

Sonnox Oxford Inflator

Operation Manual

Version 1.1 21st November 2011

1. Introduction

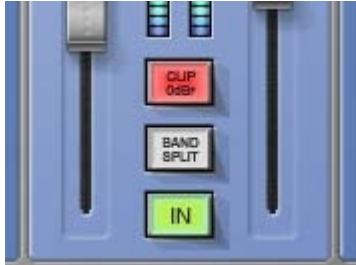
The Sonnox Oxford Inflator plug-in is designed to address the current preference to produce the maximum apparent loudness from popular music mixes. Many processes are already in use, which are variously reliant on compression and limiting to produce maximum modulation and try to give an impression of excitement to the sound of the programme. The Inflator plug-in goes further than these methods and can increase the loudness of almost any programme material, regardless of the levels of prior compression or remaining dynamic range. It will even make full level white noise sound louder! The Inflator plug-in can also be used to create much of the warmth, character and dynamic excitement of analogue systems within the digital domain.

The Inflator process functions by changing the relative probability of samples in the programme material such that there is a greater probability of larger values than the original signal. The Inflator does not employ signal compression, so there is no 'pumping', dynamic level change, loss of presence or flattening of percussive attacks. The full dynamic information of the music content is largely preserved despite the increase in average modulation density.

In addition to loudness enhancement, the Inflator can create a harmonic profile in the signal spectrum that not only increases the apparent dynamic impact of instruments and performances, but also provides 'warmth' to the programme, reminiscent of good valve systems. When used in this way, the Inflator even has the ability of good valve systems to produce great sounding programme when significantly overdriven, and can therefore be used as an artistic enhancement tool on single performances within a mix.

2. Operation

2.1 Input Clipping



The Inflator process develops internal signal levels that are notionally greater than digital maximum. For instance, with the **EFFECT** level at maximum and the **Clip 0dB** off, signal peaks above notional digital maximum can be accommodated, and much of their harmonic information can be included in the output signal, even though the peak output level will not rise above digital maximum. The presence of this extra signal range is displayed on the upper sections of the **INPUT** level meter, and represents a range of up to +6dB of useable overdrive before hard clipping occurs.

The **CLIP 0dB** function suppresses this extra range and restricts the Inflator process to the normal digital maximum range. Therefore, you will note that, with **CLIP 0dB** selected, the input level meter will not rise above 0dB, however much input gain is employed. Because the potential applications of this process are so varied, you are encouraged to experiment with **CLIP 0dB** on and off, to obtain the best results depending on your intentions. Here are some general guidelines:

Generally it is better to start by selecting **CLIP 0dB** on (the default) for most loudness enhancement purposes including direct mode (non-band split) since the control of peak levels, settings and sound character is more readily achieved when a maximum reference level is imposed on signals before the Inflator process.

In certain cases better results may be obtained by de-selecting any input limiting. In particular, the extra useable range can then be used to accommodate short-term overshoot sounds produced by compression functions, where they are generated to enhance attack and presence. Since these peaks are mostly short duration, they can often be accommodated effectively in the overdrive ranges without excessive reduction of sound quality or loss of average modulation. Please note that in this case it is important to ensure that the peaks from any prior compression are not clipped between plug-ins, by making sure that the output signal from the compressor does not quite hit peak levels *before* applying it to the Inflator plug-in.

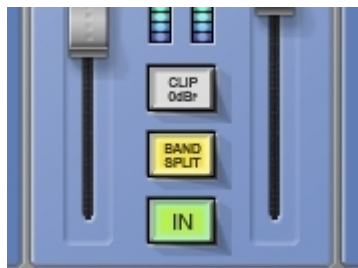
When using **BAND SPLIT** modes for loudness enhancement, using the Inflator with **CLIP 0dB** *off* may produce a reduction in unwanted intermodulation side effects when pushing for absolute maximum loudness, regardless of possible output clipping etc.

When using direct mode (without band splitting) for distortion generation, the results will be quite different with or without input clipping, and may produce useful artistic effects in either circumstance. The Inflator is able to soften clips that occur, either because of the **CLIP 0dB** setting, or even those that happen before its own processing in prior plug-ins. Therefore overdriving the Inflator with the **CLIP 0dB** function both on and off, or even applying the Inflator to the output of other plug-ins driven into overdrive, can produce a vast range of artistic effects. To explore the full range of possibilities, the importance of experimentation cannot be overstressed.

2.2 Direct and Band Splitting Modes

The Inflator application can run in either direct or band splitting modes.

In normal operation, the complete frequency range of the programme is processed simultaneously. This is usually the best way to run the process under most conditions. One significant advantage of using this mode is that the output relative peak level will not get larger than peak level, however much Effect is applied. Therefore more overall enhancement is possible before clipping the output, and louder more powerful results are possible. Also, when used for distortion generation, the relative phase of the distortion harmonics are better preserved when band splitting is not used, so accurate clip rounding is possible, thus producing a much more pleasing effect.



The **BAND SPLIT** function is offered as an additional mode that may be useful under some specific conditions. When band splitting is selected, the processing is split into three frequency bands to avoid intermodulation distortion between parts of the programme signal spectrum. This mode is occasionally advantageous when going for maximum loudness enhancement where there is a significant predominance of specific frequency ranges in the programme content. However it should be noted that, depending on programme and settings, operation in this mode produces output levels that are beyond the relative input peak level. This means that the signal is more likely to clip at the output, which may produce an increased harshness to the sound. If this becomes obtrusive, reducing the input or output levels to avoid clipping will obviously somewhat negate the purpose of the exercise!

2.3 Basic Loudness Enhancement Procedure

For basic loudness enhancement, the procedure is to get the programme up to maximum normalised level at the input (0dB_r) in order to fully benefit from the Inflator process, apply the Inflator processing to get the desired effect, and then adjust the output level to maintain desired maximum modulation.

Start with the **CLIP 0dB_r** function selected to limit the range of the Inflator to normal digital maximum.

Using the **INPUT** level control and input meter, set the level such that the red **0db** over indicator flashes occasionally to indicate the presence of max peak sample values.

Set the **OUTPUT** level control to maximum initially, so that the input and output meters have similar readings when the music is played.

Set the **CURVE** control initially to its mid position (default) and deselect the **BAND SPLIT** button.

Start with the **EFFECT** level control at 100% to obtain the maximum increase in perceived volume without extra peak output level.

The object of the exercise is to get the input level as high as possible without excessive distortion or deterioration in the sound. The type of programme material and taste will determine the extent of the enhancement that can be achieved. If it is found that the programme material is not significantly degraded at normal peak input levels, further gain in loudness may be achieved by de-selecting the **CLIP 0dB_r** button and pushing the input level into the Inflator overload region,

It is important to note that output overloads are entirely avoided only when the Effect level control is set to maximum position (100%).

In general the best results are most likely to be obtained by operating the Inflator **EFFECT** level at maximum, and adjusting the **INPUT** level and **CURVE** control to produce the best sonic compromise.

Further user modifications to the Inflator process can be invoked to gain either greater loudness or different characteristics in sonic detail, as described below.

2.4 Metering and Overload Indication

For most workstation applications, the metering overload warning indicator is intended to correspond to digital maximum modulation. Different software host applications (and different versions of those applications) may present varying interpretations of what this actually represents numerically. Because the Inflator requires a very accurate and independent internal representation of numerical maximum, differences in overload indication may arise between the Inflator and host applications. However since the Inflator overload indication is set to respond to full level samples very precisely, it will produce legal programme if overloads are not being recorded on the plug-in GUI, even if overload indications are being triggered within the host mixer application.

Further user modifications to the Inflator process can be invoked to either gain greater loudness or different characteristics in sonic detail, as described below.

2.5 Curve Modification

The **CURVE** modification control subtly affects the characteristic of the Inflator process to affect both the perceived loudness and tonal character of the signal.

With the **CURVE** control set at its minimum position (-50), the Inflator produces the most subtle changes to the sound. Overall loudness enhancement is minimal but significant harmonic content is added to produce a richer overall sonic character. When applied to composite mixes, the predominantly loud parts of the mix will apparently be accentuated over the background and reverberant parts of the programme, producing the effect of dynamic expansion (without a time constant).

This setting is particularly useful when treating drums and percussion instruments, when the impression of dynamic presence needs to be enhanced, or the contribution to the mix needs to be ‘tightened up’. This kind of setting is also useful when used on single instruments (such as acoustic guitars) where a softening of percussive aspects or ‘highs’ is needed without loss of apparent dynamic range.

Settings of the curve control between -50 and around zero have varying degrees of this behaviour and style of overall impression, but with increasing ‘fatness’ and volume as the curve control is advanced.

The **CURVE** control at its mid position (default zero) produces a special behaviour, which in many respects may give the best results in most situations. The overall loudness of the signal is considerably enhanced whilst retaining good dynamic balance between loud and soft portions of the programme, with a minimum of intermodulation effect. The sonic character has a much enhanced warmth and harmonic detail, adding presence and texture to instruments, especially in the low frequency register. The highs and peaks in the programme are softened in character without loss of apparent presence, attack or ‘bite’. Occasional peak programme overloads are softened and become less intrusive and can therefore be tolerated more readily. With the **CURVE** control in this position, the Inflator produces a gentle and forgiving behaviour, which has many aspects in common with the character of good valve amplification systems, including a natural tolerance to overload conditions. For example, when used in direct mode (band splitting de-selected) with **CLIP 0dB** selected and the **EFFECT** level set to 100%, even clipped programme signals can be rendered musical in nature. This can be used to produce artistic distortion effects on single instruments within a mix or produce dynamic ‘breaking up’ effects, much like that possible with valve amplifiers. Or you may just want to obtain an overall valve-like character and warmth to the sound.

At positions between 0 and +50 the CURVE control provides increasing ‘fatness’ and volume enhancement at the partial expense of dynamic precision, producing the loudest and most exciting effects at +50. In this position the sound becomes most powerful with a harmonic profile reminiscent of systems under great stress and running to their very limits. The music will take on an ‘in your face’ quality, creating the maximum excitement yet fine detail and subtleties within the mix will be retained. Despite rendering the signal significantly louder, the impression of considerable dynamic range is retained even though the output peak level range is largely unchanged. The low level and background parts of the mix will become enhanced and more audible and extreme LF contributions from instruments such as basses will stand out more readily on smaller reproduction systems. Programme treated with this process will produce louder sounds on all reproduction equipment, and in particular it will produce unsuspected volume and power from small domestic and portable systems.

2.6 Mixing with the Oxford Inflator

The Inflator can bring added benefit to the mixing process if it is inserted on the main output buss throughout the mixing session. In this case it is possible to use the valve-like harmonic characteristics and the extra overload area to greater advantage, because these form part of the sound of the mix as it is built up. In some respects this process is reminiscent of analogue mixing where line-up operating levels may be breached by transients without actual signal clipping, and the sonic character of the signal chain is to some degree dependent on balance and instrument contribution levels.

It is suggested that, in this case, the best initial settings are with the Inflator set to direct mode (ie. not band split), with the **CURVE** control set to the mid position (0) and with **CLIP 0dB** de-selected. The input gain should be set somewhat above unity (+6dB) to allow the mixer to operate without clipping overshoots prior to the Inflator, and the output should be set to max (0db) to provide full output modulation. These settings will establish a virtual operating level at –6dB_r within the mixing environment, with a possible overload area provided by the Inflator process for short-term level peaks to be accommodated without clipping. The Inflator input and output meters can then be used as main output buss level reference monitors during the mix session.

2.7 Distortion Generation

For distortion generation, it is best to proceed initially with the **EFFECT** level set to maximum so that the nature of any distortion can be assessed. The idea is to increase the input level with the Inflator fully operational, and the **OUTPUT** control reduced somewhat to avoid output clipping, whilst listening to the results with various degrees of deliberate and significant signal overdrive. The **CURVE** control and **CLIP 0dB** selector will both affect the sound of the results, depending on the programme material being processed. However, the best results are most likely to be obtained with the **CURVE** control set to its mid (0) position, as this produces the least higher order harmonic levels and most resembles the dynamics behaviour of valve systems. In general, it is best to avoid band-splitting mode if aiming for natural warmth and valve overdrive sounds. Input clipping will dramatically change the nature of the distortion in overdrive situations and you are encouraged to experiment with the **CLIP 0dB** selector both on and off, and changing the order of plug-ins in the signal path.

3. Description of Controls



Input Section

INPUT fader – sets the input level to the Inflator process. For full level input signals, maximum peak input is obtained with the fader set to 0dB. Further gain beyond is provided to allow lower level programme to be boosted to full modulation, and allows the Inflator to be deliberately overdriven to produce distortion effects.

INPUT value – shows the value in dB of the parameter set by the input fader. The value can be modified by clicking in the window.

INPUT meter – the input meter displays the input drive levels. With the **CLIP 0dB** button (in the Effect section) de-selected, the meter displays the level of overdrive applied to the Inflator process. The meter will be mono or stereo depending on the material content.

Effect Section

EFFECT fader – sets the amount of the overall Inflator effect that is applied to the programme, from 0% to 100%.

EFFECT value – shows the value in dB of the parameter set by the **EFFECT** fader. The value can be modified by clicking in the window.

EFFECT meter – indicates the degree of average signal modification in real time, depending on programme type and Inflator settings.

CURVE fader – modifies the processing characteristics and sonic effect of the Inflator.

CURVE value – shows the value in dB of the parameter set by the **CURVE** fader. The value can be edited by clicking in the window.

CLIP 0dB – when this button is selected, internal processing levels are restricted to the equivalent of normal digital maximum. When de-selected, internal processing may develop and process signals beyond the equivalent of digital maximum.

BAND SPLIT – selects processing on the direct full band signal or invokes a band splitting function that processes the signal separately in the LF, MF and HF spectral regions.

IN – This switches the Inflator process in and out for comparison purposes.

Output Section

OUTPUT fader – sets the output level to allow adjustment of the signal level after processing.

OUTPUT value – shows the value in dB of the parameter set by the output fader. The value can be modified by clicking in the window.

OUTPUT meter – the output meter indicates 0.5 dB per segment for the top 10dB of dynamic range, and a smaller scale thereafter. The meter will be mono or stereo depending on programme content.

Sonnox Menu Button

Clicking the **Sonnox** button produces a drop-down options menu (see right).

Clip Lights... – can be set to hold for 2 seconds, 5 seconds, or Indefinitely.

Enable Sonnox Toolbar – displays or hides the Preset Manager Toolbar.

Show Preset Name Path – displays or hides the preset name path in the Preset Manager Toolbar.

About... – displays the date, version and build number of the plug-in.



4. Preset Manager Toolbar

The Oxford Inflator plug-in comes equipped with its own Preset Manager Toolbar, which is displayed at the top of the plug-in window (see right) as if the host created it. The reasoning behind this is to allow increased portability of your presets across all the host applications, while also providing a consistent and versatile interface. While most host platforms allow creation and loading of presets, those host-created preset files are not portable between different host applications. With the preset manager for Oxford plug-ins, you can create a named preset in one host application and load it while using an alternative application.



The **Sonnox** Preset Manager is fully described in a companion document — ‘Sonnox Toolbar and Preset Manager Operation Manual’ — available for download on the Support Documentation page of the **Sonnox** website: www.sonnox.com

5. Specifications

5.1 Plug-in Instantiation Count for AAX-DSP

The table below shows the number of plug-in instantiations possible in a single chip at three sample rates.

ProTools HDX		Instantiations per chip per sample rate		
		48 kHz	96kHz	192kHz
Band Split	Mono	26	12	6
	Stereo	13	6	3
Single Path (Direct)	Mono	81	39	18
	Stereo	41	20	9

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7. Manual Revision History

Version 1.0 date 1st April 2007 – Generic Sonnox version.

Version 1.1 date 22nd November 2011 – Updated to reflect current software version

Platform Specific Supplement

S1. Supported Platforms

Avid Pro Tools (LE, RTAS, M-Powered, Pro Tools HD) and Pro Tools 10 (HDX & Native)

VST Native

Audio Units Native

S2. System Requirements

These requirements are current at this revision of manual. For latest system requirements, please see the website www.sonnox.com

Pro Tools

Pro Tools 7, 8, 9 & 10

Approved Pro Tools CPU, OS and hardware configuration (see www.avid.com)

Mac OSX 10.4 or higher

Windows XP / Vista 32 & 64 bit / Windows 7 32 & 64 bit

Ram 1GB minimum

iLok USB key with latest drivers

Audio Units

Audio Units compliant host application (e.g. Logic, Digital Performer etc.)

Mac OSX 10.4 or higher

Ram 1GB minimum

iLok USB key with latest drivers

2nd generation iLok required for 64-bit plug-ins

VST

VST compliant host application (e.g. Nuendo, Cubase, WaveLab etc.)

Mac OSX 10.4 or higher

Windows XP / Vista 32 & 64 bit / Windows 7 32 & 64 bit

Ram 1GB minimum

iLok USB key with latest drivers

2nd generation iLok required for 64-bit plug-ins