spin digital

HIGH PERFORMANCE VIDEO CODECS
Spin Digital Video Technologies GmbH

Specialists on video codecs

Spin-off of the Technical University of Berlin

In-house developed software IP & products

Based in Germany

Innovative B2B company with decades of accumulative research experience

>80% of employees are video codec engineers
Next Generation Video

- **Dynamic Range**
  - SDR
  - HDR
  - More Sharpness & more Contrast
  - clearer darker & brighter areas

- **Resolution**
  - 360° Video
  - Full HD
  - 4K
  - 8K
  - More Detail & Higher Field of View

- **Frame Frequency**
  - 30 fps
  - 60 fps
  - 120 fps
  - Smoother Motion & more details in high motion areas

- **Bit Depth**
  - 8 bit
  - 10 bit
  - Better Colors

- **Color Gamut**
  - Full HD
  - UHD
  - HD
  - More Colors

- **Immersive & Interactive Experience**

- **Next Generation Video**
Technology & Market Trends

Broadcast & VoD
- UHD: 4K HDR started in 2017
- UHD Phase B - 4Kp120 (2018/2019)
- Japan 8K: already started test broadcast (2016), commercial broadcast (2018), full launch (2020 Tokyo Olympics)

Large Screen Display
- 8K is the next gen standard format for dome projection: Zeiss, SkyScan
- Giant videowalls and media servers: 7thSense, Stumpfl

VR
- Next Gen VR needs at least 8K, 12K is emerging, and 16K has been proposed
- 4K & 8K VR cameras in the market
- 12K VR camera coming soon

Post-Production
- Creative Studios
- Post-production tools

www.spin-digital.com
Product Development

Horizontal integration with vertical extensions to the core technology for each market segment

Broadcast
- Live
- Reliability
- SDI, ASI, MMT
- Conformance
- Scalability

VoD
- Live streaming
- DRM
- Cloud encoding
- Streaming: HLS, DASH

Large Screen Display
- 3D rendering
- Distributed systems
- Ultra High Quality
- High Resolution >8K

VR & 360 Video
- Live
- Tiles, OMAF
- HMD
- 360 video, ERP, CMP
- High Resolution >8K

Other: medical, security
- Special rendering
- Low complexity codec
- Visually lossless quality

Spin Digital Advanced Codec Architecture

- Spin Enc
- HEVC Encoder
- HEVC Decoder
- Video Renderer
- Video Filters

- Spin Player
- Spin SDK

PC / Server CPU + GPU

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Core Innovation

Achieve maximum efficiency by combining expertise in all 3 areas, and years of advanced research
Very hard to replicate

Video Codec Technology
- Video codec experts
- Scientific contributions:
  - several publications in the most prestigious journals
  - IEEE Transactions on Circuits and Systems for Video Technology
  - IEEE Transactions on Multimedia
  
Software Engineering
- Software Design Experts
- Very well designed software architecture
- Feature rich API
  - Easy to use
  - Powerful
  - Mid-level abstraction

Computer Architecture
- Media Computing Experts
- Multi-threading optimization
- Optimized SIMD library for modern CPU architectures
- Memory architecture optimization

Spin Digital Advanced Codec Architecture
Products

spin enc

Leading performance and compression efficiency encoder

spin player

Full-featured media player for 4K, 8K, and 16K

spin sdk

High performance HEVC/H.265 decoder and video renderer SDK
HEVC Encoder

Higher compression & quality than leading open source encoders
Support for 4K, 8K and 16K
Fast offline compression
Ready for HDR and WCG

Product Highlights
- Fast offline encoding software solution
- Ready for 8K and beyond
- Significantly better compression and quality than competing encoders
- Enables WCG and HDR with up to 12-bit video
- Support for HDR metadata
- Versatile high precision pre-processing filters
- Preserves color resolution with 4:2:2, 4:4:4, and RGB formats
- Support for 360° video projection formats

HEVC/H.265 Encoder Package
- Encoder: standalone HEVC/H.265 encoder
- Transcoder: HEVC/H.265 decoder and encoder integrated in FFmpeg
- SDK: encoder plugin for Ffmpeg (Libavcodec)

Download Brochure
HEVC Media Player

**Performance comparison of Media Players**

<table>
<thead>
<tr>
<th>Media Player</th>
<th>8Kp60, 4:2:0, 10-bit, 120 Mbps</th>
<th>8Kp60, 4:2:2, 10-bit, 160 Mbps</th>
<th>8Kp60, 4:4:4, 10-bit, 200 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLC 3.0.0*</td>
<td>54</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>MPC-BE 1.5.2*</td>
<td>100</td>
<td>84</td>
<td>64</td>
</tr>
<tr>
<td>Spin Player 1.2</td>
<td></td>
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</tr>
</tbody>
</table>

**Media player for 4K, 8K, and 16K**

Based on HEVC software solution

**Product Highlights**

- Pure software solution
- Ready for up to 16K playback
- Professional video formats: 4:2:2 and 4:4:4
- 10-bit, HDR, and WCG support
- Next generation audio: 22.2 surround sound
- 360° video playback
- Easy-to-use graphical user interface
- SDI and GPU rendering

**HEVC/H.265 Media Player Package**

- Full-featured media player based on Media Player Classic BE
- Integrated Spin Digital HEVC/H.265 decoder
- Integrated Spin Digital DirectX 12 video render engine

**Download Brochure**

CPU: Intel Core i9-7960X @ 2.80 GHz (16 cores)
GPU: NVIDIA GeForce GTX 1060 6GB
* GPU-based HEVC hardware decoder
OS: Windows 10, 64-bit
Video: Unigine Superpostion Benchmark 8K
HEVC Decoder & Renderer SDK

Maximum achievable bitrate for HEVC decoding and video rendering using state-of-the-art PC technologies

- 60 frames/s
- 120 frames/s

Ultra high performance HEVC decoder
Next generation video rendering
Real-time 16Kp60 playback

Product Highlights
- Pure software solution
- Powerful and efficient API
- Unified API for Windows and Linux
- High quality video formats: 4:2:2, 4:4:4, up to 12-bit
- Real-time HEVC/H.265 decoding up to 16K
- 10-bit rendering and HDR support
- Flexible I/O with multiple GPU and SDI devices

HEVC/H.265 SDK Package
- C/C++ libraries
- API reference documentation (HTML, PDF)
- Application code examples
- Command line toolbox

Download Brochure

CPU: Intel Xeon E5-2696 v4 (2x 22 cores, 2.2 GHz)
GPU: NVIDIA Quadro M5000
Licensing

**End User**
- Free evaluation
- Single user
- Floating LAN

**Integrator**
- SDK
- Royalty based

**Cloud/Server**
- Usage based
- Unit based
EU Projects: DDD60

High Quality VR for Film & TV Industry Professionals

- Duration: 18 months, Nov 2016 - June 2018
- Funding: European Commission - Horizon 2020
- Budget: 880,000 €
- [www.ddd60.eu](http://www.ddd60.eu)
- Partners:

![Spin Digital Logo]

![Sheffield Doc Fest 2017 Logo]

![Tampere Film Festival 2017 Logo]

![Marché du Film Festival de Cannes Logo]

![reelport Logo]
EU Projects: Immersify

Audiovisual Technologies for Next Generation Immersive Media

- Duration: 30 months, Oct 2017 – March 2020
- Funding: European Commission - Horizon 2020
- Budget: 2.5 million €
- [www.immersify.eu](http://www.immersify.eu)
- Partners:
Deep Space 8K

- Ars Electronica (Linz, Austria) Deep Space 8K
- 8K HEVC SDK for immersive media players
- 8Kx16k projection surface
- Interactive applications
8K Player in 8K Video Walls

- PSNC (Poznan, Poland) 8K Media Laboratory
- 8K videowall (12 projectors, back-projection system, ~150 inches)
PC-Based 8K Media Player: NES

- NHK Engineering Systems (NES) NHK Open House 2016 and 2017
- PC based 8K Media Player for Home Theater applications
- 8K HEVC video + 22.2 audio
8K Media Player: Intel

- Demonstrations at NAB and IBC
- 8K PC-based media player using Intel Xeon Processors
8K 120 fps High Frame Rate: NAB 2017

- 8Kp120 PC-based media player
- 4:2:0, 10bit, 120 Hz
- GPU output
8K Cloud Streaming: NHK MT

- 8K streaming from AWS servers using HLS
- Development project by NHK MT, AWS Japan, and Spin Digital
- Demonstration performed at InterBEE 2017 (Tokyo)
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