VideoQ Test Patterns Library

Overview

Training Presentation

September 2025

VQL

videoq.com

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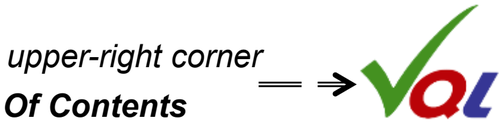
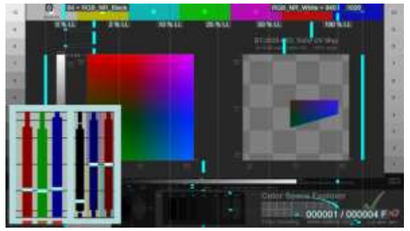


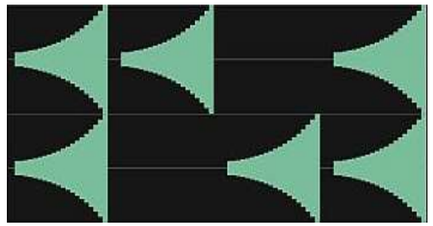
1. VideoQ Approach to Test Patterns Usage

VideoQ approach combines “classic”, “digital” and “cloud” methodologies, sharing same test patterns and covering all 3 levels of video quality control:

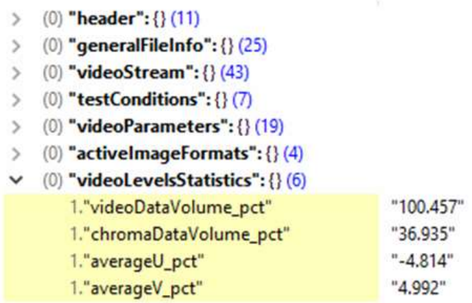
Instant visual-aural quality estimation

Objective measurements of video and audio parameters



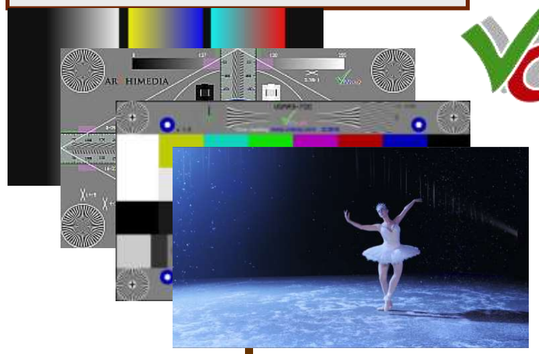


Fully automated Quality Control



2. VQL Workflow Variants

Test Patterns Library



Media File
selected by User

Test Setup

HDMI / SDI

Display Under Test

Main QC Monitor

Devices Under Test

Video Player

Processor, Encoder

SW Video Encoder

Master Player

Capture Card

Reference Decoder

Captured Video Data
e.g. YUV/RGB File

More QC Tools

3rd party Tools:
AV Waveform Monitors,
Video Compression Error Meters,
Colorimetry & Photometry Tools

VQMP
Player-Analyzer

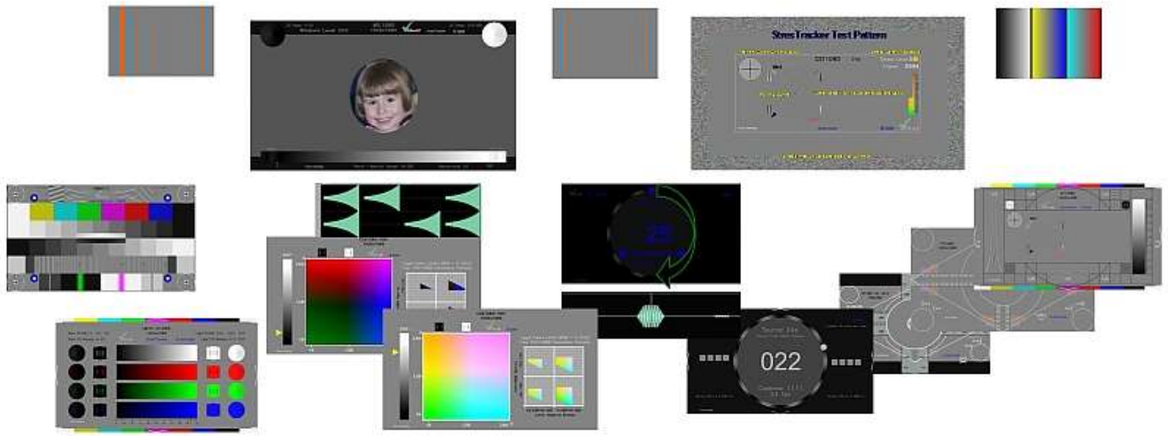
VideoQ
Analyzers

Test Reports

VQV
Viewer-Analyzer

3. Software and Hardware Applications

VQL tests are used by **Amazon**, **Harmonic**, **Netflix**, **Samsung**, **OBS**, and many other industry leaders



Software Coders, Transcoders, Players, Analyzers

VQL Compatible Hardware Players/Generators

VideoQ Players: **VQTS** series

Other (3rd party) Players:

e.g. Video Clarity ‘ClearView’,

or ISF/Murideo portable 8K HDR Generator

4. VQL Key Features

- VQL files are designed to be compatible with all commonly used software or hardware codecs and media players.
- Static and dynamic video test patterns are available in a variety of color formats, aspect ratios, frame rates and resolutions from **192x108** up to **8K**
- All test patterns remain suitable for accurate measurements even after low bitrate coding, heavy scaling and/or cropping, e.g. after down-conversion for mobile devices
- Full custom compressed and uncompressed test files and application-specific live video clips are available on request

*Next slides show just few examples of the VQL library test patterns sorted by **categories**,*

*total number of titles in VideoQ library **exceeds 4,000**.*

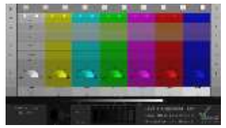
5. Test Patterns by Categories

1. Color Space, Gradations and Linearity Tests – **GradTracker™** series,

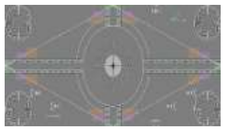
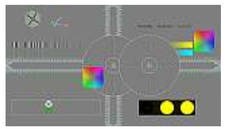
   *including the widely used **VQCB** **Wonder Bars™** – **V**ideo**Q** **C**olor **B**ars suite*

   1.a Special **HDR** (High Dynamic Range) Tests, **HDR-PQ** and **HDR-HLG** versions





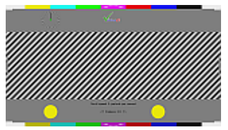
2. Geometry, Scaling, SR and Sharpness Tests – **ScalTracker™** series

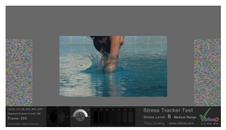



3. Motion Portrayal Tests and AV Sync Tests – **ChronTracker™** series,

   checking AV Latency, Frames Continuity, De-Interlacing, and more

4. Compression Codecs Tests – **StressTracker™** series





5. Static and Dynamic Multi-purpose Test Charts,

   *including widely used **VQCB**, **VQMA** and **VQMPC** tests*



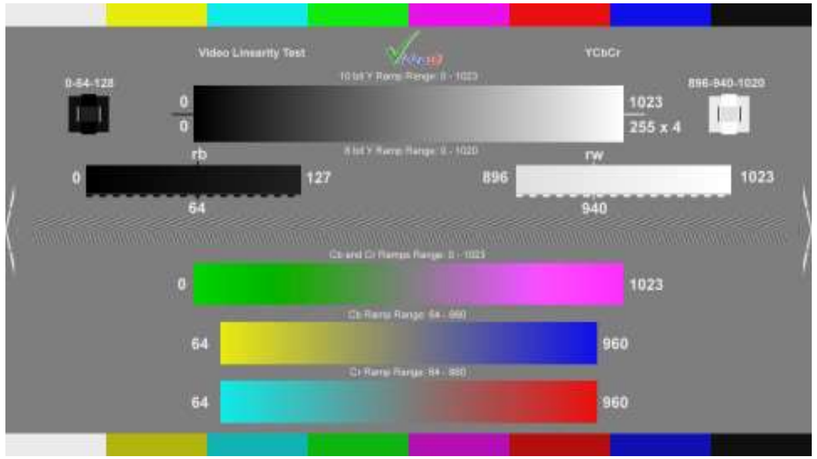
6. Reference Live Clips in a variety of formats


7. Audio Tests

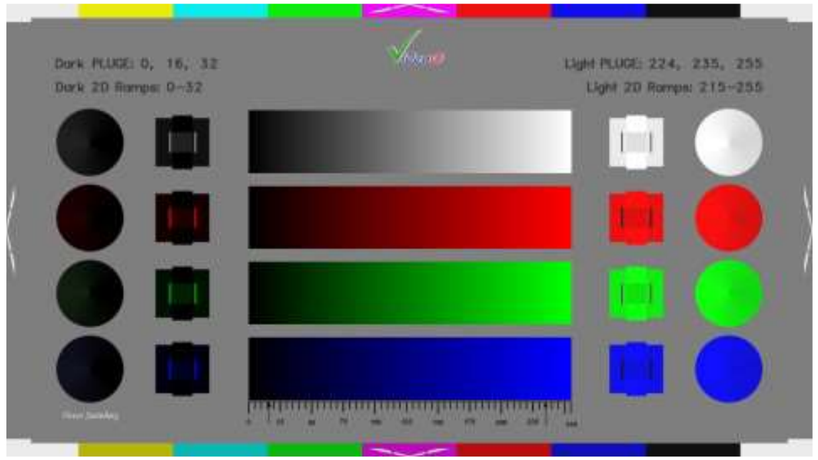
6. Color Space, Gradations and Linearity Tests

VQCB: HDR-PQ, RGB, NR, UHD, 16bit variant

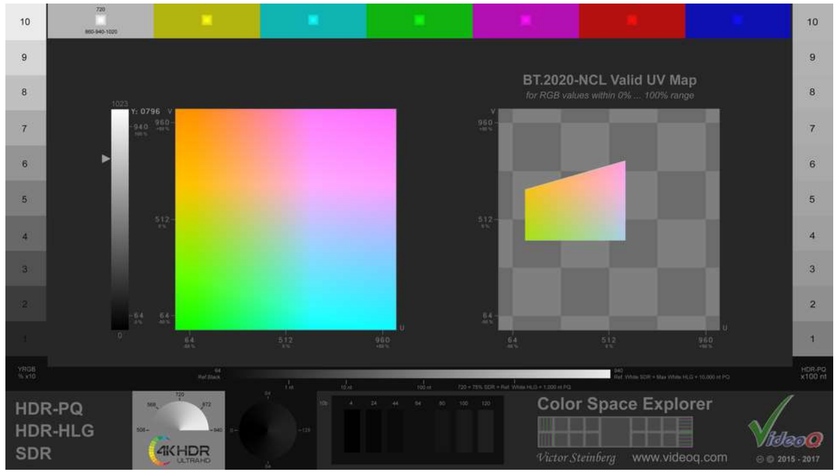
YUVL: Static Y, U (Cb), V (Cr) linearity test, UHD, 10bit



YRGBL: Static Y, R, G, B Linearity test, HD, 8bit



VQCSE: Dynamic Color Space Explorer ™ test, UHD, 10bit



6.1 VQCB Wonder Bars ™ Sequence Test

VQCB sequence is suitable for automated repetitive lab testing. The sequence consists of three segments:

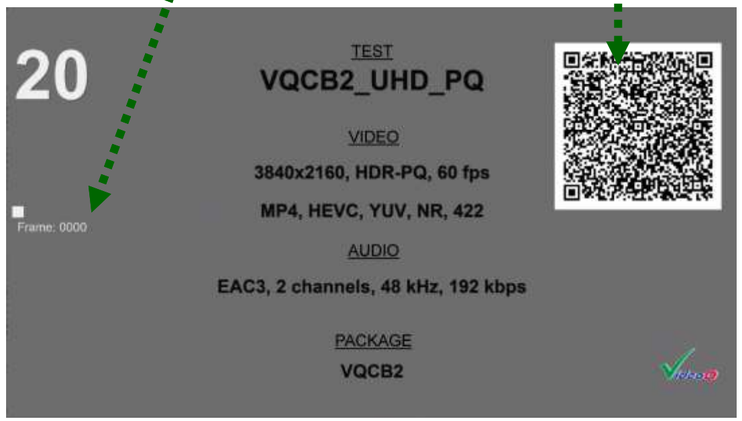
0s~10s: **Text Box** containing all test pattern details and machine-readable **QR Code**,

10s~18s: **Color Bars** test pattern,

18s~20s: **Black**.

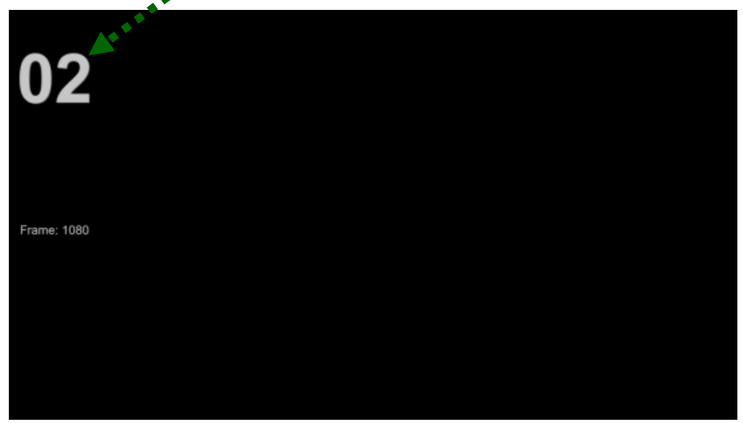
Frames Counter

QR Code



Placeholder for Info and optional Logo

20s Count-down

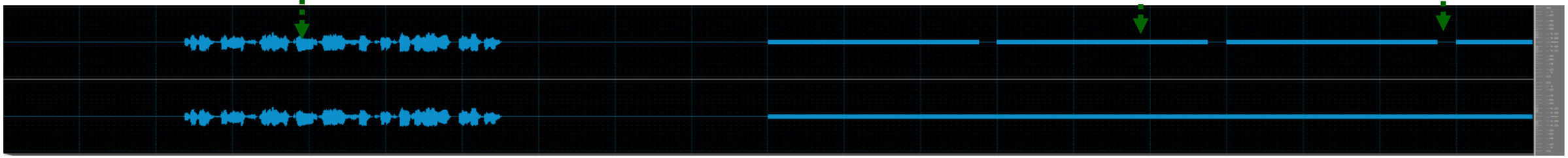


Optional audio stream composition (LR stereo, 48kHz, PCM 24b or AC3 192kbps):

0s~10s: Voice tag

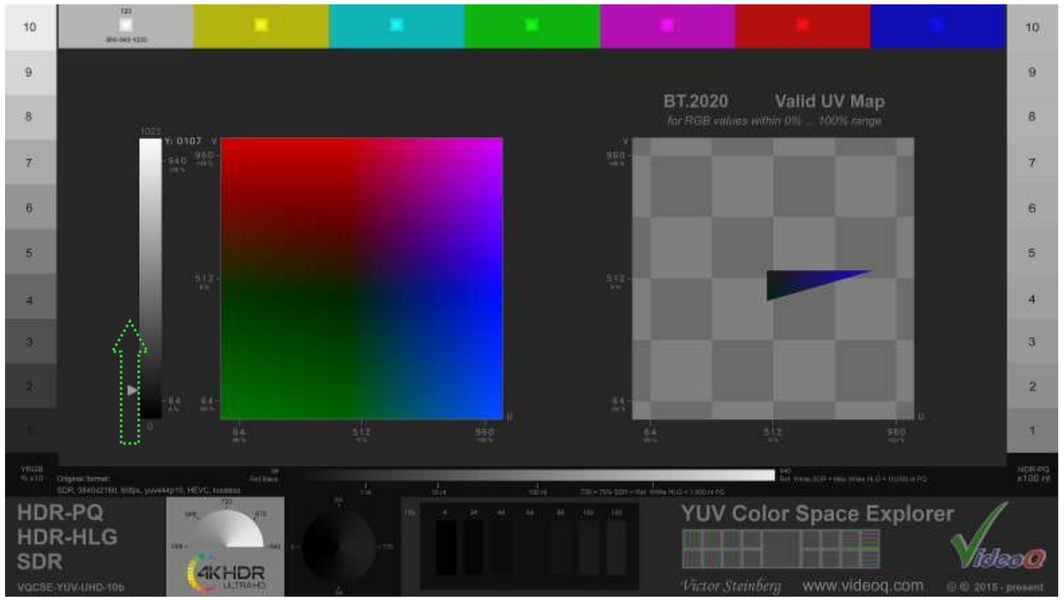
AV Sync: 0ms

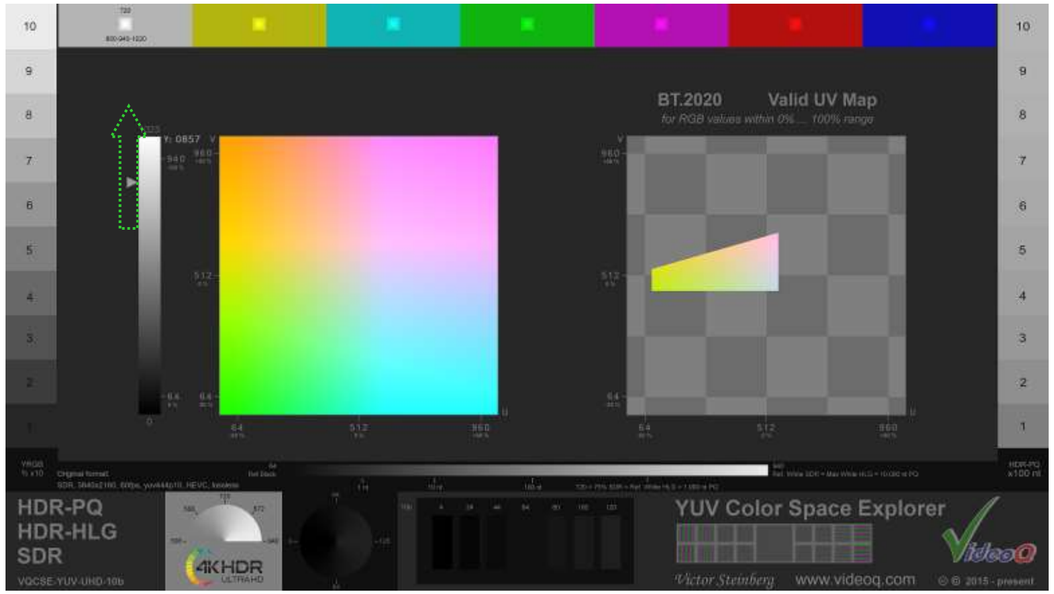
10s~20s: 1kHz tone, -23dBfs, L channel marked by 0.25s gaps



Learn more about **VQCB** and **VQCBA**

6.2 VQCSE – Color Space Explorer ™ Dynamic Test





Time

In few seconds this sophisticated dynamic UHD test checks more than one billion (1024^3) colors of the **10bit YUV** or **10bit RGB** color space. For example, the VQCSE_YUV variant covers all combinations of Y, U and V values – from 0 to 1023, including all "illegal" colors. For any given Y 10b value "Valid UV Map" on the right side shows the boundaries of "legal" colors area.

VQCSE is equally suitable for **SDR**, **HDR-PQ** and **HDR-HLG** systems, checking processors, codecs and display performance. It is suitable for both visual and instrumental tests, the results are visible on regular video monitors, waveform monitors and/or vectorscopes. VQCSE is especially efficient in combination with *the VideoQ **VQV** Viewer-Analyzer tool*.

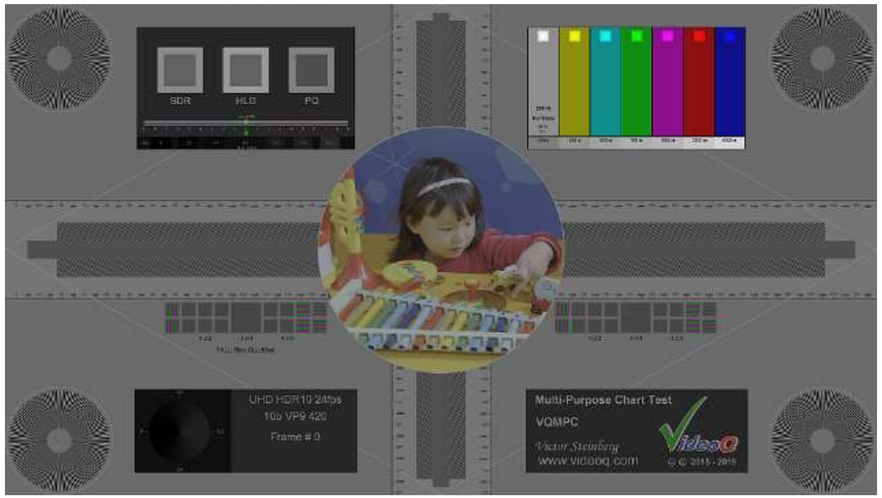
Learn more about **VQCSE**

7. HDR Tests

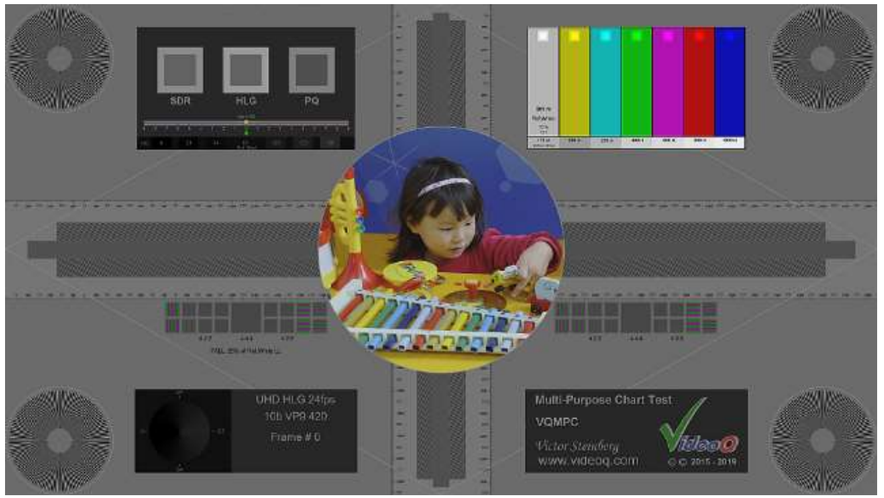
VQLA-PQ: HDR Levels Alignment Static Test

VQLA-HLG: HDR Levels Alignment Static Test

VQMPC-PQ: Dynamic Multi-Purpose Chart

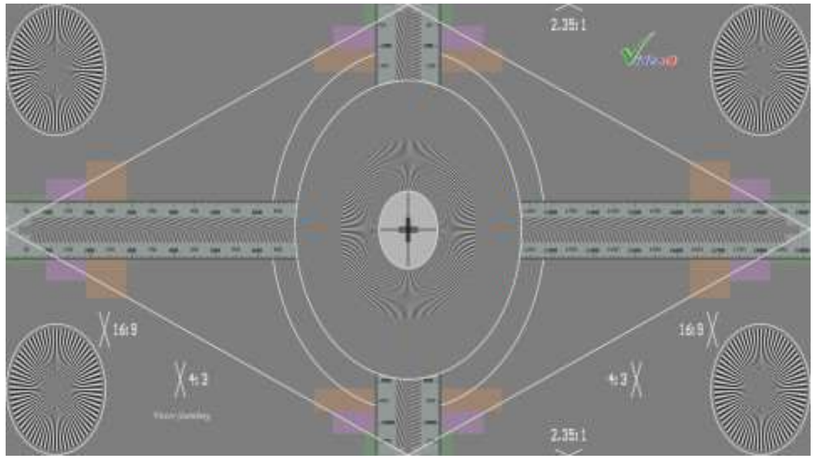


VQMPC-HLG: Dynamic Multi-Purpose Chart

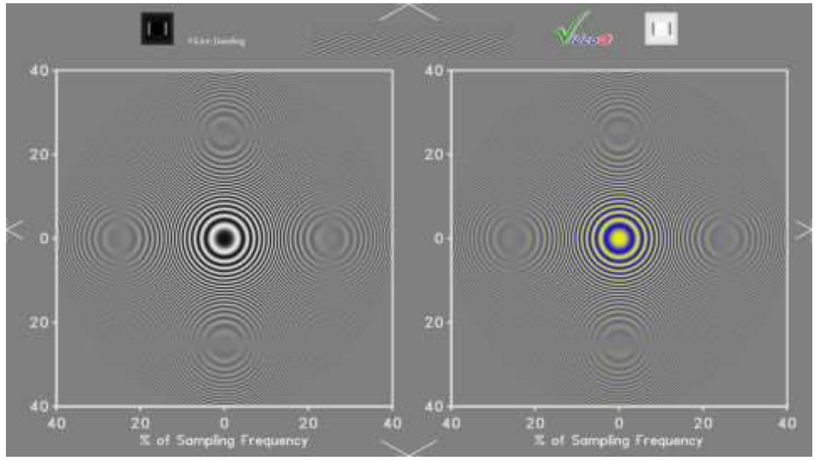


8. Geometry, Scaling, and Sharpness Tests

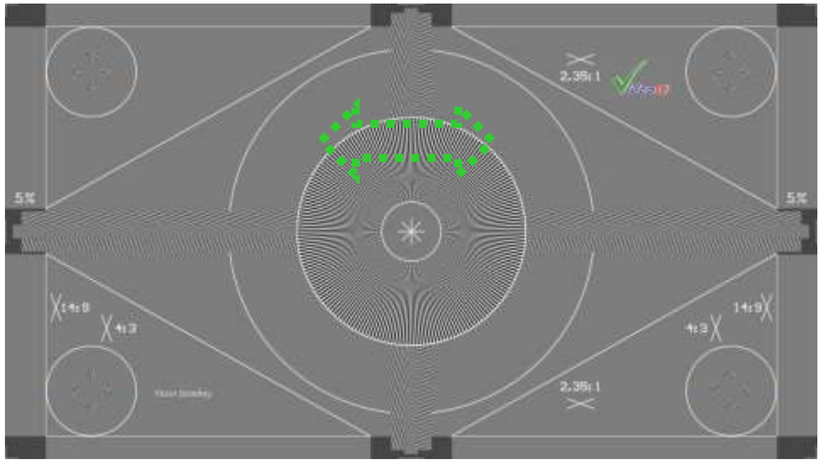
SGS235AN: **S**tatic **G**eometry & **S**harpness test
Anamorphic Active Image Aspect Ratio = 2.35:1

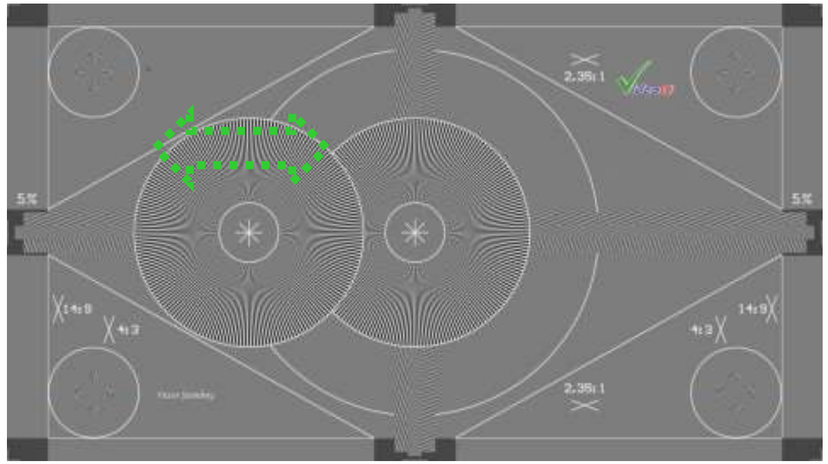


DZP: **D**ynamic **Z**one **P**late test
Variable zone plates phase speed profile



DGS178: **D**ynamic **G**eometry and **S**caling test, HD, 8bit, central sprite moves left-right with pauses

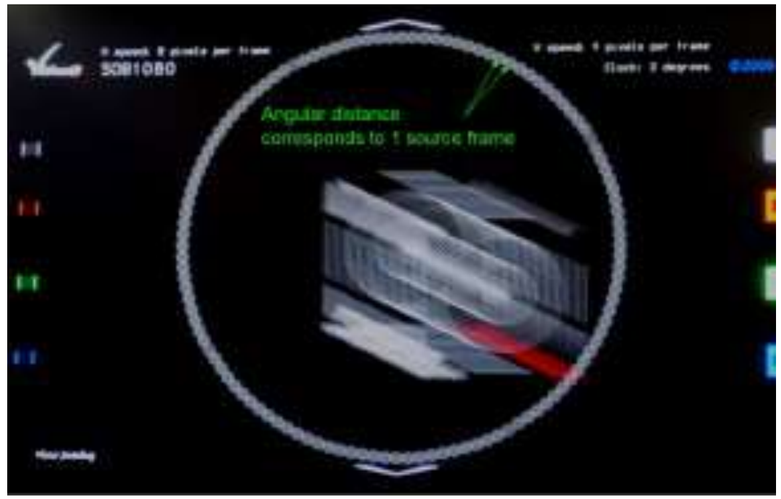




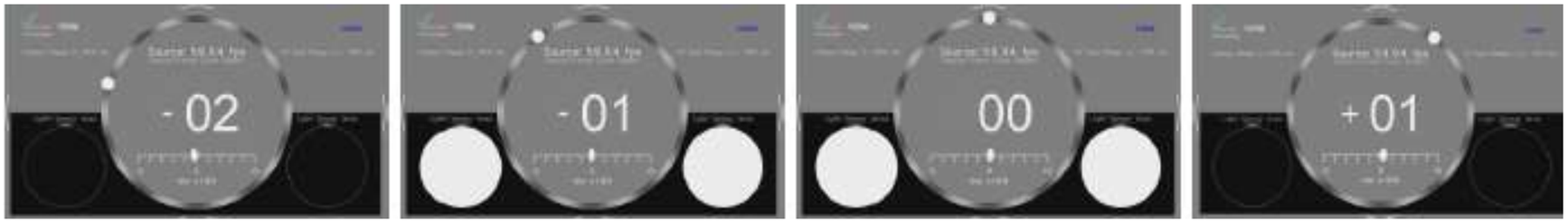
9. Motion Portrayal Tests

DIFC: **D**e-**I**nterlacing and **F**rames **C**ontinuity test,
NTSC, PAL and HD versions

SOBFC: **S**prite and **O**rbiting **B**alls **F**rames **C**ontinuity test.
Off-screen photo, long exposure time, consistent frame sequence

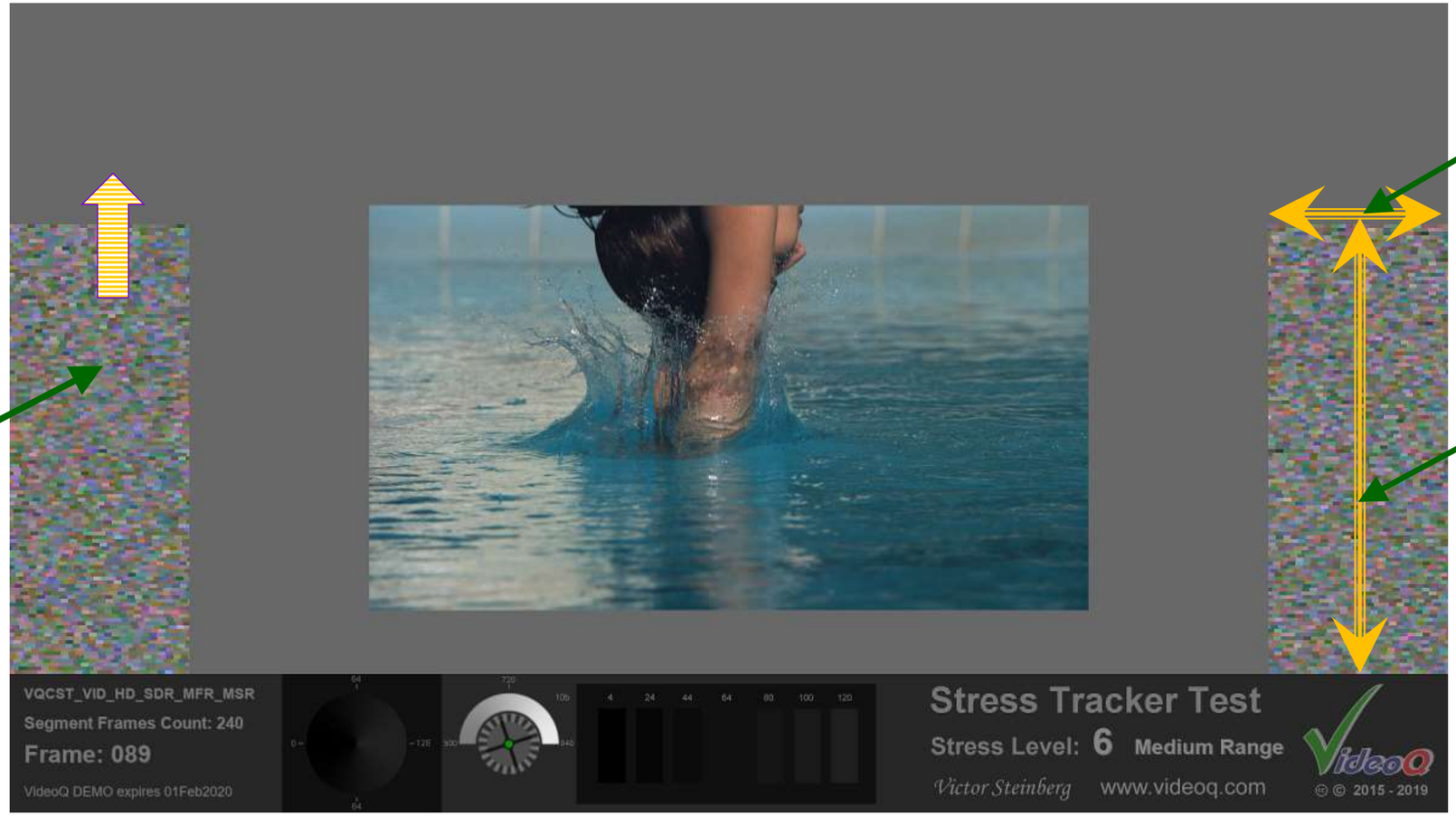


VQDM1: Dynamic AV **D**elay **M**easurement test sequence, measurable **AV sync error** range: +/-500ms



10. VQCST – Compression Quality Test

Stress Level
rising



Pseudo-random color shapes: ***calibrated and compliant*** stress source

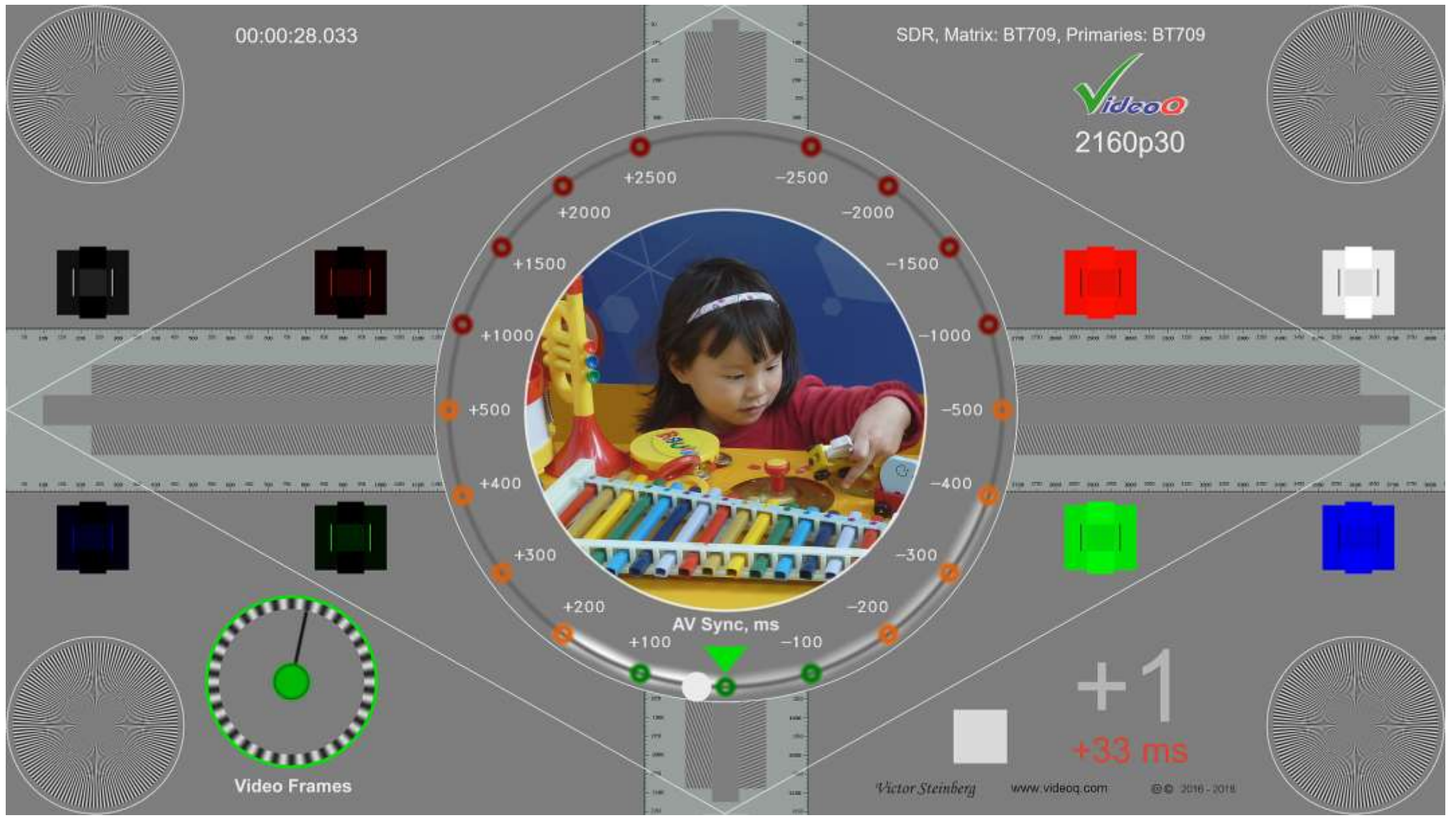
Switchable **Stress Ranges**: Low, Medium, High

Variable **Stress Level**: from 0 to 9

VQCST is a sequence of **10 Segments** (**10 Stress Levels**), each segment duration: 4.0, 4.8 or 5.0 seconds. Total sequence duration is 40, 48 or 50 seconds, depending on the selected frame rate.
Stress Tracker ™ test is suitable for **subjective image quality estimation** in real time and for **automated measurement** of **Stress Response Profile**.

Learn more about **VQCST**

11. VQMPC – Multi-purpose Test Chart



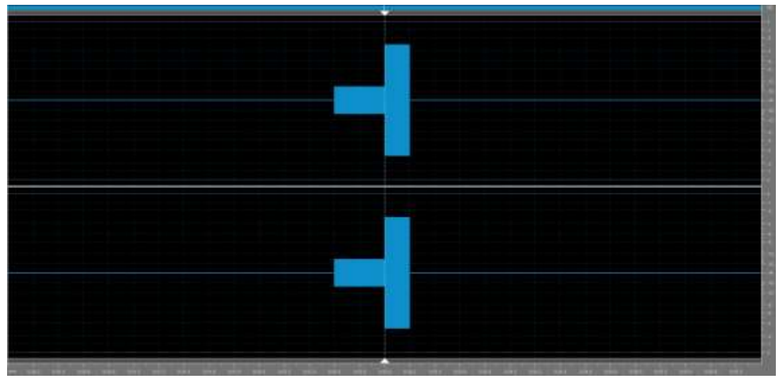
Set of test pattern video and audio files to check:

- Geometry and Aspect Ratio
- Video Levels and Color Rendition
- Scaling distortions or proof of no-scaling
- Frames continuity and AV Sync Errors
- Compression artifacts

Variety of video formats:

- Frame sizes from 720x480 to 8K
- Frame rates from 23.976 to 120.0 fps

AV Sync Reference: “Beep-bop” burst



Ideal tool for instant “at glance” video system performance estimation, e.g. for fast setup, functionality test and debugging

VQMPC test is used world-wide by a number of major companies.

Learn more about **VQMPC**

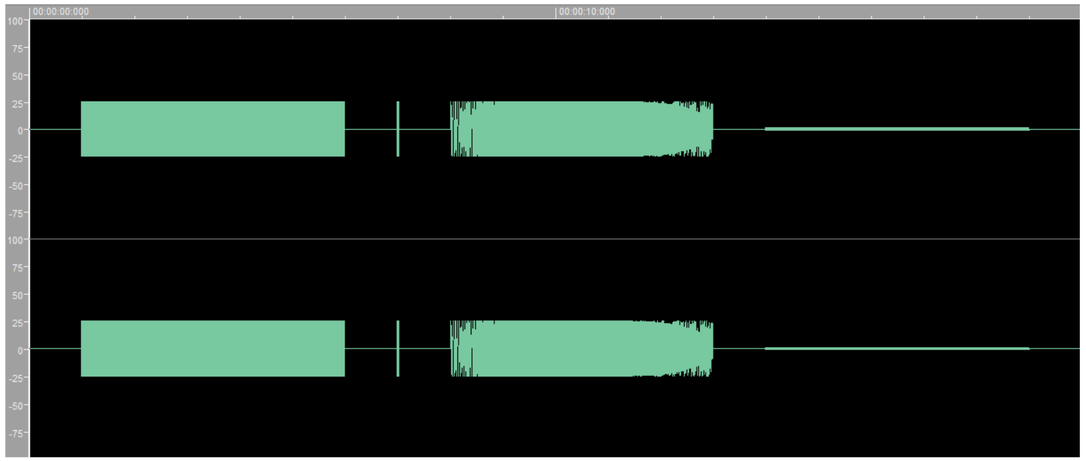
12. Live Test Clips Examples

SFO: Aerial HD video, **high original frame rate**, decimated to various frame rates; the clip versions serve for frame rate conversion testing

Ballet: based on Netflix open content ‘Nocturne’ clip; **HDR** and **SDR** versions, variety of **frame sizes** (up to **4K**) and **frame rates** (up to **120fps**).
Each test clip starts with 20s long **VQCB** leader: text box with QR code, followed by VQCB test pattern, followed by test clip live content.

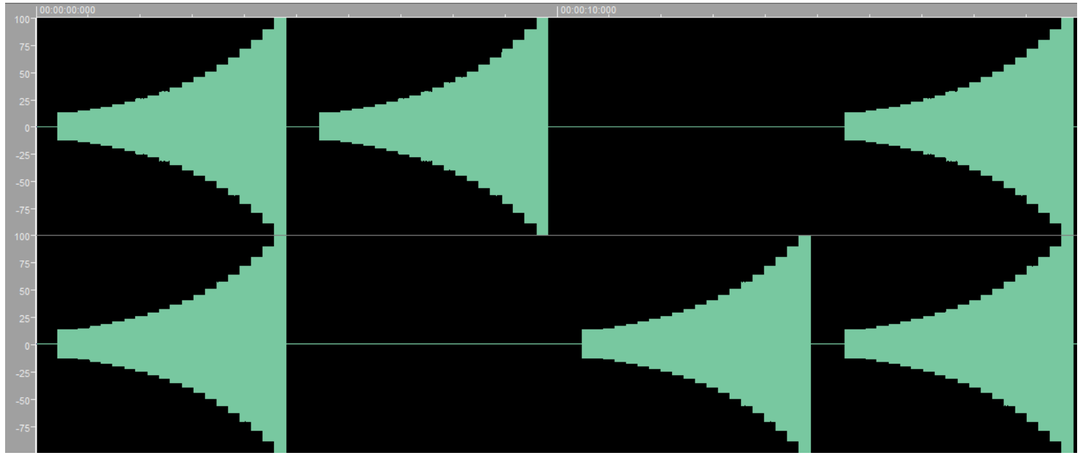
13. Audio Tests

AUD1: Audio Frequency and Pulse Response Test; 20s Sequence



- 1 sec mute
- 5 sec of 1kHz@-12dBFs
- 1 sec mute
- Pulse 0.02 sec, 1kHz@-12dBFs
  (Modulated Pulse Duration= 1 TV frame in 50p)
- 1 sec mute
- 5 sec of Logarithmic (Exponential) Sweep:
  2 octaves/sec, 10 octaves,
  20-20,000Hz @-12dBFs
- 1 sec mute
- 5 sec 1kHz@-40dBFs
- 1 sec mute

AUD2: Stereo Balance and Levels Test; 20s Sequence



- 0.4 sec mute
- 4.4 sec L&R, 1kHz,
  18 steps Raiser from -18dBFs to 0dBFs
- 0.6 sec mute
- 4.4 sec, L only (R=mute) 1kHz,
  18 steps Raiser from -18dBFs to 0dBFs
- 0.6 sec mute
- 4.4 sec, R only (L=mute) 1kHz,
  18 steps Raiser from -18dBFs to 0dBFs
- 0.6 sec mute
- 4.4 sec, R & Inverted L, 1kHz,
  18 steps Raiser from -18dBFs to 0dBFs
- 0.13 sec mute

14. VQL Files and Data Formats

Raw video data formats:

.YUV, interleaved UYVY 4:2:2, 8bit per component = *default data format*

.YUV, planar YUV 4:4:4, 8, 10, 12 or 16bit per component

.TIFF, .PNG, lossless,16bit per component, 48bit per pixel

.RGB 4:4:4, 8bit or 16bit per component

Frame sizes:

3820x2160 (UHD) **and above** (4K, 8K, etc.)

1920x1080 (HD) = *default frame size*

1280x720 (Sub-HD)

720x576 (SD-PAL)

720x480 (SD-NTSC)

Frame rates:

23.976 (24), 25, 29.97 (30), 50, 59.94 (60) **and above**, e.g. 120fps

VQCB: **8K**, **HDR-PQ,** BT.2111 compliant test, **lossless PNG RGB codec**, **16bit per component**, **23.976fps**, **.MOV** container

Raw audio data formats:

.WAV, 48kHz, 24bit per sample,

Multi-Mono, LR stereo and/or 5.1, 7.1, 7.1.4 surround sound. *Default audio data format = LR stereo.*

Alternative video formats, e.g. raw planar YUV 4:2:0, .Y4M with header, wrapped .AVI, .MOV or .MP4, alternative frame sizes and frame rates are available on request.

15. About VideoQ

Customers & Partners

Company History

- Founded in 2005
- Formed by an Engineering Awards winning team sharing between them decades of global video technology.
- VideoQ is a renown player in calibration and benchmarking of Video Processors, Transcoders and Displays, providing tools and technologies instantly revealing artifacts, problems and deficiencies, thus raising the bar in productivity and video quality experience.
- VideoQ products and services cover all aspects of video processing and quality assurance - from visual picture quality estimation and quality control to fully automated processing, utilizing advanced VideoQ algorithms and robotic video quality analyzers, including latest UHD and HDR developments.

Operations

- Headquarters in CA, USA
- Software developers in Silicon Valley and worldwide
- Distributors and partners in several countries
- Sales & support offices in USA, UK