



SONALKSIS

Ultimate-D



Operation Guide

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Sonalksis Ultimate-D

Introduction

This guide describes the features, operation and applications of the Sonalksis Ultimate-D. For detailed installation instructions, please refer to the Sonalksis Plug-in Manager User Guide. You can read more about general features common to all Sonalksis plug-ins in the Universal Plug-in User Guide.



Ultimate-D is an end-chain mastering tool providing variable re-quantization using proprietary Sonalksis 'dither' and noise shaping functions for supreme digital resolution enhancement. The processor combines these advanced processing techniques with a unique interface that contains intuitive parameters, very unlike traditional re-quantisation processors.

Of all 'standard' digital audio processes, re-quantization is arguably the least understood, and is certainly the least intuitive process to apply, given the usual array of 'noise shape' and 'dither type' options. Re-quantisation is a necessary process that usually takes place at the end of an audio processing chain, when very high resolution recordings are tailored for the final lower resolution listening medium. Even when mastering to the highest quality consumer media, it will often be necessary to reduce the audio signal down from a 64-bit or 32-bit floating point resolution to a 24-bit fixed point resolution, and if mastering for a 16-bit CD then the amount of 'quality' data that must be discarded can be large.

If all these small chunks of data that 'don't fit' on the final media are simply thrown away, an unsettling low-level distortion is created. However techniques known as dithering and noise-shaping help both to de-correlate this distortion (making it sound more pleasant) and also to increase the perceived resolution of the signal compared to a simple 'cut down' version by displacing any noise to less audible parts of the audio spectrum.

The Ultimate-D perceptibly increases the quality of the audio after re-quantization. It achieves this by applying a combination of proprietary dither and noise shaping algorithms. However the main difference between Ultimate-D and other re-quantisation processors is that the arcane dither types and esoteric noise shape curves are concealed behind an intuitive, simple interface that automatically determines the amount of dither, the type of dither, and the shaping of the noise depending on definable characteristics of the audio.

Installation



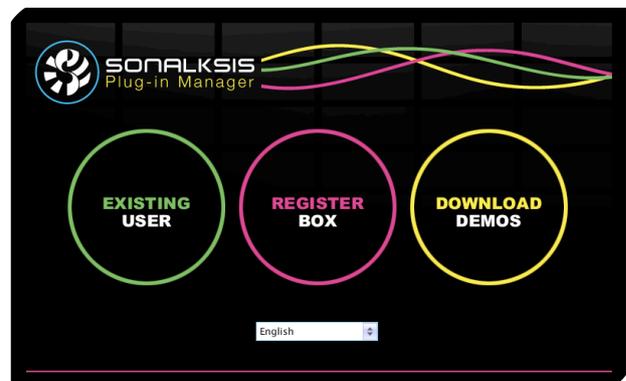
...with the *Plug-in Manager*

All Sonalksis plug-ins are installed using the 'Plug-in Manager'. The Plug-in Manager simplifies the task of managing multiple Sonalksis plug-ins, and takes care of downloading, installing, authorising and updating your Sonalksis plug-ins.

Detailed instructions can be found in the *Plug-in Manger User Guide*.



If your audio computer is not internet enabled, you must go to the 'Product Activation' section on the Sonalksis website in order to obtain an authorisation file. You will need the 'Activation Code' that is displayed when you run the Plug-in Manager on your offline system. You can then download your authorisation file which you simply need to drag-and-drop onto the Plug-In Manager window.



Authorisation

If your computer is internet enabled, all license authorisation takes place automatically. When you install Sonalksis plug-ins, any plug-ins for which you have licenses will be authorised by the Plug-in Manager.

Unlicensed Sonalksis plug-ins will function for 14 days after installation without authorisation, after which the plug-ins will no longer process audio. After this period, you can still reactivate a plug-in by obtaining a valid license.

Operation

This section describes specific functions of the Ultimate-D advanced resolution enhancement processor for word-length reduction. You can read more about general features common to all Sonalksis plug-ins in the *Universal Plug-in User Guide*.

Four Simple Switches

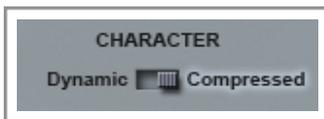


Quantize – this determines the output bit-depth, and should be set according to the resolution of the medium for which you are re-quantizing.

Application – There are often several stages during the recording process where resolution is lost, and re-quantisation should ideally be applied at every stage where this occurs. The Application parameter should be set to 'Tracking' if the plug-in is not being used at the very end of the recording chain, and set to 'Mastering' if the plug-in is the last process being applied.



This parameter actually determines the dither type used. Certain dither types (or rather a dither with certain attributes) are not suitable for multiple applications (i.e. using it on a track which is then bounced and re-quantised again), as the cumulative effects are detrimental. However these dither types actually tend to be optimal when no further processing will take place, therefore it is necessary to tailor the attributes of the dither according to whether it may be used cumulatively or not. The 'Off' setting can be used to turn off the application of Dither altogether, if you want to re-quantise while applying only noise shaping.

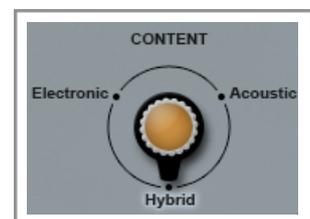


Dynamic/Compressed – you should set this switch according to whether the audio signal is very dynamic (for example a purist symphony orchestra recording), or compressed (for example a highly volume-maximised rock radio-mix). This can be a subjective judgement, however in most cases it will be obvious

which category the audio fits.

Internally this parameter affects the amount of dither applied. When 'Compressed' is selected the level of dither is increased, minimising distortion but making any noise more audible during low levels. When 'dynamic' is selected, the level of dither is reduced, which means distortion levels are slightly higher but the noise is less audible during low levels. This is usually a reasonable treatment for the dither levels, as compressed audio will generally be less susceptible to perceiving higher noise levels.

CONTENT – use this switch to select the setting which most closely reflects the general content of the audio. If the content is almost exclusively of synthetic origin (i.e. computer generated synthesised sounds) then switch to 'Electronic'. For pure real-world recordings switch to 'Acoustic' and for content that contains a mixture select 'Hybrid'.



The **CONTENT** parameter internally selects the noise shaping curve to use, and will generally suit the signal due to the specific frequency characteristics and masking potential of the respective audio content.

There is no objectively 'perfect' resolution enhancement algorithm as psychoacoustic factors mean that the algorithm will need to differ according to the audio, and furthermore there is a balance to be maintained between reducing distortion to produce 'better sounding noise', rebalancing the noise to make it less audible, and increasing resolution to the maximum. Ultimately psychology means that different people will have different preferences regarding which balance is optimal. However there are certainly objectively 'bad' re-quantization algorithms in use, and Sonalksis has undertaken much research both in areas of psychoacoustics and re-quantisation mathematics in order to produce what we believe is a system as capable as the very best available – but with an interface designed for audio engineers, not mathematicians!

The Global Programme Controls



The **A/B**, **A->B** and **Reset** buttons relate to the plug-in parameters as a whole. The collection of all parameter settings is known as a 'programme'. The Ultimate-D is equipped with two programme buffers ['A' and 'B'] that can store an entire set of control parameter values at the touch of a button. The active parameter buffer is highlighted on the **A/B** button and can be copied to or swapped with the inactive one using the **A->B** button. This can be useful for auditioning comparisons of different plug-in setups.

Clicking the **Reset** button will set all plug-in parameters to their default values. Setup preferences will remain unaffected however.

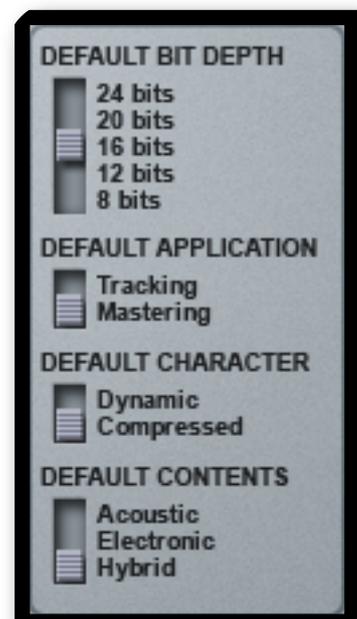
Preferences



The default parameters are user-defined, and can be altered in the preferences. These preferences are set via a number of switches on the 'backplate', which is accessed by means of the **Setup** button in the top left corner of the interface.

The preferences for the Ultimate-D define the state of front panel switches when the plug-in is initially opened.

Once you have accessed the preferences, you can exit the backplate either by selecting '**Save as default**', which saves any changes you have made, or '**Cancel**' which ignores any changes you have made.



Support



You can visit the [Sonalksis website](#) to find the latest product information. If you are a registered user you will automatically receive relevant information about new releases and updates, unless you unsubscribe from this service.

All Sonalksis plug-ins are installed, authorised and updated using the 'Plug-in Manager' application. You can download this application from the Sonalksis website.



If you encounter any difficulties when installing or using our products, please ensure that you have read all appropriate documentation, including the relevant user guides and FAQ on our website before contacting us.



If you are unable to resolve your issue after reading all appropriate documentation, you can log in to your Sonalksis user account on our website, and access the 'Support' section where you can request direct assistance.

www.sonalksis.com/support

Address

Sonalksis Ltd.
27 Parliament Street
Liverpool
L8 5RN
United Kingdom

Tel: +44 (0)151 3240022
Fax: +44 (0)870 3305980

Appendix: Technical Specifications

Ultimate-D Supported Sample Rates:

- 44.1 kHz
 - 48 kHz
 - 88.2 kHz
 - 96 kHz
 - 176.4 kHz
 - 192 kHz
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NOTICE

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