
Guitar Effects Firmware for CDB4811GTR

1.0 INTRODUCTION

A suite of sound effects has been developed for demonstration on the CS4811 DSP + CODEC chip. The sound effects included in this code release are targeted for use in electric guitar amplifiers. The high level of integration offered by the CS4811 device makes this high quality effects solution attractive, even in lower cost guitar amplifiers.

Highlighting the suite of effects is a very convincing spring reverb algorithm recently developed at Cirrus Logic. In A/B comparisons, this algorithm has proven to be almost indistinguishable from the actual mechanical spring reverb.

Rounding out the effects suite are several effects typically found in expensive guitar amplifiers such as chorus, flange, tremolo and delay.

The CS4811 is also capable of providing combination effects such as chorus + spring reverb, delay + spring reverb and spring reverb + tremolo.

A separate code release, available with the CDB4811MXR, is targeted at mixer, karaoke and acoustic amplifier applications.

1.1 Operation

The CDB4811GTR demonstration board shows 8 typical guitar effects presets, which are selectable using the 3 position DIP switch, S1. The presets are numbered from 0 - 7 and are binary encoded. Table 1. shows the preset number, the associated effect and the corresponding binary switch positions. The

presets may be changed at any time and do not require power to be removed.

The CDB4811GTR board should be inserted in the direct signal path. Ideally, this is done by inserting the board into the effects loop of the guitar amplifier. However, if the guitar contains battery powered electronics, the board may be inserted between the guitar output and the amplifier input.

The ratio of processed (wet) signal to original (dry) signal, or wet/dry mix, may be controlled in firmware or in hardware via the potentiometer, VR3.

The CDB4811GTR demonstration board has an appropriate wet/dry mix for each effect pre-programmed in the firmware. Therefore, the mix potentiometer VR3, should generally be set to the fully wet (clockwise) position. However, for the single effects presets (0 - 3), the user may use VR3 to further reduce the wet/dry mix.

Preset	Effect	SW1	SW2	SW3
0	Spring Reverb #1	OFF	OFF	OFF
1	Spring Reverb #2	ON	OFF	OFF
2	Delay #1	OFF	ON	OFF
3	Delay #2	ON	ON	OFF
4	Spr. Rvb. + Tremolo	OFF	OFF	ON
5	Chorus + Spr. Rvb.	ON	OFF	ON
6	Chorus + Delay	OFF	ON	ON
7	Flange + Spr. Rvb.	ON	ON	ON

Table 1. Guitar Effect Preset Reference