



FACTORSYNTH 3

SOUND DECONSTRUCTOR
VST • AU • STANDALONE

USER MANUAL

v. 3.1.1

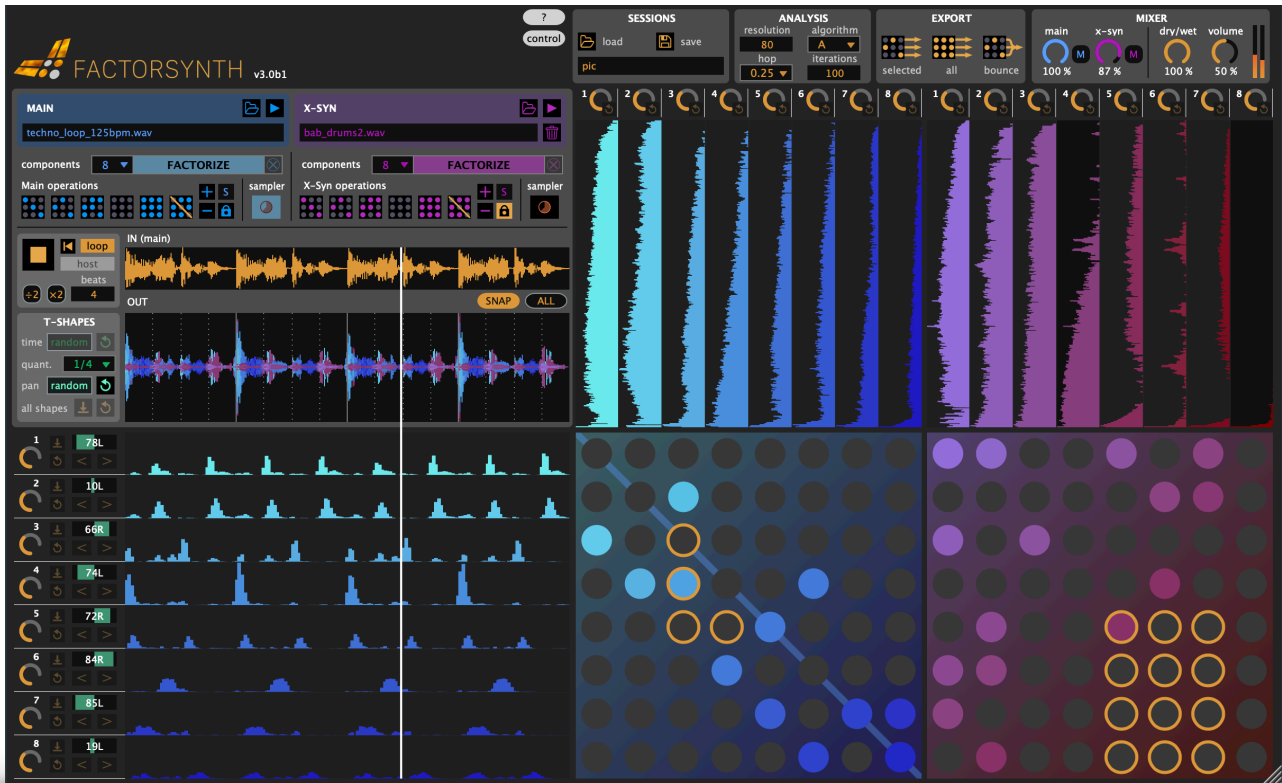


anemond

FACTORSYNTH 3

user manual

www.anemond.net - hello@anemond.net
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Factorsynth is a unique tool for sound deconstruction. Audio samples are broken down into overlapping temporal and spectral elements using a machine learning algorithm. The pieces are ready for you to rearrange and remix in infinite ways. The obtained elements can represent anything from individual notes or drum hits to attack portions, background noises, drones, repetitive patterns, and so on, and they can be overlapping, in both time and frequency.

Here are some examples of things you can do with Factorsynth:

- Remove certain elements (notes, drum hits) from clips
- Change the rhythm of a drum loop by separately displacing its components (kick drum, snare, etc)
- Randomize the timbre and the internal temporal structure of sounds
- Create infinite rhythm and timbre variations of your loops
- Create complex textures out of a song excerpt
- Create new elements consistent with the overall timbre and rhythm of the original sound
- Upmix mono clips to stereo clips by panning the individual components
- Apply audio effects selectively only to certain elements of the sound (e.g. apply reverb only to the snare)
- Separately process attack and sustain portions of notes, or consonants in voice signals
- Use a MIDI controller to assign different notes or pads to different internal elements of sounds
- Obtain hybrid sounds by using a new kind of component cross-synthesis (e.g. making each drum element drive a separate timbre element of a second sound)
- Discover hidden components in sounds that you didn't notice before

Thanks for purchasing Factorsynth, and happy factorizing!

Installation

MacOS

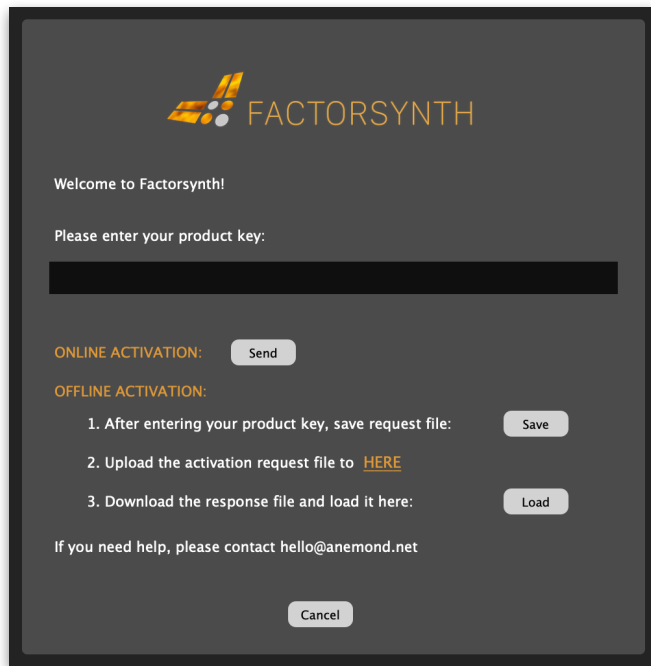
- Double click on the downloaded .dmg file. A window will open.
- Double click on the .pkg file in the window that just opened. This will launch the installer.
- Follow the instructions on the installer. At one point, you'll have the choice of which of the three MacOS versions you want to install: VST3, AU or standalone. You can install two or three of the versions at the same time:
 - The plugin versions (VST3, AU) will be installed on the system-wide folders that will be visible by your DAW.
 - The standalone version will be installed as an app in MacOS' Applications folder.

Windows

- Uncompress the downloaded .zip file (usually by double-clicking on it or by right-clicking and selecting "Extract all").
- Double click on the uncompressed .exe file. This will launch the installer.
- Follow the instructions on the installer. It will install the following two versions:
 - The plugin versions (VST3) will be installed on the system-wide folders that will be visible by your VST-compatible DAW.
 - The standalone version will be installed as a Program with Desktop and startup menu shortcuts.

Activation

The first time you open one of the plug-in or standalone versions, the following registration window will appear:



Enter the product key that you have received by email. You only need to register once on one of the versions.

- **Online activation:** enter your product key and click on "Send". If online activation doesn't work, please try offline activation.
- **Offline activation:**
 1. Enter your product key and click on "Save". A dialog window will appear to save a file called "FS3ActivationRequest.xml". Save this file to any desired location.
 2. When online, click on the link labeled "HERE" or open your browser and go to <https://anemond.net/offline-activation/>
 3. On the activation webpage, click on "Choose file" and select the file you just saved. Then click on "Activate" on the webpage. You should see an "Activated successfully" message and a link to download a file called "ActivationResponse.xml". Save this file to any desired location and go back to the Factorsynth registration window. Click on "Load" and select the file you just downloaded from the webpage.


If you encounter any problems during the registration process, please contact hello@anemond.net.

Versions

Your copy of Factorsynth 3 comes in three versions: two plug-in versions (VST3 and AU) and one standalone version:


VST3

The VST3 version will open in any DAW host compatible with the VST3 standard, such as Cubase, Ableton Live, Reaper, Bitwig, etc. Please refer to each DAW documentation to learn how to open VST3 plug-ins. Most DAWs allow loading Factorsynth into either an audio or a MIDI track.

 **Ableton Live (Windows):** In the Windows version of Ableton Live, Factorsynth's interface might sometimes appear blurry. If this is the case, right-click on the plug-in window on the effects rack, and deactivate "Auto-Scale Plug-In Window"

AU

The AU version will open in any DAW host compatible with the Audio Unit (AUv2) standard, primarily Logic Pro, but also Ableton Live, Reaper, etc. Please refer to each DAW documentation to learn how to open AUv2 plug-ins.

 **Logic Pro:** In Logic Pro, Factorsynth will only work correctly when loaded into an Instrument track (not an Audio track). In the list of AU plug-ins, Factorsynth will appear under the category "AU MIDI-controlled effects". On the instrument track, it will listed in the "Instrument" box, not the "Audio FX" box. If an instrument is loaded by default when creating a new instrument track (such as "E-Piano"), click on the instrument name and replace it with Factorsynth.

Standalone

The standalone version of Factorsynth is an independent application that can work without a DAW. Most functionalities are available in the standalone version, with two exceptions:

- Factorsynth's playback cannot be synchronized or warped to match the global transport of the host (see section on **Host Mode**).
- You cannot use parameter automation or custom controller mappings.

Workflow overview

Unlike traditional audio effect plug-ins, which take the track's audio as input and generate output in real time, Factorsynth is a **clip-based** device. It works on audio clips that have been loaded into Factorsynth. Once an audio clip has been loaded into Factorsynth, it can be decomposed into elements. The decomposition process is called **factorization**, because it is based on a technique called non-negative matrix factorization (NMF).

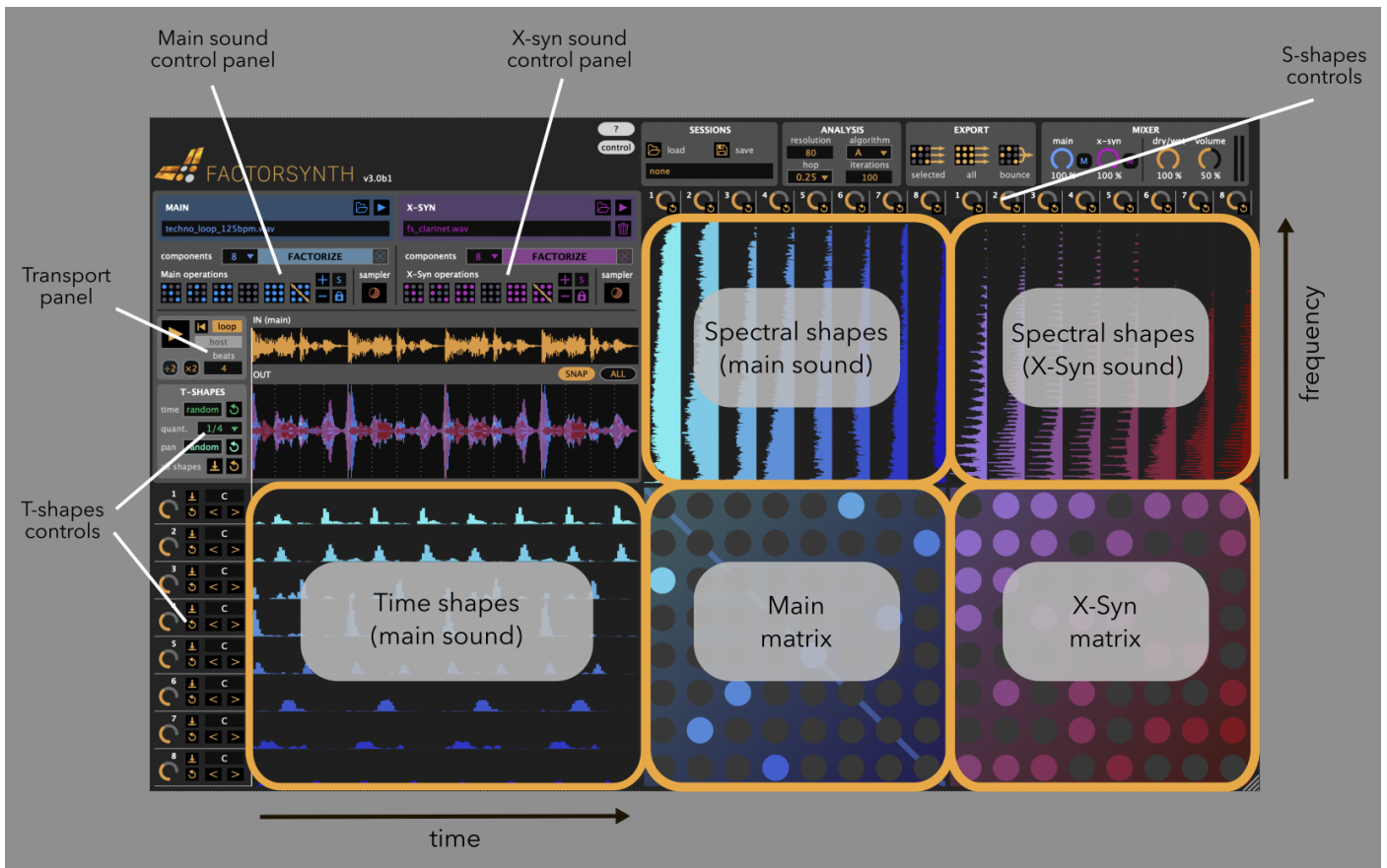
Factorization usually takes a few seconds, and can be performed while the Live set is playing. Once the factorization is ready, you can playback and modify your sound by modifying or recombining the extracted elements.

Since it is a clip-based plug-in, Factorsynth will only affect the clip that is currently loaded into the plug-in, even if the track contains other clips. Also, since the plug-in takes its input audio from the loaded clip, it must always be in the leftmost position of an audio effects chain: it will ignore any processing happening before it on the effects chain (you can of course process its output with any other audio effect).

The clip that you first load into Factorsynth becomes the **main sound**. It is the sound that will provide both temporal and spectral elements (more on this below). You can optionally load a second sound, called the **x-syn sound** (for "cross-synthesis"). This sound is used to add new spectral elements to the palette for sound creation.

Interface

Controls on the main interface are color-coded: blue controls correspond to the **main sound** and purple controls correspond to the **x-syn sound**.



The main interface is organized around several control panels and the following sections:

Time shapes (or T-shapes)

Factorizing a sound creates two types of elements: time shapes (“T-shapes”) and spectral shapes (“S-shapes”). Time shapes are displayed on the lower left of the interface. They capture the temporal evolution of distinct sound events within the original sound. For example, if you are factorizing a drum loop, one of the temporal shapes will likely contain peaks that correspond to hits of the hi-hat, another one will contain peaks when the kick drum plays, and so on. In Factorsynth, temporal shapes are always provided by the main sound.

Spectral shapes (or S-shapes)

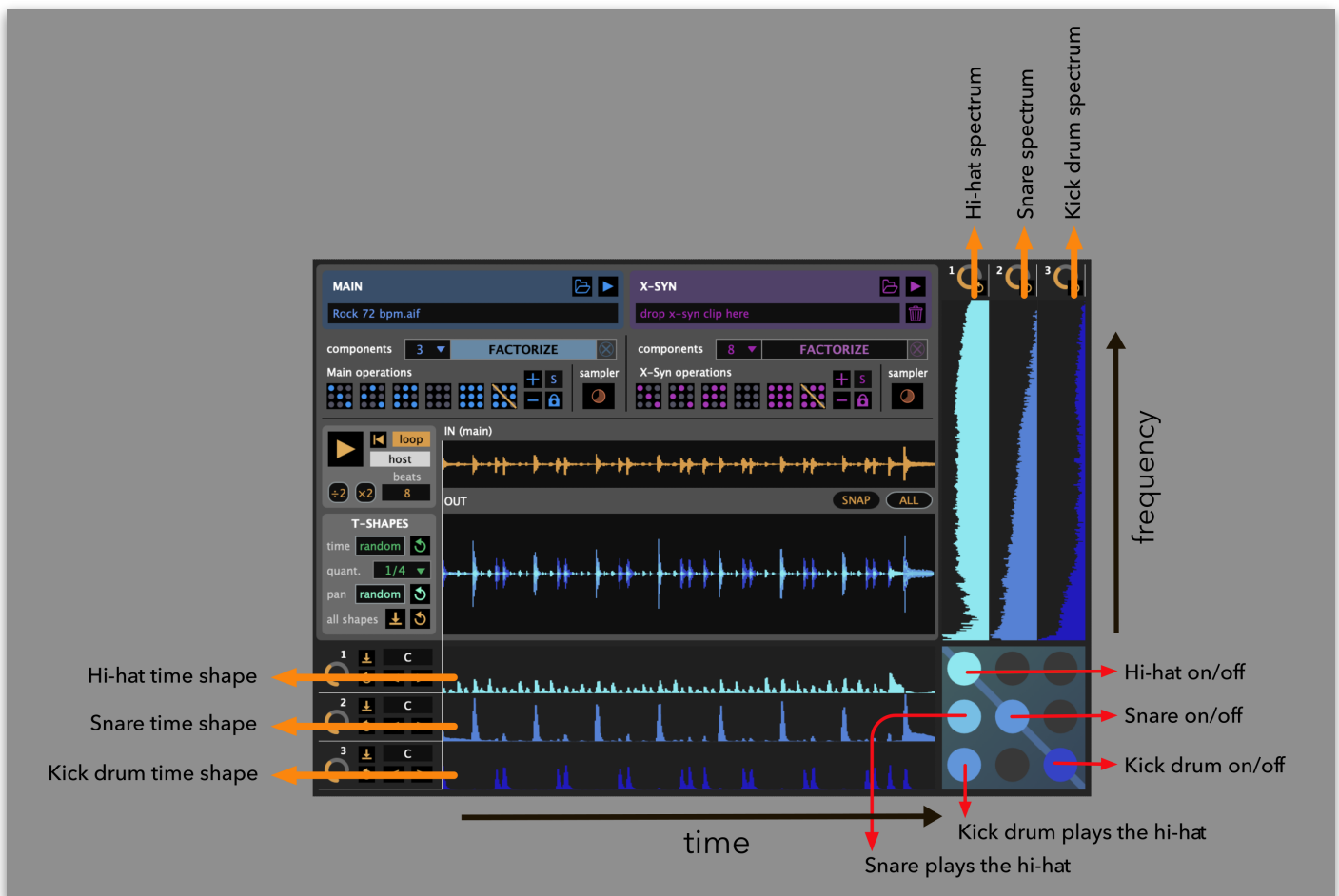
They can be understood as the “timbre ingredients” that make up the original sound. They are fixed spectra, displayed vertically, with lower frequencies on the lower part and higher frequencies on the upper part. Spectral shapes can be provided by the main sound (blue spectra) or by the x-syn sound (purple spectra).

For example, in the image above, the main sound is a drum loop. Its spectra (blue) are thus wide-band and noisy. The x-syn sound is a clarinet sound, and thus it is possible to see many harmonics as horizontal lines on the purple spectra.

Spectral shapes are sorted by “brightness”: the first (leftmost) spectral shapes are the richest in high frequencies. For instance, in a drum loop, the spectral shape corresponding to the hi-hat will likely be the first, and the one corresponding to the kick drum will likely be one of the last.

Matrices

Sound output is created in Factorsynth when you connect T-shapes with S-shapes. These connections are created by the buttons on the two switchboards or matrices: the main matrix connects time and spectral shapes of the main sound, and the x-syn matrix connects time shapes of the main sound with spectral shapes of the x-syn sound. The connection of a time shape with a spectral shape is called a **component**. The key in understanding how Factorsynth produces sound is the following: a component is created by a time shape that *modulates* a spectral shape. In other words: a component is a fixed spectrum that changes amplitude in time according to the temporal shape, which acts as a modulator. By setting a matrix button on/off you are adding/removing components to/from the output sound.



You'll notice that the **diagonal** (a straight line going from the top left to the bottom right) is highlighted on the main matrix. This is because main components on the diagonal are special: they are the original components present in the input sound. In contrast, **off-diagonal** components are new components that were not initially in the sound, created by combining originally unrelated shapes. Let's look at a simple example to illustrate this.

The figure above shows the factorization of a simple drum loop into 3 components: the hi-hat, the snare and the kick drum. Clicking on the components on the diagonal, you will add/remove the corresponding original sounds of the hi-hat, snare and kick drum. Clicking on off-diagonal components, you will generate new sound events that were not present in the original drum loop: the figure shows two examples: selecting the lower-left component makes the temporal pattern of the kick drum play the timbre of the hi-hat. Selecting the component just above it makes the temporal pattern of the snare play the hi-hat sound.

Creating connections on the x-syn matrix makes temporal shapes of the main sound modulate spectral shapes of the x-syn sound. This is a special form of *cross-synthesis*, hence the name x-syn. Playing with the x-syn matrix, you can do things like making each instrument from a drum kit (main sound) drive different piano sounds (x-syn).

Matrix connections can also be created automatically via the operation buttons on the control panel (see below).

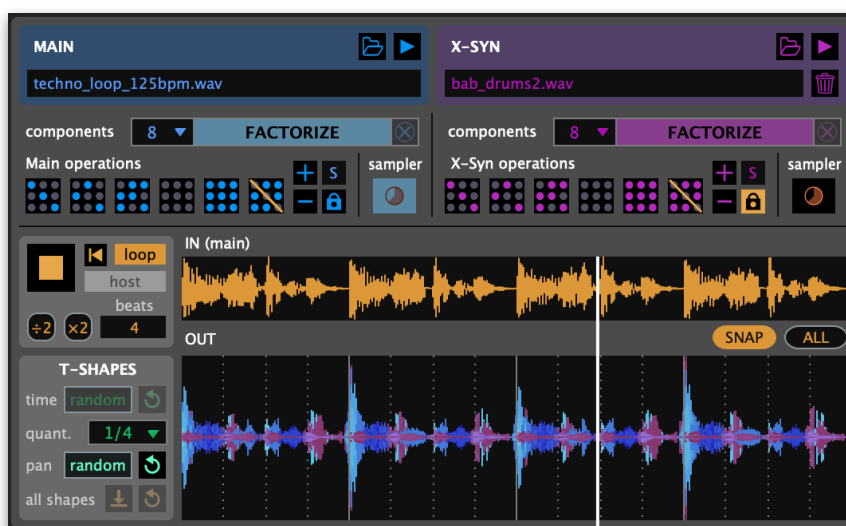
Interface zoom in/out



The three small buttons on the top-left corner of the main window control the global size of the Factorsynth interface. Click on the "+" button to zoom in, on the "-" button to zoom out, and on the "o" button to reset the zoom level to the original size.


Main control panel

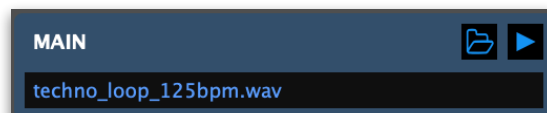
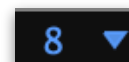
The main control panel manages sound loading and playback, launches factorizations, and creates automatic matrix connections. The left section (blue) controls the main sound, the right section (purple) controls the x-syn sound.




Factorizing (deconstructing) the main sound

The first step in using Factorsynth is to factorize (or deconstruct) a main sound. In order to do that:

2. Select the desired number of factorization components (2 to 30) from the blue component drop-down menu. For the main sound, this is the number of temporal shapes and spectral shapes that will be obtained. This parameter has a strong impact on the sound results (see section "Factorization how-to"). The default value is 8 components.
3. Open an audio file as the main sound, either by drag and drop from the system's file browser to the blue area, or by clicking on the  button. Some DAWs (such as Ableton Live) allow to drag and drop clips already sitting on a track. Factorization will start



right away, as indicated by the blue progress bar. The name of the loaded main clip will be displayed on the blue text window. You can cancel the factorization process at any time clicking on the  button next to the file name.


4. Once factorization is done, the input waveform and the main temporal and spectral shapes will be displayed. The matrix will still be empty, so you will now need to create components to start hearing any sounds. You can do this either by clicking on any connection buttons on the main matrix, or by clicking one of the **operation buttons** (see below) that will automatically create connections on the matrix.

You may want to re-factorize the same clip after changing the number of components or the analysis parameters. In that case, you don't need to drag and drop the clip again, you can just click on the factorize button.



When re-factorizing the same clip, Factorsynth's old output will keep playing until a new component is created or modified. However, when factorizing a new clip, Factorsynth's playback will stop.

Factorizing an x-syn sound

To factorize an x-syn sound, just select the components from the purple drop-down menu and drag and drop any clip or sound file to the purple area to the upper right or click on  to open a sound file. After factorization is done, you'll see the new set of spectral components displayed as purple spectra to the upper right part of the interface. You are now ready to create cross-components by clicking on the purple matrix or operation buttons.




X-SYN

bab_drums2.wav

If you want to re-factorize the same x-syn sound, you just need to click on the purple factorize button.



You can erase all x-syn components and S-shapes by clicking on .



Factorization of the x-syn sound is only possible if a main sound has been previously factorized.

Memory consumption

Factorization can be a CPU and memory-demanding process. For short short clips (less than 30 seconds) and few components (less than 8), factorization will only take a few seconds. For longer clips with more components, factorization time might be long, and memory can go up to several GBs!

For long files with lots of components, a warning window will appear. However, Factorsynth does not impose any limit on the clip length, it is up to you to check memory usage and decide how far you can go! If something is too slow or memory-demanding, remember that you can always cancel factorization once started.

To reduce memory requirements you can either:

- Select a shorter clip
- Select a lower number of components
- User a lower temporal resolution (higher "resolution" setting on the Analysis panel)

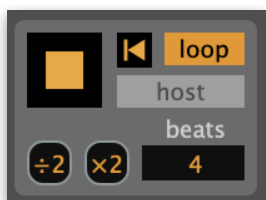
Playback input sounds




The small play buttons above the clip name fields play back the original loaded clips at the original speed.

Main transport

There are two ways of playing Factorsynth's output sounds. One is using the main transport, where all components play in sync, and the other is using sampler mode (see next section), where components can individually be launched at any time.



To play all components in sync, use the play/stop button on the main transport panel. The panel also contains the following controls:

- **Rewind:**  instantly go back to the beginning of the clip.
- **Loop:** playback will loop around the output waveform.
- **Host: (disabled in the standalone version)** In "host" mode, Factorsynth's output will synchronize with the tempo and beats of the host DAW, otherwise it will play back at the clip's original speed. When clicking on play/stop in "host" mode while the DAW is playing, playback/stopping will happen at the next measure start (the button blinks meanwhile).
- **Beats:** the beat display window shows the number of beats that Factorsynth assumes the clip has. You can edit this number to correct or change at will. When in host mode, this will affect the on-bar sync with the DAW.
- **:2 and x2 buttons:** halve or double the number of beats of the clip. When in host mode, this will result in a playback at respectively double or half speed.

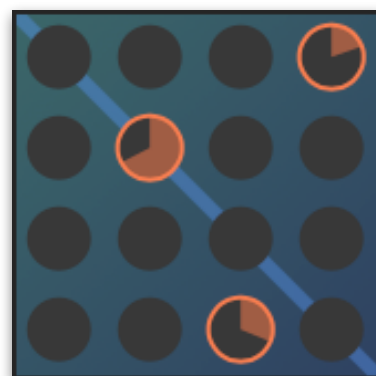
Sampler mode



When one of the matrices is in sampler mode, a component will play back as soon as its matrix button is clicked, independently of the main transport playback. A round playback indication will show up.

This allows to use Factorsynth as a MIDI-controlled sampler, where different keys or controller pads can be assigned to different components to play them independently.







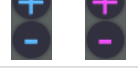
Note that while in sampler mode, editing or shifting of any T-shape or S-shape is disabled. Solo and lock modes are also disabled.



In sampler mode, components always play back at their original speed. They are not affected by the DAW tempo, even in host mode.

Matrix operations

As an alternative to creating components by clicking on individual matrix buttons, the main and x-syn operation buttons automatically create/remove several components at once:

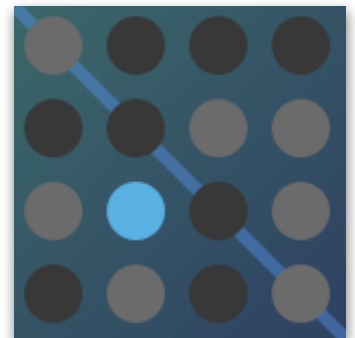
	Diagonal	Add all the diagonal components. For the main sound, this means: reconstruct the original sound. For the x-syn sound, it creates a “frequency-coherent” hybrid sound: since the spectral shapes are sorted by brightness, the brightest (resp. darkest) spectral shapes of the x-syn sound will get associated with the brightest (resp. darkest) shapes of the main sound.
	Scramble	Create random connections, but keeping only one connection per spectral shape.
	Random	Create random connections, allowing connecting several temporal elements to a single spectral shape, and vice-versa.
	Clear	Clear all connections.
	All	Activate all connections.
	Clear diagonal	Clear the diagonal connections. For the main sound, this means: remove all original components.
	Add/remove one	Randomly add/remove single components.

Solo buttons



The solo buttons activate “solo mode” for either the main or the x-syn sound. Solo mode allows listening to individual components. When in solo mode, clicking on individual components on either matrix activates that component and clears all the others. The components that were active before entering solo mode are displayed in grey. When exiting solo mode, the matrix connections that were active before entering solo mode are restored.

Note that while in solo mode, the operation buttons for the corresponding matrix are disabled.



Lock buttons



When one of the lock buttons is activated, clicks on the corresponding matrix will lock the components, which means that their on/off state won't be changed neither by clicking on them nor by using the operation buttons. A locked component is indicated by a yellow ring around it.

Component locking also blocks shifting of the T-shapes: if at least one component is locked in the row, time shifting for all the components on that row will be blocked. This is mainly to allow controlling the rhythmic and temporal variations produced by random time shifting (see next section).

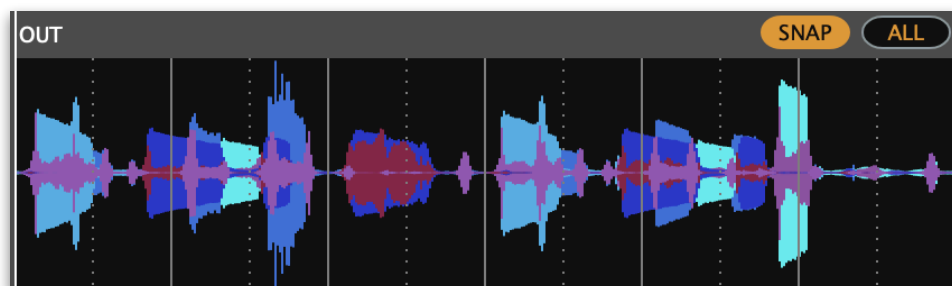


Input waveform (main)



The waveform of the loaded main sound, previous to modifications, is displayed in orange.

Output waveform



The current output waveform (the sum of all main and x-syn components) is displayed in multiple colors, corresponding to the individual components currently present.

Click anywhere on the output waveform to jump playback to that position.

You can select a playback region by dragging over the output waveform. If in loop mode, playback will loop inside that region. To go back to playing back the whole waveform, click on the **ALL** button above the waveform.

To quantize a playback region to subdivisions of the beats, as determined by the quantization drop-down menu, click on the **SNAP** button before selecting the region. Vertical bars corresponding to the beats and quantization sub-beats will be displayed. Note that, in order for this to align with the time measure of the DAW, the loop has to contain a whole number of beats, and playback must be in "host" mode.

Shapes mixing and editing

Apart from adding or removing components as a whole, Factorsynth allows several editing and mixing operations for individual temporal or spectral shapes.

Individual temporal shape controls







To the left of each temporal shape is a panel of mixing and editing operations that apply to all components connected to that temporal shape. In other words, all changes to the panel affect the current whole row of main and x-syn components on the matrices.

These controls are the following:



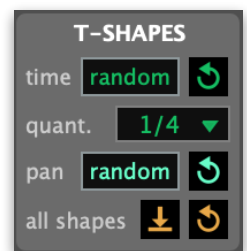
Level


The level dial controls the output level of all components connected to that row. Double-click on the dial to go back to the original (center) setting.


	Pan	The pan slider controls the stereo panning for all components connected to that row. Double-click on the slider to go back to the center position.
	Shift	The shift buttons displace the current temporal shape to the left/right. Use this to create rhythmic variations of loops. The amount of shifting is determined by the global "quantization" setting (see below). Shifting is circular: when shifting to the right, the vanishing right end of the shape comes back on the left, and vice-versa. If at least one component in the current row is locked, shifting will be locked for that whole row.
	Threshold	The threshold button removes low-energy residuals from the current temporal shape. Use this to clean leftover noises between sound events, such as between drum hits.
	Reset	The reset button restores the current temporal shape to its original state right after factorization.


Global time shape controls


The controls on the global time shape ("T-shapes") panel affects all time shapes at once. The following operations are possible:





- **Random time shifting:** Randomly shift all components in time. This creates temporal and rhythmical variations. Random time shifting can be controlled in two ways:
 - By setting the quantization in the drop-down "qant." menu (given in beats)
 - By locking/unlocking components: if at least one component is locked in a row, all components on that row won't be able to shift in time. For example, we could choose to make rhythmic variations on a drum loop by randomly shifting only the high-frequency components (hi-hats) but leaving the low-frequency components (the kick) locked in order to keep marking the main beat.
To reset the time shifts of the current row to the original position, click on .

- **Random panning:** This sets the panning settings for all components randomly. Use this, for example, for instantly converting a mono file into a stereo file by creating random stereo positions of its components. To reset the time shifts of the current row to the original position, click on .

- **All-shapes thresholding:**  This applies the thresholding operation (removing low-energy residuals) to all components. In some cases this results in a certain level of de-reverberation of the sound.

- **All-shapes reset:**  Resets all T-shapes to its original form after factorization: removes all drawn edits, the thresholding, and restores the temporal shifts. Level and pan are not affected.

Spectral shape controls

Spectral shapes have only a level dial  and a reset button . In this case, this will affect all the components connected to the current *column* of either the main or the x-syn matrix.

Free shape editing

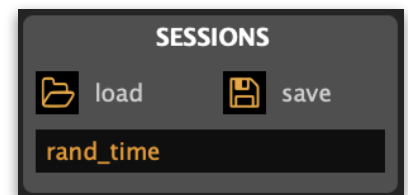


Finally, temporal and spectral shapes can be edited by drawing on them. The changes will be effective when you release the mouse button after drawing. Note that the reset button also restores all the drawn edits.

Session panel

The session panel allows to save and restore your Factorynith sessions. Sessions will be stored in files with the extension `.fs`.

Alternatively, if using one of the plug-in versions with a DAW, you can also use that DAW's integrated preset system to save and restore sessions (please consult the specific DAW documentation on saving and loading presets).

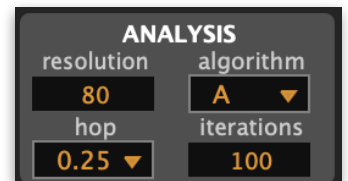


When re-loading a session, factorizations need to be performed again. They will be automatically launched right after loading.

The location of the original sound files should not change, otherwise the session will fail to load.

Analysis panel

The analysis panel contains four parameters that, together with the number of components, control the factorization algorithm. Note that, when you modify one of them, it will be applied on the *next* factorization you will perform (the factorization buttons will blink to indicate this).

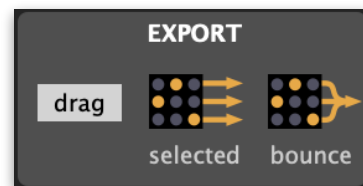


- **Resolution:** sets the time resolution (in milliseconds) of the analysis window. Possible values: 5-180. Default: 80. Low values mean a high temporal resolution (e.g., attacks and impulses will sound cleaner), but at the cost of a lower frequency resolution (e.g. it will be harder to distinguish individual harmonics) and higher memory consumption.
- **Hop:** sets the hop size (given in % of overlap) of the analysis window. Possible values: 0.25 and 0.125. Default: 0.25. A lower value means a higher temporal resolution without changing the frequency resolution, but at the cost of higher CPU and memory demands.
- **Algorithm:** it is possible to choose between two variations of the factorization algorithm. Algorithm B has a higher tendency to keep transients and stable parts of notes together in the same component.
- **Iterations:** Possible values: 5 to 200. Choosing a high number of iterations will often result in a better separation of the factorized elements, but at the cost of longer computation times.

Export panel

The export panel controls the file exporting options of Factorsynth. All sounds are saved as WAV files with the same sampling rate and bit number than the main sound.

There are two ways of exporting files: via drag and drop and via dialog windows.



Export by drag and drop

The easiest way to export components or the output mix from Factorsynth is by drag and drop. You can drag and drop components to tracks in your DAW, or to the Finder or File Explorer. When you drag and drop into the Finder or File Explorer, one or several WAV files will be generated at the target location. The exported audio corresponds to the currently selected region on the output waveform.

Note that you should drop the exported sounds into tracks other than the one Factorsynth is loaded, otherwise the exported clips will not play back (once Factorsynth is loaded as a plug-in into a track, it takes over the whole audio output of that track).

To use drag and drop export, click on the "drag" button on the export panel. The button will light up in red, and a number of red upward arrows will appear on the elements that you can drag and drop out of Factorsynth.



- **Bounce output by drag and drop:**
With the drag mode activated ("drag" button in red), drag and drop the "bounce" icon to the desired destination (a track on your DAW or a folder on your hard drive). A WAV file will be created containing the current global output sound.
- **Export all selected components by drag and drop:**
With the drag mode activated ("drag" button in red), drag and drop the "selected" icon to the desired destination (a track on your DAW or a folder on your hard drive). A number of WAV files will be created, one for every component that is currently activated, with the following naming convention: $m_i_j.wav$ for the main components and $x_i_j.wav$ for the x-syn components, where i and j are the row and column coordinates of the components on the matrices, (1,1) being the upper-left component.

You can output multiple components to several tracks in your DAW by a single drag and drop operation. Depending on the DAW, a window might appear asking if the multiple files are to be exported so a single track (in a sequence) or to multiple tracks (in parallel). In Ableton Live, you can press the Command key (on Mac) or the Control key (on Windows) before dropping in order to export to multiple tracks

- **Export individual components by drag and drop:**
When the drag mode is activated ("drag" button in red), red arrows will appear on top of each selected component in both the main and x-syn switchboards. Drag and drop the desired component button to the desired destination (a track on your DAW or a folder on your hard drive).



Export by file dialog windows

As an alternative to drag and drop, you can click on the "selected" or "bounce" icons with the "drag" button off to open file save dialog windows.

- **Export all selected components:**

A WAV file is created for each main and x-syn component that is currently selected on the matrices. Clicking on the button opens a dialog window to select the saving location. Factorsynth will create a folder at this location, which will contain the WAV files, one for each activated component.

- **Bounce to file:**

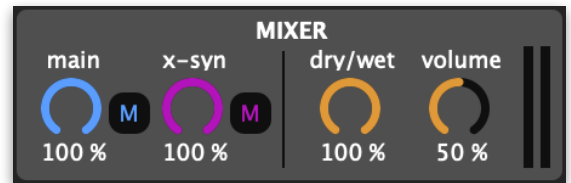
A WAV file is created containing the current global output sound.

Mixer panel

The mixer panel controls the main output volume of the plug-in.

- **Main volume:** controls the volume of the part of the output produced by the main components.

- **X-syn volume:** controls the volume of the part of the output produced by the x-syn components.



- **Mute buttons (main and x-syn):** mute all the main resp. x-syn components. As opposed to clearing the matrices, muting eliminates the output but does not clear the selected components.

- **Dry/wet:** mix of the original, unprocessed main sound, with Factorsynth’s output.

- **Volume:** the global output volume of the plug-in. Double-click on the dial to get back to original (50%) gain.

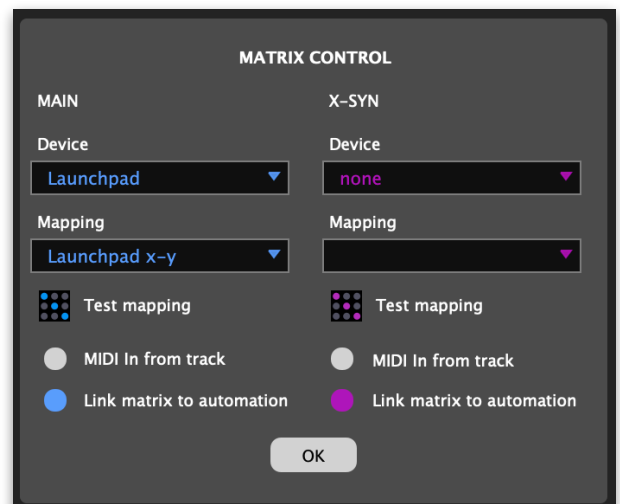
Matrix control via MIDI or automation

The first 8x8 buttons on the main and x-syn matrices can be individually or jointly controlled via MIDI. The corresponding configuration is contained in the “Matrix Control” window which opens clicking on **control**.

Pre-programmed MIDI mappings

Factorsynth contains a number of pre-programmed mappings for several hardware controllers consisting on a 8x8 matrix of pads, such as the Novation Launchpad, the Ableton Push or the Akai APC mini. If you own one of those devices, you just have to select your controller from the “device” list, and select one of the different layouts from the “mappings” list. A single device can work under a different set of layouts, depending on the configuration of the device.

Once your device is selected, try out several of the mappings. Each time a mapping is selected, Factorsynth will try to illuminate all pads corresponding to the main diagonal (a line from the top left to the bottom right). If you can see all pads on the diagonal turn on for a second, then the selected mapping is correct.



You can also click on **test mapping** to retry illuminating the diagonal.

- ⚠ Depending on the DAW, when using a controller with Factorsynth, you must sometimes remove any references to your controller from the DAW's own settings to avoid interferences of MIDI messages.
- ⚠ If automatic mapping is not working, try switching between different mode pages if your control surface supports them. For example, Launchpad devices will work with Factorsynth on the "User 2" page, and the Ableton Push 2 will work in "User mode".

Manual MIDI mappings

Alternatively, you can freely assign any MIDI note or controller messages of pads, keyboards or any other hardware controller, to the 8x8 buttons (or any other Factorsynth parameter) via the MIDI mapping capabilities of your DAW. Please consult its documentation.

MIDI in from track

By default, the external MIDI controllers bypass the DAW's input MIDI ports and communicate directly with Factorsynth. Alternatively, if you're using Factorsynth on a MIDI or software instrument track, you have the possibility to control the 8x8 matrix buttons from the MIDI input of the track checking the corresponding setting on the matrix control window. This is useful for playing back a MIDI recording sitting on the current track, which will then control the matrices.

Link matrix to automation

This setting ("on" by default) controls whether the first 8x8 buttons on the main and x-syn matrices are connected or not to the DAW's automation system. When on, this means that each time a button is turned on/off, it will be detected as a parameter change by the DAW, and will be therefore possible to record or automate it.

However, it is sometimes better to turn this option off to avoid overloading the DAW with a lot of parameters (up to 128 additional parameters, 64 for each matrix).

Also, when recording or automating clicks on the global operation buttons (diagonal, scramble, random, etc), this option should be off to avoid interferences between the automation of the operation buttons and the automation of the individual component buttons.

Factorization how-to

Choosing the right number of components is crucial for obtaining good factorizations. Of course, this will depend on the complexity of the input sound and on the type of elements you would like to obtain. You'll see that it is mostly a trial-and-error process, but here are some guidelines that might help you:

- If your input clip contains a few simple sound events (for example, a drum loop or a sequence of a few notes), Factorsynth will likely separate them into components. For example, if you have a melody containing 7 different pitches (not counting the repeated ones), doing a factorization with 7 components will often (but not always!) result in one temporal/spectral shape pair per pitch.
- In the same scenario of a simple clip with few events, if you factorize into more components than events in the original sound, Factorsynth will start digging deeper to extract more underlying structures. For instance, if your clip contains 3 piano notes and you factorize into 10 components, some components will contain the noisy and impulsive parts of the attack phases, and other will contain the harmonic sustain and/or release parts of the different pitches.

- By the nature of matrix factorization (it groups similar patterns together), transients often end up grouped in a separate component. If you wish to keep the transients (e.g. attacks) together with their notes, choosing a lower number of components might help.
- For complex input clips (loops containing several instruments, song excerpts or full songs), the decomposition is more unpredictable, but can often detect interesting elements such as a rhythmical motif of the bass, a guitar lick, an underlying pad, impulsive noises, etc.
- If you decompose a song excerpt with few components, it is likely that all the drums will end up on one or two components.
- Factorsynth cannot separate full instruments or voices, except in very simple cases. You won't be able to do things like suppressing a singing voice or guitar solo. That's the job of *source separation*, which is a harder thing to do! In that sense, Factorsynth is not a "source separator", it is a tool for sound design based on deconstructing sounds into interesting (and sometimes unexpected!) elements.

As you can see, using Factorsynth is a pretty exploratory process. After a bit of testing, you will get a sense of how it reacts to the clips in your collection.

Support

For assistance, bug reports and any suggestions, please contact hello@anemond.net

If you're sending in a bug report, please include the following information:

- Your Factorsynth version
- Your OS version
- Your DAW version
- If possible, the audio clip that produced the issue
- If possible, a screen recording of the actions that produced the issue