

# Sonoris Dither VST 1.1

## User Manual



# Introduction

Thank you for choosing Sonoris Dither VST!

## ***What is it?***

Sonoris Dither VST is a high quality audio plugin for mastering purposes. With this plugin, in VST format, you can requantize audio to a lower bitdepth with dither and/or noiseshaping. The dither noisetype is selectable between TPDF and High Pass (HP) TPDF. TPDF is short for Triangular Probability Density Function, a form of dither that eliminates non-linear distortion during re-quantization and has no signal modulation artifacts. The noiseshaping can be set to three flavours: Curve A, B and C or "Off". It is also possible to set noiseshaping without dither. The output bitdepth can be set to 16 and 20 bit or "Off" for no quantization.

## ***About the plugin***

Much effort has been put in maintaining the sound quality. All calculations are performed with 64 bit integer math except for the noiseshaping filters.

It is advisable to patch the dither plugin as the last effect in the whole chain. Only a metering plugin may be patched after it. So, all signal processing, should be done before dithering, including gain changes and samplerate conversion!

## ***About this helpfile***

This helpfile explains all settings and options. Basic understanding of dither is needed.

Have fun!

## What is dithering?

When audio is requantized from a higher to a lower bit depth there will be a quantization error. This error is correlated to the input signal and has unwanted harmonics. The result is non linear distortion and some people claim this to be the source of a "harsh" or "digital" sound.

When low level white noise is added to the signal, prior to the requantization process, the quantization error will become random and uncorrelated with the input signal resulting in a white noise spectrum. In other words: the non linear distortion is changed into white noise, resulting in a lower signal to noise ratio. However, the human ear is capable of hearing signals below this noise and the perceived dynamic range of the system will increase. It is possible to get 20 bit performance with a 16 bit system with proper dithering.

The noise is at a very low level, but noiseshaping can be used to minimize the audibility of the noise even further. Noiseshaping is the process of changing the noise spectrum in a way that noise is moved from frequency areas where the ear is most sensitive to areas where sensitivity is less. The total noise power will be the same and the dither function remains intact, but the noise is less hearable resulting in a higher perceived dynamic range.

## Features

- supports 2 dither types:
  - TPDF (Triangular Probability Density Function)
  - HighPass TPDF
- 3 noiseshaping curves:
  - curve A: 5th order
  - curve B,C: 9th order
- dither and noiseshaping independant adjustable
- dither is generated in assembly language
- quantization to 20 or 16 bit
- full automation possible.
- low CPU load.
- 64 bit integer math throughout the signal path, except for the noiseshaping filters.

## Dither type

The dither type can be set to "Off", TPDF and HP TPDF. When set to "Off", you can still apply noiseshaping. The difference between TPDF and HP TPDF is that in the latter case the noise is shifted a bit to the higher frequencies, above about 2KHz.

When TPDF is used without noiseshaping, the result is flat TPDF.

This setting is automatable.

# Noiseshaping

Noiseshaping can be set to "Off", curve A, B or C. The difference between the curves is subjective and should be set by taste. Some technical specifications:

curve A: 5th order noiseshaping filter following an improved E-weighted response.

curve B: 9th order noiseshaping filter following an improved E-weighted response.

curve C: 9th order noiseshaping filter following an F-weighted response.

Important note:

When you know that after the dither/noiseshaping is applied, further processing of the signal will be needed, it is advisable that no noiseshaping is used.

This setting is automatable.

## Bit depth

With this parameter you can set the final bit depth: 16 or 20 bit. When set to “Off”, the effect is the same as bypassing the plugin.