

x-dream-media GmbH

Consulting, Development, Deployment, Training and Support for Media-IT

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Thema:

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1 Introduction

The x-dream Broadcast Suite is a professional software suite designed for live, near-live and compliance-critical broadcast workflows. It provides broadcasters and proAV operators with a reliable, efficient and cost-effective toolset for media playback, recording, monitoring and regulatory compliance.

The Broadcast Suite focuses on operational excellence in live environments. The suite consists from a set of Windows desktop applications for manual operations and from a series of server software with webGUIs for either fully automated or manual assisted operations. Thus it combines desktop applications for local signal handling with server-based services for continuous monitoring, recording and compliance tasks. The modular design allows customers to deploy exactly the functionality required for their operational needs, from single workstations to larger broadcast infrastructures.

Key characteristics of the x-dream Broadcast Suite include frame-accurate video handling, support for SD, HD and selected UHD formats, professional SDI and NDI workflows, multi-instance operation and legally compliant recording capabilities.

1.1 Scope of this Document

This document gives an introduction and insight into x-dream Broadcast Suite. It's made to inform project architects, planners and managers but also operators and engineers.

1.2 Licensing Model

The x-dream Broadcast Suite Desktop products are all perpetual and node locked licensed. The x-dream Broadcast Suite Server products are perpetual, temporary or subscription based and typically node locked licensed.

1.3 Scalability and Redundancy

The x-dream Broadcast Suite Desktop scales by workstations it's installed on. This also gives redundancy for live operations when running jobs double on two different workstations. The x-dream Broadcast Suite Server scales by concurrent jobs per server and servers stacked to run as farm. Redundancy for live operations can be achieved by running processes two times on different machines and doubling the farm management.

1.4 Limitations and Known Constraints

The x-dream Broadcast Suite Desktop runs on Windows operating system only and is limited in it's internal video processing to SDR. HDR sources are played and recorded but converted at the importer to SDR.

The x-dream Broadcast Suite Server does not underly such limitations and fully supports HDR. Both product sets support up to 4k resolutions, 60 fps and GPUs.

1.5 Supported Operating Systems and System Requirements

The x-dream Broadcast Suite Desktop runs on Windows operating system only.
The x-dream Broadcast Suite Server runs on Windows and Linux.

The software runs on Intel and AMD CPUs in a corresponding ecosystem equally good. For stable operations we recommend a minimum of 4 cores/8 threads 2,9 GHz and 8 GB RAM for two concurrent playbacks or recordings. For every other concurrent playback or recording please add 2 cores/4 threads and 4 GByte RAM.

The random storage/disk read & write speed and the network speed is required to be calculated as number playbacks/recordings per machine * number machines * (video bitrate + audio bitrate) and some buffer is to be added.

1.6 Support and Maintenance

Software support and maintenance is available for all licensing methods by email, phone, online and remote desktop.

1.7 Supported Input Sources

The x-dream Broadcast Suite Desktop supports file sources only.

The x-dream Broadcast Suite Server supports file, stream, IP, NDI, SDI and SMPTE 2010 sources.

1.8 Supported Output Interfaces

The x-dream Broadcast Suite Desktop supports file, NDI and SDI outputs.

The x-dream Broadcast Suite Server supports file and stream outputs.

1.9 Supported Codecs & Formats

The x-dream Broadcast Suite supports a very wide range of input and output codecs like MPEG-1, MPEG-2, H.264, HEVC, AVC, DNxHD, ProRes, AAC and formats like MPEG-2, MP4, MOV, TS, MXF.

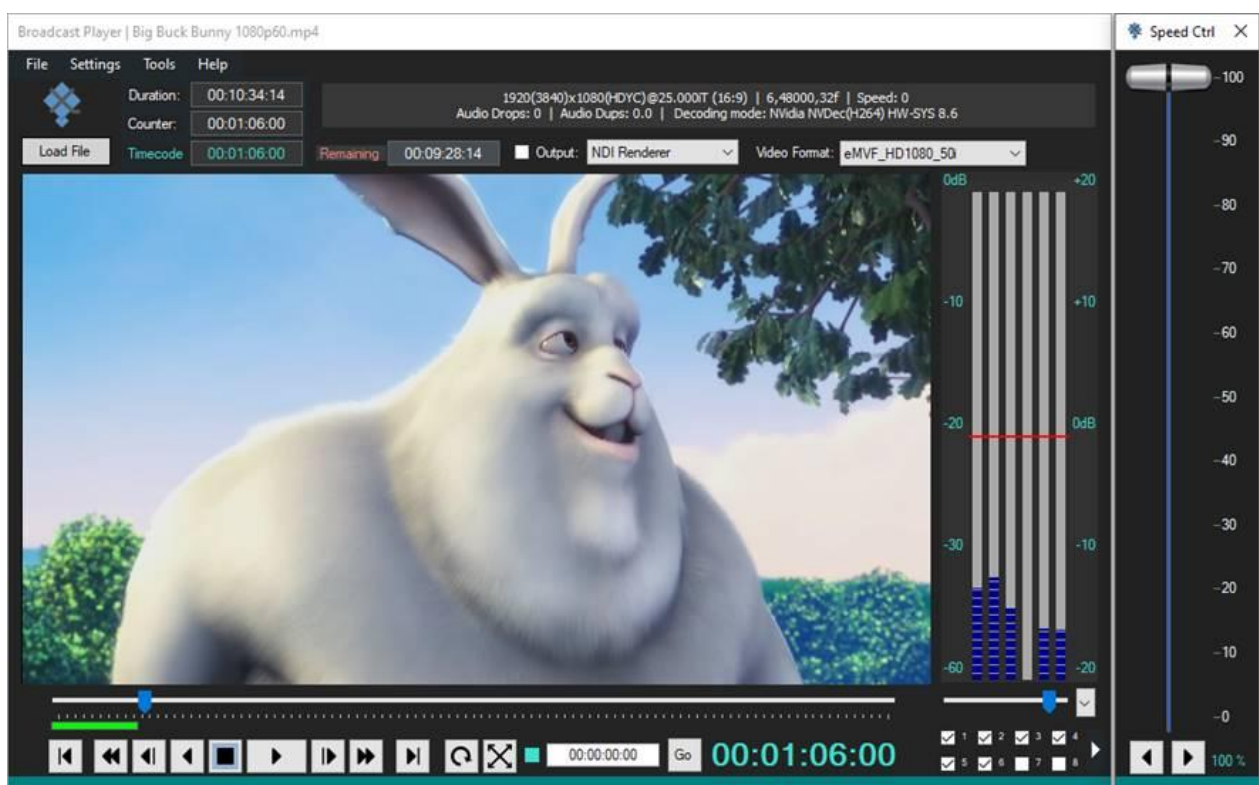
2 Broadcast Suite Desktop Products

2.1 Broadcast Player

2.1.1 Description

The Broadcast Player is a widely applicable tool in file-based environments. Due to its extremely powerful decoding engine, it can play the majority of SD and HD video formats and even various UHD formats. It supports camera, editing, archiving, video server, streaming and download formats. Thus, it can be used for ingesting, reviewing or quality control.

The Broadcast Player is equipped with the usual player controls, as well as single frame stepping and looping. Furthermore, a frame-accurate seeking and playback of video files are possible. It also displays LTC and VITC timecode. A special highlight is the ability to output the video through professional interface cards as HD-SDI signal. Another highlight is the side-by-side view. This allows a direct comparison of two video files for instance on two monitors. Thus, the Multi-Format Player is ideal for video quality comparisons.



2.1.2 Purpose and role in the workflow

The Broadcast Player is very often used for file checks in ingest, quality control and archiving. But it's also made for live production in broadcasting, at conferencing and events. It's origin is in engineering because of it's analysis and comparison features.

2.1.3 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

2.1.4 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

2.1.5 Features

- | | |
|----------------------------|------------------------------|
| • Any file format playback | • Playlist & looping support |
| • GPU support | • Metadata display |
| • UHD support | • Looped playback |
| • HDR support | • Cliplist support |
| • Professional controls | • Screenshot creation |
| • Professional timecodes | • Side-by-side view |
| • Professional audiometer | SDI, NDI, HDMI output |

2.1.6 Limitations

The Broadcast Player does not support stream sources currently.

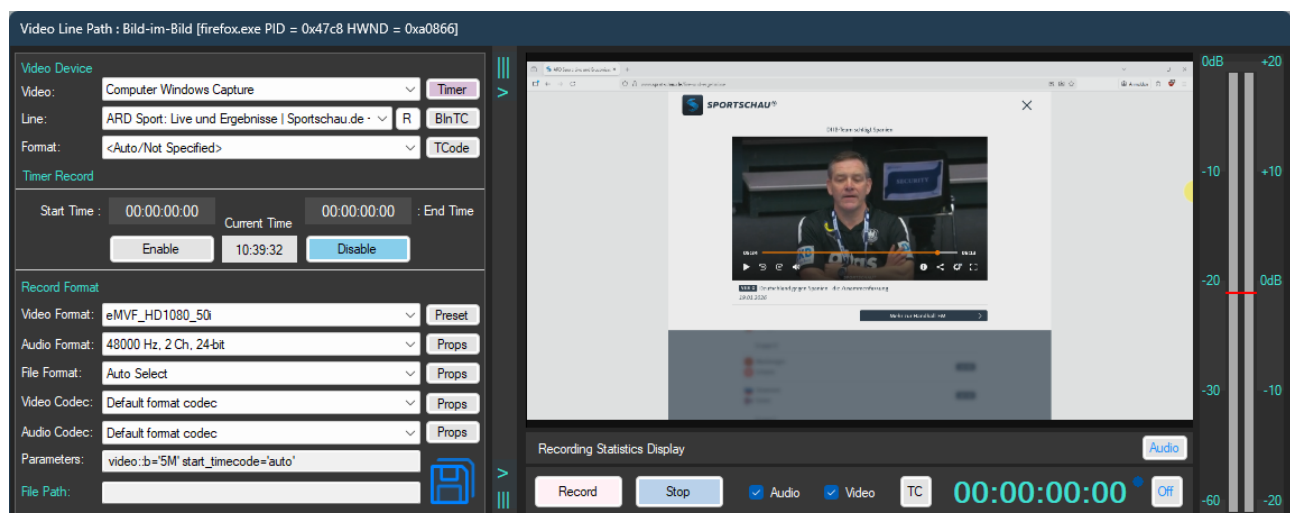
2.2 Broadcast Recorder

2.2.1 Description

The Broadcast Recorder is a widely applicable tool at live productions. Due to its simple but powerful usability, it's suitable for professional studio productions, business TV, for feed recordings at broadcasting, for recordings of educational content, as an engineering tool and as a disaster recovery tool. It records to all relevant SD and HD video formats. It supports various source devices and formats.

The Broadcast Recorder is equipped with the usual recording controls as well as audio leveling faders. It records LTC, VITC or system time-code. A special highlight is the ability to run multiple instances of the recorder in parallel. This allows ISO studio recordings. Thus, the Broadcast Recorder is the ideal tool for all kinds of studio productions or feed recordings.

The Broadcast Player nicely combines with the Broadcast Recorder as an immediate review and quality control tool.



2.2.2 Purpose and role in the workflow

The Broadcast Recorder is typically used for live production in broadcasting, sports, at conferencing and events. It can be combined with the Broadcast Player for highlight playback.

2.2.3 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

2.2.4 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

2.2.5 Features

- Recording from SDI, NDI, HDMI sources
- Professional controls
- Professional timecodes
- Professional audiometer
- Professional format support
- Multi instances support
- ISO recording
- Monitoring on desktop

2.2.6 Limitations

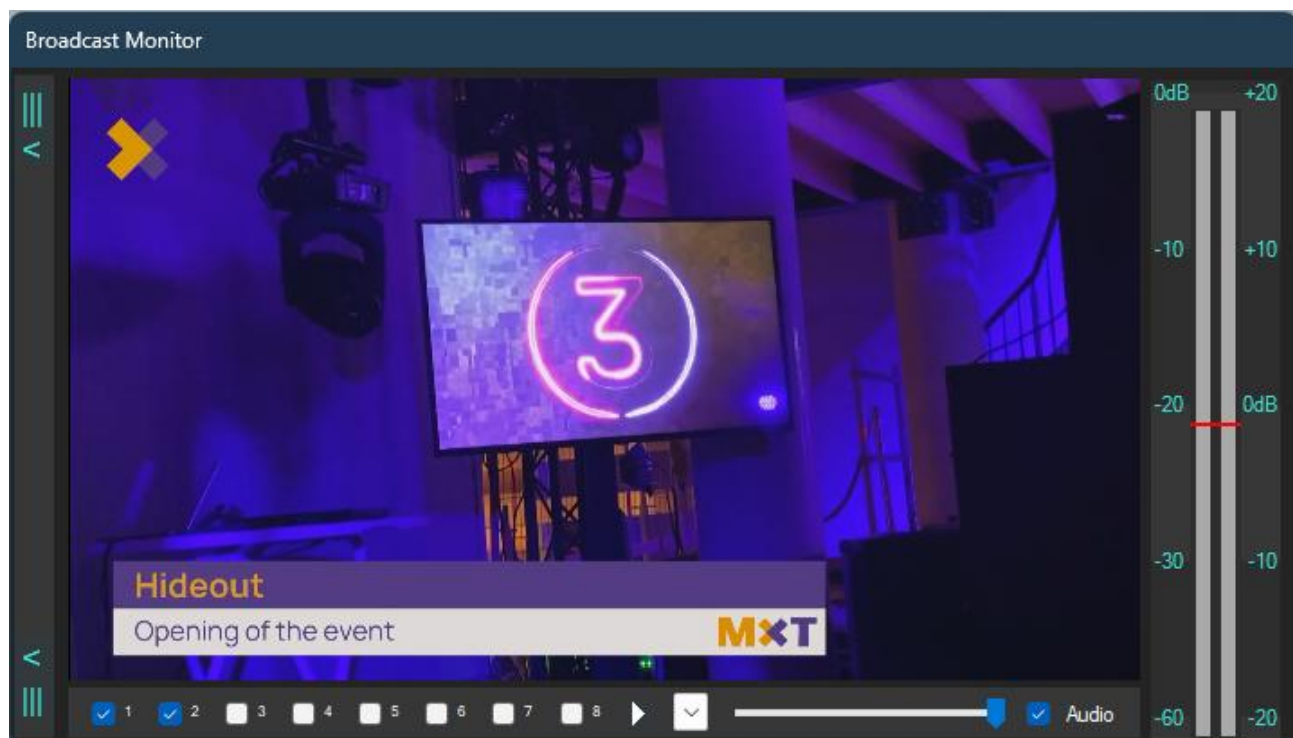
The Broadcast Player does not support stream sources currently.

2.3 Broadcast Monitor

2.3.1 Description

The Broadcast Monitor is a widely applicable tool for live productions and broadcasting. It's made to visualize SDI and NDI signals on computer monitors. Due to its extremely powerful decoding engine, it can play any SD and HD and many UHD video formats. Thus, it's ideal for studio production, feed and program payout monitoring.

The Broadcast Monitor is equipped with an under monitor display, audio levels and audio channel selectors. Multiple instances can be started to monitor multiple signals in parallel.



2.3.2 Purpose and role in the workflow

The Broadcast Monitor is made to preview and monitor NDI and SDI sources at live production in broadcasting, sports, at conferencing and events.

2.3.3 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

2.3.4 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

2.3.5 Features

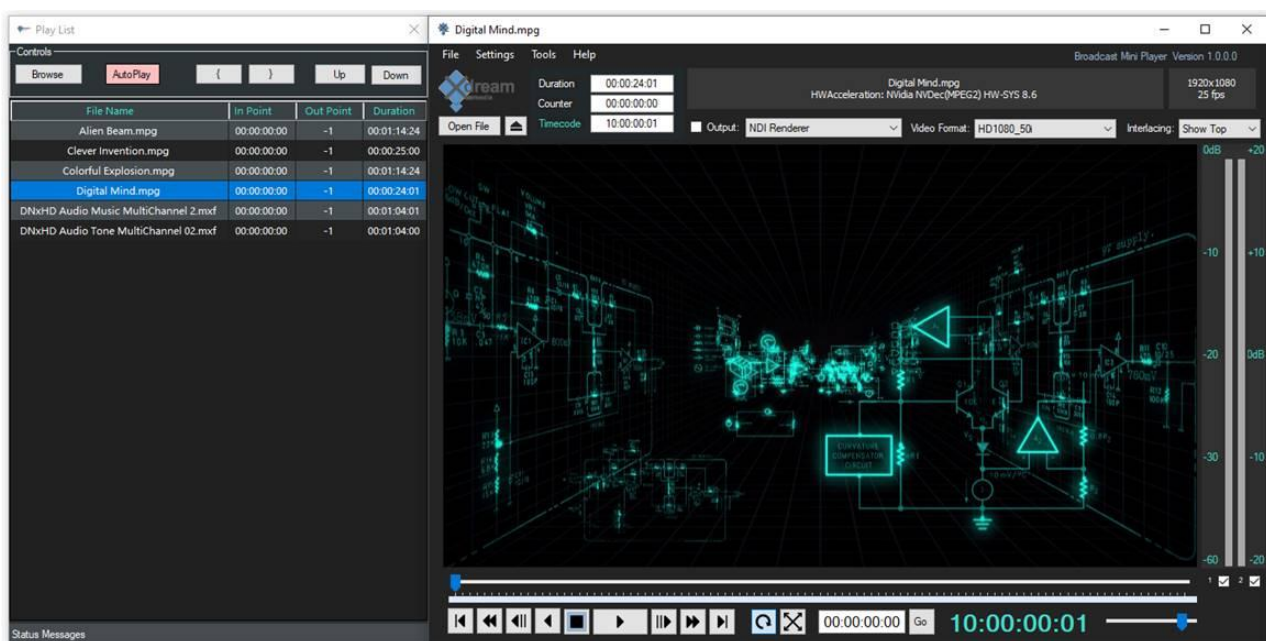
- SDI and NDI support
- UHD support
- HDR support
- Under monitor display
- Professional audiometer

2.4 Broadcast miniPlayer

2.4.1 Description

The new x-dream **Broadcast miniPlayer** is designed to provide basic playback functions and features with an automatic media file association for playback. Broadcast miniPlayer is a light version of Broadcast Player and part of the Broadcast Suite. It copies most of the controls from Broadcast Player, it doesn't however support the use of hotkeys.

There is nearly no file format that Broadcast miniPlayer does not support. You might find gaps when loading raw camera formats. Please inform us when you experience wrong HDR colorinterpretation. All common media file types, formats & extensions are supported. To associate a media file extension/s, use the following procedure.



2.4.2 Purpose and role in the workflow

The Broadcast miniPlayer is made to be integrated into Webapps for playing production file formats. Such applications are often used for ingest, quality control and archiving.

2.4.3 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

2.4.4 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

2.4.5 Features

- Any file format playback
- GPU support
- UHD support
- HDR support
- Professional timecodes
- Professional audiometer
- Playlist & looping support
- Metadata display
- Looped playback
- Cliplist support
- Screenshot creation
- Side-by-side view
- SDI, NDI, HDMI output

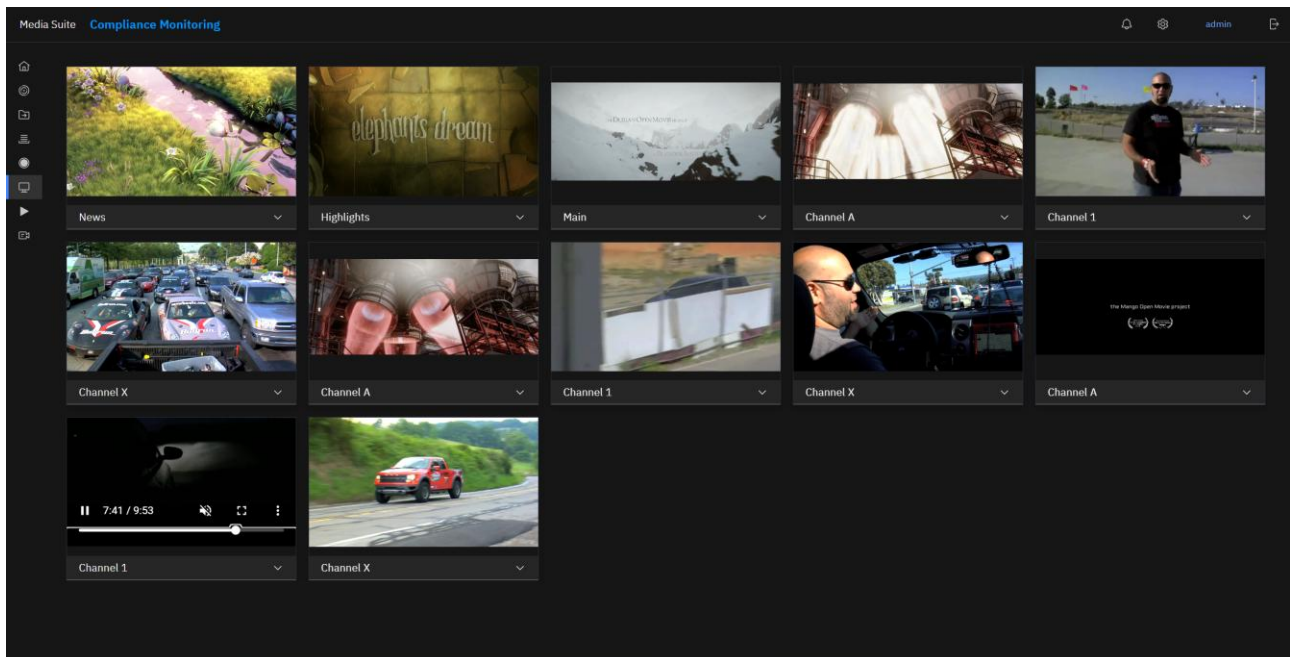
2.4.6 Limitations

The Broadcast miniPlayer does not support the Playlist and Highlights mode.

3 Broadcast Suite Server Products

3.1 Monitoring

The Monitoring module of Broadcast Suite Server is made for controlling the streaming operations of different and multiple sources on a single web interface and monitor multiple channels at the same time. It supports the most commonly used formats and codecs and video input cards. It can be used stand alone or combined with the the modules.



3.1.1 Purpose and role in the workflow

The Broadcast Suite Server Monitoring module visualises source or output streams and signals at feed, event and compliancy recording, event and programm encoding. It can be also used for feed monitoring in newsrooms or content rights monitoring.

3.1.2 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

3.1.3 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

3.1.4 Features

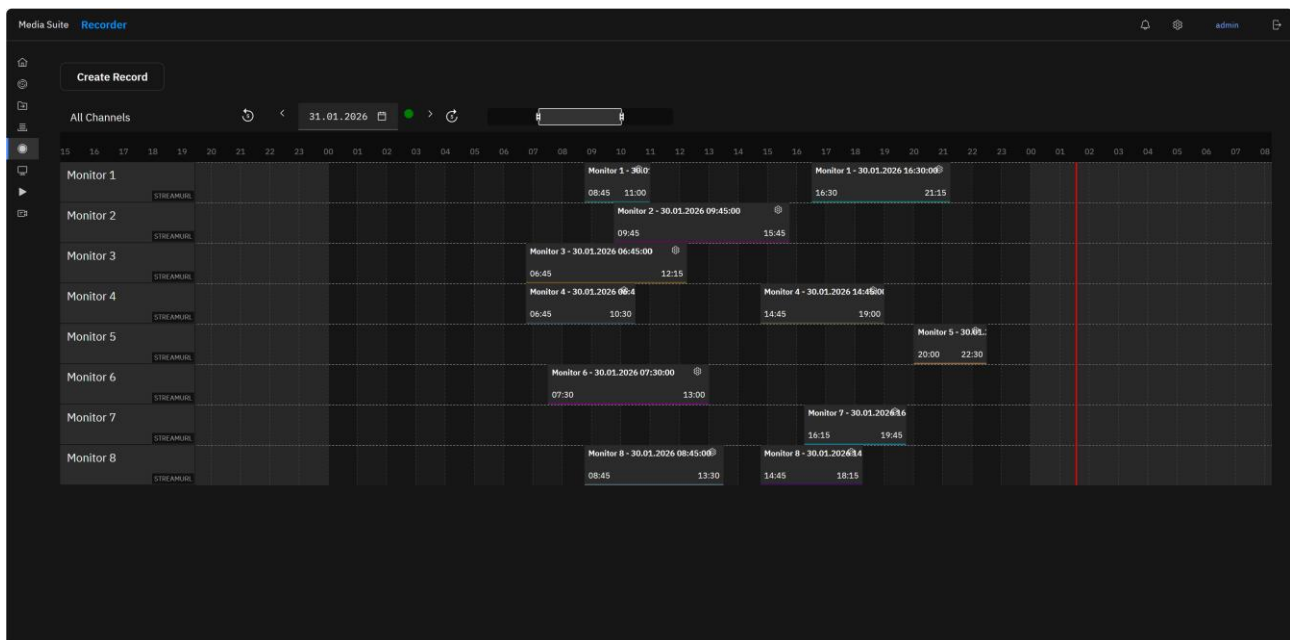
- Display of stream sources
- Flexible layout assignment
- Background conversion of web player non-compliant sources

3.1.5 Limitations

- none

3.2 Feed Recorder & Event Encoder

Broadcast Encoder is a live encoding and transcoding software to create single bitrate or adaptive bitrate streams from video or stream sources.



Control the streaming operations of different and multiple sources on a single web interface and monitor multiple channels at the same time. Stream the most commonly used formats and codecs for best compatibility with streaming server or stream receivers. Supports various stream sources and video input cards.

Scale operations from a single server setup to farm distributed operations. Perform subsequent tasks like file transfer, webservice calls and housekeeping options. Get e-mail and visual notifications from the system to identify problems.

Runs jobs as n+1 or 1+1 redundancy configuration based on three layers of redundancy; frame-accurate video servers, redundant controllers, and multiple clients provide resiliency for different failure conditions. Automatically failing over to ensure sustainability and prevent any interruption such as black-frame, freeze-frame, or drop frames on the screen with router control gateway.

3.2.1 Purpose and role in the workflow

The Broadcast Suite Server Feed Recorder and Event Encoder module can be flexibly used for scheduled or crash recordings of news feeds and studio productions. Alternatively it can encode the sources planned or spontaneously for live streaming. But it can also record and encode in parallel either just for production monitoring or for live streaming.

3.2.2 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

3.2.3 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

3.2.4 Features

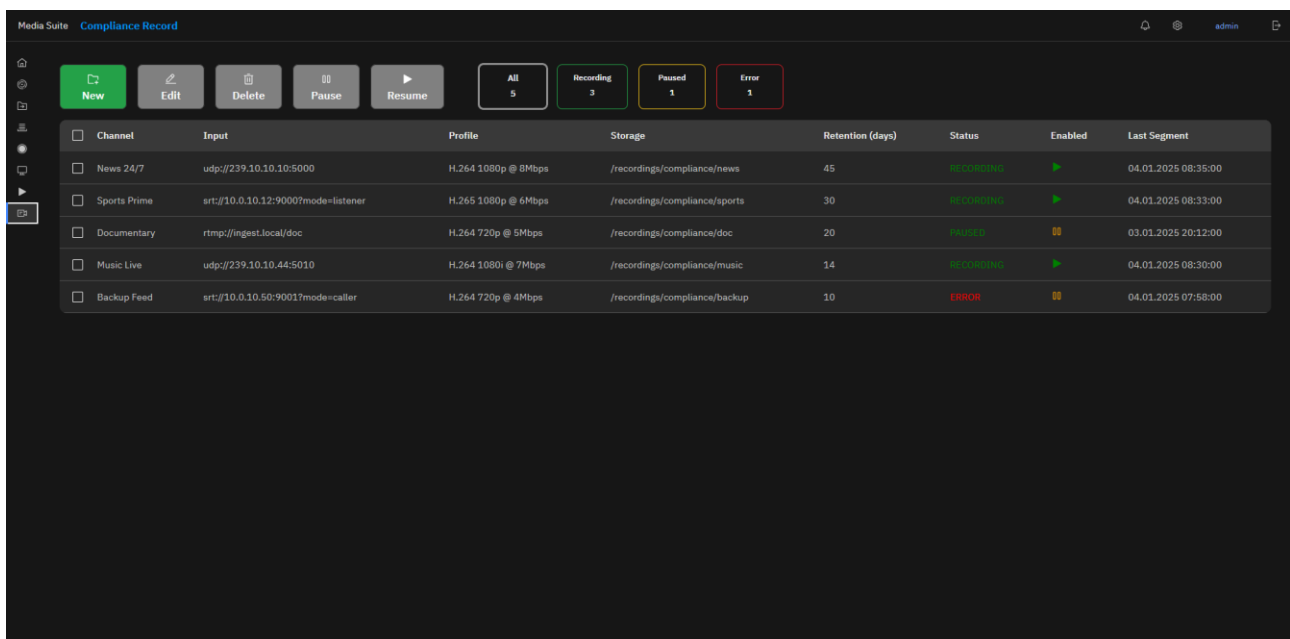
- Supported sources: stream, IP, SDI, NDI, SMPTE 2110
- Supported outputs: professional file formats, stream, IP
- Scheduled and crash recording & live encoding
- Multi instances support
- Farm load-balancing
- Farm redundancy
- ISO recording

3.2.5 Limitations

none

3.3 Compliance Recorder & Broadcast Encoder

The Broadcast Compliance Recorder is a video program recording and video stream capture software to review and prove aired content. It addresses legal mandated requirements to prove regulations are met, is used to prove facts in dispute regulations and helps meeting quality goals.



The screenshot shows the 'Media Suite Compliance Record' interface. At the top, there are buttons for 'New', 'Edit', 'Delete', 'Pause', and 'Resume'. Below these are status boxes for 'All 5', 'Recording 3', 'Paused 1', and 'Error 1'. The main part of the interface is a table with the following columns: Channel, Input, Profile, Storage, Retention (days), Status, Enabled, and Last Segment. The table contains five rows of data.

Channel	Input	Profile	Storage	Retention (days)	Status	Enabled	Last Segment
<input type="checkbox"/> News 24/7	udp://239.10.10.10:5000	H.264 1080p @ 8Mbps	/recordings/compliance/news	45	RECORDING	▶	04.01.2025 08:35:00
<input type="checkbox"/> Sports Prime	srt://10.0.10.12:9000?mode=listener	H.265 1080p @ 6Mbps	/recordings/compliance/sports	30	RECORDING	▶	04.01.2025 08:33:00
<input type="checkbox"/> Documentary	rtmp://ingest.local/doc	H.264 720p @ 5Mbps	/recordings/compliance/doc	20	PAUSED	⏸	03.01.2025 20:12:00
<input type="checkbox"/> Music Live	udp://239.10.10.44:5010	H.264 1080i @ 7Mbps	/recordings/compliance/music	14	RECORDING	▶	04.01.2025 08:30:00
<input type="checkbox"/> Backup Feed	srt://10.0.10.50:9001?mode=caller	H.264 720p @ 4Mbps	/recordings/compliance/backup	10	ERROR	⏸	04.01.2025 07:58:00

3.3.1 Purpose and role in the workflow

The Broadcast Suite Server Compliance Recorder and Encoder module is typically used in 24/7 operations or long running productions for the recording of stream or live signal sources. Alternatively it can encode the sources or it can record and encode in parallel either just for production monitoring or for live streaming.

3.3.2 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

3.3.3 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

3.3.4 Features

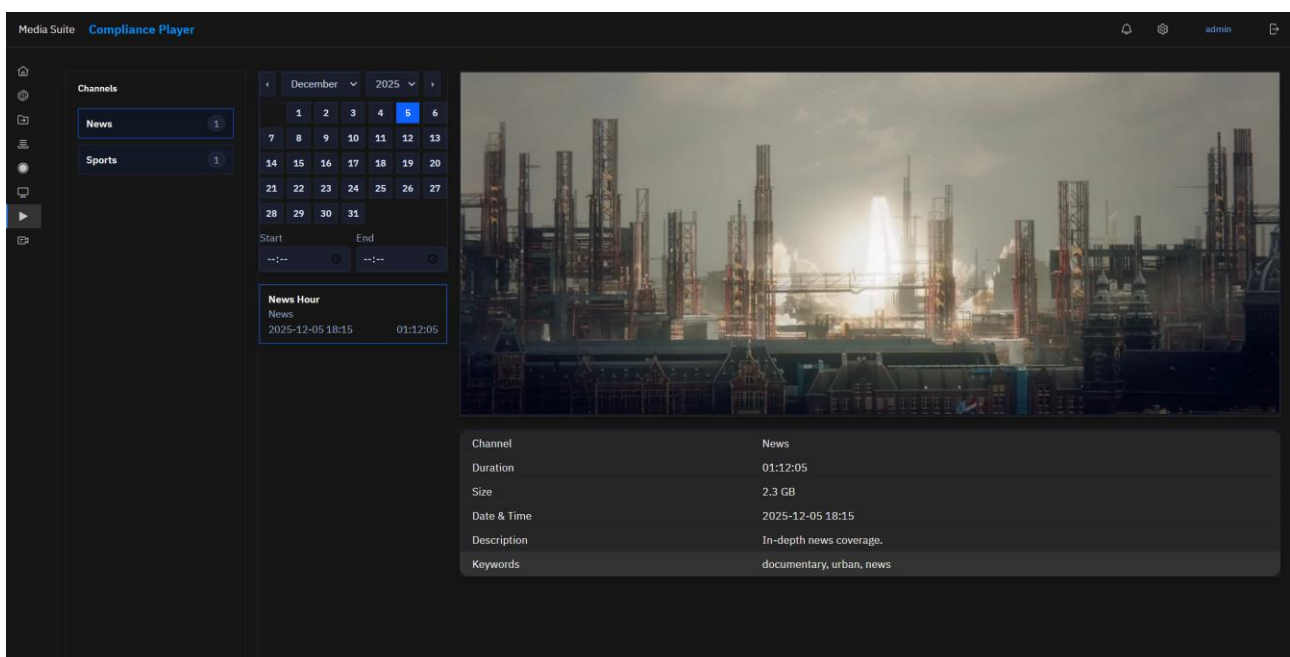
- Supported sources: stream, IP, SDI, NDI, SMPTE 2110
- Supported outputs: professional file formats, stream, IP
- Continuous recording & live encoding
- Multi instances support
- Farm load-balancing
- Farm redundancy

3.3.5 Limitations

none

3.3.6 Compliance Player

The Broadcast Suite Compliance Player is a module that serves as a review player for compliance recordings created by Broadcast Suite Compliance Recorder.



3.3.7 Purpose and role in the workflow

The Broadcast Suite Server Compliance Player is used to review own or 3rd party program recordings in case of program or quality complaints or content rights violations.

3.3.8 Typical Use Cases

The x-dream Broadcast Suite is used in a wide range of broadcast and proAV scenarios, including:

- Live studio productions
- Feed and line recordings
- Compliance and legal proof recording
- Quality control and review
- Disaster recovery recording
- Educational and corporate broadcast environments
- Engineering and technical monitoring

3.3.9 Target Customers

The x-dream Broadcast Suite addresses professional users and organisations such as:

- Broadcasters (regional, national, news, special interest)
- Production studios
- OB vans and live event operators
- ProAV system integrators
- Educational institutions
- Corporate broadcast environments

3.3.10 Features

- Supported sources: streaming files from compliancy recording
- Search and playback by channel, day, time or program
- Supported outputs: professional file formats
- Export of selected recording segments
- Trimming to selected in/out points

3.3.11 Limitations

None

3.4 Format Support

Containers

- ❖ MXF
- ❖ MOV
- ❖ MP4
- ❖ TS
- ❖ AVI

Protocols

- ❖ UDP
- ❖ RTP
- ❖ RTMP
- ❖ SRT
- ❖ HLS
- ❖ MPEG-DASH

Video Codes

- ❖ AVC-Intra
- ❖ AVC-LongGOP
- ❖ XAVC
- ❖ XDCAM HD
- ❖ MPEG-2
- ❖ AVC/H.264
- ❖ HEVC/H.265
- ❖ DNxHD
- ❖ ProRes
- ❖ DV

Audio Codes

- ❖ AAC
- ❖ MP2
- ❖ MP2
- ❖ MP
- ❖ PCM

IO Devices

- ❖ SDI
- ❖ HDMI
- ❖ SMPTE 2110
- ❖ NDI
- ❖ Direct Show
- ❖ IP/Web-Cameras