

# TSE X50 v2.4

## USER GUIDE

**ROSEN DIGITAL**

**FAT-LAZY**

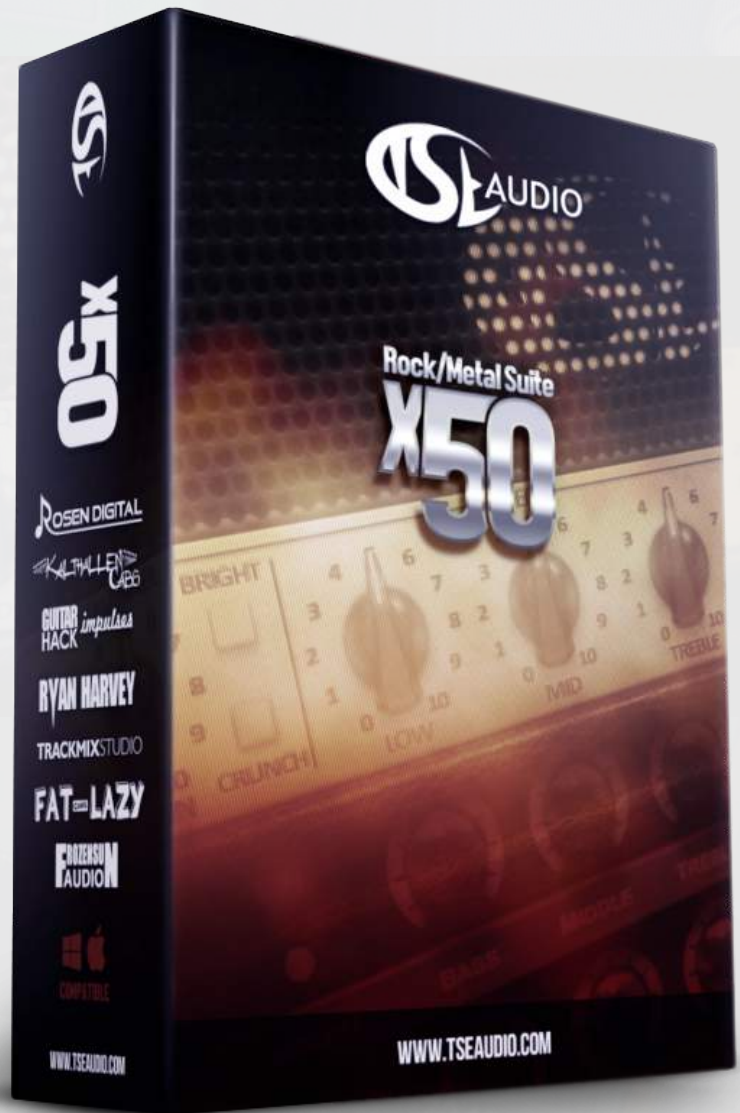
**KALTHALLEN**  
CABS

**GUITAR HACK** *impulses*

**RYAN HARVEY**

**FROZENSUN**  
AUDION

**TRACKMIXSTUDIO**



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# Introduction

Congratulations on your **TSE X50 v2** purchase!

We have spent a great amount of time designing this product to be a real competitor to the somewhat similar software that's available today. We've specifically addressed the issues of cost, ease of use, and sound quality!

The modeling algorithms used in our software are derived from the most advanced electrical simulation methods available. The software uses internal circuit simulations, derived from physics, instead of the common «black box» approach where the output is based on static wave shapers and post equalized to imitate a guitar amp-like sound.

This software has been developed and upgraded over time by incorporating suggestions from both our users and testers. We're confident the end result will be a very pleasant user experience.

A huge thanks goes to our beta testers who've helped make this product possible!

Thanks to:

- *Joe Stratton*
- *Sebastian Pods*
- *Scott J. Cortese*
- *Diogo C. Borges*
- *Shea Sterner*
- *Markus Kalthallen*
- *Guille Marea*

A special thanks goes to our IR developers, who make our software shine in the mix!

Thanks to:

- Rosen Digital
- Fat Lazy Cabs
- Kalthallen Cabs
- Trackmix Studio
- Frozen Sun Audio
- Ryan Harvey Audio
- GuitarHack Impulses

## ***Best Regards***

John A. Johansen  
CEO / Lead Developer

Jeffrey Pelosi  
Support / Artist Relations

Pavel Shevtcov  
Artwork / GUI Design



## Minimum System Requirements

- Low Latency Audio Interface (ASIO / Core Audio compatible).
- High-Z (high impedance) instrument input.
- Digital Audio Workstation (**DAW**) or a standalone plugin host.

### Windows requirements:

- Windows Vista 32/64 bit.
- Intel Core 2 Processor Family or better.

### Mac requirements:

- OS X 10.7
- Intel Core 2 Processor Family or better.

## Recommended System Requirements

Intel Core i5 processor or better is recommended for the best user experience! The TSE X50 v2 is created on a Intel Core i7 processor and is mainly meant to be used with modern processors.

During the recording or monitoring of a guitar input signal we recommend a audio buffer size of 128 samples or lower, this is to minimize latency and improve the play through experience. This can be set in your audio interface setup utility or in your current DAW audio settings.

The software has a automatic oversampling function that will allow you to record and mix with a lower oversampling setting while the offline rendered mix will be processed by a higher setting.

## Installation

- Run the provided installer(s) and follow the current instructions given by the installation software.
- Double check that you have the plugin path listed in your DAW to make sure it's found by the host after installation.

*Please Note: Pro Tools has the plugin located in it's 'Harmonics' category.*

## Setting up your audio device for best performance

We are interested in monitoring and recording a guitar signal, so make sure your audio device has a dedicated high impedance instrument input (**Hi-Z**) or is buffered by a D.I. Box before attempting to record any guitar signals from a guitar with passive pickups.

Please note that some active pickups such as the EMG-81 or similar have a low output impedance and can therefore be connected directly to the line input of your audio device. In your DAW there should be a dedicated option to adjust your audio device settings.



The result of not following these directions by e.g connecting a passive high impedance pickup in a low impedance line input can result in a dramatic loss of high end details in your guitar signal and attenuated output volume of your guitar. In short, this will result in a lower quality guitar signal, and can't be fixed "in the box" later.

Fresh strings and a good quality instrument cable shouldn't have to be mentioned.

For the best result the input gain of your guitar signal should be set as close to 0 dBFS as you can come without clipping the actual signal. This increases the SNR (signal to noise ratio) and you will get a cleaner guitar signal with less noise when overdriven.

As an example we can imagine a recorded guitar signal peaking at -6 dBFS, to normalize this signal to -0.1 dBFS you need 6 dB of gain, which in practice is doubling the signal. But what happens to the noise present in this signal? (Hint: it doubles as well)

The TSE X50 operates internally with virtual currents and voltages and expects a real life representation of it's input signal, in most cases the D.I. will be boosted higher than 0 dBFS in the software. Even if you prefer recording at -12 dBFS, please follow our guidelines presented here when working with the X50 for the best possible results. You can lower the track volume in the mixer or lower the final processed/bounced signal. Keep in mind that DI noise is your worst enemy when working with high gain amps, either in the box or with outboard gear.

We recommend a sample rate of 44.1 kHz and a auto 4X-8X oversampling setting which will run the plugin at an internal sample rate of 176.4 kHz while mixing and a sample rate of 352.8 kHz while doing an offline render. Please note that your DAW needs to inform the plugin about offline rendering in order to do this change automatically.

We also recommend a device buffer size of 128 or lower for the lowest latency while recording directly or monitoring the guitar signal.

Note: Roland is a trademark of the Roland Corporation.

# Pedal Board

THE PEDAL BOARD IS A NEW FEATURE FROM VERSION 2.3 AND UP.



## Gestures:

Below each pedal there are icons to perform certain gestures. These are as follows:



*Swap position with the pedal to the left.*

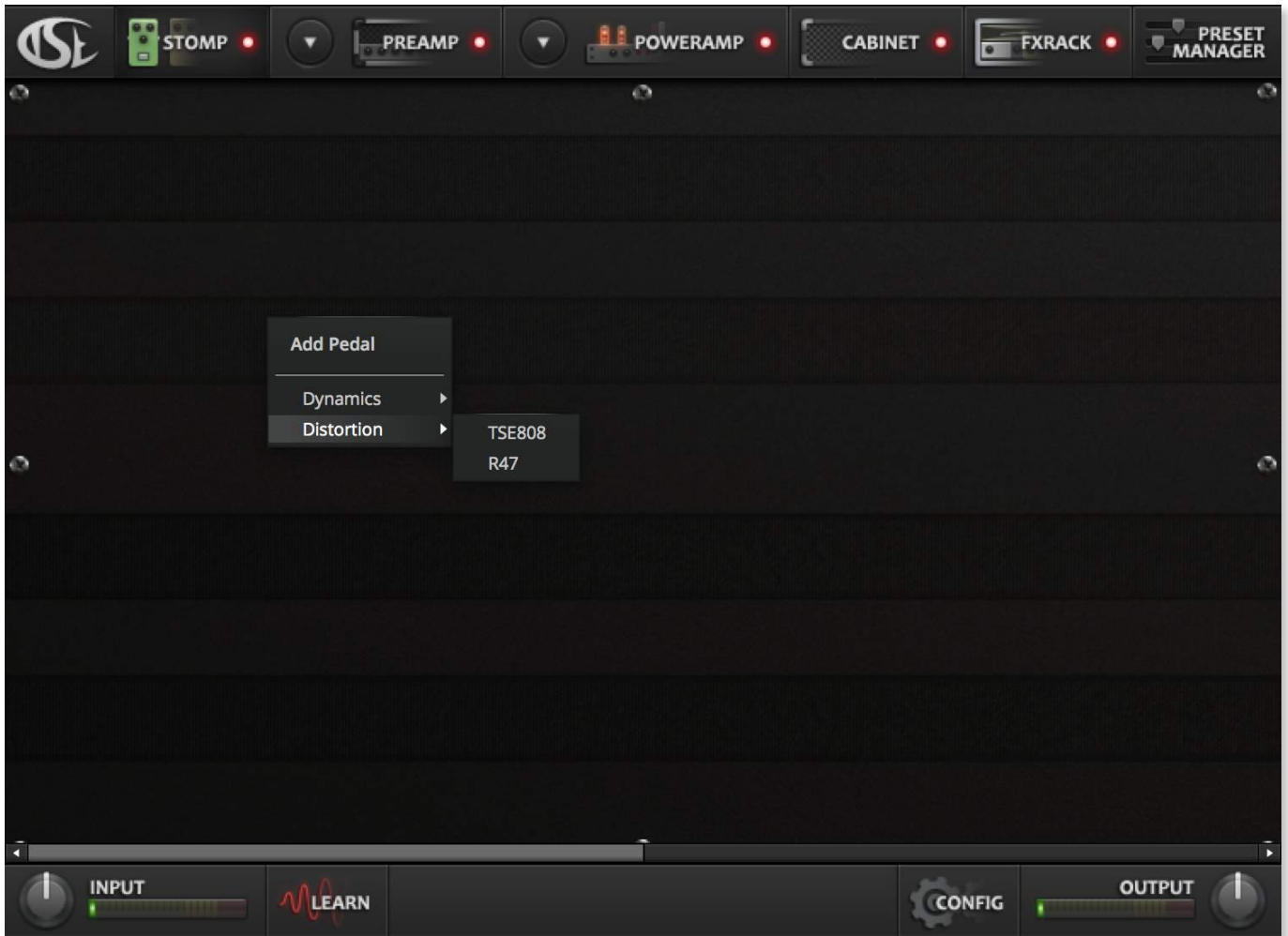


*Move/Drag pedal.*



*Swap position with the pedal to the right.*

The horizontal scrollbar is located just above the lower menu panel. This moves the current view to the left or right, and allows you to insert more pedals than the original window size can display.



When you first open the stomp/pedalboard section you are presented with an empty pedalboard. To insert a new pedal, simply right click on the pedalboard and select your pedal of choice from the menu.

To remove a pedal, simply right click on the background and select **Delete Module**. Optionally, you can clean the entire board by selecting **Delete All**.

## Pre Amps

### TSE X50 Preamp



X50 is the heart of this plugin. It is modeled after a high-gain monster that was given birth to in the early 90s, and still remains one of the most popular go-to amps for the metal genre.

The first X50 model was made in early 2010 and has been upgraded numerous times since.

#### Available controls:

Pre Gain

Low

Mid

Treble

Post Gain (*Normalized, to avoid blowing your ears off*)

Low End

Presence

Bright switch (Green channel)

Crunch switch (Green channel)

Red Channel Mod Switch (To switch between the MK.I and MK.II versions of the amp)



## TSE X30 Preamp



X30 is a versatile 4 channel guitar amplifier. This is our 5-year anniversary model incorporated into v2.4

### Available controls:

Clean Gain	Lead Gain
Clean Bass	Lead Bass
Clean Middle	Lead Lo Mid
Clean Treble	Lead Hi Mid
Clean Volume	Lead Treble
Clean Bright switch	Lead Volume
	Lead Contour

Gain Switch  
 Channel Switch (Clean/Lead)  
 Preamp Defeat

## Power Amps

### TSE X50 PA

#### Power Tubes



This lets the user choose which tubes to use. This is power amp related only.

- 6L6GC - (Tetrode)
- EL34 - (Pentode)

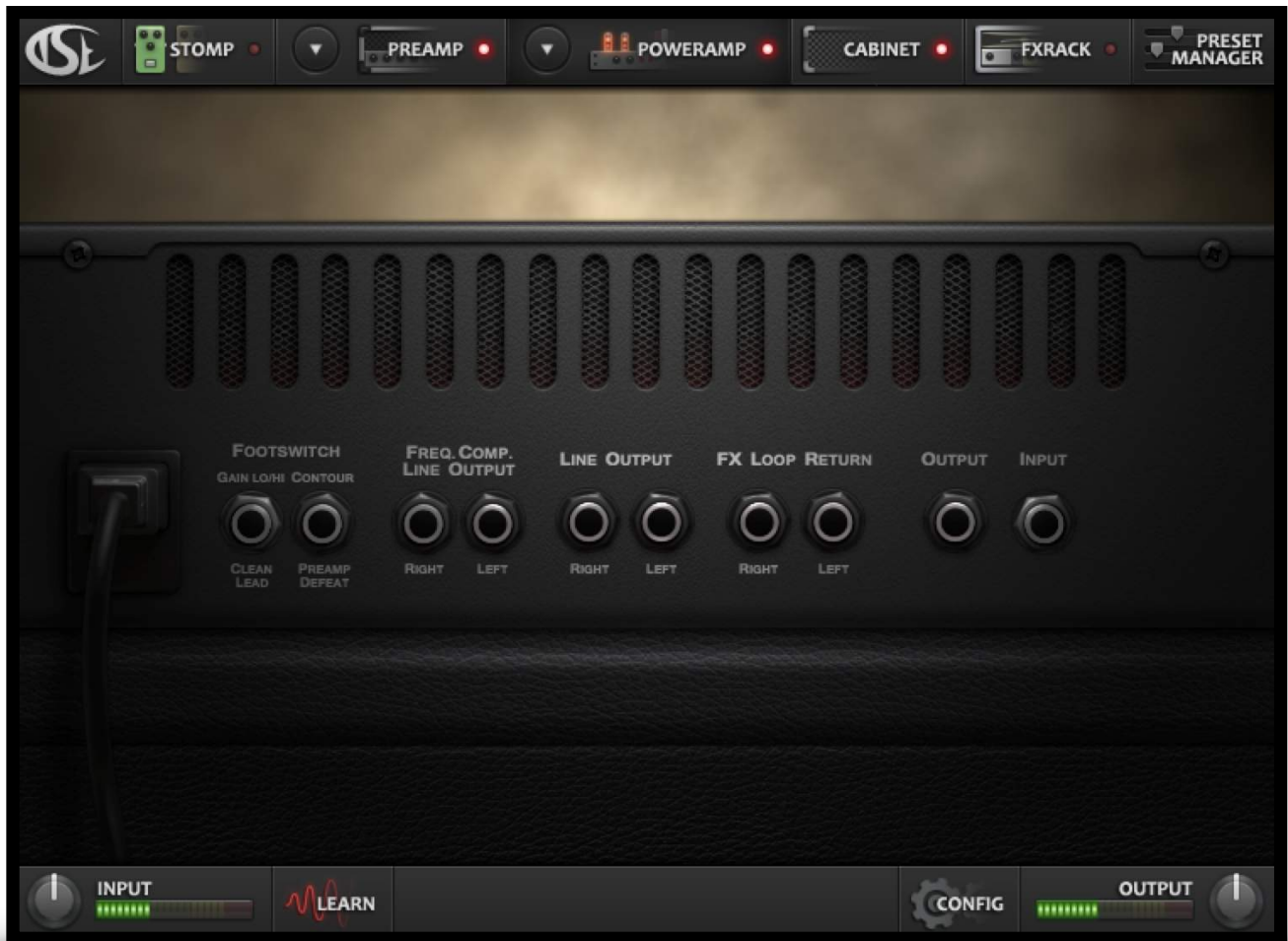
#### BIAS

This sets the bias, or "working-point" of the power amp. This is visually illustrated by the BIAS analyzer where the red dot represents the bias point, and it's current position on the the load line.

Place it on the most straight/linear section of the load line (white) to get a more open sound, when you get closer to the extreme ends the power tubes will start breaking up more easily and will add a different character to the distortion.

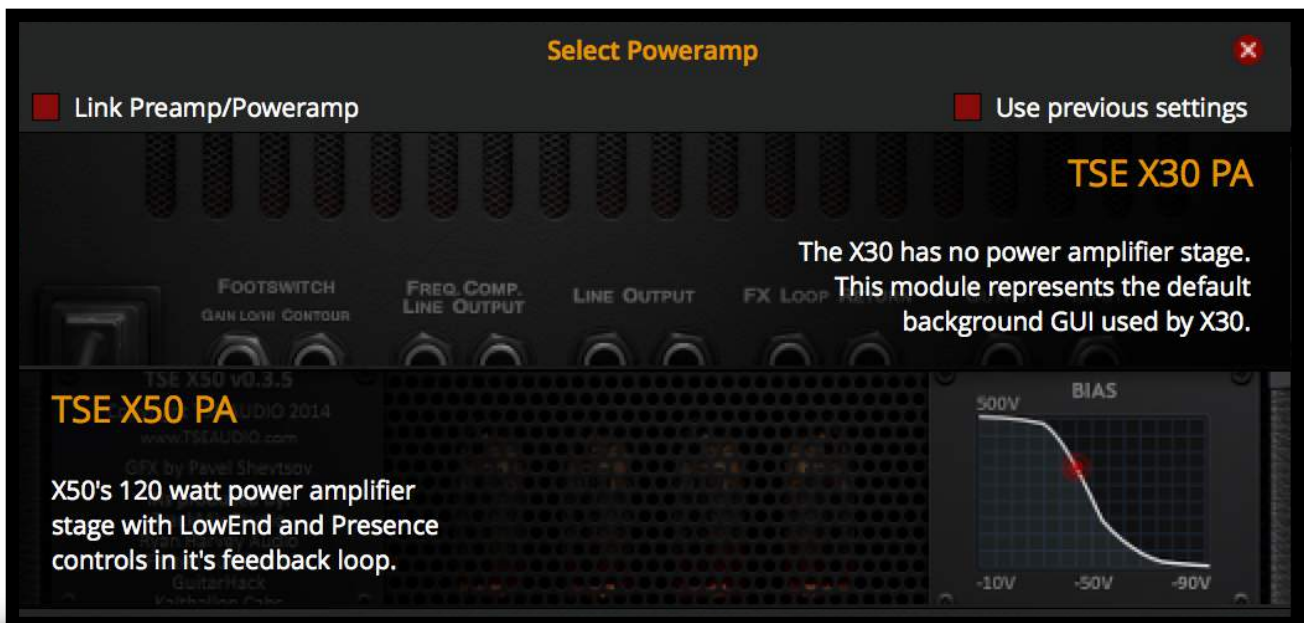
There is no magical set-point, the default values are set where the tubes are normally biased in the real world, but you can choose a different set-point that suits your music and playing style better.

## TSE X30 PA



The X30 is a preamp only and its “Power Amp” has no other purpose than filling out the Poweramp section of the GUI when the X30 is loaded.

## Preamp / Poweramp Selection Windows



### Link Preamp/Poweramp

When this option is enabled (by default) you will automatically get the corresponding power amp when selecting a different preamp. This can be disabled to run different combinations.

### Use Previous Settings

When enabled the plugin will remember the last setting used on a particular amp model in the current session.

# FIRE Impulse Convolution Engine



TSE X50 is delivered with a cpu-efficient, zero-latency, Dual IR loader. The IRs are loaded within a selectable range from 64 to 32768 samples.



## Frequency Analyzer

Relative to the current IR length up to 4096 samples.

Click on the number representing the IR length to select a new length.

Note: This will be the default length for the next loaded IRs as well. If the loaded impulse isn't long enough it will simply load the available samples and update the length value accordingly.

*Note: Resampled IRs will be shorter in length after resampling.*



**Equalizer**

Each slot has a separate high pass and low pass filter. You can enable these by double clicking on them or by right clicking and selecting enable. To set their value simply drag the point to the left or right, or use the set value option in their popup menu.

**IR Length**

A higher sample count gives a more detailed low end representation, and also brings in more of the actual room "response" where the IR was originally captured.

**Processing modes**

When the plugin is run in stereo mode the stereo mode selecton is enabled.

Mono mode – Both IRs are run on the same channel. Panning is disabled.

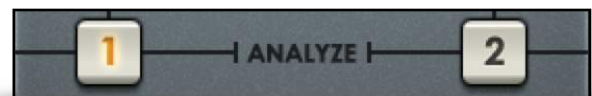
Stereo mode – One IR for each channel. Panning is enabled

Dual stereo mode – Two IRs are loaded into each slot. The panning controls are replaced by a width control that adjusts the current stereo width of corresponding pair.

Slot 1 being one stereo pair, and Slot 2 being the other stereo pair.

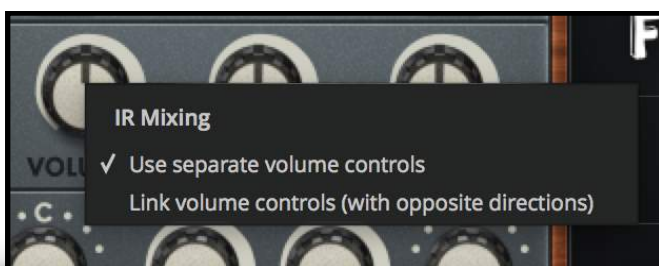
**Analyze**

Selects the current IR slot to edit/analyze.



**Volume / Master**

Adjusts the volume of the corresponding IR slot. The master control raises the levels up or down for both slots simultaneously.



In order to blend the IRs more easily you have the option to link the volume controls with opposite directions. If enabled, the volume of IR 2 will be lowered by the corresponding amount that IR 1's volume was raised. Right clicking on the Volume 1 or Volume 2 knob will bring up the link mode selection.

**Width/Pan**

Mono mode: Controls are disabled.

Stereo mode: Pans signal left or right.

Dual Stereo mode: Adjust the width of the current IR pair.



## Delay

The delay knob adds a delay to the selected slot in order to tune in two IRs that would otherwise be out of phase. This control offers a lot of power when two IRs are run in parallel. By a simple turn on the knob you could fatten up the resulting tone, or make it sound thin and horrible (if you overdo it). Usually you want to blend IRs that already are in phase with each other.



## Movement

The movement knob adjusts the strength and harmonic content of the poweramp-to-speaker simulation. The harmonic content is strongest at the speaker's resonance frequency. This effect is very subtle, and also frequency dependent.

You could spice up a rather lifeless IR by also modelling some physical speaker limitations.

## Phase Invert

Invert the phase by 180 degrees on the selected slot.

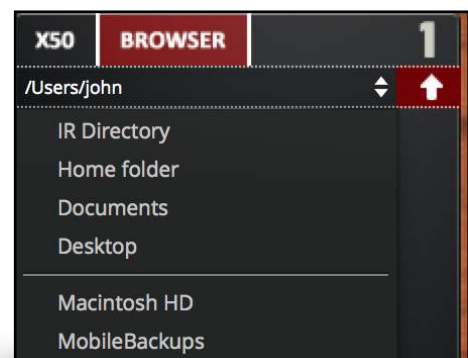
## Power / Enable

The 'power' switch completely bypasses the IR loader, while the 'enable' switch mutes its corresponding IR slot when it is set to the off (up) position.



## File Browser

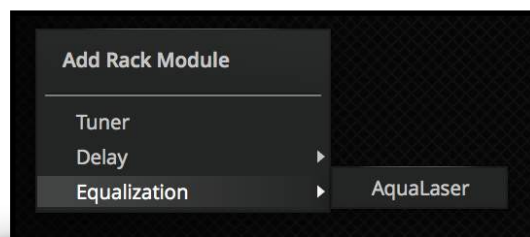
X50 tab – Browse the included IRs of the software.  
 Browser tab – Browse the file system of your computer.  
 When in browser mode, clicking on the file path drop-down box will allow you to browse your user pre-set IR directory or other common directories on your computer. IRs are loaded by double-clicking on the selected file. If resampling is needed, it is detected and taken care of internally by the software.



## FX Rack



**TSE X50 v2.4** is delivered with a modular FX Rack. When you first open the rack it will be empty. However, right clicking on the rack's background will allow you to select your module of choice and add it to the rack. Modules are processed in series from top to bottom.



### Gestures:



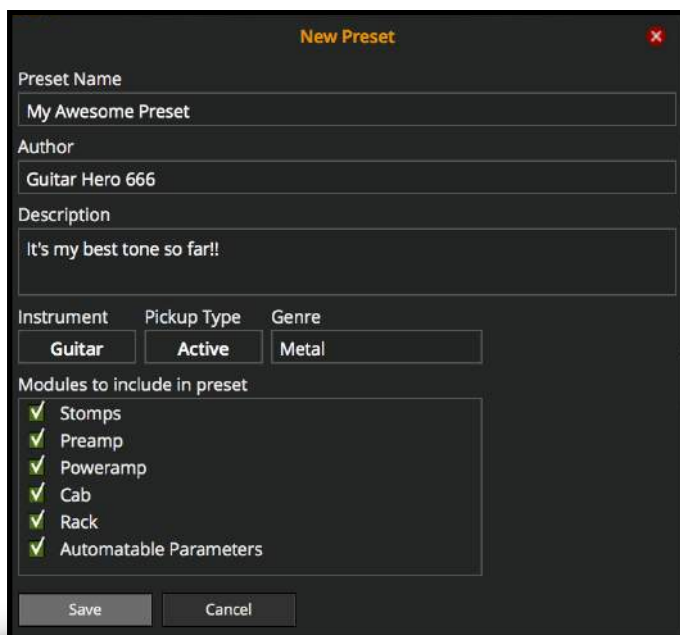
To the right of each rack unit there are icons to perform certain gestures. This icon moves the rack module up or down. Simply press the move button and drag the rack unit up or down to change its order in the rack. The other modules will move automatically making room for its new position. Release the mouse button when you have selected its new location.



# Preset Manager



TSE X50 v2.4 comes with a new powerful Preset Manager that lets you load just the modules you need.



## New Preset Window

Your current tone and settings can be saved as a new preset.

Simply create or select a bank to store your preset in and click the 'New Preset' button.

## Modules

You can choose what to save in your preset. By default it makes a full preset save, but you are free to discard parts of the system in the final preset.

# Miscellaneous

## Lower Panel

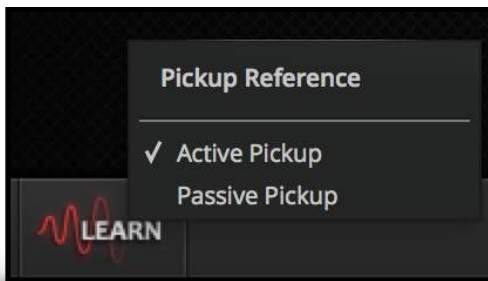


### Input

Adjusts the input gain of the incoming (guitar) signal.

### Output

Adjusts the output gain of the software.



### Learn

This function will analyze your guitar signal over a timeframe of 5 seconds.

It uses the maximum recorded value to determine how far you are from the set point.

It is recommended that you play some hard palm mutes in order to generate your highest signal peaks.

Right click the learn button to select the 'Active' or 'Passive' pickup choice. For a result with lower input gain you should select the passive pickup option.

### Config

Pressing the config button will display the config menu.

**Quality:** Select High or Low quality interpolation.

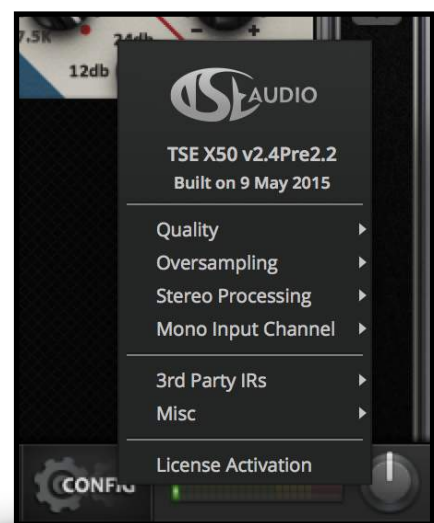
**Oversampling:** Set the amount of oversampling.

**Stereo Processing:** Enable/Disable stereo mode.

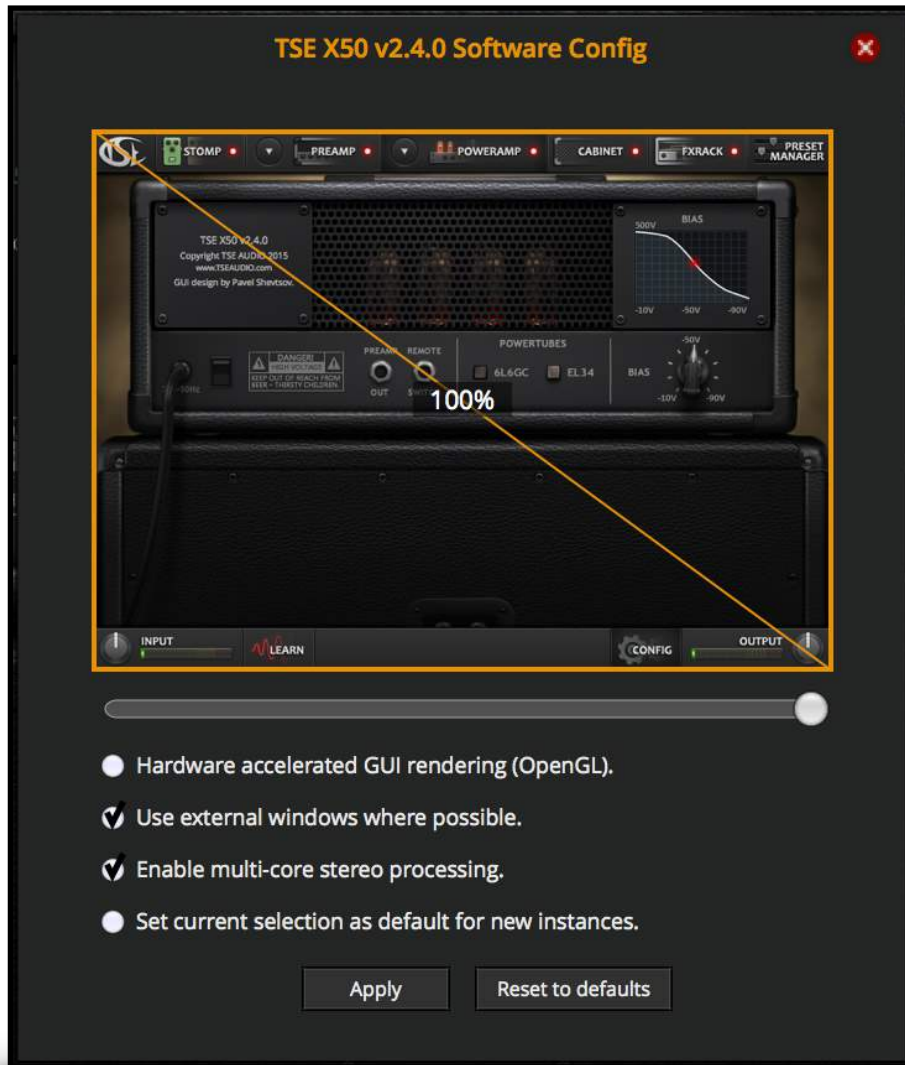
**Mono Input Channel:** Select left or right input reference.

**3rd party IRs:** Sets the path to your personal IR collection.

**License Activation:** Online or Offline activation.



## Software Configuration



### Hardware accelerated GUI rendering (OpenGL)

This option enables the graphic card to take over the graphics drawing. When running with modified plugin size this can be beneficial to take the load of your CPU.

### Use external windows where possible

If you want to keep the main software window free of obstacles you can enable this option to open e.g. the preset manager in a external window that can be moved freely on your desktop/DAW.

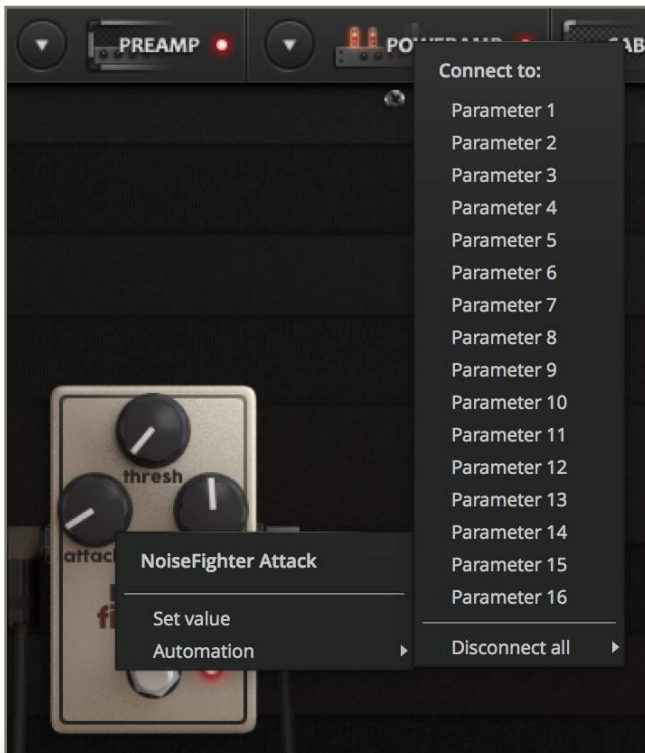
### Enable multi-core stereo processing

This is a powerful feature introduced in X50 v2.4 that lets you share the processing load over multiple cpu's when running in stereo. When processing the two (internal) instances of the plugin in parallel instead in series you will get a better load sharing with the result of reducing stress on the cpu.

### Set Current selection as default for new instances

Enable this before applying your settings to keep them enabled in new instances.

# Automation



To automate a control - right click on the button or knob you wish to remotely control to bring up the automation menu\*.

Here you can connect the control to a free parameter slot, optionally disconnecting a previously set parameter.

Because of the modular approach used in TSE X50 a fixed set of parameters is hard to realize.

To act as a workaround for this fact we have set a fixed preset amount of 16 parameter slots that are available when you are ready to automate X50 in your DAW.

Parameter names should be updated automatically in DAWs that supports dynamical naming of parameters, such as Reaper.

When a module is removed or deleted the connected parameters will be disconnected automatically.



\* FIRE controls are not automatable at the time this manual was written.

## Additional Notes

### Oversampling

#### 2X / 4X / 8X

This enables the plugin to run at a higher (internal) sample rate than the audio project itself. This helps with the reduction of aliasing by giving the anti-aliasing filters more bandwidth to work with.

**Aliasing occurs when high frequency content, generated by non-linear processing, has a high enough frequency to wrap itself back down into the audible frequency spectrum, and is usually identified as un-musical artefacts or harmonics/ frequencies that aren't supposed to be there!**

#### Sampling rate in a nutshell

If the sample rate is not high enough you cannot truly represent the original signal if it has frequency content over  $\text{SampleRate}/2$  (usually 22050 Hz). An example of this can be easily seen in movies where cars are moving forward, but the wheels of those cars appear to be rotating backwards. This is a direct result of the speed of the car being faster than the camera's frame-rate.

#### Auto 2X/4X and Auto 4X/8X

When selected the plugin uses 2X oversampling for realtime processing/mixing and automatically set the oversampling to 4X or 8X when the host informs the plugin of an offline rendering state.

**In Reaper you have to make sure "Inform plugin of offline rendering state" is checked for this function to work correctly. Check your DAW if such an option exists.**

### Quality

#### Low

This setting allows the plugin to use linear interpolation for it's algorithms, which is a very efficient, but a bad sounding approach for digital audio. By using enough data points the "numerical error" is kept to a minimum, but the SNR (Signal to Noise Ratio) is still bad.

#### High

This setting allows the plugin to use cubic spline interpolation for it's algorithms, which is a very inefficient, but a better sounding approach for digital audio. This interpolation algorithm finds the unknown data points in a very smooth way, while keeping the SNR fairly low.

#### Stereo mode:

Processes a stereo-pair of guitars simultaneously, with the same settings.  
Keep the inputs hard-panned left/right to avoid signal bleed between the channels!

## License Activation

The plugin won't be fully functional until you provide it with a valid license file.

Follow these steps to complete the software activation.

**Please note that renaming the license file is not allowed! If you do so it will be detected by the software and activation will be refused!**

### Online Activation:

- 1) Enter your username/e-mail address.
- 2) Enter your TSE Audio account password.
- 3) Press "Request and install license" to automatically download and install the license file.

*Please note that an active internet connection is required for this step.*

### Offline Activation:

- 1) Enter your e-mail address.
- 2) Click 'Browse' and locate your XLIC license file that you should have gotten after the initial purchase step.
- 3) Click the 'Register' button and follow any instructions.

Please note that the original version 2.0 license file is **NOT compatible** from version 2.3 and up. Please log into your account so you can request or download the new version 2.4 license file.

## Troubleshooting

### ***The plugin makes no sound at all, why is this happening?***

You have most likely not activated the software yet, or the license file has moved to a different location and the software can't find it anymore. Please check the license activation window and double check that it still says you are registered. If not, simply redo the steps mentioned in the License Activation chapter.

### ***The plugin occasionally makes no sound at all, but the sound comes back as normal after a little while.***

You are running in demo-mode. Please check the answer above.

### ***The plugin is using too much cpu***

X50 is written for modern computers and is using very complex algorithms.

Reduce the oversampling rate and quality while mixing. If you want a higher quality on the mix-down please select Auto 2X/4X or Auto 4X/8X oversampling.

### ***Where can I find the X50 config file or the preset folder on my system?***

The location of the config file depends on the operating system, the standard locations used by the software is as follows:

<b>Windows Vista</b>	C:\Documents And Settings\ <b>Username</b> \Local Settings\Application Data\TSEAUDIO\
<b>Windows 7</b>	C:\Users\ <b>Username</b> \AppData\Roaming\TSEAUDIO\
<b>OS X</b>	/Users/ <b>Username</b> /Application\ Support/TSEAUDIO/

Please note, that these directories are usually hidden. This requires you to make your system show hidden files and folders if you are thinking about getting there by browsing folder by folder.