Audio Digital Signal Processor

BeCreative Minor

Fontys Engineering

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Abbreviation List

Abbreviation	Explanation
DSP	Digital Signal Processor
ADC	Analog-to-Digital Converter
DAC	Digital-to-Analog Converter

Table 1: List of commonly used Abbreviations

Chapter 1 A

Chapter 2 Requirements

The audio system has some requirements to specify the final result. These requirements are derived with the "MoSCoW" method.

ID	Requirement	Priority	Status
U1	**Inputs:** • Two RCA audio inputs which work on a line level of 4dBu(±1,74V) • Two 6,35mm TRS plug audio inputs which work on a line level of 4dBu(±1,74) • Two XLR audio which work on a line level of 22dBu(±9,75)	Must	Proposed
U2	**Outputs:** • Two RCA audio outputs which work on a line level of 4dBu(±1,74V) • Two XLR signal outputs which work on a line level of 22dBu(±9,75)	Must	Proposed
U3	The system should have a bandwidth (±3 dB) of at least 20 Hz up and till 20 kHz without any filters applied.	Must	Proposed
U4	The system has an Audio sample rate of at least 192 kHz	Must	Proposed
U5	The ADC and DAC resolution is at least 16-bit	Must	Proposed
U6	Signal-to-noise and distortion (SINAD) is at least 100dB	Must	Proposed
U7	Anti-aliasing filter is a 6th order filter	Must	Proposed
U8	propagation delay of less than 100ms without any filters applied	Must	Proposed
U9	The system has two samplers	Must	Proposed
U10	The system has two input samplers	Must	Proposed
U11	The system has two output channels	Must	Proposed
U12	The system has two signal processors	Must	Proposed
U13	User can select what input will be routed to what channel via a user interface	Must	Proposed
U14	User can select what output will be routed to what channel via a user interface	Must	Proposed
U15	User can select 1 effect to be active in one channel at the same time	Must	Proposed
U16	User can configure each effect	Must	Proposed
U17	The system works standalone	Must	Proposed
U18	The user can configure each effect in the user interface	Must	Proposed
U19	The in- and outputs can be soft-patched in the user interface	Must	Proposed

U20	The system has a visual representation of the user interface	Must	Proposed
U21	Effects configurable in each signal processor channel: • Distortion • Reverb • Gain • Equalizer • Delay	Must	Proposed
U22	An FPGA is used as processor	Must	Proposed
U23	RAM is at least 2MB	Must	Proposed
U24	The system should have a bandwidth (±1 dB) of at least 20 Hz up and till 20 kHz without any filters applied	Should	Proposed
U25	The ADC and DAC resolution is at least 24-bit.	Should	Proposed
U26	Signal-to-noise and distortion (SINAD) is at least 120dB	Should	Proposed
U27	The system has three samplers	Should	Proposed
U28	The system has three input channels	Should	Proposed
U29	The system has six output channels	Should	Proposed
U30	The system has six signal processors	Should	Proposed
U31	The system has a USB audio input	Should	Proposed
U32	Six XLR signal outputs work on a line level of 22 dBu (±9,75 V)	Should	Proposed
U33	The system is able to recover the last saved configuration of the effect and the channel routing after reboot	Should	Proposed
U34	The system has equalizer presets e.g. Rock, Classical, Default, effect	Should	Proposed
U35	The system has different effect presets	Should	Proposed
U36	The system has default settings for channel routing and presets	Should	Proposed
U37	User can select up to 4 effects to be active in one channel at the same time.	Should	Proposed
U38	Local power supplies for different parts of the system	Should	Proposed
U39	Effects configurable in each signal processor channel: • Phaser • Tremelo • Flanger • Fuzz • Overdrive • Chorus • Compressor • Wah • Looper • Wow and flutter • Modulator • Echo • Fade in • Delay (at least 4 seconds)	Should	Proposed
U40	Signal-to-noise and distortion (SINAD) is at least 140dB	Could	Proposed
U41	The user can configure custom presets for the equalizer, effect and channel routing via the user interface	Could	Proposed
U42	User can select up to 10 effects to be active in one channel at the same time	Could	Proposed
U43	Touch screen user interface	Could	Proposed

U44	Self-made mains power supply	Won't	Proposed