

XIP Flextron DC14

User Manual

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<http://www.soft-amp.com>

axp@soft-amp.com

Introduction

Flextron is a virtual-analog guitar amp based on a concept of the hybrid guitar distortion pedal I've built for myself a while ago. This prototype pedal in its turn was based on two commercial tube emulation technologies – Flexwave by Crate and Cooltron by VOX. This combination was discovered by accident when I was repairing my bandmate's VOX Bulldog distortion pedal. I didn't like the Bulldog that much, however I got interested in its low-voltage tube design so I assembled a copy on a test bench. On its own it has provided very little overdrive, just as expected, but when combined with the Crate Flexwave preamp (my favorite solid-state distortion) it has completed its great tone, giving it more fullness and presence. I've used this arrangement for rehearsals and some gigs and got complemented for the tone.

Flextron goes a step further and accurately models a range of Crate solid-state amps powered by Flexwave circuit. Every stage of the preamp signal path is carefully analyzed and modeled with the same attention to details as my previous SoftDrive GV and SoftAmp FM25 plugins.

The Flexwave amp design has evolved over the years. I've counted 6 different variations. After careful analysis, I've narrowed down the scope to 3 models. The one I've played with was made in the late 90's and I think it sounds the best of them all. However in 2000's they have changed the gain channel structure significantly and after some consideration I've decided to model all three flavors in my plugin.

The Cooltron circuit in its turn has remained the same across their pedal range. I've tried a couple of different approaches of modeling it before settling on the final one. Since I've had a real physical implementation at my disposal I was able to successfully verify the accuracy of the digital model.

Interestingly, both Flexwave and Cooltron follow exactly the same idea – they essentially are an asymmetric clipping stage biased by the low-passed feedback signal. Having made my own SoftAmp 3OD model I can say that this is exactly how a real guitar amp triode stage works. The main difference is that Cooltron uses a 12AU7 tube running on 6V anode voltage for the authentic tube clipping shape, while Flexwave relies on an asymmetrically configured “rubber diode” pair to achieve the same effect.

In addition to the fully featured 3-channel preamp and a tube saturation stage, Flextron offers a dual-mode stereo reverb, a speaker simulator with two cabinet models and an ambience control, a switchable order oversampling and a set of visualization instruments, such as an EQ curve plot and stage bias indicators.

Just as with my previous plugins, every single control is remapped to produce linear response on a dB scale.

This plugin was made for KVRAudio Developer Challenge 2014:
www.kvraudio.com/kvr-developer-challenge/2014

If the plug-in's interface doesn't look like pictured above, make sure your desktop is configured for 32-bit color depth.

Flextron will not check for updates automatically. It was done deliberately to make sure it doesn't get in the way of your audio production workflow. There's a manual "Check for updates" feature that will query the server to see if there is a new version available. If you are not, you will be prompted to open the download page in your browser.

Enable – bypasses the whole effect except the oversampling stage (to ensure the phase alignment)

Input Level – input gain prior to any processing. Use this control to adjust to your recording equipment and environment. Range: -12dB .. +12dB

Limiter – limits the output signal swing to 0dB. Try to keep the output level under 0dB with the Master Level control or it will sound terrible.

Master Level – output attenuation control. It is a plugin output level, not the amp control.

Bypass/Clean/Drive/Lead – preamp channel switch. The Bypass setting completely bypasses the preamp, but leaves the tube/post-processing stages enabled – useful for non-guitar signals.

About – shows the contact and version info

Update – checks for updates. Look for a notification in the tooltip lane.

Stereo – enables stereo processing. Doubles the CPU load. Note that it affects all stages, including reverb and speaker simulator. It is strongly suggested to keep it enabled if you use reverb or ambience.

1x/4x/16x – switches the oversampling order. 1x is no oversampling (very low CPU load, audible aliasing), 4x is the recommended setting (average CPU load, aliasing audible on some signals and at higher gain settings), 16x is recommend for final mixdown rendering (moderate CPU load, inaudible aliasing).

Gain – preamp gain control. Appears only on Drive and Lead channels and depend on the selected Amp model.

Volume – Preamp volume control. Affects the tone as well, depends on the selected Amp model and channel.

Low/Mid/High – 3-band interactive tonestack. Depends on the selected Amp model and channel.

Shape – Additional tone shaping control for the Lead channel.

Bright – High frequency boost. Available only on the Clean channel of the '90s amp model.

Amp ['90s/2000 mk.I/2000 mk.II] – Switches between different flavors of the amp. The tonal difference between 2000 mk.I and 2000 mk.II is much less pronounced than between them and the '90s one. The '90s flavor is modeled after Crate Flexwave GX-120 made in 1994, the 2000 mk.I one – after GTX-212 made in 2000 and finally the 2000 mk.II represents the GTX-212d made in 2002.

Tube [Off/Pre-Eq/Post-Eq] – Switches the tube stage. In the “Post-Eq” mode, it is applied after the preamp. Think of it as a tube power amp section that is overdriven by cranking the preamp Level control. Also note that tonestack settings affect the overdrive character. In the “Pre-Eq” mode it becomes a part of the preamp and is applied before the tonestack. Consider it as just another gain stage. The amount of tube overdrive in this mode depends on the preamp channel and gain control, but not on the tonestack settings.

Reverb [Off/Hall/Spring] – switches the Reverb mode. In the “off” setting, this stage is bypassed, saving the CPU cycles. The “Hall” mode is a generic spacious reverb with a rather slow echo buildup and an even frequency response. The “Spring” mode is a distinctive kind of reverb usually found in guitar amps. It has a very pronounced dispersive qualities and a resonant frequency response

Reverb Amount – controls the amount of reverb output mixed with the direct signal. Control range: -40dB..0dB

Speaker [Off/1x12"/4x12"] – switches the speaker simulator mode. Two different cabinets are available. Switch to the “Off” setting if you are using an external cabinet or simulator.

Ambience – adds some of the room early reflections to liven up the speaker cabinet response. It is mainly intended to be used with headphones, since when listening through speakers you already have your own room's response. Only available when the speaker simulator is enabled.

Display Mode [Off/Bias/EQ/Tube] – Switches the visualization mode. The Bias mode displays the momentary bias voltage of the dynamic gain stages – the main clipping stage of the preamp's Drive or Lead channels and the Tube circuit. The EQ mode displays the plot of the equalizer frequency response. Note that it doesn't include the filtering that takes place inside the gain stages. The Tube mode displays the momentary transfer characteristic of the Tube circuit. It is shown as X-Y plots separately for left and right channels.

Credits

I'd like to thank:

- My wife for putting up with me spending endless nights on this work and for her suggestions on the GUI design.
- Alexey Khomich for our invaluable DSP & music talks
- Teemu Kyttälä for his insight into solid-state guitar amp design and operation, particularly of the Flexwave circuit.

It is my hobby to develop the VST audio effect models. I'm not getting paid for it and I use my own (very limited) spare time to do this work. If you like my projects and would like to encourage the future development please consider doing something of the following:

- Tell your friends about my site and my plug-ins
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