GeminiPTE

USER MANUAL

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Thanks for purchasing DiBiQuadro GeminiPTE. This is the result of a meticulous engineering design and passion for perfection.

Please take your time to read carefully the content of this manual.

Passive Tube Equalizer in a Double Format

Imagine a seasoned audio wizard in the world of music and sound. This magical device, known for its distinctive tube-based circuitry, possesses a distinct and enchanting sonic aura that's often described as warm and colorful. GeminiPTE recreates this pure magic in a glorious double format. *Mono, Stereo or Mid/Side processing are available at your finger tip.*

SOUND

Warm and Colorful: GeminiPTE brings a warm and vibrant character to your audio, like the inviting glow of a crackling fireplace on a winter's night. It's as if it paints your sound with musical hues.

Tube Magic: This mystical device harnesses the power of tubes, much like the age-old practice of brewing potions. These tubes introduce a delightful touch of harmonic distortion and saturation, wrapping your audio in a cozy analog embrace.

Boost and Cut: One of its most intriguing spells is the ability to simultaneously boost and cut the same frequencies. It's like the yin and yang of audio shaping, allowing you to sculpt your sound in a way that's simply enchanting.

Gentle Waves: Picture its EQ curves as gentle, rolling waves, caressing your sound with care. It doesn't abruptly alter your audio; instead, it weaves subtle, harmonious changes throughout.

APPLICATIONS

Tonal Wizardry: GeminiPTE is a go-to choice for shaping the tonal essence of your audio. It's like having a musical sorcerer at your disposal, ready to add warmth, presence, or clarity to instruments and vocals with a flick of their wand.

Mastering Mastery: When mastering your musical creations, GeminiPTE works its final enchantments. It imparts a polished and melodic touch, preserving the dynamic soul of your mix.

Drum Enchantment: For drums, it acts as a rhythmic spellcaster, enhancing the low-end thump and high-end shimmer of kick and snare drums. It brings weight and sparkle to these percussive spirits.

Vocal Charms: When weaving its magic on vocals, it bestows a vintage and soulful charm, enhancing the singer's unique timbre and making their voice resonate in the mix.

Guitar and Bass Enchantment: Electric guitars and basses are like musical wands themselves, and GeminiPTE helps refine their tone, adding richness and harmonious resonance.

Mixing Magic: In the grand tapestry of your mix, this mystical device can be placed on the mix bus, acting as a guardian of sonic cohesion. It imparts a warm and analog-style glow that ties all the musical elements together.

The perfect approach to circuit modeling

GeminiPTE features the same built-from-scratch proprietary 64-bit engine used for SaturnLO, MercuryRec and JupiterXTC which is based on general purpose hi-quality algorithms and the most recent non-linear models. Particular attention has been put on the definition of the Non Linear Solver to get the maximum quality and realism, without losing details in favor of performances (Double-Precision Non-Linear Computing).

Our non-plus-ultra reproductions bring a completely new philosophy to the table: being able to shape your tone by giving total access to the circuit components. Managing gain stages and tube buffers, shaping the filters or modifying the tubes characteristics: there is virtually no limit to what you can achieve with our plugins!

Double-Precision Non-Linear Computing

About (db)²

DiBiQuadro is the result of the joint forces of two Italian Software Engineers with more than 15 years of experience in several industries including Biomedical, Military, Insurance, Travel, Telecommunications and Pro Audio.

Our purpose is to deliver superior results in the Audio market with ground breaking technology and exquisite user-friendly graphic interfaces.

DiBiQuadro full logo

DiBiQuadro compact logo

GUI: tooltips and Edit Mode

The graphic engine has been designed with a purpose in mind: keeping a clear indication of the status of the elements without altering their 3D rendering on the scene. Tooltips serve this purpose perfectly especially when dealing with knobs status. A typical approach to this problem would be to compress the height of the knobs trying to prevent the user to commit parallax errors. As a side effect the graphic designer would be forced to take into account this constraint by limiting the 3D depth of the scene.

Another good reason to use a tooltip-based approach is to allow the update of the knobs status by using an Edit Mode.

EDIT mode

When using a state-of-the-art system – see minimum requirements in the product webpage – the GUI is able to deliver more than 60 FPS at a reasonably low CPU usage for a super fluid knob tweaking and a hyper realistic meter response.

The tooltip approach

Controls

GeminiPTE is a dual channel unit. Each channel has all the classic controls you would expect from a classic passive tube program equalizer, plus some basic controls to simplify the gain staging process and the routing:

In [dB]. This knob adjusts the level of the signal entering the plugin. When TRIM INPUT is enabled, the input level is automatically compensated on the output of the plugin, allowing the user to quickly adjust the amount of harmonic distortion generated by the circuit simulation.

Input Phase. This switch inverts the phase of the input signal, thus before entering the circuit simulation.

Out [dB]. It adjusts the overall output of the plugin.

Output Phase. It inverts the phases of output signal.

LOW [Hz] (Low Frequency Selection). This switch determines the frequency of the low shelf portion of GeminiPTE. Six frequencies are available: 20, 35, 70, 100, 150 and 200 Hz.

Low BOOST. This knob determines the amount of low shelf gain to be applied to the frequency set by the LOW switch.

Low ATTEN. It determines the amount of low shelf cut to be applied to the frequency set by the LOW switch.

HIGH [kHz] (High Boost Frequency Selection). This switch determines the frequency of the high boost portion of GeminiPTE. Six frequencies are available: 2.4, 3, 3.6, 7.4, 13 and 18 kHz.

High BOOST. It sets the amount of gain for the high frequency portion of the equalizer.

BANDWIDTH. This knob is a Q control for the High BOOST section. Higher values yield a broader band.

ATTEN SEL [kHz] (High Cut Frequency Selection). This switch determines the frequency of the high cut portion of GeminiPTE. Six frequencies are available: 1.2, 1.9, 2.8, 4, 5.6 and 8.4 kHz.

Hi ATTEN. It determines the amount of high shelf cut to be applied to the frequency set by the ATTEN SEL switch.

SOLO. When enabled, it lets the signal pass only through this channel, by muting the other one.

In addition, GeminiPTE offers the following set of general switches.

INPUT TRIM. It affects the behavior of the Input knobs (Check In [dB] for more details).

LINK. It links the controls of the 2 channels.

BYPASS. It bypasses the circuit simulation.

ChannelMode. Three modes are available:

- M. Mono
- L/R. Left/Right
- M/S. Mid/Side

LOAD/SAVE. The LOAD button opens a window to select a previously saved preset – this includes knobs, buttons, switches, SIZE, TWEAK and SET settings –. The SAVE button allows to save a file containing the current settings of the plugin.
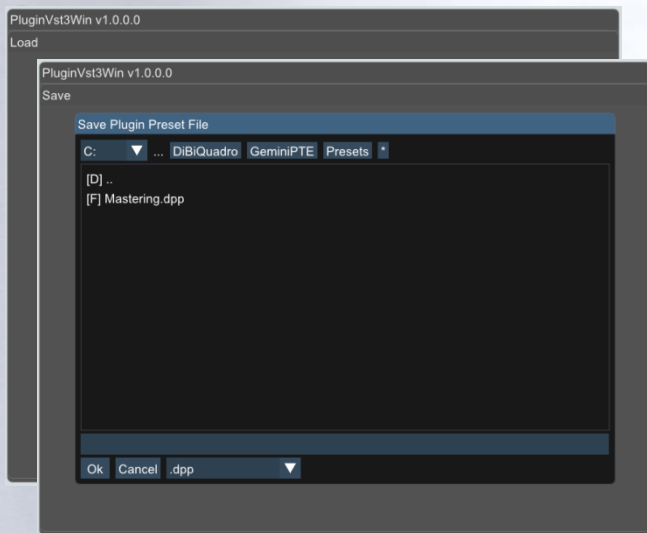
LOAD and SAVE windows

PREV/NEXT. Use these buttons to browse back and forth through the preset files.

SIZE. Press this button to load the double sized graphic interface for 4K monitors compatibility.

SET/TWEAK. Please refer to the dedicated sections.

GUI useful tricks

Here some useful tricks to interact with the GUI:

- use "CTRL + click" on a knob to reset the value to its default;
- use the mouse wheel on a knob for fine adjustments;
- press SHIFT while moving a knob to fine adjust.
- (Windows OS only) Right click with your mouse on the GUI to choose between 2 different GUI sizes ("Normal" and "Full"):
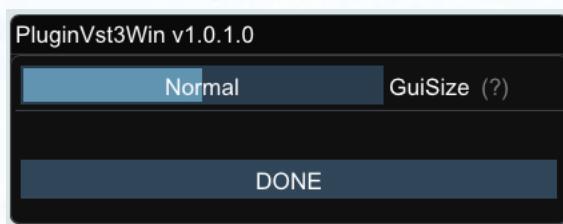
GuiSize window

Edit Mode

The Edit Mode is accessible by double clicking on a knob. Once done, you can edit the value by using arrows, digits and ".", "+", "-" keys. INSERT key is supported too: INSERT status is recognizable by checking the cursor

inside the tooltip ("|" means INSERT disabled, "_" means INSERT enabled). After modifying the value press ENTER to commit or ESC to roll-back to the latest value set before accessing the Edit Mode.

SET
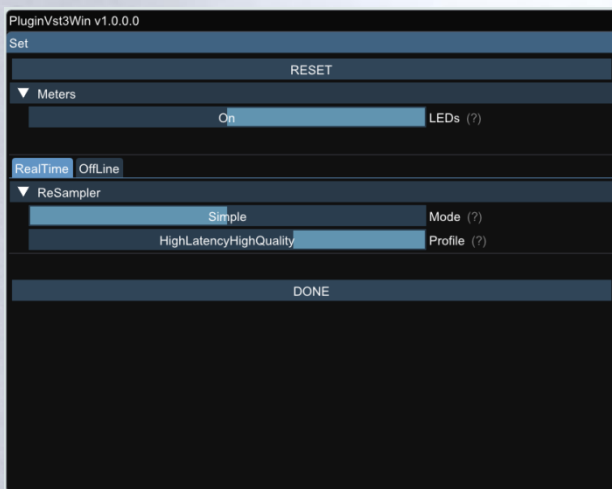
SET window

You can open the SET window to access the configuration settings for meters, ReSampler and PreRender.

RESET. It restores the default values for all configurations in the SET window.

LEDs. It activates / deactivates the meter LEDs.

RealTime and OffLine tabs. These tabs allow the user to specify different configurations for the ReSampler, which are taken into account depending on the current processing mode.

RealTime tab. These ReSampling settings are applied by your DAW when playbacking tracks through this plugin. It provides two modes: "Simple" which allows the selection of pre-defined profiles, and "Advanced" which gives you full control on all ReSampling parameters. With the default settings ("Simple" Mode and "HighLatencyHighQuality" Profile) an UpSamplingFactor of 4x at 44100/48000Hz, of 2x at 88200/96000Hz is applied. This can be considered more than enough for the majority of the applications.

OffLine tab. This mode is set by your DAW when bouncing a track or the complete mix. If the elaboration time is not a constraint for you and you are cranking the input up, we suggest to set the UpSamplingFactor to at least 128x @ 44100/48000Hz, 64x @ 88200/96000Hz in order to minimize the aliasing artifacts and get super high-quality harmonic distortion.

ReSamplerBufferSize. This is the ReSampler Buffer Size in number of samples.

UpSamplingFactor. This is the UpSampling Factor applied to the base input SampleRate. Use it to increase the quality or your playbacks and renders, but take into account that high UpSampling factors correspond to more samples to be processed, and consequently longer processing times.

UpFilterTransBand. This is the UpSampling Filter Transition Band, in percent of the spectral space of the input signal between filter's -3 dB point and the Nyquist frequency.

UpFilterType. It defines the UpSampling filter's phase response: Minimum Phase or Linear Phase.

DownFilterTransBand. This is the DownSampling Filter Transition Band, in percent of the spectral space of the output signal between filter's -3 dB point and the Nyquist frequency. If you are working at sample rates higher than 44100/48000Hz, we suggest to increase it to 43% to have a smoother low pass filter and to reduce the latency without impacting the audible frequencies.

DownFilterType. It defines the DownSampling filter's phase response: Minimum Phase or Linear Phase.

PreRenderFactor. Together with input SampleRate and UpSamplingFactor, PreRenderFactor affects how many samples will be pre-rendered by the model before the real processing. We suggest to set it to the highest value – 32x – in Offline mode.

DONE. It closes the SET window.
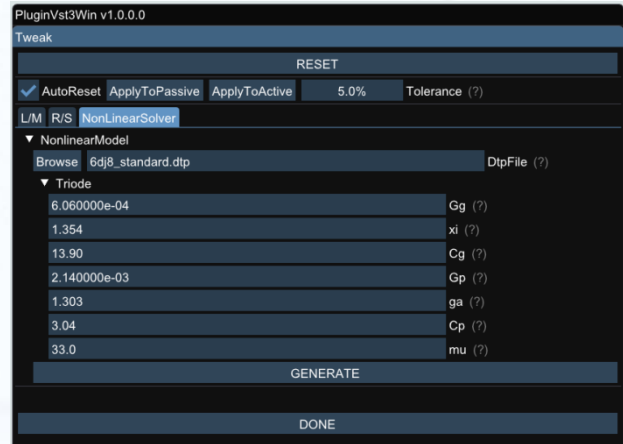
TWEAK
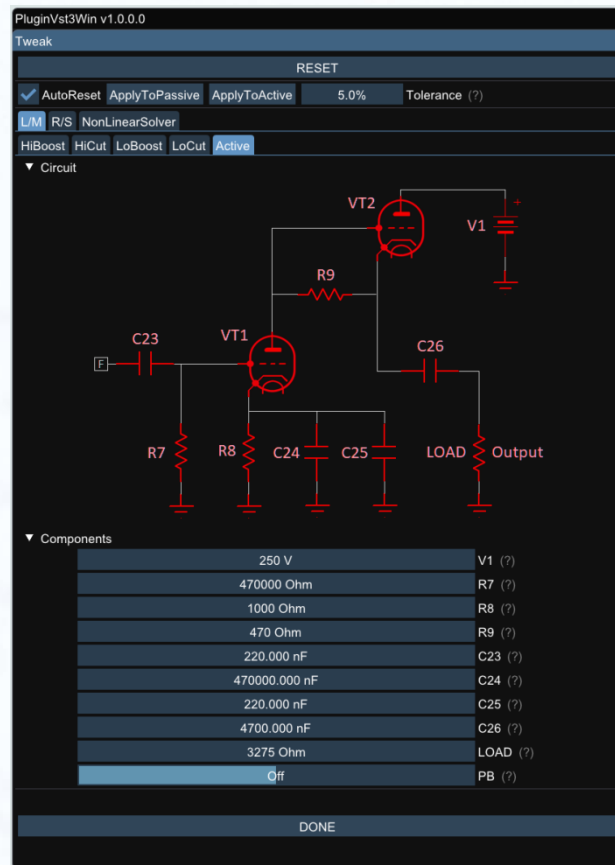
TWEAK window

The TWEAK window gives you the power to modify every single component of the circuit. Even the Triode model of the 6DJ8/ECC88 can be tweaked in the NonLinearSolver tab. Play with this window very carefully, possibly in front of an analyzer, to get exactly what you are looking for. We **do not** guarantee that any possible combination of values makes sense, so it's up to you to find a configuration that works and satisfies your needs.

RESET. It restores the default values for all configurations in the TWEAK window.

Tolerance. This feature can be used to apply random variations to each component of the channel circuits. You can increase or decrease the percentage deviation (default value: 5.0%) and apply it separately to the passive sections with "ApplyToPassive" (HiBoost, HiCut, LoBoost, LoCut) or to the tube section ("ApplyToActive"). When checked, "AutoReset" always resets each component of both channel circuits to its default value before applying the random variation.

Primary tabs: L/M, R/S and NonLinearSolver. The primary tabs provide access to the different channels of GeminiPTE and to the triode model. Each channel can be tweaked independently or at the same time depending on the state of the "LINK" button in the GUI, while there can be only one triode model for all triodes in the circuit simulations.

Secondary tabs: HiBoost, HiCut, LoBoost, LoCut, Active. They provide access to the different sections of the circuit.

TWEAK window – NonLinearSolver tab

NonLinearSolver tab. Use this section to change the characteristics of the triodes in the channels. The easiest way to tweak the triode characteristics is to:

1. Modify the name in the DtpFile textbox.
2. Change one or more parameters of the triode model[1].

3. Press **GENERATE** button.

DONE. It closes the SET window.

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[1] Take a look at https://www.dafx.de/paper-archive/2011/Papers/76_e.pdf for more details.

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$$E=(db)^2$$