

VSNX Studio Converter v2.4

Official User Guide & Technical Manual | XYMRA Studio Security Ecosystem

1. Introduction & DRM Security Architecture

VSNX is a high-performance, military-grade encrypted multimedia format and software ecosystem engineered specifically to eliminate online course piracy, unauthorized screen recording, and content redistribution. Traditional streaming protocols (MP4, unprotected HLS, WebM) expose raw media buffers directly to web browsers and download scrapers. VSNX transforms standard video into an encrypted, tamper-resistant container playable exclusively through authorized cryptographic environments.

Core Security & Performance Pillars

- **Dual-Layer AES-256 Encryption:** Every video and audio packet is encrypted at the frame level.
- **Invisible Forensic Watermarking:** Dynamic steganographic watermarks embedded into frames allow forensic extractors to identify User ID, IP address, and timestamp even from external phone recordings.
- **Dynamic HWID Lock:** Restricts playback exclusively to a specific physical computer.
- **Zero-Re-encode Instant Byte-Patching:** Updates student watermarks and HWIDs in under **0.5 seconds**.
- **Fragmented Fast-Start Web Streaming:** Segmented architecture optimized for the VSNX WebAssembly (WASM) Player and WordPress LMS.

2. System Requirements & Installation

Parameter	Requirement Specification
Operating System	Windows 10 / Windows 11 (64-bit, x64 architecture)
Processor	Intel Core i5 / AMD Ryzen 5 or higher (AVX2 instructions recommended)
System Memory (RAM)	8 GB minimum (16 GB recommended for 4K transcoding)
Storage Space	Fast SSD with at least 5 GB free space for temporary frame buffers
Graphics / Subsystem	DirectX 11 / Windows Media Foundation hardware-accelerated GPU

Package Components & Activation:

- **vsnx2_converter_gui.exe:** Graphical batch converter interface.
- **vsnx2_converter.exe:** Command-line interface (CLI) for automated backends.
- **vsnx2_player_gui.exe:** Desktop media player with cryptographic decryption.
- **vsnx2_forensic_extract.exe:** Forensic watermark analysis and leak detection utility.
- **Licensing:** Defaults to Trial Mode (capped at 30 frames / ~1-2 sec). For commercial activation, place vsnx.lic into the root directory.

3. Graphical Interface (GUI) Transcoding Guide

The GUI interface (vsux2_converter_gui.exe) is designed for high-volume batch transcoding and DRM packaging. Workflow steps include:

Workflow Step	Configuration Details & Options
1. Batch Ingestion	Drag-and-drop files (.mp4, .mov, .mkv, .avi), add folders, or import CSV files for automated bulk configuration.
2. Profile Presets	Standard: 1080p content. Web Streaming: Fragmented fast-start for WASM browser player. Studio Archive: Master archival quality.
3. Quality & GOP	Quality slider range: 1–100 (Default: 45, visually lossless). Keyframe interval (GOP): Default 60 frames (~2s at 30fps).
4. Audio Parameters	Presets: Speech (32kHz Mono), Light Speech (24kHz Mono), Standard (44.1kHz Stereo), Studio (48kHz Stereo).
5. DRM & Security	Enable AES-256 password encryption, set Target HWID lock, add visible overlay text, and enable invisible forensic watermarks.

4. Command-Line Interface (CLI) Reference

For server automation and CI/CD pipelines, use vsux2_converter.exe.

Command	Primary Purpose
encode	Converts raw video into an encrypted .vsux container file.
patch	Instantly updates student watermarks and HWID locks in < 0.5s without re-encoding.
inspect	Dumps container headers, DRM status, and technical metadata.
decode	Decrypts and tests a .vsux container back into raw frames.

CLI Command Examples:

Example 1: Standard Web-Optimized Encryption

```
.\vsux2_converter.exe encode "D:\Courses\Lesson01.mp4" "D:\Output\Lesson01.vsx" \  
--quality 45 --gop 60 --fast-start \  
--password "SecurePass@2026" --audio-preset speech
```

Example 2: Zero-Re-encode Instant Student Byte-Patching

```
# Personalize master video for Student #1042 in < 300 milliseconds:  
.\vsux2_converter.exe patch "Master_Course.vsx" "Student_1042_Course.vsx" \  
--password "MasterKey" \  
--watermark "Licensed to: John Smith (ID: #1042)" \  
--target-hwid "A921-DF34-55E1-7890"
```

5. Web SDK & LMS Integration Reference

To deliver .vsnx videos over web portals or WordPress LMS platforms:

- 1. **Always Transcode with --fast-start:** Allows browser decryption upon receiving the first data chunk.
- 2. **CDN / Web Hosting:** Host on AWS S3, Cloudflare R2, or NGINX. Standard HTTP Range requests (206 Partial Content) are supported.
- 3. **Web Player Component:** Embed using the VSUX Web SDK custom HTML element:

```
<video-vsnx
  src="https://cdn.example.com/videos/Lesson01.vsnx"
  password="SecurePass@2026"
  watermark="User: student@email.com">
</video-vsnx>
```

6. Troubleshooting & Technical Solutions

Symptom / Error	Likely Root Cause	Recommended Resolution
Video stops after 1–2s (30 frames)	Unlicensed Trial Mode active	Place valid vsnx.lic license file in application directory.
Media Foundation initialization failed	Missing Windows Media Feature Pack	Install Media Feature Pack via Windows Settings \$rightarrow\$ Optional Features.
Missing .dll startup error	Missing Visual C++ Redistributable	Install Microsoft Visual C++ 2015-2022 x64 Redistributable (vc_redist.x64.exe).
Conversion progress is slow	4K source video on mechanical HDD	Move source files to an SSD and adjust Quality slider to 40–50 range.
Web player black screen with audio	Encoded without --fast-start	Re-transcode with --fast-start checked; verify HTTP Range headers.

7. Technical Support & Licensing Inquiries

- **Official Website:** <https://vsnx.xymra.com>
 - **Technical & API Support:** support@xymra.com
 - **Commercial Partnerships:** contact@xymra.com
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