



HD621

HDMI Audio Processor

Product Information



The Meridian HD621 HDMI Audio Processor extracts the audio signal from the data stream at the HDMI input and provides separate audio outputs suitable for a Meridian surround controller. Internal buffering and processing improves audio quality. It is also a 6-into-1 HDMI video switch, allowing all your HDMI-based components to be fed via a single video cable to your display.

HDMI (High Definition Multimedia Interface) connectors are a common sight on HD video and other equipment. Usually employed to carry digital video, HDMI also carries digital audio. However, having both audio and video on the same cable is not always convenient, nor does it deliver the maximum level of quality of which digital multimedia signals are capable.

Digital video signals have traditionally been the bane of those in search of the best audio quality. They include very high frequency signals with very fast rise-times and thus tend to radiate an enormous spectrum of harmonics. This unwanted radiation can leak into audio circuits, causing noise and even disrupting the signals themselves, causing muting, interpolation and other effects. In particular, digital video (indeed video of any sort) can leak into analogue audio circuitry, causing hum, buzz, noise and other unwanted artifacts.

The HD621 solves these problems at a stroke, while allowing all your components that deliver video via HDMI a common destination. A single cable can be run from

the HD621 to the display, while enhanced digital audio is fed to the sound system. The HD621's audio outputs connect directly to an existing Meridian processor, offering complete and immediate system integration.

The HD621 includes Meridian's comprehensive FIFO buffering system and resolution enhancement, based on that used in the 800 Series. This cleans up incoming PCM digital audio signals, removing the timing and other degradations audio suffers when combined with video in HDMI. The audio is clocked into a dual-section buffer and clocked out again after re-shaping the digital audio waveform structure and re-timing with extremely accurate reference clocking signals. The result is a significant and audible improvement in quality, including accuracy of stereo and surround imaging and localisation, as well as overall sonic benefits including improved transparency at the high frequency end. The unit also allows for up- and down-sampling of digital audio signals, to provide outputs at standard (44.1/48 kHz) or high (88.2/96 kHz) resolution sampling rates.

A configurable audio delay system is built in, allowing you to ensure that sound is always in perfect synchronisation with the picture, even if the image is being processed with significant amounts of latency. The HD621 also ensures that the HDMI interface is driven correctly, which may result in improved video as well as audio performance.

The HD621 is housed in an elegant black slimline 1U rack-mount panel for unobtrusive installation.

Product highlights

Six-input HDMI switch.

HDMI video output.

Extracts up to eight channels of high-resolution audio from the HDMI data stream, supplying them to separate audio-only outputs.

Connects HDMI audio direct to a Meridian processor.

Smartlink coaxial digital audio output (up to 8 channels).

Multichannel Meridian High Resolution (MMHR): balanced digital audio output via RJ45/Cat 5 cable (up to 8 channels).

Up- and down-sampling of digital audio.

Audio FIFO buffering and resolution enhancement improves PCM audio received via HDMI.

Lip-sync control compensates for latency resulting from external digital video processing.

Keeps HDMI video signals away from your audio equipment, minimising signal degradation.

Outline specification

Form factor

- 1U 19in rack mounting

Power

- Internal universal power supply, 100–250Vac

Connections

- Power input (IEC connector)
- DB9M Sub RS232 serial connector
- BNC and DIN Meridian Comms
- Six HDMI input sockets
- HDMI output
- 8-channel MMHR digital audio out (RJ45)
- 8-channel coax digital audio out (4 x phono)

Front-panel Indicators

- Power LED
- 6 x HDMI Input LEDs (selected input lights)



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Front panel

The front panel (see above) simply shows a power LED plus six LEDs indicating which input is currently selected. A manual select button allows you to step through the inputs.

Rear Panel

The rear panel features the following connections (L to R):

RS232 DB-9M Sub connector - this enables the processor to be controlled remotely via serial command.

Meridian Comms BNC and DIN connectors – these enable the processor to be integrated with a Meridian audio/video system and controlled by it, for example, switching the HDMI input when the appropriate selection is made via the system controller.

HDMI Inputs H1–6 – These follow the standard input identification in a Meridian system (this can be overridden when the system is being configured).

HDMI Output: Video – This outputs the video information present on the selected HDMI input. By default, it does not carry the audio information, but can be configured to do so.

MMHR Output – This RJ45 connector carries eight channels of balanced digital audio data at up to 96 kHz sample rate conforming to the Meridian Multichannel High Resolution (MMHR) specification, with encryption where required to carry high-resolution audio data.

SmartLink Output – These four phono sockets each carry a pair of digital audio channel signals at up to 96 kHz sample rate: 1/2, 3/4, 5/6 and 7/8. These are encrypted to Meridian High Resolution (MHR) specifications when carrying high resolution data.

Power input socket, power switch and fuse holder – the power supply accepts a standard IEC power connector and is a universal voltage type accepting voltages between 100 and 250Vac at 50/60 Hz.

Up/downsampling of digital audio

The MMHR and SmartLink outputs can be set to deliver either standard (44.1/48 kHz) or high resolution (88.2/96 kHz) sample rate digital audio, with resolution enhancement to 24-bit.

When set to standard rates, the output is either 44.1 or 48 kHz irrespective of the input rate, high sample rates being downsampled by a factor of two (ie an 88.2 signal is downsampled to 44.1, while a 96 kHz signal is downsampled to 48 kHz). 44.1 and 48 kHz rates are unchanged.

When set to high rates, the output is always either 88.2 or 96 kHz, irrespective of the input rate. Standard sample rates are upsampled by a factor of two using Meridian's powerful DSP technology, so that input signals of 44.1 and 48 kHz are output at 88.2 and 96 kHz respectively. 88.2 and 96 kHz input signals are passed with their sample rates unchanged.

FIFO Buffering

In addition to the features noted above, the

HDMI audio processor reclocks PCM digital audio information received via HDMI and re-times it, clocking it into and then out of a FIFO (First In, First Out) buffer system. This ensures that the audio extracted from the HDMI stream is of the highest quality.

HDMI carrying both video and audio is not the best environment for digital audio and the integrity of the audio signal can be compromised, especially as far as timing is concerned, where the rise-time of digital audio signal pulses can be lengthened, resulting in uncertainties about exactly when the value changes between 0 and 1. This results in timing irregularities which can adversely affect stereo and surround imaging and blur the soundstage. These problems are minimised by the buffering stage resulting in the highest possible audio quality from the original HDMI signal.

Non-Meridian sources sending audio via HDMI should in most cases be configured to decode the audio to PCM in the source component to take advantage of the resolution enhancement and upsampling features of the HD621. As a general rule, audio from Meridian sources is fed direct to a Meridian surround decoder via SmartLink.

Lip-sync Delay

The processor also includes a configurable audio delay of up to 85ms to allow lip-syncing in the event of a delay between the audio and video. This is often the case when an amount of digital video processing is being carried out, which can add considerable latency to the system (video processing is more complex, thus more time-consuming, than audio processing in most cases).