

Programmable Digital Effects Rack

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Abstract

This report presents the design and implementation for a Field Programmable Digital Effects Rack using the Xilinx 2 series FPGA. Using an 18-bit AC'97-compatible codec (audio) and a 24-bit VGA output (video), the FPGA can be used to synthesize the large, even cumbersome devices normally used by musicians and sound engineers to modify sound in real-time. Industry standard effects such as delay, pitch modulation, convolution, filters, and others will be available to the user. Modular effects blocks and configurable dataflow allow for an extensible library and numerous arrangements of effects. The user interface for constructing an ordering through the effects will be displayed on a monitor and interactively changed via a keyboard and mouse. The final result is a modular system for emulation of audio effect devices many times the size of an FPGA, which is compatible and interchangeable with the actual devices that it emulates.