

ENSO

AUDIODAMAGE

TRIGGER

LENGTH MULT

POST RECORD

LENGTH UNIT

REC & STOP

INPUT MONITOR

FEEDBACK

DUB IN PLACE

3

1/4

FREE

MODE QUANTIZE

+

+

+

+

Lead Bouzouki

×

START 4

LENGTH 4

]

[

1

2

3

4

SECTOR

SECTOR XFADE

1:1

LINK

RTZ

1.28

PLAY SPEED

-2.00

REC SPEED

FX & LEVELS

MIDI CONTROL

SETTINGS

TAPE

SATURATION

HISS

FILTER

LOWPASS

HIGHPASS

CHORUS

RATE

DEPTH

LEVELS

INPUT

LOOP OUTPUT

DRY OUTPUT

IN

OUT

v1.4.0

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System Requirements

The following table summarizes the operating system requirements and formats provided for Enso. Enso is a 64-bit plugin.

Operating System	Minimum Version	Formats
macOS	10.13	AAX, AudioUnit, CLAP, VST3; Intel and Apple Silicon
Windows	10.0 version 1607	AAX, CLAP, VST3
Ubuntu	20.0	CLAP, LV2, VST3
iOS (separate purchase)	iOS 16	AUv3

Demonstration Version

We encourage you to download and try the demonstration version of Enso before purchasing it. The demo version of Enso is the same as the regular version, but has the following limitations:

- Presets cannot be saved, nor can parameter values or other settings. This includes the information usually stored by your host DAW. If you save a DAW session with an instance of the demo version of Enso, the plugin will revert to its default state when you reload the session.
- Enso will cease to emit audio altogether 20 minutes after you add it to your DAW session. You can remove it and add it again, but it will revert to its default state.

If you purchase Enso after using the demonstration version, simply run the installer provided to you after your purchase to replace the demo version with the full version.

Introduction

The term *looper* refers to musical devices which record and play back sound in a repetitive manner. Repetition is an inherent aspect of music, but loopers are generally improvisational tools, often used in live-performance contexts. The term itself originates with tape loops—literally physical loops created by splicing the ends of a strip of magnetic recording tape together to create a medium which plays the same recording over and over again. As such, looping is as old as electronic music itself, but the compositional approach of using tape-based delays and looping to build layers of sound is primarily attributed to the mid-20th-century musicians Terry Riley and Steve Reich, followed by Brian Eno and Robert Fripp.

Looping proliferated over the last couple of decades as digital audio technology allowed creation of looping systems that were far more convenient and less cumbersome than tape decks. Digital delays, samplers, dedicated devices and software have inspired musicians of widely varied interests and styles to incorporate looping into their live performances and compositional process. With Enso, we introduce a looper which offers both the convenience and nearly perfect audio reproduction of DSP software with some of the flexibility and desirable artifacts of tape-based systems.

A comprehensive introduction to the history of looping-based music can be found here:

http://www.livelooping.org/history_concepts/theory/the-birth-of-loop/

There's a more technically oriented history here:

http://www.livelooping.org/history_concepts/theory/richard-zvonar-a-childs-garden-of-looping-2002/

and there's all sorts of information about looping at the parent site of those pages:

<http://www.livelooping.org/>

To use Enso, you'll need a 64-bit host application such as Ableton Live, Bitwig Studio, Apple Logic, Avid Pro Tools, etc.¹ We assume that you are familiar with using plugins with your host. If you have general questions about installing and using plugins with your host, please refer to its documentation.

What's New in Version 1.4

Release 1.4 is mostly about how Enso sounds rather than what it does, along with a few new controls and the usual crop of corrections:

- Another major de-clicking campaign. We hate clicks more than you do. This time the fixes are concentrated in the places that were still stubborn: moving or resizing a sector while it plays (short ones especially), switching into overdub while a sector is playing, going from overdubbing back to recording with signal present at the input, and the moment when the record and play heads run into each other.

¹ Product names and plugin format names are copyrighted by their respective owners.

- Better audio quality at speeds other than 1.0. Both playback and recording now use improved band-limited resampling, so fast speeds no longer alias and slow speeds no longer smear. The difference is most obvious down at the bottom of the speed range, where Enso used to get gritty. Recording a loop for the first time at a speed other than 1.0 has also been cleaned up.
- New control: SEAM XFADE, on the Settings panel. Every pass through the loop has a splice at the seam, and Enso has always crossfaded it by a fixed nine milliseconds. Some of you told us that this setting was too long, others said it was too short. Now you can set that time yourself, from 0 to 100 milliseconds. Short settings keep transients crisp; long settings smooth out sustained material that would otherwise bump at the seam.
- Related: a SECTOR XFADE of zero now falls back to the SEAM XFADE time for sector switches, MIDI slice jumps, and RTZ, rather than cutting hard. Since zero is the default, this means those transitions arrive de-clicked out of the box. Setting SEAM XFADE to zero restores hard cuts everywhere, if that's what you're after.
- New control: DRAG RENDER, on the Settings panel. With it on, dragging a loop out of the center display gives you a rendered file, with play speed, direction, and the effects are all baked in, and the seam is crossfaded so the file loops cleanly. In other words, what you hear is what you get. Turn it off for the old behavior, which hands over the raw contents of the buffer.
- New control: TOOLTIPS, also on the Settings panel, for those of us who stop needing the little hover descriptions after the first week.
- The preset manager gains favorites and drag-and-drop, bringing Enso in line with the rest of our current products.
- MIDI Slice mode now observes the SECTOR XFADE setting, and no longer drops the occasional note.
- Fixes: reducing a sector's length to zero while playing would silence Enso and keep it that way until you intervened; overdubbing could go haywire after a sector change; and the effects could be killed outright by rare aberrant signal values. All addressed.

What's New in Version 1.3

If you are coming to 1.4 straight from 1.2, here's what arrived in between. Release 1.3 added a couple of new features, a bit of polishing and tidying, and some errors corrected:

- New feature: Automatic return to zero (RTZ). When engaged, Enso will reset the playback and recording locations to the beginning of the current sector, at one of several intervals. This can be found in the Settings panel.
- New About panel with buttons for contacting us and diagnostic information about your computer.
- Updated preset manager, as seen in recent versions of our other products.
- The "save buffer in preset" setting has been removed. Enso now always saves its buffer in presets. If you don't want this to happen, clear the buffer before saving.
- OpenGL rendering has been removed altogether. It was fun in the beginning, but it just wasn't a viable long-term relationship.
- Many small bug fixes, in response to small bugs brought to our attention by our testers and customers.

The Name Enso

The name Enso comes from the Japanese word *ensō* (円相). It means "circle" but specifically refers to a circle drawn with one stroke of a calligraphy brush, as a practice in Zen Buddhism. The symbol itself, and the practice of drawing it, are rich with tradition; there is a good description at this website: <https://www.modernzen.org/enso/>

A Note for Logic Users

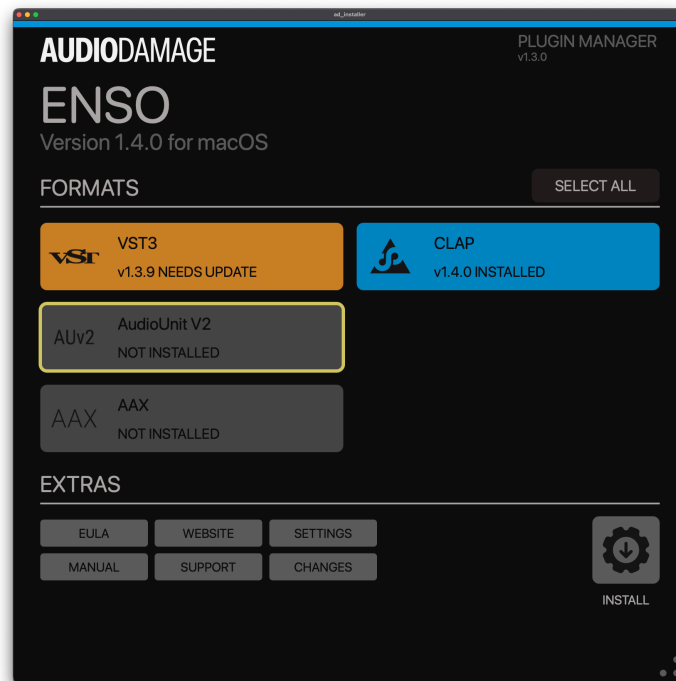
As of October 31, 2023, we and our testers have found that Apple's Logic Pro for Mac version 10.7.9 has a new, more aggressive strategy for suspending the execution of plugins which do not have audio input. While this is a sound strategy (no pun intended) for most audio-processing plugins, Enso often needs to run in the absence of any input signal. Logic's CPU-saving strategy will often cause Enso to stop working altogether for no readily apparent reason. This behavior is beyond the control of any plugin and there appears to be no means for the user to alter this behavior either.

One viable workaround seems to be to put Enso in an instrument slot (as you need to do for any plugin that you wish to control with MIDI). Another method is to insert a utility plugin before Enso which generates a very low-level noise or other signal so that Logic perceives that Enso needs to keep running.

At the risk of editorializing, we will state our opinion that Logic (and its related product Mainstage) are not very flexible host DAWs and are not suited to live-performance looping as well as other hosts.

Installation

Enso uses our custom plugin manager application for installation. Launch it as usual on your operating system of choice and you'll be presented with a window like this:



Near the top of the window, beneath the name of the plugin, you'll see the version number of the software carried by the installer. This is distinct from the version of the plugin manager itself, which is shown in the upper right and usually not of much interest. (Note that the version numbers in this screenshot are for demonstration purposes only and may not reflect the actual version numbers of the software at the time you read this manual.)

Under the heading FORMATS are large buttons corresponding to the plugin formats which can be installed: AAX, AU, CLAP, LV2 and/or VST3, depending on the operating system. If the plugin is already present on your system in one or more formats (i.e. if you're upgrading from a previous version), the corresponding button is drawn in blue. When possible, the version number of the existing plugin is also shown. If the installer contains a newer version of the plugin than the one(s) already installed, the button is drawn in orange to alert you to the fact that an update is available. If a format is not present on your system, its button is drawn in grey.

Click a button to select the format for installation. A yellow outline appears around the button to indicate that its format will be installed. In the above screenshot, AAX and AudioUnit are not installed, VST3 is installed but older than the version contained in the installer, CLAP is installed and up to date, and the AudioUnit is selected for installation. Clicking a button a second time removes the yellow outline, and the corresponding format will not be installed. Clicking the SELECT ALL button selects all available formats for installation.

No changes to your system's storage device take place until you click the INSTALL button near the lower-right corner of the window. Click that button and you'll receive visual confirmation that the format(s) you've selected have been installed. (Yes, it happens quickly. Our products are not encumbered by any DRM or anti-piracy baggage and hence install more quickly than many others.) On Windows and Linux, if you hold down the Shift key on your keyboard, the INSTALL button's label switches to UNINSTALL, and clicking it will remove the selected formats from your system². Once you've installed and/or removed the formats you need, simply close the application in the usual manner for your operating system. You're done. There is no license code or other authorization necessary; we'd rather assume we can trust you than burden you with an onerous DRM system.

You'll find some handy buttons under the EXTRAS heading, all of which are pretty self-explanatory:

- EULA: presents the End-User License Agreement for our products. By clicking the INSTALL button you're implicitly agreeing to these terms, but we expect that you'll find them reasonable should you take the time to read them.
- MANUAL: opens the current version of this user manual, in PDF form, in your web browser.
- WEBSITE: opens the product's web page in your browser.

²Blame Apple, not us, for the lack of this feature on macOS. On macOS just manually delete the plugin(s) from your plugin folder(s).

- **SUPPORT:** displays information for contacting us, either via our Discord presence or through email.
- **SETTINGS:** produces a panel in which you can choose the installation locations for each plugin format. Note that these locations are nominally stipulated by the publishers of the formats and changing them might cause problems for some hosts.
- **CHANGES:** displays a summary of what we've added, changed or improved since the last version of the product. This button isn't present on the first release of the product.

Enso Overview

Before we dive into the details, we'll describe Enso's overall architecture and introduce a few terms. At the risk of oversimplification, Enso can be thought of as an audio recorder somewhat similar to a tape recorder or a voice-memo app on a smart phone: it records audio and plays it back. It plays the audio as if it's a *loop*; that is, when it reaches the end of the recording, it starts over at the beginning. The audio is recorded in what we call the *loop buffer*. Making a new recording sets the length of the loop.

There is only one loop buffer, so Enso can hold only one loop at a time. However, the loop buffer has four regions called *sectors*. Sectors can span the entire loop buffer or any portion of it, and can overlap each other. Once you've recorded a loop, you can play a portion of it by playing one of the sectors. You can also erase, re-record, and overdub within sectors.

Enso can play loops faster or slower than the speed at which they were recorded. Just like a tape recorder, if you play the loop faster or slower, its perceived pitch increases and decreases. Enso will follow tempo changes in your host DAW by speeding up and slowing down in sync. In a deliberate nod to its roots, Enso does *not* apply any sort of pitch or tempo correction when changing speed. Among other things, Enso is a tool for exploring the weird and sometimes wonderful things that happen when audio is played faster and slower than usual. Enso can also play the loop backwards, and even play in one direction while recording in the other.

As audio is played from the loop buffer, it passes through a series of *effects*. These effects distort, soften, and/or blur the loop to give it a new character or make it blend well with new material added on top. Depending on how Enso is configured, these effects can either affect the loop only once as it plays, or in a cumulative manner as it is fed back and re-recorded.

Like most plugins, Enso relies primarily upon your host Digital Audio Workstation (DAW) software to provide connections to your MIDI controller hardware. However, to aid its use in live performance contexts, Enso also has its own MIDI mapping system for connecting MIDI foot controllers and push buttons to many of its software buttons.

Obloid Controls

Enso's user interface has several controls which we affectionately refer to as *obloids*. They look like this:



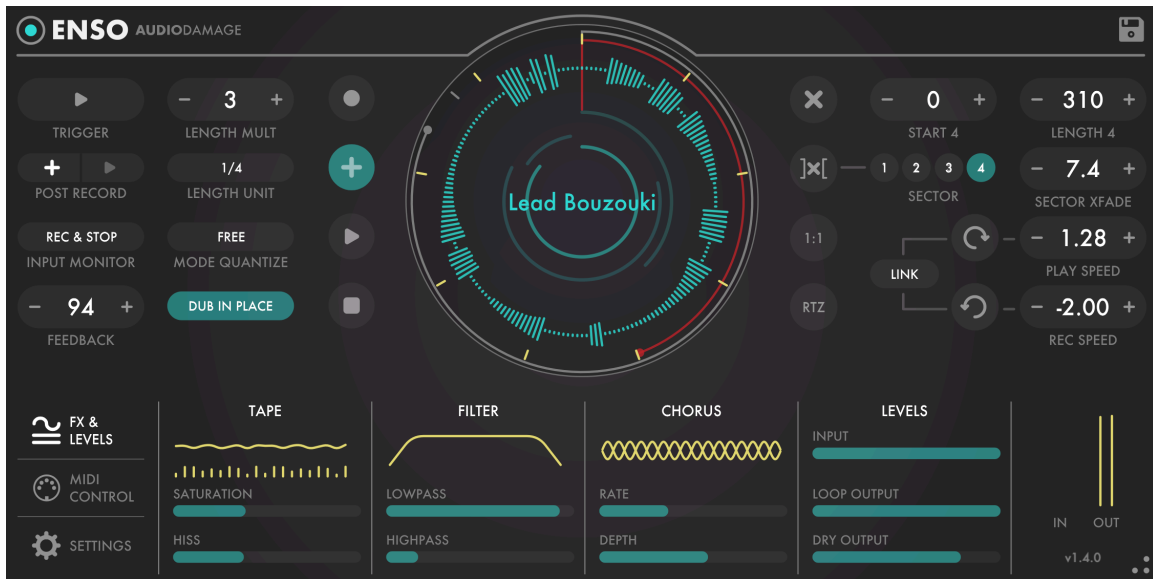
This kind of control handles several parameters in Enso. There are several different ways you can change parameter values with an obloid:

- Click and drag vertically with your mouse or trackpad (or with your finger if you're using an iOS device) to increase and decrease the value.
- Click or tap the minus symbol on the left to decrease the value; click or tap the plus symbol on the right to increase it.
- Double-click or double-tap the numeric value to type in a new value directly. Press the Enter or Return key on your keyboard to finish changing the value, or press Escape to cancel your changes.

Enso's other controls should be self-evident: horizontal sliders which you drag left and right, switches which turn on and off when you click or tap them, and a few popup menus which appear when you click or tap.

The Loop Display

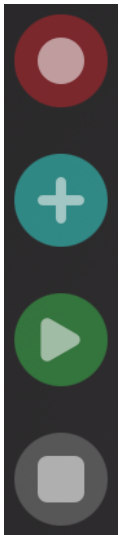
Here's an image of Enso's window. We'll describe the controls in the following sections. You can resize the window by clicking and dragging the three dots at the lower-right corner.



The circular loop display at the center of Enso's window provides a graphical display of the contents of the loop buffer, shows the positions of the sectors, and shows the recording and/or playback position. The beginning of the loop is positioned at the top of the circle (or at 12:00 if it were the face of a clock). If the loop is playing forwards, the playback position moves in a clockwise fashion. Positions within the buffer are expressed in degrees. There are 360 degrees in a circle, so the halfway point, for example, is at 180 degrees. A grey dot and arc indicate the play position; when recording or overdubbing, a red dot and arc show the recording position. The sectors are shown as concentric arcs in the center. In the illustration above, the play position is at about 240 degrees and the recording position is at about 170 degrees.

You can copy the contents of the loop buffer into a WAV file by clicking the circular display and dragging into a suitable destination, such as the desktop of your computer or a sample container in your DAW. You can also import audio files into the loop buffer by dragging them into the circular display. You can even drag buffers between Enso and our other looper plugin Circa.

Mode Buttons



Immediately to the left of the loop display are Enso's mode buttons. You can probably guess what these buttons do by looking at the symbols on them. From top to bottom, the mode buttons are:

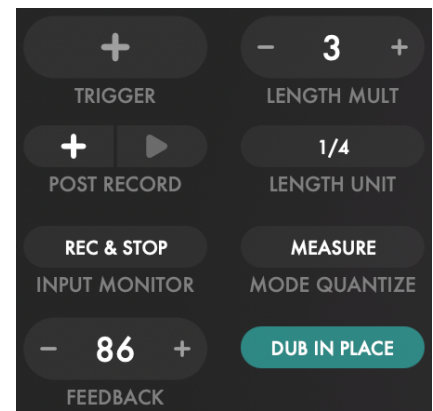
- Record: click this button to start recording a new loop, or record new material into an existing loop, replacing the old audio. Enso doesn't do much of anything until you've recorded a loop, because it uses your initial recording to define the length of the loop buffer.
- Overdub: click this button to record new material on top of an existing loop, adding to the old audio. Overdubbing is affected by the FEEDBACK and DUB IN PLACE controls; we'll talk about this more later.
- Play: click this button to start playing the loop you've recorded or loaded from a file.
- Stop: click this—well, we don't actually have to explain this one, right?

The mode buttons are colored to show which one is active. For illustrative purposes, the illustration shows all of them active at once, a situation that never actually arises in normal operation.

Important: your host DAW's transport must be running to make Enso operate. Enso depends upon its host for timing information and will just sit there doing nothing if its host is stopped.

Mode Quantization

By default, Enso responds to its mode buttons as soon as you click them. For more precise timing you can synchronize the mode changes to metrical intervals. The MODE QUANTIZE popup menu sets the intervals at which Enso will change between the Record, Play, and Stop modes. If you set Mode Quantize to 1/4, for example, then click the Record button, Enso will wait until your host DAW reaches the next quarter-note position, and then begin recording. If you then click the Stop button, Enso will cease recording when the host reaches the following quarter-note position. A grey ring appears around a mode button after you click it while Enso waits to switch modes.



Triggered Operation

The TRIGGER button provides one-touch control of Enso's most basic operations: recording and playing a loop. The Trigger button does different things depending on Enso's current state—that is, what you've done previously. The symbol on the button changes to show you what will happen next time you click it. Clicking the button can: record a new loop, cease recording and switch to playing the new loop, cease recording and switch to overdubbing new audio onto the loop as it plays, or start playing the loop if it's currently stopped.

The LENGTH MULT and LENGTH UNIT controls work together to make Enso record for a specific length. They are relevant only when the loop buffer is empty and you're making a new recording initiated with the Trigger button (not the Record button). The length of the resulting loop will be equal to the setting of the Length Unit control multiplied by the value set with the Length Mult control. To make a slightly contrived example: if Length Unit is 1/4, Length Mult is 8, and Mode Quantize is Measure, and you click the trigger, Enso starts recording when your host reaches the beginning of the next upcoming measure, records for exactly two measures, and then ceases recording.

What happens next depends upon the POST RECORD switches. These switches choose what happens when you click the Trigger button while it's recording a new loop, and/or what happens if Enso finishes recording in accordance with the settings of the Length Mult and Length Unit controls. Depending on which Post Record button is illuminated, Enso will either finish recording and switch to playing the loop, or it will switch to overdubbing, playing the loop and recording new material on top.

Input Monitor

The INPUT MONITOR popup menu chooses whether, and when, Enso passes the signal present at its input through to its output, possibly mixing it with the loop as it plays. There are four options, with the following effects:

- ALWAYS: the input signal is always sent to the output, regardless of what Enso is doing.
- NEVER: the input signal is never sent to the output. If Enso isn't playing a loop, you won't hear anything come out of it.
- RECORD: the input signal is passed to the output only when Enso is recording or overdubbing.
- REC & STOP: the input signal is passed to the output when Enso is recording, overdubbing, or is stopped.

Which input mode you'll use depends partly on how you have Enso set up in your DAW. If you're using Enso on an effects-send channel, sending audio to it from other tracks, you probably don't want the audio it receives to be included in your overall mix, and the Never mode will be useful. On the other hand, if you're using Enso as an insert effect, use one of the other monitoring modes.

Overdubbing: Two Modes

The DUB IN PLACE button affects how new audio is added to the audio already present in the loop when overdubbing. If DUB IN PLACE is turned on, the new audio is added directly to the old audio already in place in the loop buffer, after the old audio's loudness is reduced by the amount set with the FEEDBACK control. For instance, if feedback is set to 50%, overdubbing reduces the old signal by half, adds the new signal, and stores the result back into the loop. This is the way that most contemporary looper pedals and programs work. If DUB IN PLACE is turned off, Enso behaves more like a long delay constructed with a tape recorder. The new audio is added to the *output* of the loop player as it is played, and the mixed signal is recorded into the buffer. Again, before the two signals are added together, the FEEDBACK control determines how much of the old signal is added to the new signal.

Dub In Place and Effects Routing

An important distinction of these two modes is that when DUB IN PLACE is off, the feedback signal passes through Enso's effects before it is added to the incoming signal and re-recorded. When DUB IN PLACE is on, the effects are applied only to the output signal. In other words, if DUB IN PLACE is off, the effects are cumulative, or "stack": the effects are re-applied to the signal with each cycle of the loop. If DUB IN PLACE is on and you briefly wiggle any of the effects controls while overdubbing, you won't hear your wiggling on subsequent passes through the loop. If DUB IN PLACE is off, you will hear your wiggling, because that signal was re-recorded into the loop buffer.

In either mode, entering and leaving overdubbing with the Trigger or Overdub button is *not* affected by the Mode Quantize setting.

Sectors

Once you've recorded a loop, you can divide it into up to four regions, which we call sectors. Each sector can span all or part of the entire loop, and sectors can overlap each other. Four concentric arcs in the center of the loop display show the position and range of the sectors; the current sector's arc is brighter than the others.

The current sector is indicated by, and chosen with, the four buttons labeled SECTOR in the upper-right area of Enso's window. Click one of these buttons to choose the current sector. The obloid controls in the upper-right corner set the position and range of the current sector. These controls operate in degrees; a complete circle has 360 degrees. So, for example, if you set the sector's START to 180 and its LENGTH to 45, it will start playing halfway through the complete loop and play one-fourth of the loop, over and over again. In the following illustration, the sector start settings are 0, 45, 90, and 200; the length settings are 90, 90, 180, and 300. Sector 2 is currently active, as shown by the sector buttons, the brightly illuminated arc in the inner area of the loop display, and the tick marks near the perimeter of the loop display.



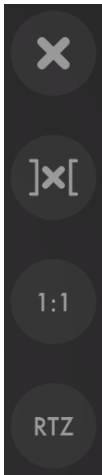
Once you've set the start and length of sectors, you can switch between them by clicking the sector buttons. Changing sectors while playing causes Enso to move the playback position to the beginning of the sector. Enso switches sectors only while playing or stopped; you can't switch while recording or overdubbing. If you try, Enso will postpone your request until you switch it from recording to playing. Also, the MODE QUANTIZE control affects sector changing in the same way that it affects the transport controls.

Crossfading Sectors

The SECTOR XFADE obloid sets a crossfade time for switching sectors. Rather than switching immediately from one sector to another when you click the buttons, Enso will fade out the current sector while fading in the next sector. If the sector crossfade time is significantly longer than the durations of the sectors themselves, you'll hear both sectors playing simultaneously for the duration of the crossfade, the first blending into the second.

Sector Xfade defaults to zero, which prior to version 1.4 meant a hard cut. It now means "use the SEAM XFADE time instead," so that sector switches, MIDI slice jumps, and RTZ are all gently spliced without your having to set anything up. Dial in an explicit Sector Xfade time and it takes precedence, as you'd expect. If you genuinely want hard cuts, set SEAM XFADE to zero. The Stop button always takes effect immediately regardless of either setting.

Other Buttons



The buttons immediately to the right of the loop display perform the following operations:

X: erases the entire loop and empties Enso's audio buffer, making everything ready to record a new loop.

][: silences the audio within the current sector. Audio outside this sector isn't changed. Even if the sector's length is 360, this button has a different effect than the Erase button. Clicking this button does not completely reset Enso; it preserves the length of the currently recorded loop. Hence if the current sector spans the entire loop, you click the Erase Sector button, and then begin recording, your recording can't be longer than the loop you previously recorded.

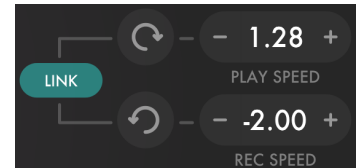
1:1: sets both the Play Speed and Record Speed to 1.00, and both directions to forward.

RTZ: resets both the play position and record position to zero, i.e. the beginning of the current sector. The RTZ button's behavior is governed by the MODE QUANTIZE control in the same manner as the other transport controls.

Speed Controls

The PLAY SPEED and REC SPEED obloids set the speeds of the loop playback and record positions, or "heads," respectively. They both have a range of -4.0 to 4.0. A speed of 1.0 represents a normal play/record speed. Play speeds greater than 1.0 mean that the audio in the loop is played back faster than normal and will sound higher in pitch. A speed of 2.0 is twice as fast as normal, and pitched sounds will be transposed up by an octave. Speeds less than 1.0 mean that the audio is played back slower than normal. A speed of 0.25 is one-fourth as fast as normal, and sounds will be transposed down two octaves. Enso's audio quality is best, and its processing load is lowest, when speeds of 1.0 are used. Obviously, though, speeds other than 1.0 are where the most fun is had. Negative values represent playing in reverse, so a playback speed of -1.0 means playing at the normal speed, but backwards.

Recording speeds are also relative to 1.0. A recording speed of 2.0 means that audio will be recorded into the loop twice as fast as normal, occupying twice as much time and memory. This means that if you record audio with a speed of 2.0 and play it back with a speed of 1.0, it will play at half its original speed and sound an octave lower. In the end, it's the ratio between the recording speed and the playback speed which determines whether the audio you hear sounds



faster or slower than normal. Recording speed can be negative also, meaning that Enso can record backwards.

Since the playback and record heads can have different speed settings, Enso can simultaneously play at one speed while recording or overdubbing at a different speed and/or direction. Yes, this means that the heads can move past each other, a capability which isn't often found in loopers. The results can be strange and unexpected, particularly if DUB IN PLACE is off, which is exactly why we gave Enso this capability.

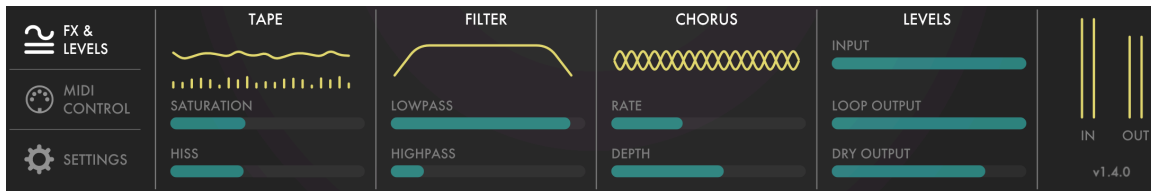
Direction and Link Controls

The buttons with curved arrows to the left of the speed controls change the sign of the PLAY SPEED and REC SPEED obloids, and hence the direction of motion of the playback and record heads. With normal, default settings, both positions move forward in a clockwise manner in the loop display. Click the direction button to reverse the motion of the play position, and you'll hear your loop play backwards. If you reverse the record position, you can record or overdub new material in reverse while the original material plays forwards. There is one exception: when you first record the loop, recording always happens in a forward, clockwise direction, regardless of the recording-direction control. (Like the speeds, the directions are relative to each other, so you can get the same net result of recording backwards by recording forwards and then playing backwards.)

If the LINK button to the left of the speed controls is illuminated, the recording position is linked to the playback position and the REC SPEED control has no effect; the record position is the same as, and moves at the same speed and in the same direction as, the playback position. Turn the LINK button off and on by clicking it. Note that the DUB IN PLACE switch also affects overdubbing, in that if DUB IN PLACE is on, the signal at the recording position is re-recorded, and if DUB IN PLACE is off, the signal at the playback position is re-recorded. If LINK is on, these positions are the same, but if LINK is off, these positions can be entirely different—and can change at different speeds and/or with different directions. Note that the record speed won't visibly change when LINK is on and you adjust the play speed; this allows you to leave the record speed at a different value which takes effect when you turn LINK off.

Effects (FX) and Levels

Enso has several built-in effects which can be engaged to alter the looped recording as it plays. There are three effects: a Tape simulator adds hiss and soft saturation reminiscent of the analog tape recorders originally employed to create loops and long delays; a Filter reduces the high and/or low frequencies of the signal, making it darker or thinner; and a modulated-delay-based Chorus thickens the sound, adds animation, and smears out transients. Each effect is described below. If the controls for the effects are not currently visible, click the FX & LEVELS button near Enso's bottom-left corner.



Tape

Prior to the proliferation of digital audio processing, looping systems used magnetic audio tape. When tape was the only recording medium available, we chafed at its limitations—its finite dynamic range, its inherent noise floor, etc. Digital audio provides nearly perfect recording and reproduction. However, in retrospect, it turns out that some of the limitations of tape contributed to looping and long-delay systems. The inherent reduction in quality created by repeated recording passes slowly erodes the sound, fading it into the background, making auditory room for new sounds recorded on top. Enso's Tape processor, while not a slavishly accurate emulation of analog tape recording, recreates some of this useful audio damage.

The SATURATION slider adjusts a softly curved distortion processor which approximates the signal overload (or saturation) inherent when excessively loud signals are recorded to tape. Moving the slider to the right increases the amount of distortion. The result of this distortion depends heavily upon the original signal; generally speaking, more distortion makes the signal sound louder but also less defined. Enso's saturation process employs some amount of gain compensation so that you can distort the signal without radically increasing its overall amplitude, although you may still have to tweak the feedback setting to control undesired runaway feedback while overdubbing.

The HISS slider adds noise reminiscent of the hiss present in analog tape decks. Enso's hiss has reduced high frequencies to give it an analog-like warmth, and reduced low frequencies to prevent rumbling from building up in the loop. Move the slider to the right to increase the amount of hiss; leaving the slider at the far left turns the hiss off.

Filter

Enso's Filter section contains two filters in series: a high-pass filter for removing low frequencies, and a low-pass filter for removing high frequencies. Each has a single slider for controlling its operating frequency. As you move the LOWPASS slider to the left, the low-pass filter's frequency is reduced, and the high frequencies of the audio are removed. Conversely, as you move the HIGHPASS slider to the right, the high-pass filter's frequency is increased, and the low frequencies of the audio are removed. The low-pass filter has a range of 1kHz to 20kHz, while the high-pass filter has a range of 10Hz to 1kHz. This means that if you leave the sliders at their default positions, the filters have no audible effect.

Chorus

The Chorus processor uses a pair of modulated delays to add animated doubling effects to the loop. There are two controls, DEPTH and RATE. The Rate slider controls the frequency of the modulation oscillator which varies the delay times of the chorus processor. Moving the slider to the right increases the frequency of the oscillator and hence the perceived speed of the effect. Leaving the slider all the way at its left position effectively disables the modulation, and the Chorus will create a sort of comb-filtering effect which may or may not be useful. The Depth slider adjusts the apparent intensity of the Chorus; moving it to the right increases the intensity. If the Depth slider is at its extreme left position, the Chorus processor is inaudible. You may find that it's helpful to move the Rate and Depth sliders in complementary directions while fine-tuning the Chorus effect; i.e. a high Rate setting may sound better with a low Depth setting and vice-versa.

Signal Routing

We mentioned this previously, but it's an important point so we'll reiterate: signals are routed through the effects in two different ways, depending on the setting of the DUB IN PLACE switch. More specifically, the feedback path used while overdubbing is different depending on the switch's setting. If DUB IN PLACE is on, the signal played from the loop is fed back while overdubbing *before* the effects. If DUB IN PLACE is off, the feedback signal is taken *after* the effects.

As a result, Enso's effects are non-destructive if DUB IN PLACE is on. In other words, the effects do not alter the audio present in the loop buffer—they only alter the signal as it's played from the buffer. If DUB IN PLACE is off, the signal re-recorded in the buffer

is potentially altered by the effects, possibly many times if you allow the loop to cycle many times while overdubbing. Again, this difference is relevant only during overdubbing. If you're just playing the loop, the effects process only the output signal.

Levels and Meters

The three level sliders adjust the amplitude or loudness levels of signals as they enter and leave the plugin. Click and drag them to the left to attenuate the signals. Each slider has a range of about -40dB to 0dB (unity gain), but if you slide them all the way to the left, they silence the corresponding signal altogether.

The INPUT level slider controls the level of the signal immediately after it enters the plugin. It affects the signal before it is recorded or overdubbed, and when it passes through the plugin if the Input Monitor mode is appropriately set.

The LOOP OUTPUT slider controls the loudness of the signal played back from the loop buffer. The DRY OUTPUT slider controls the loudness of the signal passed from the plugin's input to its output if the Input Monitor mode and current mode of operation permit the signal to pass through.

There are two stereo level meters in Enso's lower-right corner. They display the relative loudness of the signals entering and leaving Enso. The IN meters reflect the signal after the Input level slider's influence. The OUT meters correspond to the final output signal; that is, the loop's output and the dry signal added together after they are adjusted by the Loop Output and Dry Output sliders (again assuming that the Input Monitor mode is set such that the dry signal passes through). The top of the meter range represents 0dBFS.

MIDI Control

Enso's MIDI assignment options let you assign up to eight MIDI buttons or footswitches to various operations. These assignments can be made in addition to, or instead of, MIDI controller assignments in your host DAW software. Obviously you will have to route MIDI messages to Enso; how this is done varies from one host to another. Consult your DAW's documentation for information about routing MIDI to effects plugins if you're not already familiar with the procedure. You'll probably have to set up a separate track in your DAW for routing MIDI from your controller to the track containing Enso, selecting Enso as the destination for the MIDI connection. Enso will present 16 destinations, one for each MIDI channel, but they are merged internally so it's easiest to simply select the first on the list. Click the MIDI CONTROL button near the lower-left corner of Enso's window to find the MIDI assignment controls.

 FX & LEVELS	MIDI MSG		ON PRESS	ON RELEASE	MIDI MSG		ON PRESS	ON RELEASE	MIDI SLICES	
	D#1	X	TRIGGER	-	C2	X	CLEAR LOOP	-	ON	ACTIVE
	CC 1	X	PLAY	STOP	C4	X	PLAY REV	PLAY REV	60	ROOT
	WAITING	X	-	-	-	X	-	-	9	# SLICES
	-	X	-	-	-	X	-	-		

To assign a controller, click one of the empty ovals underneath the MIDI CC headings. The oval will display "WAITING," indicating that it is waiting to receive a MIDI Continuous Controller (CC) message. Press the appropriate button on your controller. The oval changes to display the CC number it receives, such as "CC 64" for the standard sustain pedal MIDI message.

Then, click on either or both ovals to the right under the ON PRESS and ON RELEASE headings to invoke a popup menu to choose an action. You can assign a separate action to pressing the MIDI controller button, releasing the button, or both. The actions correspond to buttons in Enso's window and should be self-explanatory.

Enso considers a button to be pressed when it receives a MIDI CC message with the value 127, and released when it receives a message with the value of zero. This means that you can also assign knobs and sliders to Enso, and Enso will respond when you move the control from one extreme position to the other.

To remove a MIDI controller assignment altogether, click the small button labeled X to the right of the oval.

The MIDI assignments are stored in Enso's presets. You can save separate template presets for different controllers or situations, and each instance of Enso can have its own MIDI assignments.

MIDI Slices Mode

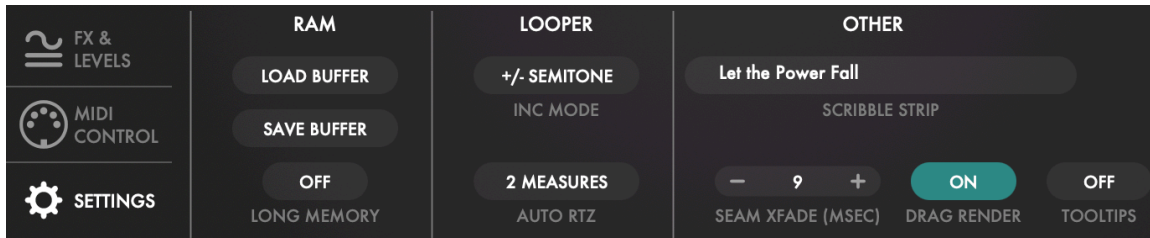
When turned on with the ACTIVATE button, the MIDI Slices mode jumps Enso's playback position in response to MIDI note-on messages. The # SLICES control sets the number of slices or jump points within Enso's loop buffer. The slices are equally spaced, starting at the beginning of the loop, and are indicated by yellow marks around the perimeter of the loop display. After jumping to the beginning of a slice, Enso continues playing indefinitely.

The ROOT control shows the MIDI note number which will trigger the first slice. Click it, then hit a key, pad or button on your controller to set the note number.

Here's an example to show how this all fits together: suppose the number of slices is eight and the root note is 60. Hitting a key on your controller which transmits a Note On message with note number 60 will cause Enso to jump to the beginning of the loop and play from there (assuming that Enso is already playing). Sending a Note On message with note number 64 will jump to the middle of the loop. A Note On message with note number 66 will jump to 3/4 of the way through the loop, and so on.

Settings

The controls in the Settings pane are grouped under three headings. RAM holds the loop buffer's file operations and the memory switch. LOOPER holds the controls which affect how the speed obloids behave, the automatic return-to-zero function, and the crossfade applied at the loop seam. OTHER holds a pair of preferences and the scribble strip.



Saving and Loading the Loop Buffer

You can load audio from files directly into Enso's loop buffer, and you can save the audio therein to a WAV file. Clicking the LOAD BUFFER button invokes a standard file-loading dialog box, allowing you to choose any audio file in the common formats such as WAV, AIFF, and MP3. Enso will convert the sampling rate of the file to match that of your current DAW session and set the loop buffer length to the length of the file. If the file exceeds Enso's maximum buffer length, it will be truncated to fit.

Clicking the SAVE BUFFER button invokes a standard file-saving dialog box, where you can choose the destination folder for the audio file. Enso provides a default name for the file based on the current date and your host's tempo setting, but you can edit this name to your liking before you save the file. Files are stored as uncompressed stereo WAV files with the current sampling rate of your DAW. The audio in the file corresponds to a play speed setting of 1.0, regardless of the current setting of that control.

As mentioned above, you can also copy the contents of the loop buffer into a WAV file by clicking the circular display and dragging into a suitable destination, such as the desktop of your computer or a sample container in your DAW, and you can import audio files into the loop buffer by dragging them into the circular display.

Long Memory

The LONG MEMORY switch determines how much memory (RAM) Enso reserves for recording. By default, the switch is off, and every instance of Enso consumes about 22MB, enough memory for one minute of stereo audio recorded with a 48kHz sampling rate. If you turn on LONG, each instance of Enso sets aside 10 times as much, so that your loop can be up to 10 minutes long (if recorded at 48kHz).

Looper Inc Mode

The INC MODE popup menu selects one of several modes of behavior for the increment/decrement buttons on the Play Speed and Rec Speed obloids, and for the corresponding MIDI assignment targets. The choices are:

- +/- 0.01: changes the speed by adding or subtracting 0.01 to/from its current value. (Yes, that's a relatively small change.)
- +/- 0.1: changes the speed by adding or subtracting 0.1 to/from its current value.
- x2, 1/2: clicking the increment button doubles the current speed, while clicking the decrement button halves it. This produces relative pitch changes of octaves for tonal material. Repeatedly halving the speed will eventually reduce it to nearly zero, whereupon it will be rounded to zero. After that, doubling it will have no effect, since two times zero is still zero.
- +/- SEMITONE: increases/decreases the speed to produce a perceived pitch change of one semitone.
- +/- OCTAVE: increases/decreases the speed to produce a perceived pitch change of one octave.
- +/- 5TH/OCT: increases/decreases the speed to produce perceived pitch changes of fifths and octaves.

The last three modes adjust (or quantize) the speed to the nearest interval. For example, suppose you're using a setting of +/- Semitone. If you're playing a loop with a normal speed of 1.0 and the pitch of the audio is C, clicking increment will raise the pitch to C#, which will be displayed (with rounding) as a speed of 1.06. If you then manually adjust the speed to 1.05, you'll hear a slightly flat C#. If you then click decrement, the speed will go back to 1.0 and you'll hear C again, not a slightly flat C. Putting it another way, the x2, 1/2 setting differs from the +/- OCTAVE setting in that the latter simply multiplies and divides the current speed by a factor of two, while the former snaps the current speed to 2.0, 4.0, 0.5, 0.25, etc.

Auto RTZ

If the AUTO RTZ (for Return To Zero) popup menu is set to something other than Never, its default value, Enso will automatically move the play and record positions to the beginning of the current sector at specified intervals. You can choose intervals of one, two, four, and eight measures. For instance, if Auto RTZ is set to two, Enso resets the play and record positions at the beginning of the first, third, fifth, etc. measures of your DAW's transport timeline. Use Auto RTZ to force Enso to play in sync with your other material, or to create rhythmic effects.

Scribble Strip

Any text you enter in the SCRIBBLE STRIP field is superimposed in the center of Enso's window. This feature lets you differentiate between two or more instances of Enso, ameliorating confusion which may occur when you have many loops running at once.

Seam Xfade

Every time the play position reaches the end of the loop, or the end of the current sector, it jumps back to the beginning, and that jump is a splice. Unless the audio happens to line up perfectly across it, a splice makes a click. Enso crossfades the seam to hide it, and the SEAM XFADE obloid sets how long that crossfade lasts, from 0 to 100 milliseconds. The default is 9 milliseconds, which is the fixed value Enso used before this control existed, i.e. in versions prior to 1.4.

Short settings keep transients crisp, at the risk of letting a little of the splice through. Long settings smooth out sustained material that would otherwise bump at the seam, at the cost of softening anything percussive near the loop points. The right answer depends entirely on what you've recorded, which is why we handed the control to you. Setting it to zero gives you a hard cut.

Note that this is the crossfade applied at the seam on every pass, which is a different thing from the SECTOR XFADE control described earlier. That one governs the blend when you switch from one sector to another.

Drag Render

As described earlier, you can drag a loop out of the circular display and into your DAW or onto your desktop. The DRAG RENDER switch determines what you get when you do.

With DRAG RENDER on, you get a rendered file: the current play speed and direction and all of the effects are baked in, and the seam is crossfaded so that the file loops cleanly. What you hear is what you get, in other words, which is usually what you want when you're moving a loop into an arrangement.

With DRAG RENDER off, you get the raw contents of the loop buffer, without speed changes, effects, or seam treatment. This is the behavior of versions of Enso prior to 1.4. Use it when you want the recording itself rather than the performance of it.

Tooltips

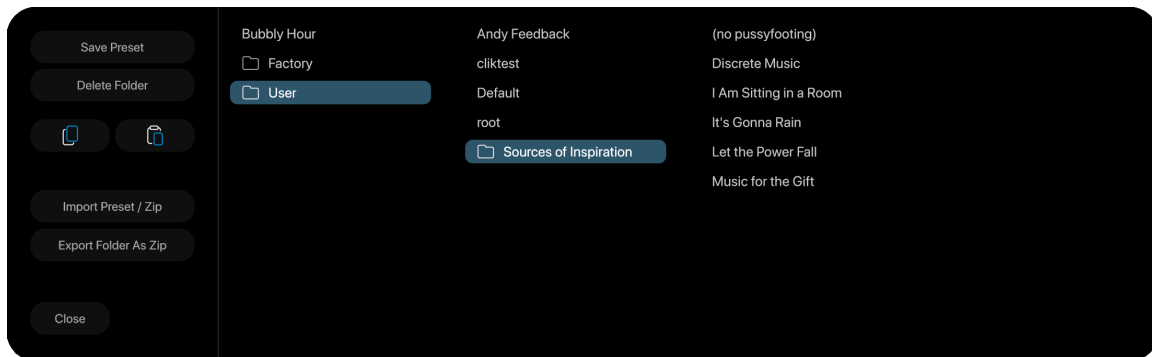
Hover the mouse over any of Enso's controls and a short description of it appears. Once you no longer need them, turn the TOOLTIPS switch off and they stop appearing.

Automation

Most of Enso's controls can be automated using your host's automation features. Consult your host's documentation for information on how to use its automation features. The Trigger button is an exception because momentary buttons often cause feedback problems with DAW automation. This is why the trigger is one of the controls that can be mapped to MIDI messages.

Presets

Enso includes a number of presets to serve as a demonstration of its capabilities and inspirations for your own creations. To access the presets, click the floppy-disc icon near the top right corner of the window to open the preset browser. Click anywhere outside the preset browser to dismiss it.



The browser displays presets and folders in scrollable lists, arranged in columns. The leftmost list shows the presets and folders within Enso's preset collection. Clicking any of these folders reveals its contents in the next list. These folders can contain sub-folders of their own. Clicking on a preset name loads the settings into Enso. Double-clicking a preset name loads the preset and dismisses the preset browser. You can move presets and folders between folders by dragging and dropping them.

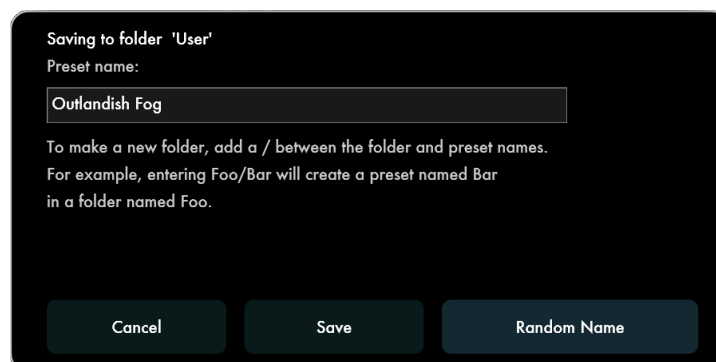
Once you have clicked on any item in the panel, you can navigate within the preset browser with the keys on your keyboard. The left and right arrow keys move the selection between columns, and the up and down arrow keys move it within the list. Tapping the ESC key has the same effect as clicking the Cancel button.

Just like the star at the top of the window which we mentioned previously, the stars to the right of preset names mark presets as favorites. Clicking a filled star removes the mark from a favorite. Once you've marked at least one favorite, a correspondingly named category appears in the leftmost column. Clicking it shows you all the presets you've marked, and clicking their names loads them as usual.

The folders and presets in the browser correspond to folders and files within Enso's own folder on your storage device (i.e. your computer's hard drive or SSD). This folder is located at `C:\ProgramData\Audio Damage\Enso\` on Windows, and `~/Music/Audio Damage/Enso/` on macOS and Linux. You can store your presets anywhere you like, but for them to show up in the User list they must be placed in the User folder within Enso's folder. Also, to avoid possible collisions during future updates, do not store your presets within the Factory folder.

Any folders you create within the User folder will show up as folders in the User list. You can create sub-folders within the User folder, and sub-folders within those folders. You can't nest folders deeper than that because the preset browser has only four lists.

Loading a preset irretrievably erases Enso's current settings, so if you have created a sound that you want to use again, save it as a new preset before loading another preset. To save your own presets, click the SAVE PRESET button at the left edge of the window. This invokes a dialog box with a couple of helpful features. As the text therein describes, you can create a folder within the destination folder (whose name is given at the top of the dialog box) by adding the folder's name to the beginning of the preset's name, separated by a slash mark. The browser displays four columns so you can nest up to three levels of folders within the Presets folder; that is, two levels of folders within the User folder.



Clicking the RANDOM NAME button replaces the preset's name with a pair of words chosen at random from two lists. While the resulting names won't have any connection with what the plugin is doing, you may find this feature useful for coming up with alternatives to routine names like "Kalimba Loop 17".

Potential pitfall: once you've saved a preset, clicking its name in the list loads the preset, overwriting whatever changes you've made since you saved the preset. Hence if you want to save the preset again to preserve the changes you've made, do not click on its name before saving it.

You can delete presets from the lists by clicking their name and then clicking the DELETE PRESET button. Enso will give you a chance to confirm this action or cancel it. If you confirm, the preset/folder will be removed from your storage system and is gone for good.

Importing and Exporting Presets

Preset files are plain-text XML files so that you can exchange them online in forums, copy them between a Windows computer and a Macintosh, email them to your friends, etc.

The two buttons with icons representing copying and pasting (copy on the left, paste on the right) copy Enso's current settings to the system clipboard and paste settings from the clipboard. You can use the copy and paste commands to transfer settings between two instances of Enso or paste the settings into an email message or text editor. When copied to the clipboard, presets are presented in the same XML text as used in preset files.

The IMPORT PRESET / ZIP button provides a way to add presets to Enso without manually moving them into the appropriate folders in your file system. Clicking this button produces a file-browser window wherein you can select either a single preset file or a .zip file containing one or more presets. After you select the file, Enso copies the preset(s) into whichever folder you have selected in Enso's preset list, unzipping the file first if necessary.

Depending on whether you've selected a preset or folder, the EXPORT SINGLE PRESET or EXPORT FOLDER AS ZIP button performs the complementary functions of the IMPORT button. First select either a preset or a folder in Enso's list, then click the export button. A file-save window appears; choose a location in your file system, give the file a name, and click Save. If you have chosen a folder in Enso's preset list, the plugin places it and all of the presets it contains in a .zip file.

Default Preset

If you save a preset with the special name "Default" in the User folder, new instances of Enso will load it automatically when you add it to your DAW session. You can use a default preset file to give you the same starting point with Enso whenever you use it. Enso's installer creates a default preset file for you but feel free to replace it with your own.

Presets and the Loop Buffer

Enso always saves the contents of the loop buffer within presets. (This is a departure from the behavior of versions of Enso prior to 1.3.) Note that this can make preset files rather large since they contain uncompressed, text-encoded copies of the audio. You will see a corresponding increase in the time it takes to load and save DAW sessions. If you don't want a preset to carry audio with it, clear the buffer before saving it.

If a preset contains audio, a little waveform drawing appears next to its name in the preset browser.

Support

If you need help with Enso you can contact us in a couple of ways. First, our email address is support@audiodamage.com. Second, we have a Discord server on which you can usually find someone helpful—either us or other customers—in a short period of time.

If you click near Enso's upper-left corner, you'll see our About panel. In it are buttons for reaching our Discord server and our website, and for generating an email message which is automatically populated with information that may be helpful to us while helping you.

And Finally...

Thanks for purchasing Enso. We make every effort to ensure your satisfaction with our products and want you to be happy with your purchase. Please write to support@audiodamage.com if you have any questions or comments.

Document Revisions

- 1 March 2019: Initial release
- 4 April 2019: Replaced link to article on history of looping (thanks, Michael Peters)
- 14 August 2020: Minor updates for software release 1.0.15
- 6 June 2023: Updates for software release 1.2, miscellaneous reformatting
- 16 June 2023: Corrections to System Requirements
- 31 October 2023: Added note about Logic's misbehavior, clarified effect of Mode Quantize setting
- 1 July 2024: Updates for software release 1.3, added information about support resources
- 3 August 2026: Updates for software release 1.4, rebuilt in our current manual format