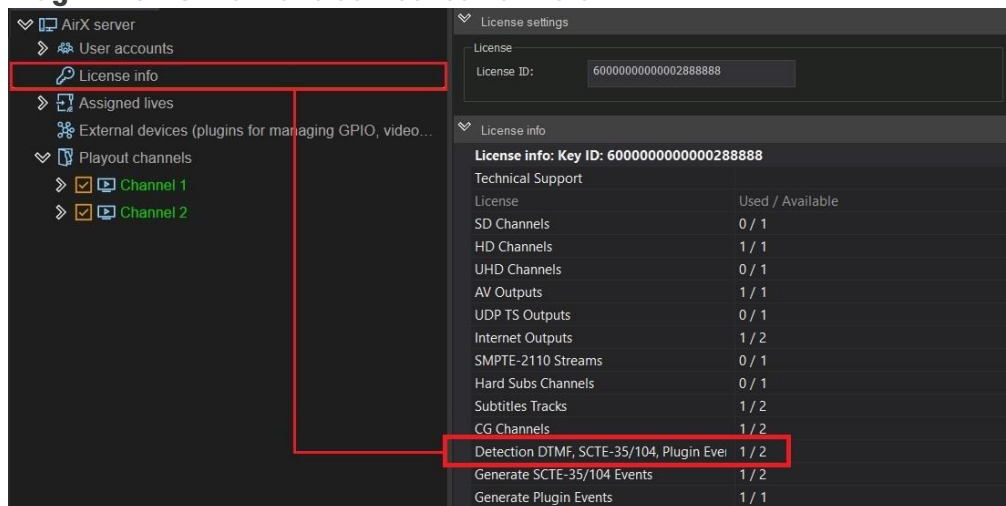


Figure 322. AD markers detection license

2. Expand the Assigned lives branch of the Server resource tree to see available Live sources, connected to the broadcast playout server (see the **Channel live inputs** chapter for details). Select the desired Live and click it to open the Settings pane on the right side of the app window. Scroll down the settings and find the DTMF and SCTE-35/104 panes.

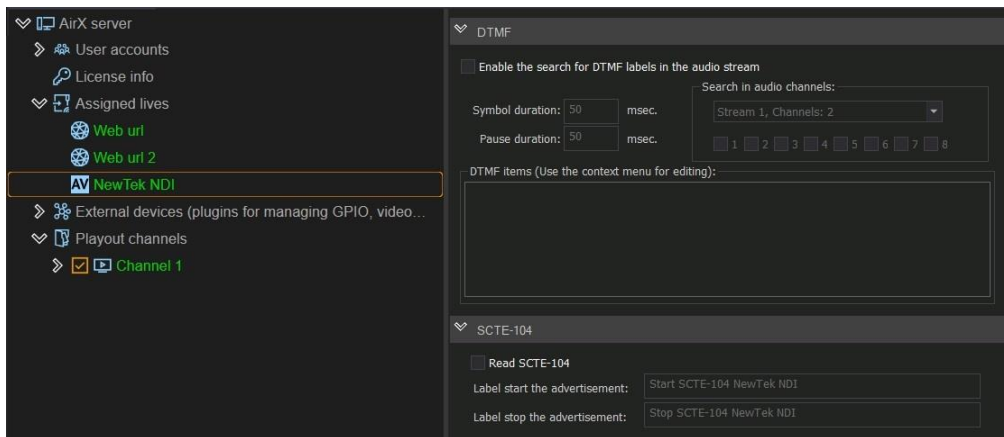


Figure 323. DTMF and SCTE-35/104 settings

- Set up the input cue according to the instructions in the chapters corresponding to the type of signal you receive (see the **Channel live inputs** chapter for details).

In the following example you can see the NDI input stream.

DTMF input settings:

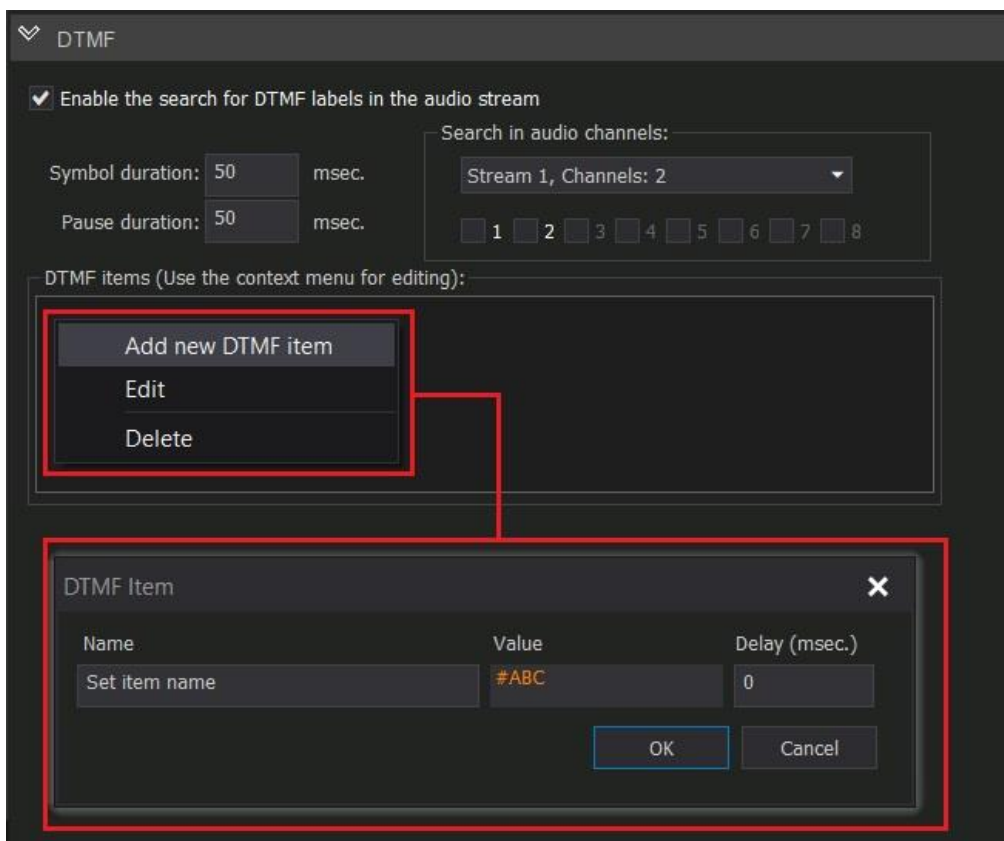


Figure 324. DTMF input settings

Check the **Enable the search for DTMF labels in the audio stream** checkbox to enable the DTMF monitoring mode. After checking the box, the remaining fields of the settings section will become available.

- **Symbol duration** to set the duration of the DTMF keys (0-9, #, *, A, B, C, and D)
- **Pause duration** to set the duration of the pause between keys
- **Search in audio channels** with numbers from 1 to 8, to specify the audio stream in which the DTMFs will be searched
- **DTMF items** – field intended for entering the DTMF search mask (value and order of keys in the DTMF, for example #ABC).

Click **Save** to save changes, then **Restart** to restart the AirX server after setup is finished.

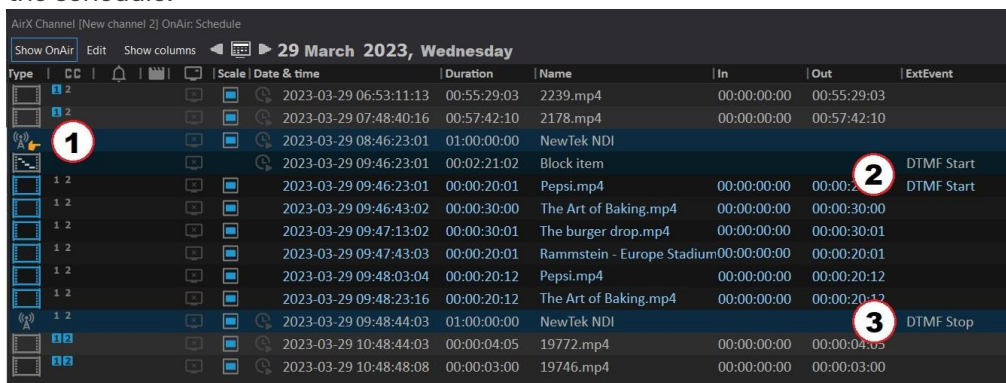
SCTE-104 input settings:



Figure 325. SCTE-104 input settings

Check the **Read SCTE-104** checkbox to enable the SCTE-104 monitoring mode. Click **Save** to save changes, then **Restart** to restart the AirX server after setup is finished.

4. Launch the **Channel Manager** client application to add AD insertion markers into the schedule.



Type	CC	Scale	Date & time	Duration	Name	In	Out	ExtEvent
1 2			2023-03-29 06:53:11:13	00:55:29:03	2239.mp4	00:00:00:00	00:55:29:03	
1 2			2023-03-29 07:48:40:16	00:57:42:10	2178.mp4	00:00:00:00	00:57:42:10	
1 2			2023-03-29 08:46:23:01	01:00:00:00	NewTek NDI			
1 2			2023-03-29 09:46:23:01	00:02:21:02	Block item			DTMF Start
1 2			2023-03-29 09:46:23:01	00:00:20:01	Pepsi.mp4	00:00:00:00	00:00:20:01	DTMF Start
1 2			2023-03-29 09:46:43:02	00:00:30:00	The Art of Baking.mp4	00:00:00:00	00:00:30:00	
1 2			2023-03-29 09:47:13:02	00:00:30:01	The burger drop.mp4	00:00:00:00	00:00:30:01	
1 2			2023-03-29 09:47:43:03	00:00:20:01	Rammstein - Europe Stadium	00:00:00:00	00:00:20:01	
1 2			2023-03-29 09:48:03:04	00:00:20:12	Pepsi.mp4	00:00:00:00	00:00:20:12	
1 2			2023-03-29 09:48:23:16	00:00:20:12	The Art of Baking.mp4	00:00:00:00	00:00:20:12	
1 2			2023-03-29 09:48:44:03	01:00:00:00	NewTek NDI			DTMF Stop
1 2			2023-03-29 10:48:44:03	00:00:04:05	19772.mp4	00:00:00:00	00:00:04:05	
1 2			2023-03-29 10:48:48:08	00:00:03:00	19746.mp4	00:00:00:00	00:00:03:00	

Figure 326. DTMF labels in the schedule

You can see the schedule with DTMF events on the Figure above:

1. The Live input stream from the head channel with the Manual Exit flag. The Manual Exit flag means that Live is waiting for an external event (or user's actions) to jump to the next event. Until AirX receives an incoming command, Live playback will not stop, regardless of its duration.
2. The AD insertion block with the ExtEvent parameter. The ExtEvent means that the schedule playback will jump to this schedule row only after the external event (in this case, DTMF Start).

If you want to set the ExtEvent, expand the drop-down list in the ExtEvent column and select an event from the list.

Please see the **How to: Add and edit a Block** chapter for Block item description and instructions.

Please note that if you want to set an ExtEvent to a block, you must set a parameter to the first video clip included in the block.

3. Live input stream from the head channel without the Manual Exit flag and with the ExtEvent parameter set. In this case, the ExtEvent parameter of the Live means that when you receive the DTMF Stop event, the commercial block will stop (regardless of whether it was played in full) and the playback will switch to the main video. If the DTMF Stop will not be received for any reason, the commercial block will be played in full and then the schedule will continue with the Live.

You can use SCTE-35/104 in the schedule as well as DTMF, all actions will be the same.

AD markers insertion

1. SCTE-35/104 insertion requires the additional license for each channel. Launch the **AirX Config** server application. Make sure your license includes SCTE-35/104 insertion - expand the Server resource tree and go to the **License info** branch. In the **Generate SCTE-35/104 Events** line the value must be 1 or more.

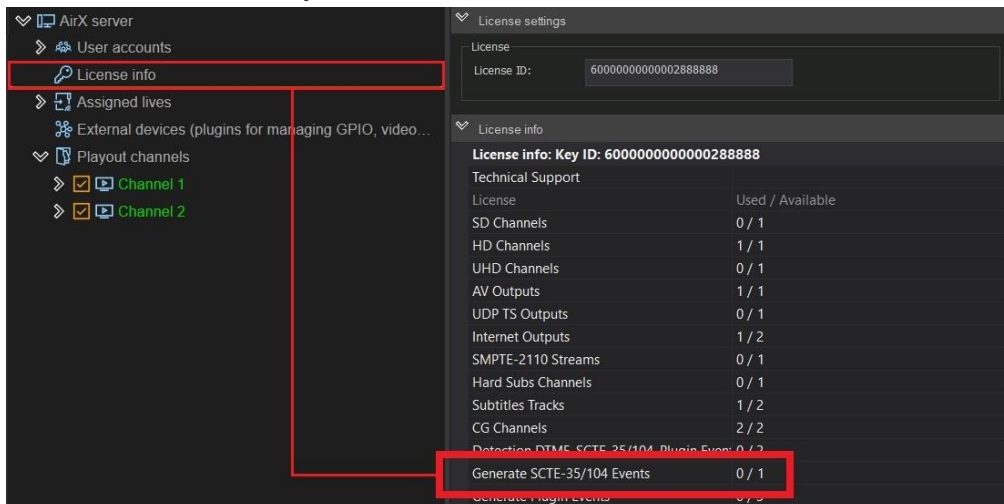


Figure 327. AD markers insertion license

2. Expand the Playout Channels branch of the Server resource tree and click to the desired channel to open the settings pane on the right side of the app window. Scroll down the settings and find the SCTE Events Generation pane. Check the **Generate SCTE** checkbox and rename the Labels names if necessary.

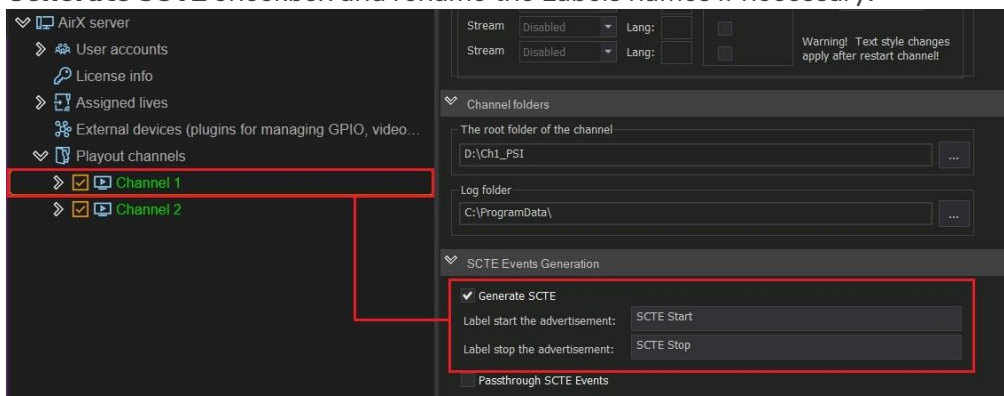


Figure 328. SCTE Events Generation

If you just want to detect ad insertion markers that come with an input stream and pass them to the output stream (without your own markers generation), check only the **Passthrough SCTE Events** checkbox. But this also requires the additional license for each channel.

- Expand the Channel resource tree and select the Output you want to use. Set up the output cue according to the instructions in the chapters corresponding to the type of your output signal (see the **Outputs** chapter for details). In the following example you can see the NDI output stream.

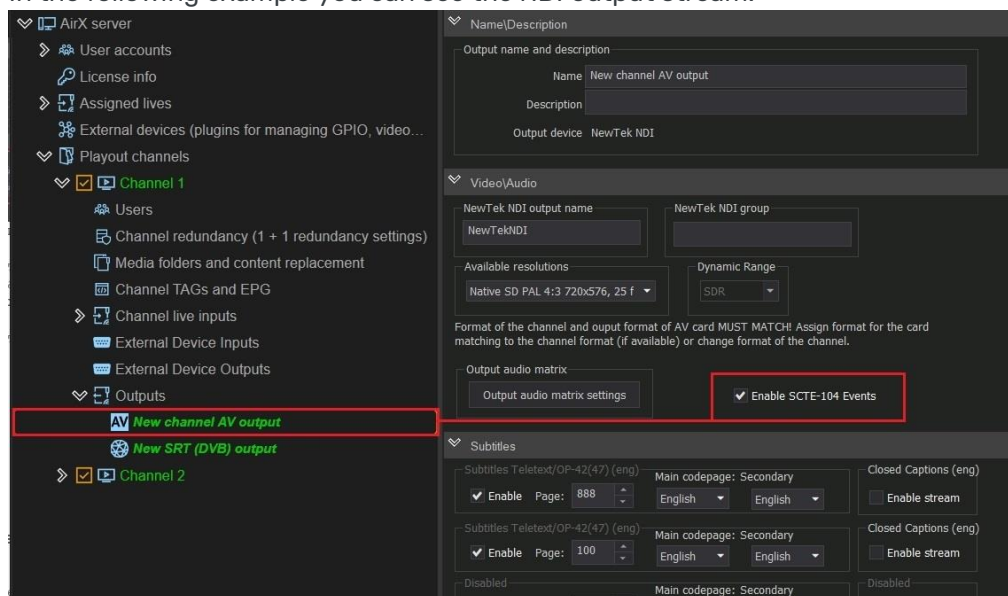


Figure 329. Enable SCTE-104 Events in NDI Output

Check the **Enable SCTE-104 Events** checkbox.

Click **Save** to save changes, then **Restart** to restart the AirX server after setup is finished.

- Launch the **Channel Manager** client application to add AD insertion markers into the schedule.

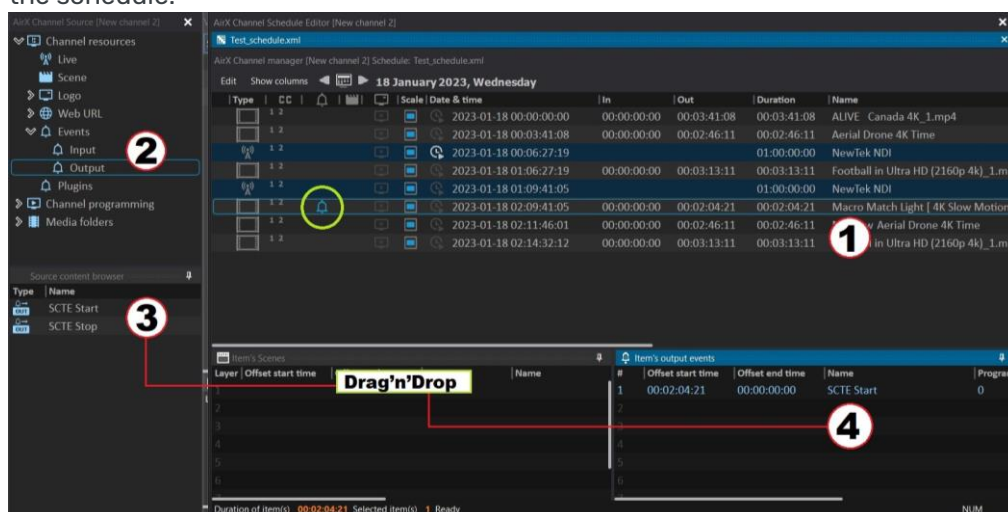


Figure 330. SCTE markers in the schedule

- Select the schedule row to add the SCTE output event (Figure 330, point 1)
- Expand the Channel resource tree on the left side of the app window. Expand the **Events** branch to see the list of events. Select the **Output** item (Figure 330, point 2).

3. After you click the Output item, you will see the list of available external events (SCTE markers) in the Source content browser window (Figure 330, point 3). Select the desired SCTE and drag it to the **Item's output events** window (Figure 330, point 4).
4. Edit the SCTE parameters in the Item's output events window: Offset start time, Preroll etc. See the **Item's Output Events window** chapter for details.
5. After you add the SCTE output event to the Item's output events window you will see a **bell icon** in the AirX Channel OnAir window. It will appear on the schedule row where you have added the output event. So you can visually check output events in the schedule.

Input redundancy

The main requirement for the dynamic AD insertion is the high quality input signal and its stable decoding. AirX broadcast automation has the built-in Input redundancy to solve this issue. Each of the input streams is in a continuous monitoring state by AirX services. This feature provides real-time monitoring of the connection state and the signal quality of the input stream. In case of disconnection or quality loss, AirX allows you to replace the failed Input with a backup one in three seconds. It will be switched automatically without any additional user's actions.

Input redundancy settings:

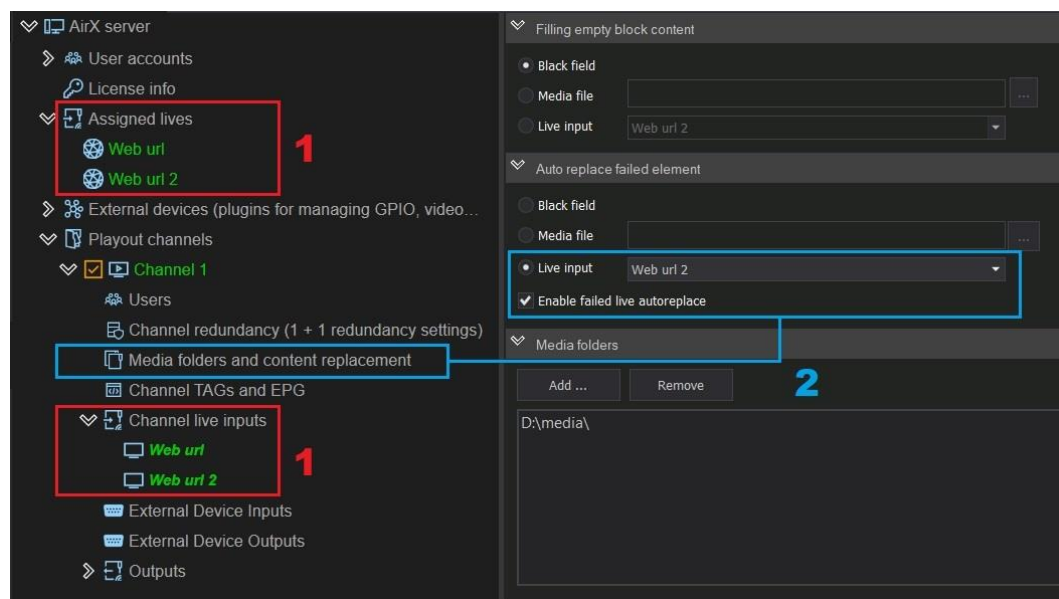


Figure 331. AirX Input redundancy

1. You have to configure two input Live signals – the main and the backup ones (see the **Channel live inputs** chapter for details). Both of these signals must be connected to the Playout channel (the connection settings are described in the **Live sources connection and distribution** chapter).
2. Expand the Channel resource tree and click the **Media folders and content replacement** branch to open the settings pane on the right side of the app window. Find the **Auto replace failed element** pane in the settings. This pane is intended for automatic replacement of damaged schedule elements and has the following options:
 - **Black field** - auto-replace an element with a black screen
 - **Media file** - auto-replace an element with a media file

- **Live input** - auto-replace an element with Live source

By default, all of the auto-replacement options are applied only to corrupted video files in the schedule. However, in the same pane there is a checkbox **Enable failed live autoreplace**. When activated, all the options will also be applied to the damaged Live source. Check the box and select the backup Live from the drop-down list.

The Input redundancy is one of AirX’s core features and does not require an additional license.

AirX channel redundancy (1+1)

AirX software has a built-in 1+1 redundancy, based on the independent synchronous work of two playout channels controlled from one client workstation. Redundancy mode requires the additional license for each channel.

The redundancy scheme includes two broadcast playout servers. Primarily they are only synchronized by the time parameter, using the Network Time Protocol (NTP server). The only thing that connects these two servers is a **setting** that shows to the client application that these two servers are working in pair.

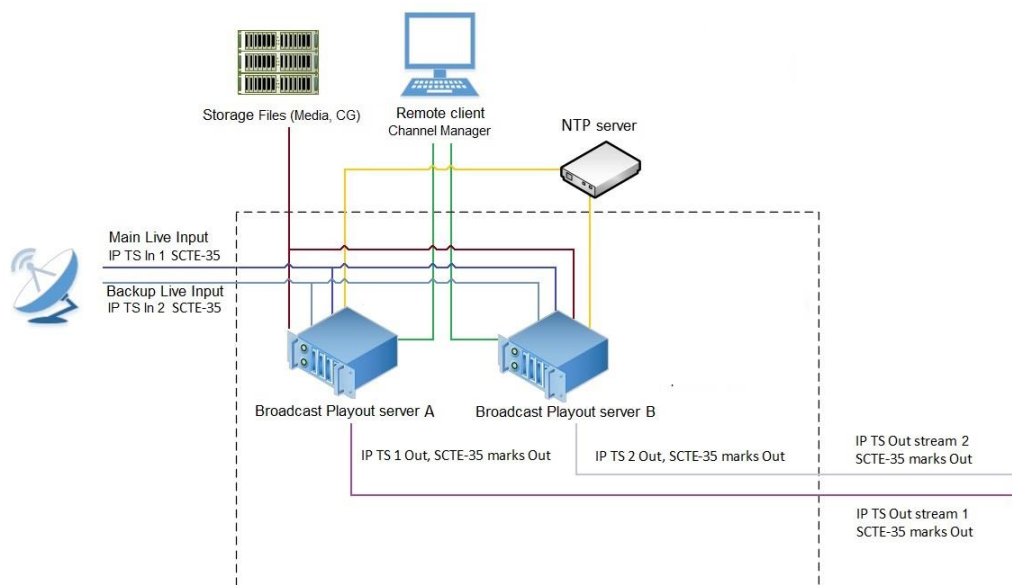


Figure 332. AirX channel redundancy (1+1)

For the client application, the redundant servers are displayed as the single playout channel. But the broadcast is being made from two servers in every moment of time. When the servers are connected in such redundancy, synchronization point is a **client application** that sends commands to both servers at the same time

In the AirX Launcher application, channels, added in redundancy mode, are named **A** and **B**. This **does not mean** that server A is the main one, and server B is the backup (!) Servers and channels in 1+1 mode are completely equal and letters A and B are assigned randomly.

Schedules and files must be uploaded to both servers. All paths, files and schedules must be identical. All the basic settings of servers and the settings of playout channels must be identical! Please read the **Channel redundancy (1+1 redundancy settings)** chapter for detailed description of redundancy settings.

Color-coding of redundancy states

While working in redundancy mode, you can control the state of the redundancy from the Channel Manager client application.

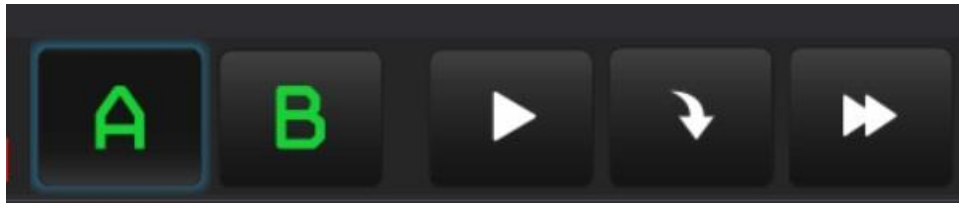


Figure 333. Redundancy is Ok

The green color of the schedule switching buttons means that the servers are working normal and synchronously.

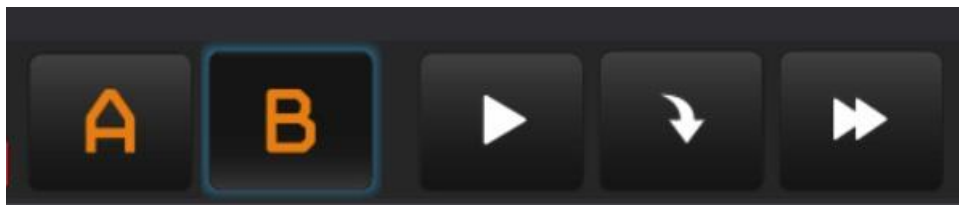


Figure 334. Channels are out-of-sync

Orange color means that schedule synchronization is broken (channel schedules are not identical) or it is up to 5 frames out of sync between servers.

This is easy to check by switching the schedule A and B using the buttons - the numbers in the Countdown field of the top menu will be different. Therefore, the schedules are not synchronized.

You can correct this manually using the **Redundancy -> Synchronize channel** items of Channel Manager control menu.

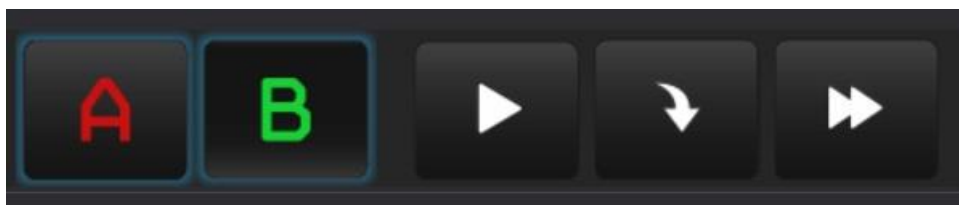


Figure 335. The channel is unavailable

Red alert illumination of one of the buttons means a critical error - one of the broadcast playout servers is unavailable. In this case, the server troubleshooting is required.

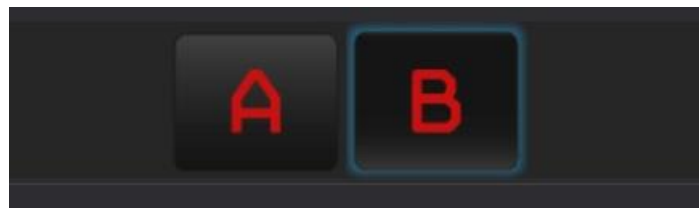


Figure 336. Both channels are unavailable

Red alert illumination of both channels means that the client application cannot connect to both broadcast playout servers. In this case, a complex troubleshooting of the broadcast automation is required.

Synchronization of schedules

The redundant servers work synchronously and additional synchronization of schedules is not required. However, if an out of sync event happens (orange color of the schedule switching buttons), manual synchronization is also possible.

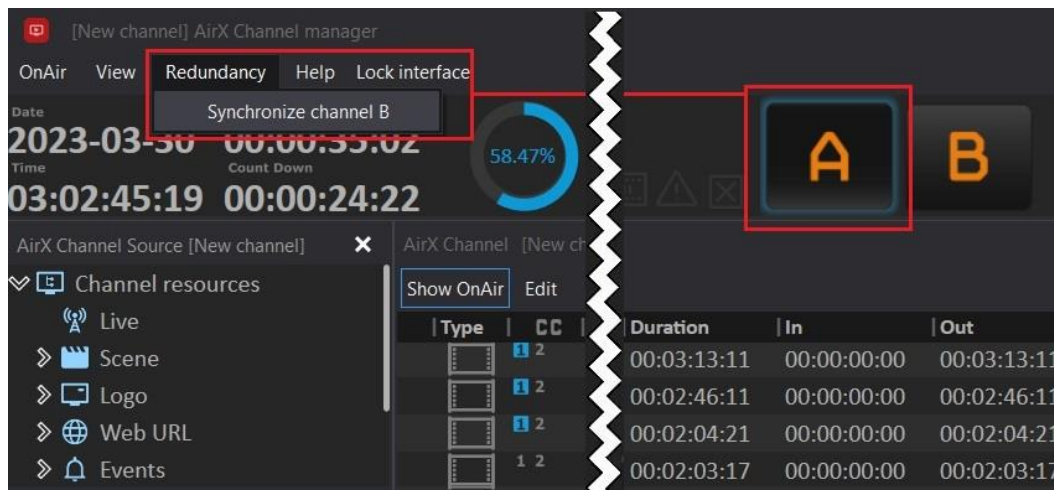


Figure 337. Manual synchronization of schedules

1. Select schedule A or B. Expand the **Redundancy** main menu item and click **Synchronize channel**. The schedule of the second channel will be synchronized to the selected one.

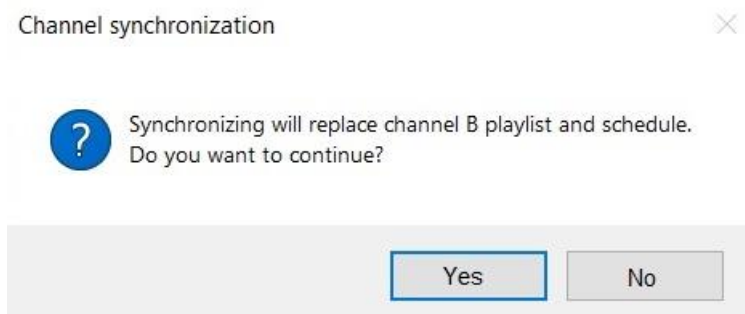


Figure 338. Channel synchronization alert

2. A pop-up window will warn you that the air schedule and playlist of the synchronized channel will be replaced by the current schedule and playlist of the main channel. Confirm sync.



Figure 339. Synchronization progress

3. During the synchronization process, the button of the synchronized schedule will be marked with a circular progress bar. At the end of the synchronization process, the buttons of both schedules will turn green.

Channel redundancy errors

All standard errors that are possible in a single channel schedule playback are also possible in a schedule operating in redundancy mode. This includes errors of primary events (a video file missing from the storage server or critically damaged video), errors of the CG overlay, external events or Live input errors.

ATTENTION: Please note that schedule errors in redundancy mode do not change the color of schedule switching buttons!

The buttons display only the current state of channels synchronization with the local time server (NTP server). All schedule errors of channels A and B will be displayed by warning icons (see the **States of the schedule elements. The color-coding and navigation.** chapter for details). Please note that errors in schedules A and B are not identical, they must be fixed individually for each channel.



Figure 340. Schedule errors in redundancy mode

As you can see in the example above, the schedules of both channels have a CG overlay errors, marked with the Error icon and highlighted in red in the schedule field.

On server A, the CG scene "weather" is missing; on server B, the CG scenes "weather" and "cat" are missing. At the same time, the color of the schedule switching buttons is green and the synchronous operation of the servers that are in redundancy is Ok.

Group operations in AirX

AirX broadcast automation allows multiple selections of schedule elements and group operations with them. This may be useful for manual scheduling because it reduces the operating time. The standard keyboard shortcuts for multiple selections:

- Select an entire fragment of the schedule - **Shift** + click on the first and the last elements of the fragment you want to select.
- Several separate elements of the schedule - **Ctrl** + click on each of the elements you want to select.

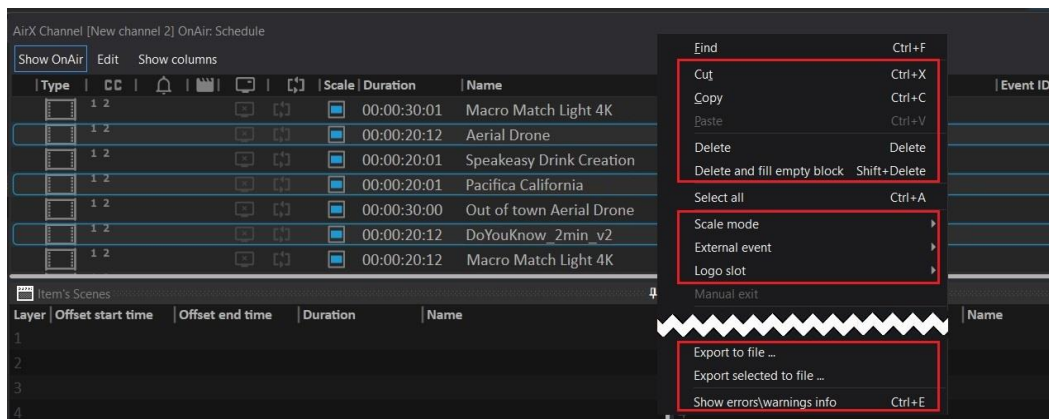


Figure 341. Multiple selections of schedule elements

The following context menu actions are available for a selected group of elements:

1. Standard **Cut**, **Copy**, **Paste** actions. If you copy and then paste multiple elements selected with Ctrl, they will be added to the schedule as an entire block without any schedule rows between them.
2. You can **Delete** a group of elements. If you work with the Schedule (not Playlist), please note, that all the schedule rows hold positive times in the Date & time column, calculated according to the current time and the duration of the preceding clips. If you delete any schedule rows, the starting times of the following clips will be recalculated accordingly. That is because AirX has an additional deletion option - **Delete and fill empty block** (Shift + Delete). If you use this feature to a group of schedule rows selected with Ctrl, a separate empty block (dummy clip) will be added to the schedule instead of each deleted row (in the corresponding position).
3. **Scale mode**: LetterBox, Pan & Scan or Anamorph scale modes can be applied to the group of selected video files
4. **External event** – you can assign or cancel an external event for a selected group of elements:
 - Turn event OFF
 - Start SCTE-35
 - Stop SCTE-35
5. **Logo slot** – you can set one common logo for a selected group of elements
6. **Export to file** – you can save the selected part of a schedule to an *.xml file as an independent schedule. This option is only available to a group of elements selected with Shift

All of the actions above are available in both Schedule and Playlist modes.

Playlist-specific is the **Set loop area for selected items** function. This function is only available to a group of elements selected with Shift. The playback of the selected playlist fragment will be looped, the loop count can be set in the drop-down list:

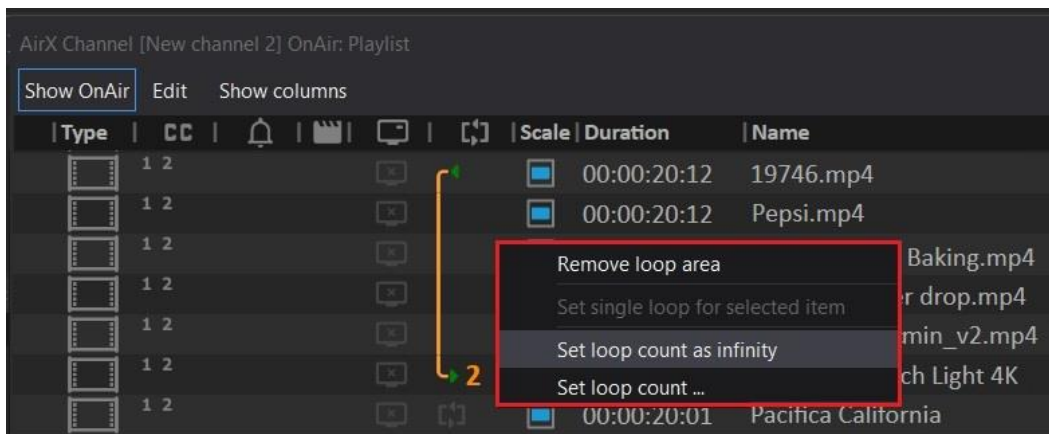


Figure 342. Loop area drop-down list

In addition to the actions of the context menu listed above, the group addition of CG scenes is also available.

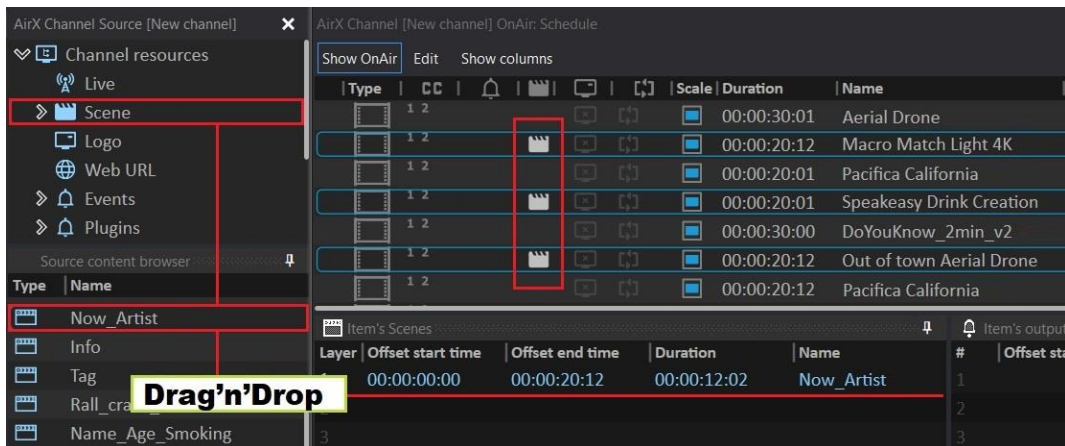


Figure 343. The group addition of CG scenes

CG scenes can be added from the Source content browser tab of the **Scene** branch of the Channel resource tree.

In case of multiple selections, the parameters of the added CG scene will be identical for all selected schedule rows. You should pay attention to the **Duration** and **Offset time** parameters of the selected CG scene to avoid mistakes in the schedule.

And finally, the group addition of external control events is also available for selected schedule rows:

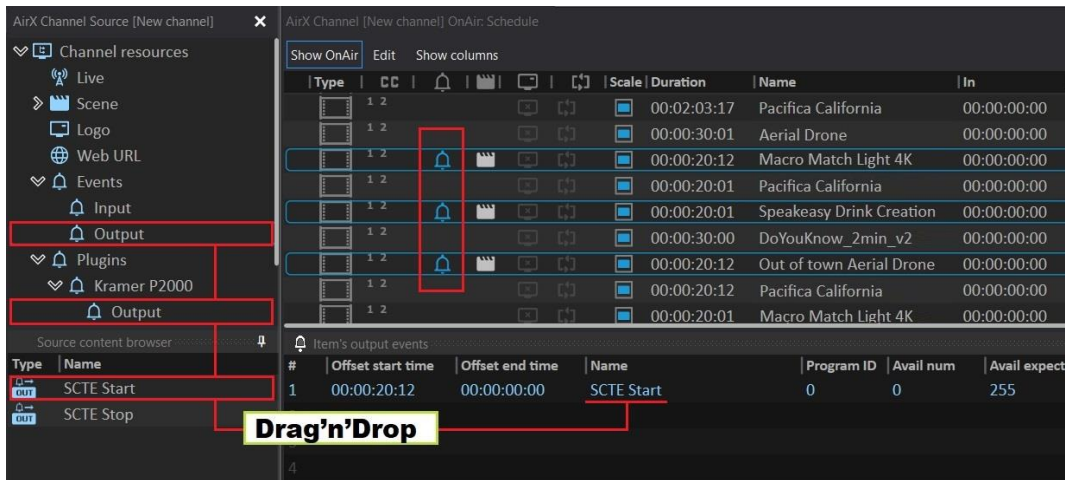


Figure 344. The group addition of external control events

Please pay attention to the **Duration** and **Offset time** parameters of the selected external event that will be identical for all selected schedule rows.

Table of codecs

	AVI	MOV/MP4	MXF	TimeShift	Software / Hardware
VIDEO	SD/HD Ready/HD/UHD, 23,97/24/25/50/29 .97/30/60 FPS				
H.264 4:2:0	V	V	V	-	SW/HW
MPEG-2 4:2:0	V	V	V	-	SW
H.265 (HEVC) 4:2:1	V	V	V	-	SW/HW
MPEG-2 I-Frame 4:2:0	V	V	V	+	SW
DVCAM 4:2:0	V	V	V	+	SW
DVCPro 4:1:1	V	V	V	+	SW
DVCPro50 4:2:2	V	V	V	+	SW
DVCPro HD 4:2:2	V	V	V	+	SW
MPEG IMX 30 4:2:2	V	V	V	+	SW
MPEG IMX 40 4:2:2	V	V	V	+	SW
MPEG IMX 50 4:2:2	V	V	V	+	SW
DNxHD 120 4:2:2	V	V	V	+	SW
DNxHD 185 4:2:3	V	V	V	+	SW
AppleProRes HD HQ 4:2:2/10bit	V	V	V	+	SW
AppleProRes HD LT 4:2:2/10bit	V	V	V	+	SW
AppleProRes HD Proxy 4:2:2/10bit	V	V	V	+	SW
AppleProRes HD NQ 4:2:2/10bit	V	V	V	+	SW
AppleProRes SD HQ 4:2:2/10bit	V	V	V	+	SW

AppleProRes SD LT 4:2:2/10bit	V	V	V	+	SW
AppleProRes SD Proxy 4:2:2/10bit	V	V	V	+	SW
AppleProRes HD NQ 4:2:2/10bit	V	V	V	+	SW
XDCAM HD 17 4:2:0	V	V	V	-	SW
XDCAM HD 25 4:2:0	V	V	V	-	SW
XDCAM HD 35 4:2:0	V	V	V	-	SW
XDCAM EX 35 4:2:0	V	V	V	-	SW
XDCAM HD 50 4:2:2	V	V	V	-	SW
AVC Intra 50 4:2:0/10bit	V	V	V	+	SW
AVC Intra 100 4:2:2/10bit	V	V	V	+	SW
AVC Intra 200 4:2:2/10bit	V	V	V	+	SW
XAVC Intra 300 4K 4:2:2/10bit	V	V	V	+	SW
H264 4:4:4 I-Frame	V	V	V	+	SW/HW
HEVC 4:4:4 8Bit I- Frame	V	V	V	+	SW/HW
HEVC 4:4:4 10Bit I- Frame	V	V	V	+	SW/HW
DNxHR SQ (4:2:2 8Bit)	V	V	V	+	SW
DNxHR HQ (4:2:2 8Bit)	V	V	V	+	SW
DNxHR HQX (4:2:2 10Bit)	V	V	V	+	SW
DNxHR 444 (4:4:4 10Bit)	V	V	V	+	SW
ProRes UHD (Progressive 2160P) 4:2:2 10Bit HQ	V	V	V	+	SW
ProRes UHD (Progressive 2160P) 4:2:2 10Bit LT	V	V	V	+	SW
ProRes UHD (Progressive 2160P) 4:2:2 10Bit Proxy	V	V	V	+	SW
ProRes UHD (Progressive 2160P) 4:2:2 10Bit NQ	V	V	V	+	SW

Table 3. Table of codecs