iSolve Multimedia-Exerciser

Hardware-Based Functional Verification

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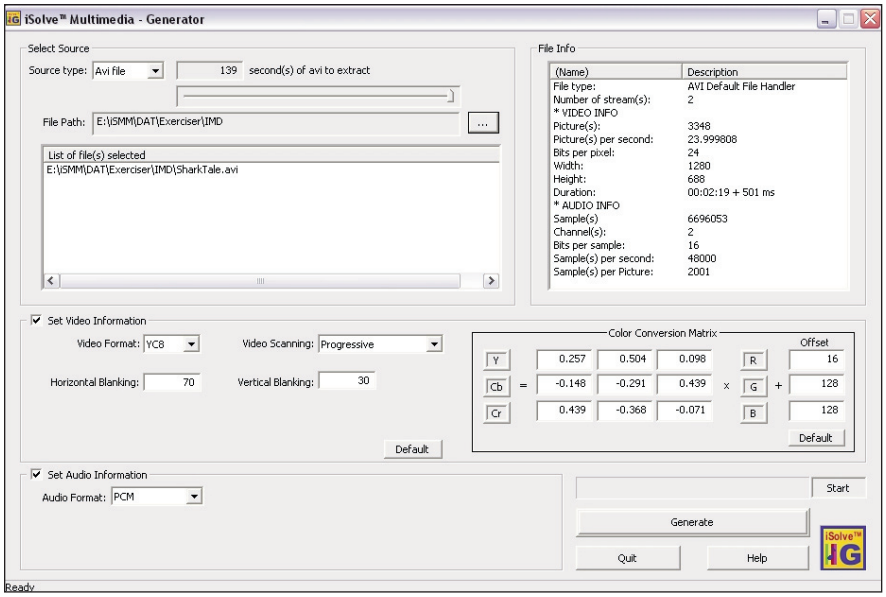


iSolve Multimedia-Exerciser provides the ability to generate audio/video data for your multimedia design.

Solutions for Hardware-Based Functional Verification

The Mentor Graphics® iSolve™ Multimedia-Exerciser solution addresses a major challenge in developing and testing SoC-based products, such as consumer electronic devices and portables that incorporate complex audio and video interfaces — namely, early verification of the multimedia processing capabilities.

iSolve Multimedia-Exerciser generates and exercises video and audio streams to design RTL running in Mentor Graphics Veloce™ emulators. Through these capabilities, it serves as a hardware testbench for the audio and video interfaces on the SoC using actual data streams. Maximum performance is achieved by streaming data into the design under test at full emulation speeds.

System verification using the iSolve Multimedia-Exerciser solution, together with Mentor's Veloce emulators, delivers a 1,000 to 10,000X speed-up over software simulation, saving weeks or even months of time spent on regression testing. iSolve Multimedia-Exerciser gives design teams the confidence that comes from running billions of real-world cycles on their SoC before tapeout, meeting customer delivery schedules and rigorous project goals.

Incorporating iSolve Multimedia-Exerciser into the design process allows teams to identify and fix system bugs in both hardware and software. Moreover, designers can combine the iSolve Multimedia-Exerciser with existing tools, such as the iSolve Multimedia-Analyzer, to provide both a stimulus exerciser to their SoC, and then analyze the audio-video data streams from the SoC in an easy-to-use environment. Through these methods, design teams can perform true, system-level verification and address important interoperability and performance issues.

Major product features:

- **Video formats supported** – RGB, CCIR 601 and 656 standards, SMIA 1.0 Raw Bayer, HDMI 1.3a YUV and RGB, and DVI 1.0 RGB. Up to 5600 x 4300 frame resolutions
- **Audio formats** – I²S, S/PDIF, 32-bit linear PCM, and HDMI audio packets
- **File formats** – .WAV, .AVI, .TIFF, and .BMP
- **Server-Client architecture**
- **Generation of data** – on any WinXP PC
- **Support for HDMI interface version 1.3a** – for both video and audio content. Additionally, supports audio/video content protection using HDCP standard
- **Supports DVI 1.0 video content**
- **Supports the exercising of transport streams** – e.g. MPEG2/4, using the GenericIO facility

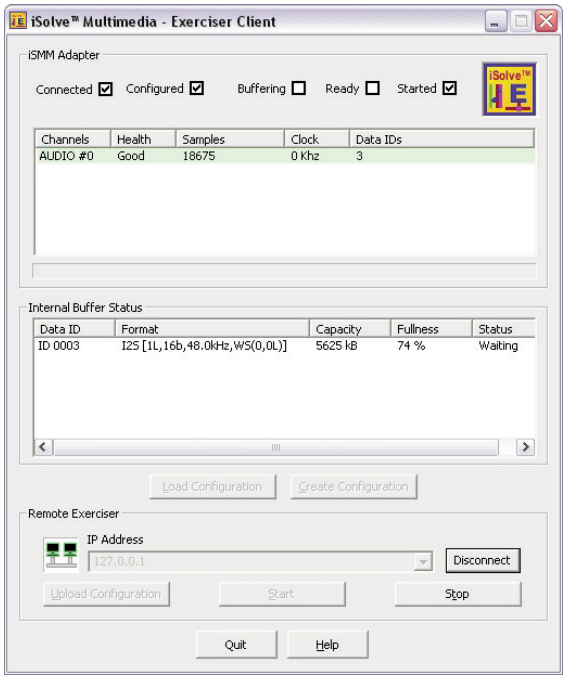
Product benefits:

- **Fast, easy set-up** – A simple connection to any Mentor Graphics Veloce emulator
- **Supports major industry standards** – Improves potential for design reuse and helps to ensure product interoperability for audio and video
- **Generates SoC audio input** – Streams in real audio data to a design under test
- **Exerciser-Client GUI** – Can be used on any WinXP PC to control the data streaming
- **Enables remote access and control of data streaming** – Provides design teams with a network-capable environment
- **MHz verification speeds with Veloce**

Mentor Graphics®

Variety of Video Formats Supported

iSolve Multimedia-Exerciser supports video formats: RGB, YUV 4:2:2 and 4:4:4, and Raw Bayer 8/10-bits for mobile applications (SMIA 1.0). Both progressive and interlaced formats are supported with frame sizes up to and including 5600 x 4300 pixels for HDTV.



Audio and video data can be streamed to the design through the iSolve Multimedia-Exerciser interface.

Video input formats (generated from .AVI, .TIFF, or .BMP files) supported:

RGB

- Pixel resolutions: 24- and 30-bit
- Hsync, Vsync, front and back porch

YUV 4:2:2

- Pixel resolutions: 8-/10-bit multiplexed
- Embedded sync (SAV/EAV, horizontal/vertical blanking)

YUV 4:4:4

- Pixel resolutions: 24- and 30-bit
- Embedded sync (SAV/EAV, horizontal/vertical blanking)

Raw Bayer

- Pixel resolutions: 8- and 10-bit
- Supports mobile applications as defined in SMIA 1.0

(All formats can be any frame size, up to 5600 x 4300, interlaced or progressive)

Variety of Audio Formats Supported

iSolve Multimedia-Exerciser supports audio inputs: I^2S (Inter-IC sound), S/PDIF (IEC 958), and 32-bit linear PCM. The generated data from .AVI or .WAV is available to be streamed to the design under test (DUT).

HDMI Interface

iSolve Multimedia-Exerciser supports the popular HDMI interface standard, version 1.3, for the automatic generation and streaming of audio and video content into the DUT. HDMI deep color features supported by Multimedia-Exerciser.

Additionally, the Exerciser supports the HDCP 1.2 content protection standard for the verification of an HDCP sink in the Veloce emulator, by mimicking an HDCP source device.

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

Additional HDTV Interfaces

Exerciser supports popular HDTV interfaces such as the DVI 1.0 standard for video content.

Intuitive GUI

The interactive GUI allows the user to exercise the DUT with a variety of video and audio formats, including the configuration of any control signals (i.e., sync pulse widths or blanking periods) required to apply these video/audio streams to the DUT.

File Format Support

iSolve Multimedia-Exerciser can gen-erate a stream of data from .WAV (audio), .AVI (audio and video), .TIFF, and .BMP files to exercise the DUT.

Visit our website at www.mentor.com/emulation for more information

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