

KODAMO[®]

ESSENCE FM



User Manual

Preliminary Version

12-12-2019

For reference only

Welcome to the Kodamo EssenceFM! Thanks for purchasing our instrument, which represents another and new vision of FM synthesis. We were always focused on making the EssenceFM “musician oriented”, aiming for reliability and comfort of use in every situation.

This manual was written to offer you the best experience you’d get from the EssenceFM. We recommend to read at least the first section and store this handbook preciously in case you want to get further information.

Main features

- 300-voice polyphony 6-operator FM sound engine,
- 16-part multitimbral,
- 6-point loopable envelopes,
- Free Algorithm and Envelope Design,
- 8-cord Modulation matrix with 138 sources/228 destinations,
- 24 user-editable Waveforms,
- 2 independent Multi-Effect DSPs
- Powerful Voice Sequencer

Safety Precautions

- Use only the supplied power adapter.
- Ensure your outlet is properly grounded
- Do not cover the vent holes to prevent overheating
- Do not open the device.
- Do not expose the device to water or any kind of liquid. If this happens, immediately turn it off and unplug it, then put it in a warm place. Try turning it on again only when it’s completely dried.
- Do not use the device in excessively hot environments (>40°C)
- Do not put any heavy objects on the device, the touch screen could be easily damaged.
- Ensure the device is in a stable position before using it
- Never power off the device when you are saving

Please regularly save your data to a USB storage device (see Global > Storage). Like on most synthesizers, a power loss while saving may corrupt your sounds!

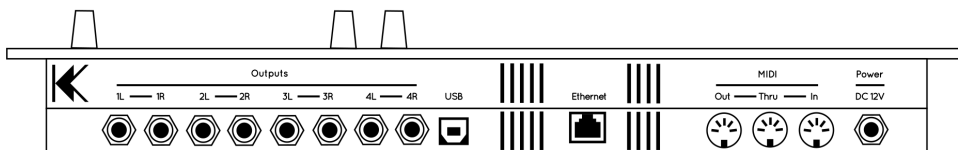
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Making connections

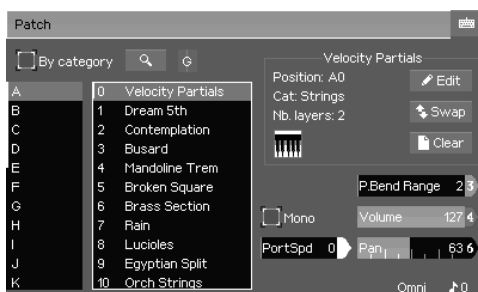
It's the moment to plug your EssenceFM!



All the back panel connectors are detailed below:

- Audio Output Pairs 1 to 4 (¼ inch / 6,35 mm TRS phone jacks): Each pair can operate as a stereo bus (cf. FX and Routing section). Each output delivers balanced signal, but still can be connected to an unbalanced TS jack.
- USB (Type B): Connects to a host system for USB-MIDI transmission.
- Ethernet (8-pin RJ45): Connects to a network to carry MIDI-RTP packets.
- MIDI Out (5-pin DIN): Connects to any MIDI instrument to be controlled by the EssenceFM.
- MIDI Thru (5-pin DIN): Any MIDI data fed into the MIDI In port will be output here directly.
- MIDI In (5-pin DIN): Connects to any MIDI controlling device (e.g. master keyboard, synth, sequencer, computer MIDI interface, wind controller, etc.)
- DC Power supply: Connects to the supplied 12V DC 2A power unit.

Let's play !



When powered up, the EssenceFM starts in Patch mode by default, letting you play with its presets sounds.

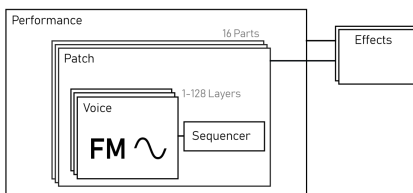
Just scroll down the list and select a patch by pressing on its name to use it.

The EssenceFM power resides into its structure, smaller elements are stacked to make big ensembles. Let's familiarize with it.

Voice: The Voice is the smallest element that the EssenceFM uses to make a sound. It's the basic starting point to make a sound.

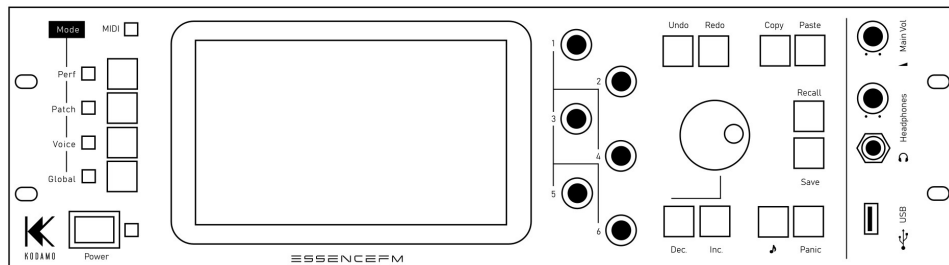
Patch: The Patch is basically gathering one or more voice(s), by stacking, layering, sequencing them together and adding effects. It's the main element to play with the EssenceFM.

Performance: The Performance is the dedicated mode to multitimbral operation. It allows you to assign a patch to each MIDI channel. In this mode the effects DSPs are shared, ignoring patch effect settings.



Introducing the Front Panel

The EssenceFM's front panel is based on the combination of a large touchscreen and hardware controls. Hardware controls provide a quick access to the most common features.



MODE KEYS

- **Performance** Those keys provides direct access to the associated modes. See the Performance/Patch/Voice/Global sections to know more about them.
- **Patch**
- **Voice**
- **Global**

DATA ENTRY

- **Direct Access knobs:** Those 6 knobs are used for the Direct Access feature described below, except on the main page of the Performance mode, where they act as real-time MIDI controllers.
- **Main Dial:** Modifies the focused element on screen (which will be detailed in the next section).
- **Inc / Dec:** Works in the same way as Main Dial (increments and decrements value)

EDIT KEYS

Copy: Places the focused element into the clipboard for further use.

Paste: Places the clipboard content into the focused element.

Undo: Discards the last operation, up to 1000 times. Note: leaving a page resets the undo/redo history.

Redo: Restores the previously discarded operation.

Save: Saves the current element into the internal memory. Apart from some global settings, an element is never automatically saved when copied, moved or edited, you need to explicitly press Save. Pressing save on a general page (e.g. Patch list) will open a popup allowing you to save some specific elements, or to save them all.

Recall: Reloads the edited element (performance, patch, voice, scale or waveform) from its last saved state.

MISC.

Preview (J): Plays a few notes to quickly listen to an element without having to use a MIDI controller. To customize preview, take a look at the Preview tab in Global > MIDI page.

Panic: Immediately stops all notes currently playing.

User Interface Elements

The EssenceFM user interface is organized into pages. After pressing a mode key, the main page of the mode is displayed, then you can access more sub-pages from it.



Patch* > D1 Cold Cathedral* > Voice Seq

The breadcrumb located at the top of the screen always shows you where you are in the page tree. You can navigate back by pressing on a page's name.

Note the asterisks (*) on some page names. It means that the related element was modified but wasn't saved. When the asterisk is not on a page representing a specific element but on a «general» page (like Patch here, which is the patch list), that means at least one patch is unsaved. As described above, pressing Save here will allow you to save all or some of the modified elements, without having to reach all of them one by one.

If you are not familiar with computers and user interfaces, here is a description of the elements you'll find in the EssenceFM :

Focus notion: Focus is the graphical representation of which element is currently editable, it's represented by a frame surrounding the focused element. A focused element is directly editable by turning the Main Dial knob, pushing INC/DEC keys, and is eligible to a COPY/PASTE operation.

Direct Access feature: The 6 knobs located on the right side of the touchscreen allow you to edit values without needing to focus the element. Elements concerned by Direct Access are always flagged with the associated knob number. It's mostly sliders, but envelope points can be directly

accessed this way too. (see *Architecture Reference* chapter to see how the Envelope Editor works)

Popup: A window that appears in front of the rest of the page for an action confirmation, or to show you more parameters relative to the button you pressed.

Button: Clicking it triggers an action, exactly as a physical key can do. It's used to go to a subpage, confirm an operation, etc.

Slider: Allows you to set a value. To modify it, simply drag horizontally the slider gauge. You can also type directly a numerical value by using the virtual keypad. To access it, focus the slider you want to modify, then click on the Keypad button at the top right corner.

List: Allows you to select an element in a list. You can swipe it vertically to quickly scroll across the elements, or slowly move your fingertip to reach precisely what you are seeking in the list. Any list element can also be accessed by entering its index with the virtual numerical keypad (by clicking on the button after it's focused, like the slider).

Text field: Allows you to enter text data (e.g. patch name). Clicking on it opens the alphanumeric virtual keyboard.

Checkbox: A parameter that can be activated (checked) or deactivated (unchecked).

Radio Button: Allows to make a choice between several options. Unlike checkboxes, radio buttons are at least two, and only one can be selected at a time into a set.

Tab field: Splits interface elements into several tabs, which are like small pages. Accessing a particular tab is done by clicking on its header.



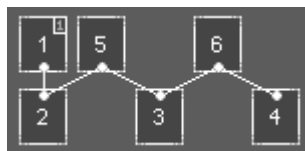
First steps

Introducing FM synthesis

FM stands for "Frequency Modulation". A waveform is multiplied ("modulated") with another waveform to create a new one. It's the same as vibrato, except that it is much faster, so much faster that it sounds like a different timbre to the ear, rather than a quick vibrato.

If you're familiar with the subtractive synthesis used in analog synths, FM is the opposite: you usually start from sounds with low harmonic content (e.g. a Sine Wave), that once modulated will create the desired harmonics.

The new harmonics created, sometimes called "Partials", depends on the frequency ratio between the carrier (the base sound) and the modulator (the one modulating the carrier's



signal).

In FM synthesis, a block generating sound is usually called an Operator, and the Operator arrangement is called an Algorithm.

An FM Algorithm is usually represented as below, and is to be read from top to bottom.

When an operator is feeding its signal into another one under it (1, 5 and 6) it is called a *Modulator* -you don't hear its direct sound-, while operators at the bottommost (2, 3 and 4) are *Carriers*.

Changing the volume of a carrier will effectively change your sound's volume, but doing the same thing on a modulator will modify the harmonic content of the sound. This is where the power of FM synthesis resides! Coupled with envelope generators, harmonic content that changes over time is easily achieved.

There may be several modulators for one carrier, in this case their output is simply summed before the modulation happens (additive synthesis). Or there may be a modulator modulating several carriers, in that case its output is simply sent to each carrier.

The quickest way to learn FM synthesis is by looking at existing sounds. Go into Voice mode, select one from the list and press "Edit". Now you're free to modify it, destroy it or make it better!

FM synthesis has the big advantage of being really fun to work with - after about 10 years experimenting with it, we are still surprised by the variety of sounds we can get from it.

We hope you'll like it as much as we do!

Sound design tips

Start with a single audible operator (mute the others), then build your sound from it, by adding operators as you need them. Instead of using a single modulator with a very high volume, try using several of them chained in different ways, with a lower volume to achieve a more refined sound.

When trying to achieve a particular sound, try to split it into several sub-sounds to make them easier to manage. For example, for a pan flute, you may want to create a short noise attack sound + a sustained, cleaner pipe sound.

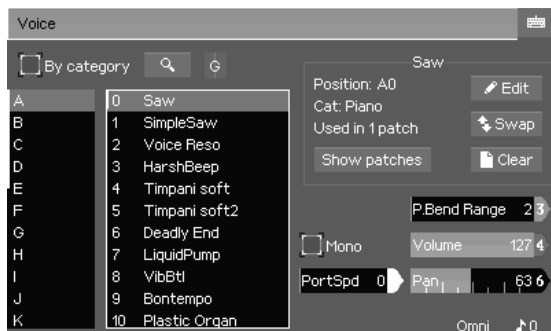
Use the sine wave first. They are the most flexible and useful in FM synthesis. Use other waveforms with care, as their aliasing limit is easily exceeded. You will find that some waveforms are well suited to some instruments (like the Square wave for cymbals, or the HSine for bowed strings).

When you have a good sound that is just a bit "thin" sounding, try detuning an operator ("Fine" parameter) to create a rotating phase shift. If the wobbly effect isn't appropriate, try instead overlapping two instances of the voice in Patch mode, with a slight detune applied to one of it. Also, don't underestimate the effects. Some chorus or phaser may do wonders.

Voice mode


In Voice mode you can organize, play and edit a 6-op FM voice. This mode responds to the Global Channel, see Global > MIDI configuration.


Voice List



Bank / Voice Lists: Those lists allows you to select the voice you want to play or edit in this mode

By Category: Shows the voices/patches sorted by Category instead of sorting them by Bank.

Find : Allows to search a voice by name.

MIDI activity indicator : Shows the Pan (light vertical bar), Volume (height), Channel (channel number or G for

global channel) and MIDI activity (color) in a very compact way.

Edit: Goes into the Voice Edit Mode

Swap: Swaps the current voice with another one, select via a popup.

Clear: Resets completely the current voice

Show Patches: Shows all patches using the selected voice. It's useful to see which patches will be affected when editing this voice.

These parameters on the aren't stored within the voice, they are for playing purposes:

P.Bend Range (0 ~ 96): Pitch Bend range in semitone

Volume (0 ~ 127): Volume of the voice

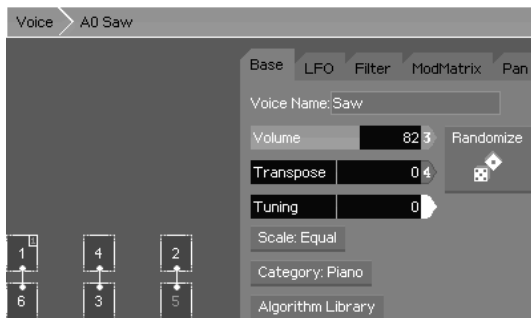
Pan (0 ~ 127): Pan of the voice

Mono: Toggles voice to monodic play mode

PortSpd (0 ~ 127): Portamento Speed, works only when the voice is in Mono Mode

Voice Editor

The voice editor is split into two parts: the left part of the screen always displays the algorithm, while the right



panel displays parameters relative to the selected element.

Algorithm design

The algorithm on the left side of the screen shows the operators, their output level is displayed in real-time when you are playing, allowing you to clearly see how their envelopes are working.

There are several actions you can do on the operators via the touch screen to build your algorithm :

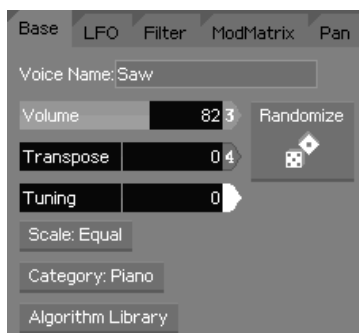
- Pressing an operator and releasing it (drag&drop) onto another one will connect them together. If these operators are already linked together, their positions will be swapped.
- Pressing an operator to move it always removes its bottom links.
- Releasing an operator in an empty area and it will simply fall, going to the bottom or to the nearest operator below.
- Using two fingers and pressing simultaneously two operators will link them together. It allows to create additional links that aren't always possible with the simple drag&drop operation

Limitations : There can be only 1 operator that has more than two operators feeding into it. It can be any operator as it's managed by the engine. Additional links won't be created if you request them when the limit is exceeded.

Editing voice/operator parameters

When an operator is pressed, the right panel shows the operator's parameters.

When you press the touchscreen in an empty region of the left part of the screen, the right panel shows the voice settings.



Voice settings

BASE TAB :

Voice Name: Sets the name of your voice

Volume (0 ~ 127): Sets the volume of the voice

Transpose (-36 ~ +36): Sets the semitone transposition of the voice

Tuning (-100 ~ +100): Sets the fine tuning of the voice

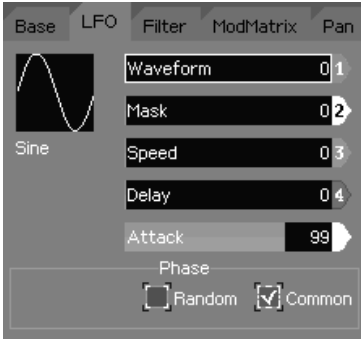
Scale: Selects the scale which will be applied to the voice (cf. Tuning section in Global Mode)

Category: Assigns a category to your voice (cf. Sorting

section in Global Mode)

Algorithm Library: Here you can choose one of our 32 preset algorithms to help you to start creating a new voice

Randomize: This button generates a new sound using a “smart randomize” process, in case you need some new sound ideas !



LFO TAB :

Waveform (0 ~ 23): Selects the waveform you want to use with your LFO. It's the same waveform set used into synthesis.

Mask (0 ~ 12): This mask distorts and reshape the selected LFO waveform. It doesn't overwrite the original waveform.

Phase Offset (0 ~ 31): Here you can set the point where the LFO waveform will start to play.

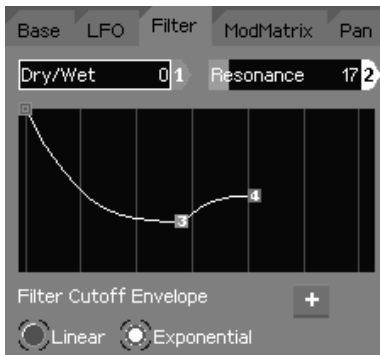
Random Phase: Use a random number generator to set the LFO waveform start point when the note is played.

Common Phase: If checked, the LFO isn't triggered at each Note On, but it still work at background, and the voice is just "connected" to the LFO when Note is triggered.

Speed (0 ~ 127): Sets the LFO speed rate

Delay (0 ~ 127): Sets the delay between the Note On message, and the start of the LFO.

Attack (0 ~ 127): Sets the slope of LFO amount when triggered



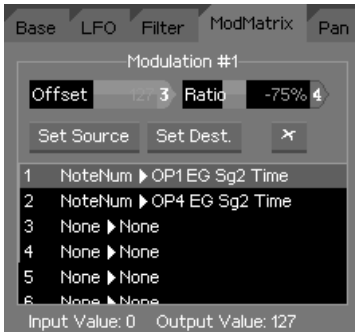
FILTER TAB :

D/W Balance (0 ~ 127): Here you can set the balance between the dry sound and the filtered sound. It works in the same way you can find in any serial connected audio processor. A value of 64 means you've got a 50%-50% mix between dry and filtered sound.

Resonance (0 ~ 120): This slider allows you to set the resonance of the filter

Cutoff Env (5-segment): This envelope allows you to control cutoff evolution during the time. See Envelope Edit section to know more about manipulating

envelopes.



MODMATRIX TAB :

Up to 8 modulation cords can be setup for each voice. Sliders and buttons applies to the current selected modulation line in the list.

Offset: Applies an offset (adds, subtracts) to the modulation source

Ratio: Scales the modulation source

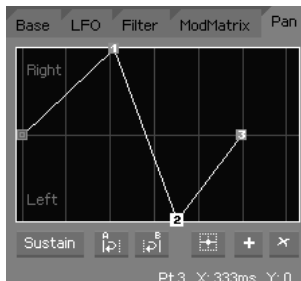
Set Source: Selects the source to use (cf. source list below)

Set Dest.: Selects the destination parameter to affect (cf. destination list)

Cut cord (x): Removes the selected modulation line

I/O value monitor: On this line, you can check, for the selected cord in the list above, the source value and how the Offset and Ratio amounts are working on it. It's a good tool to fine tune those values according to what you are sending into the mod. matrix.

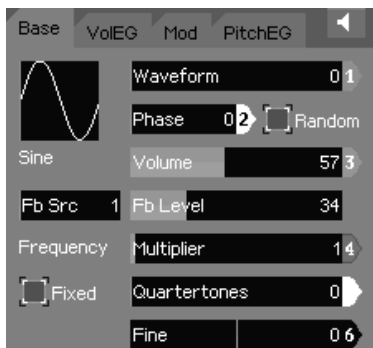
Mod Matrix Sources	Mod Matrix Destinations	
Note number	Volume	Volume
Velocity	Freq. Coarse/Fine	Freq. Mult
Release Velocity	LFO Speed	Freq. Coarse
Aftertouch	LFO AM/FM Depth	Freq. Fine
Poly. Aftertouch	LFO Waveform/Mask	Waveform
Pitch Bend	Fit Reso/Cutoff	Initial Phase
LFO	FitEG Speed	LFO AM/FM
Note count	FitEG Sg1-5 Time	EG Speed
RNG	FitEG Pt1-6 Y	EG Sg1-5 Time
Envelope (any)	PanEG Speed	EG Pt1-6 Y
Control Change (any)	PanEG Sg1-5 Time	PitchEG Speed
	PanEG Pt1-6 Y	PitchEG Sg1-5 Time
	Feedback Src	PitchEG Pt1-6 Y
	Feedback Lvl	



PAN TAB :

This envelope allows you to control the Pan of your voice over time. See Envelope Edit section to know more about manipulating envelopes.

Operator settings



BASE TAB :

Waveform (0~23): Sets the waveform used as base oscillator for the selected operator. See Waveforms section in Global mode to know how to edit and customize those waveforms.

Phase (0~31): Sets the initial phase where the waveforms starts at.

Random Phase: Use a random number generator to set the initial phase.

Volume (0~127): Sets the operator's volume.

Feedback Source (1~6) *[OP1 only]*: Selects which operator output will be fed back into OP1.

Feedback Level (0~127) *[OP1 only]*: Sets the level of the feedback loop.

Fixed: Toggles between Fixed or Multiplicative operator frequency mode. In Multiplicative mode, it follows MIDI note frequencies with multiplier applied to it, while in Fixed mode, it stays always the same.

Multiplier (0~40) *[only in Multiplicative mode]*: Sets the operator frequency multiplier. Original frequency depends on incoming MIDI note pitch.

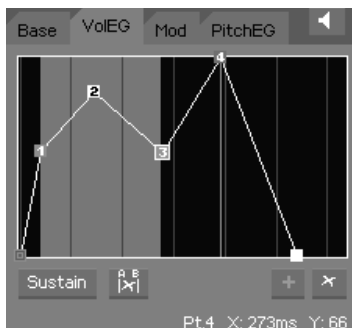
Quarternotes (0~24) *[only in Multiplicative mode]*: This parameter allows you to "transpose" the operator note by quarter-tone steps.

Fine (-100~+100) *[only in Multiplicative mode]*: This parameter allows you to fine tune the operator's frequency.

Freq. Multiplier *[only in Fixed mode]*: Sets the multiplier of the operator fixed frequency. Available values are 0.1, 1, 10 and 100

Freq. Fine (0 ~ 255) *[only in Fixed mode]*: Sets the operator fixed frequency according to the multiplier set below.

Frequency indicator *[only in Fixed mode]*: This number shows you the operator actual frequency in Hertz. It's useful to accurate the two previous parameters.

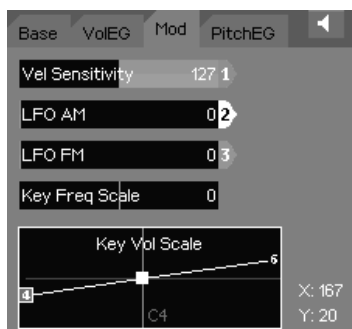


VOL EG TAB :

This envelope allows you to control the operator's volume during time. See Envelope Edit section to know more about envelope manipulation.

Caution: If the selected operator is a carrier, you must end its envelope with a value of zero, otherwise your voice will

never stop playing. Don't forget to press the panic button if a note is stuck !



MOD TAB :

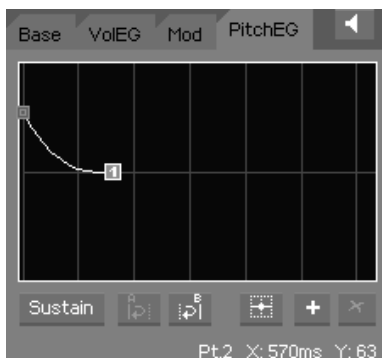
Velocity Sensitivity (-127 ~ +127): Sets how the operator volume is affected by the note on velocity.

LFO AM: Sets how much the LFO affects the current operator's volume.

LFO FM: Sets how much the LFO affects the current operator's frequency.

Keyboard Scaling: This curve allows you to set the operator keyboard scaling. It scales the operator's volume according to the incoming MIDI note. There are 3 parameters: Lower

volume, Center note, and Upper volume. The two (upper and lower) volumes represents the amount at bottom and top of your MIDI keyboard. The center note parameter sets the root of those two curves.



PITCH EG TAB :

This envelope allows you to control the selected operator pitch during the time. See Envelope Edit section to know more about manipulating envelopes.

Pitch EG Range (shown when no point is selected): This value sets the Pitch EG maximum value. Available ranges are Tone, Quint and 1 to 4 octaves.

Envelope Edit

The EssenceFM envelope editor is quite different from those you can find in other synthesizers. Instead of the classic ADSR we have points without predetermined roles, they can be placed freely to create the envelope shape.

Each EG segment is delimited by 2 points and you can drag them to adjust segment start and end values (vertically) and duration (horizontally). Vertical lines indicates the time scale, and the horizontal zoom can be adjusted by pinching with two fingers.

EG manipulations are described below:

Add Point (+): Add a new point after the selected one.

Delete Point (x): Remove the selected point.

Center Point (Pan & Pitch EG only): Centers vertically the selected point on the origin axis.

Sustain Point: Attach sustain to the selected point. The envelope level will be locked at it until Note Release.

Skip on Release (only shown when Sustain Point is selected): If checked, when the note is released before reached the sustain point, the envelope value will jump to this point.

Segment Loop A / B: Sets the Loop Start and Loop End points of a segment loop, which can take in several segments. Loop must be set before the sustain point to work.

Linear / Exponential (only shown when no point is selected): Sets the envelope in Linear or Exponential mode.

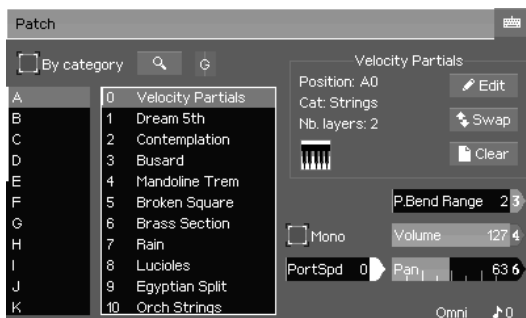
Selected Point Information: On the page bottom line, selected point coordinates are shown to help you adjusting them.

Information: Main Jog Wheel and INC/DEC keys behavior is quite different when you're editing an EG point. Jog Wheel adjusts (like Direct Access knobs) the horizontal position and INC/DEC keys modifies the vertical position.

Patch mode

In Patch Mode you can organize, play and edit Patches. This mode responds to the Global Channel, see Global > MIDI configuration.

When going into Patch Mode, the first page showing up is the Patch List.

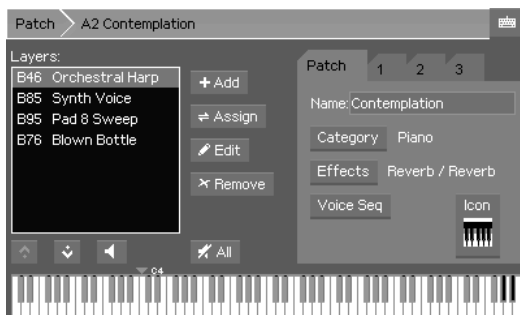


Like in Voice mode, parameters on the Patch List page aren't saved into the patch (Pitch Bend Range, Volume, Pan...).

"Edit" brings you to the Patch Editor.

"Swap" swaps the current patch with the patch of your choice.

"Clear" clears the current patch.



Patch editor

Layer management


Layer list: All voices layered into the current patch are listed here. It allows you to select the layer you want to work on, whose parameters are on tabs 1 to 3.

Add Layer (+): Adds a new layer based on the previous element.


Assign Layer: Assigns a voice to the selected layer.


Edit Layer: Opens the selected layer in Voice Editor. You can edit the voice and hearing it in context, but BEWARE, any modification is reflected on ALL PATCHES which are using the edited voice.

Remove Layer (x): Remove the selected layer from the patch. Obviously, it doesn't delete the original voice.

 **Move Layer up:** Puts selected layer before the previous element in the list.

 **Move Layer down:** Puts selected layer after the previous element in the list.

 **Mute Layer:** Mutes the selected layer. This setting is stored into the patch.

 **Mute All:** Toggles mute for all layers.

Patch settings



PATCH TAB :

Name: Sets the patch name

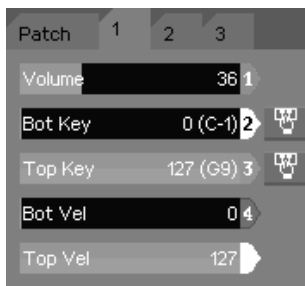
Category: Assign a category to current patch (cf. Sorting section in Global Mode)

Effects: See the Effects section for more information.

Voice Seq: See dedicated section below

Icon: Sets an icon to your patch

Layer settings



TAB 1 :

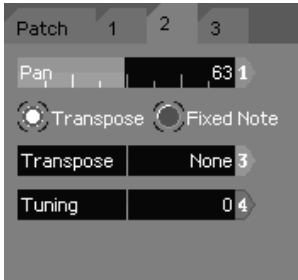
Volume (0 ~ 127): Sets the selected layer volume

Bottom Key (0 ~ 127): Sets the selected layer bottom bound note. You can use MIDI Learn button on the right to set it directly via your MIDI controller.

Top Key (0 ~ 127): Sets the selected layer top bound note. You can also use MIDI Learn button on the right to set it directly via your MIDI controller.

Bottom Velocity (0 ~ 127): Sets the lower velocity bound from which the selected layer should be heard.

Top Velocity (0 ~ 127): Sets the top velocity bound at which the selected layer should be heard.



TAB 2 :

Pan (0 ~ 127): Sets the selected layer pan position.

Transpose mode: In this mode, selected layer will respond to the incoming MIDI note pitch

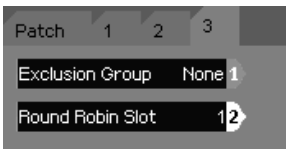
Fixed mode: In this mode, selected layer will ignore the incoming MIDI note pitch

Transpose [Transpose mode only] (-36 ~ +36): Sets the incoming note pitch offset

Note [Fixed mode only] (0 ~ 127): Sets the selected layer pitch

Tuning (-100 ~ +100): This parameter allows to set the note pitch really precisely.

TAB 3 :

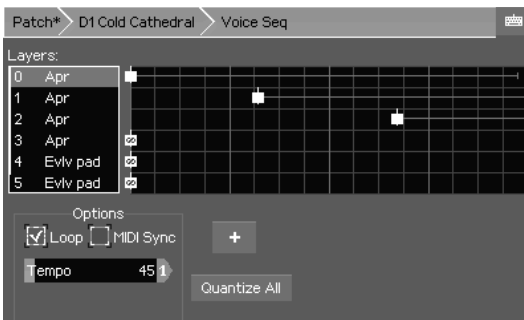


Exclusion Group (None, 1~8): Sets the Group in which all notes, from the selected layer, shouldn't be allowed to play simultaneously. It's a useful tool to make realistic drum-kits (e.g: Open and Closed hi-hat should be in the same exclusion group).

Round Robin Slot (1 ~ 32): This feature allows you to play the selected layer sequentially, each time you trigger a note. For

example, if you've got 2 layers which are respectively in slot 1 and 2, the first incoming note will play on the first layer, the next note on the second layer, and so on.

Voice Sequencer



This tool, built into the patch, is a powerful way to make rhythmic and evolving sounds, following its own tempo or locked to an external MIDI Clock.

It basically works like every event-based MIDI sequencer, but in a simpler way.

Each patch layer appears like a "track" in which you can put one or more events.

There are two kind of events: note and swap. Note event triggers a sound corresponding to the layer assigned voice.

Swap event moves the current playing note to another layer.

You can add, drag horizontally, and remove any event into the sequencer grid in order to compose a sequence following your creativity !

Layer List: Selects the layer you want to work on.

Sequencing Grid: As explained above, this grid is the main space in which you place events to build your sequence.

Loop: If checked, the sequence will play indefinitely until you release the note.

MIDI Sync: If checked, the Voice Sequencer will lock to an external MIDI clock, instead of internal tempo. Caution: be sure your sequencer (or any other MIDI controller) is able to send this kind of message when you're using this feature, otherwise your Voice Sequence won't play at all. The line which appears below shows you if an external clock is received, and, if so, the calculated tempo.

Fixed Tempo [Internal Sync mode only] (1 ~ 500): Sets the internal Voice Sequence tempo

Step division [MIDI Sync mode only] (0.125 ~ 2): Sets the grid division of the sequence when synced to an external MIDI clock.

Add Event (+): Adds an event into the selected layer track

Quantize: Puts selected event on the closer beat vertical rule.

Quantize All: Temporally aligns all events on the sequencer grid.

Event kind radio buttons (Note or Swap): Selects the current event type, which was detailed in Overview section below.

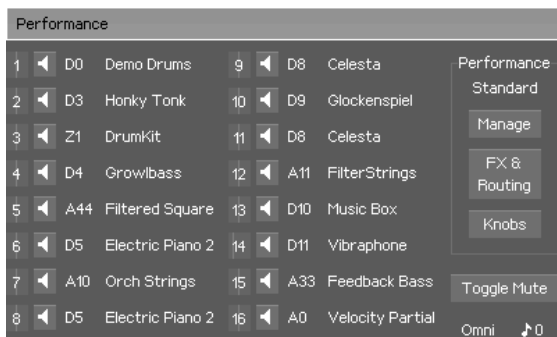
Duration [Note event only] (0 ~ 126 ; Infinite): Sets the event length, and allows to simulate a Note Off event. If set to infinite, this event won't be simulated. Note: A real Note Off event, incoming from MIDI, will always be a priority !

Relative Note [Note event only] (-48 ~ +48): Sets the note event transposition, relatively to the incoming MIDI note pitch.

Layer Number [Swap event only]: Sets the layer to which the note will be swapped.

Trigger Once: Triggers the event only once if the sequence is looped.

Delete Event (x): Remove selected event from the grid.



Performance mode

Manage: Goes to Performance Manage page, described below.

FX & Routing: Goes to Performance Effects and Routing parameters page,.

Knobs: Goes to Knob assign page

Toggle mute: Mute all unmuted parts, and vice-versa.

For each part, pressing the **MIDI**

channel number indicator opens a popup to change it.

Pressing the individual **Mute**  buttons mute the selected part.

Manager

On this page, you can manage all 256 performances stored in the synth. You can also see several information about current and selected performances, especially the patches assigned to the 8 first parts.

Performance List: One among the 256 performances can be selected here

Swap Perf: Swaps the selected performance with another you select via the shown dialog.

Clear Perf: Resets the selected performance to factory defaults.

Perf Name: Sets the performance name.


Make Current: Loads the selected performance into a buffer, in order to be used when you're in performance mode. Caution: If you want to keep your changes, you have to save the current performance into a slot in the list BEFORE loading another one into the active performance buffer.



Part Editor

Bank / Patch Lists: Those lists allows you to select the patch you want to assign to the selected part

By Category: Toggle the Bank/Patch Lists into Category/Patch lists mode

Find : This function allows you to browse among patches according to a string you entered.

MIDI activity indicator: Shows the Pan,

Volume, Channel and MIDI activity

Edit: This button goes into Patch Edit Mode, but you still hearing it in Performance context.

P.Bend Range (0 ~ 96): Pitch Bend range in semitone

Volume (0 ~ 127): Volume of the part

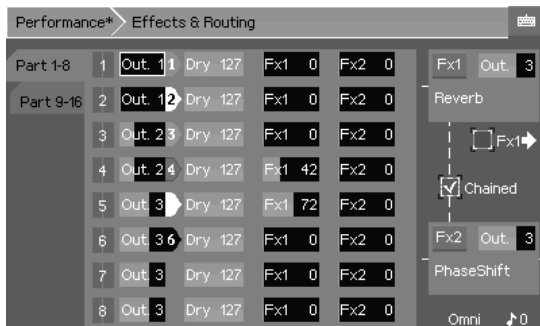
Pan (0 ~ 127): Pan of the part

Mono: Toggles part to monodic play mode

Porta Speed (0 ~ 127): Portamento Speed, works only when the part is in Mono Mode.

Prev / Next: Jumps to the previous or next part without having to go back to the main Performance page.

Effects / Routing

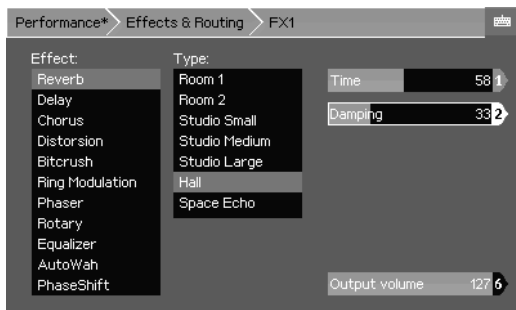


Effect levels and output routing are configured here.

For each part, you may configure:

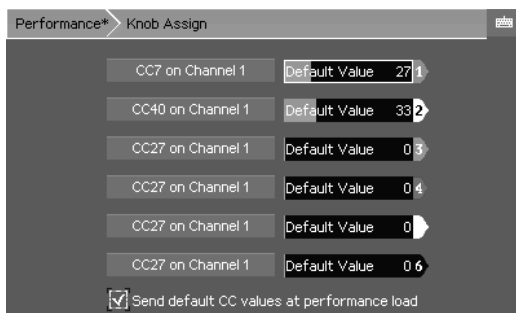
- **Output** pair (1~4)
- **Dry** level (0~127), the amount of original sound from the FM engine
- **Fx1** send level (0~127), the amount of signal sent to the first effect DSP
- **Fx2** send level (0~127), the amount of signal sent to the second effect DSP

Each effect DSP can be routed to any output pair, and the effect can be selected by pressing the “Fx1” and “Fx2” buttons.



Effect selection

The list on the left selects the effect, which may have a Type depending on the effect, and one or more parameters.



Knob Assign

In this page, you can assign 6 MIDI Control Changes to the 6 encoders, which will be sent when manipulated while EssenceFM is in Performance mode.

CC Assign button: The command button caption shows the current CC and channel corresponding to the knob. Pushing it

opens a dialog in which you can select CC and channel numbers.

Default Value (0 ~ 127): This slider assigns a default value to the corresponding knob CC.

Send Default CC Values at performance load: If checked, the synth will send the 6 default values to the engine and via the MIDI output (if CC aren't filtered in global mode)

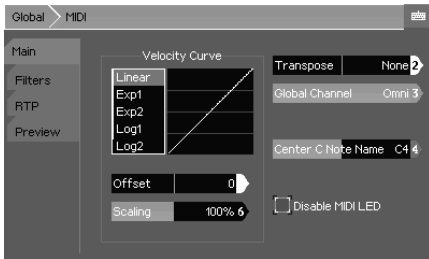


Global mode

All the global parameters of the EssenceFM are accessible through this mode. When entering the Global mode, the current active mode (Performance, Patch or Voice) keeps running in background without any sound interruption.

MIDI and Display settings are automatically saved when leaving the page.

For most other elements (Scales, Waveforms, Categories) they will appear with an asterisk when modified, so they need to be saved manually by pressing the “Save” button.



Global > MIDI

MAIN TAB:

Velocity Curves:

Shape: Choose from Linear, Exponential, Logarithmic or Fixed modes.

Offset (-64~64): Vertical offset

Scaling (0~200%): Vertical scaling

Transpose (-36~+36): Global transposition, in semitones

Global Channel (1~16 + Omni): MIDI channel that responds to the Global Channel, which is used for Patch and Voice modes. (and Performance, if you assigned a Part to the Global Channel).

Center C Note Name (C3~C5): Choose the center C note name according to your country’s standard. This parameter is purely for display purposes, it does not affect the sound in any way.

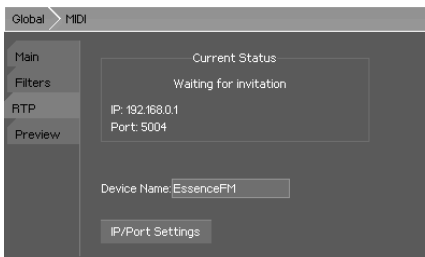
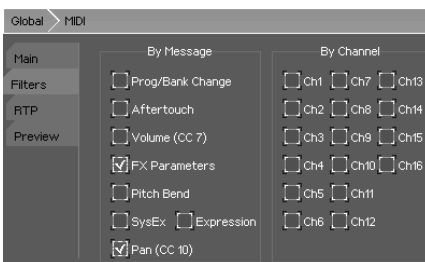
Disable MIDI LED: If checked, disables the MIDI activity LED

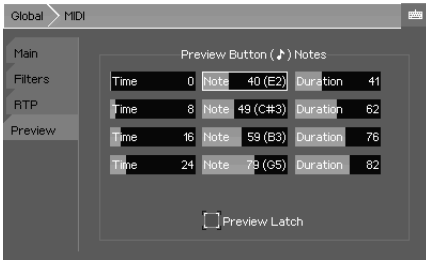
FILTERS TAB:

Check a message type or MIDI channel number to filter (block) it.

RTP TAB:

Device Name: Defines the name of the device





IP/Port Settings: Selects the IP mode (Fixed/DHCP), IP settings (IP, Mask, Gateway) if the IP mode is Fixed, and Port number.

PREVIEW TAB :

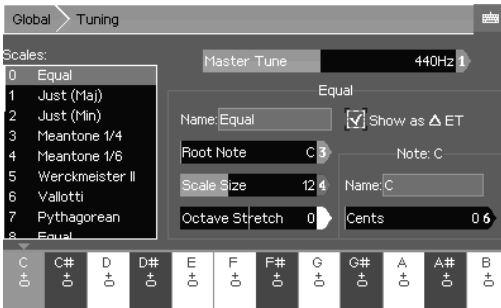
Here you can configure the notes played when pressing the [J] button. For each note there are 3 parameters:

Time (0~127): Selects the timing for the note to be triggered

Note: Selects the note number

Duration (0~127): Selects the duration for the note

Preview Latch : If checked, the preview won't stop when releasing the [J] key.



Global > Tuning

This page provides access to the master tune setting and scale editor.

SCALE PARAMETERS :

Root Note: Base note for the scale.

Scale Size (1~32): Number of notes in the scale.

Octave Stretch (-50~+50): Allows to stretch the octave. Zero means each octave is double the frequency. A negative value will

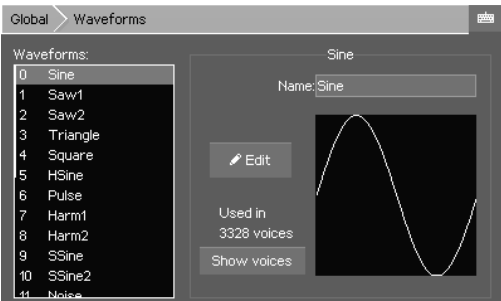
make it smaller, while a positive value will make it wider.

Show as Delta Equal Temperament: instead of showing the values in absolute Cents, it shows them relative to Equal Temperament (only works if scale size = 12)

NOTE PARAMETERS :

Name: The note's name

Cents (0~1200): The note's tuning value. 1200 = frequency of the next octave.



Global > Waveforms

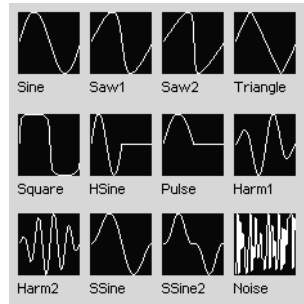
This page shows you all the waveforms in the EssenceFM. When entering this page, current Performance/Patch/Voice modes are temporarily override to let you listen to the waveforms.

Name: Renames the waveform

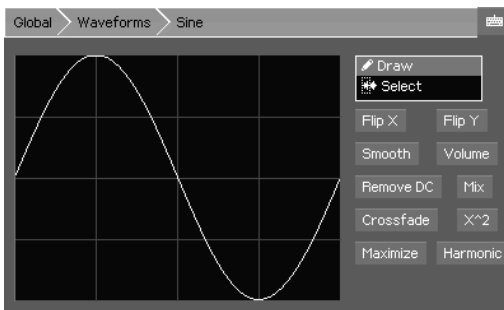
Edit: Goes to the waveform edition page

Show voices: Shows which voices use the selected waveform. This is very useful as the waveforms are global to the synth - they are shared between voices. You need to be careful when modifying one, as all voices using it will be impacted.

The EssenceFM has 24 editable waveforms, it comes with 12 presets and 12 empty slots.



Default waveforms



Waveform Editor

In **Draw** mode, waveform can be modified directly by pressing then moving the finger on the touchscreen.

In **Selection** mode, part of the waveform can be selected to apply transformations only to it.

Flip X: flips the waveform horizontally

Flip Y: flips the waveform vertically

Smooth: smooth the waveform. Press several times to smooth more.

Volume: scales the volume, from 0 to 200%

Remove DC: centers the waveform vertically (removes any DC offset)

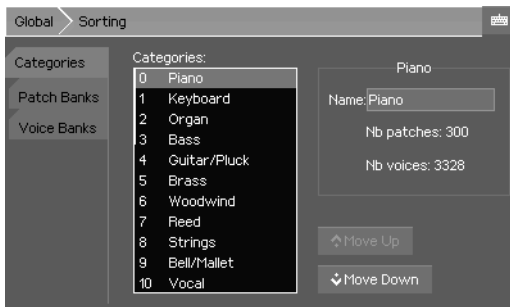
Mix: mix the waveform with another waveform

Crossfade: smooth the waveform ends to make it seamless

X²: replaces the current waveform with its power of 2

Maximize: scales and centers the waveform to use the maximum amplitude

Harmonic: adds an harmonic (0~40) to the current waveform

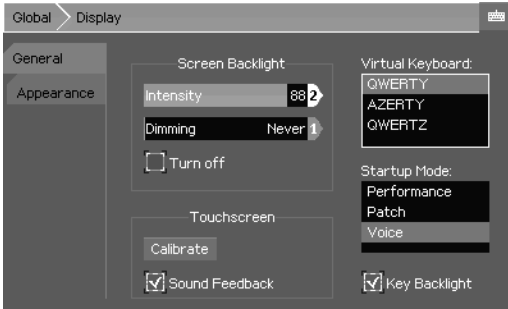


Sorting

CATEGORIES TAB: Here you can organize and rename the Patch/Voice categories.

PATCH BANK TAB: To swap/clear whole patch banks. Changes aren't saved until you go to the Patch Mode and press Save.

VOICE BANKS TAB: To swap/clear whole voice banks. Changes aren't saved until you go to the Voice Mode and press Save.



Display

GENERAL TAB :

Screen Backlight Intensity (0~100): Adjusts the backlight brightness

Screen Backlight Dimming

(Never/Adjustable Delay): Selects a delay before the display is dimmed to extend its lifetime/reduce power usage.

Turn off: When checked, if Dimming is not

on "Never", the display will be completely turned off instead of being dimmed

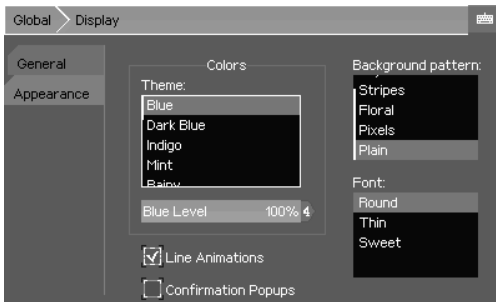
Touchscreen Calibration: Begins the calibration process if the touchscreen default settings aren't optimal for your usage

Touchscreen Sound Feedback: When checked, the internal buzzer will emit a "click" sound on each touch screen finger press.

Virtual Keyboard: Selects the scheme used for the alphanumeric keyboard.

Startup Mode: Sets the default mode the synth boots in.

Key Backlight: Enables LED backlight under the keys.



APPEARANCE TAB :

Color Theme: Selects the color theme for the interface

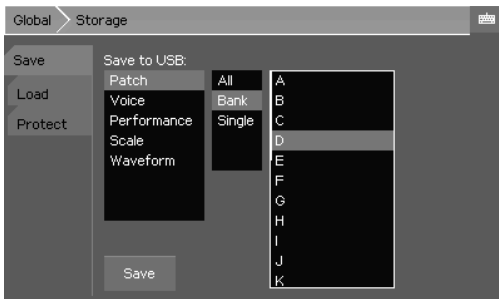
Blue Level: Allows to adjust the global blue level

Line Animations: Enables line animations that are used for the lines connecting operators and the lines in the Effects page.

Confirmation Popups: Enables confirmation popups on Save/Recall/Overwrite actions.

Background Pattern: Selects the background pattern

Font: Selects the font used on every page



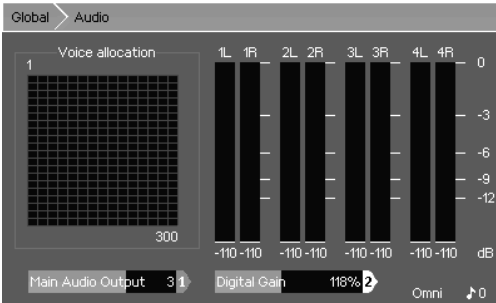
Storage

SAVE/LOAD TAB :

This page allows you to Load/Save elements from an USB mass-storage device.

PROTECT TAB :

Selects the items you want to protect from saving.



Audio

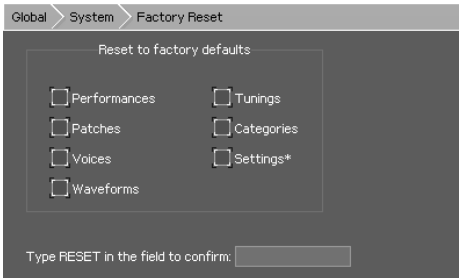
This page provides a monitoring of the allocated voice channels in the FM engine and vu-meters for monitoring the audio output.

Notes currently playing are represented by a green dot, they carry an instance of the Voice Sequencer. Then, each allocated voice is represented by a white square (or

grey if its sustain state has finished)

Main Audio Output: Selects the audio output used for Patch and Voice modes.

Digital Gain: Sets the global output volume. It's useful for minimizing noise if you play quiet sounds (high digital gain), or to avoid clipping if you play lots of stacked sounds (low digital gain).

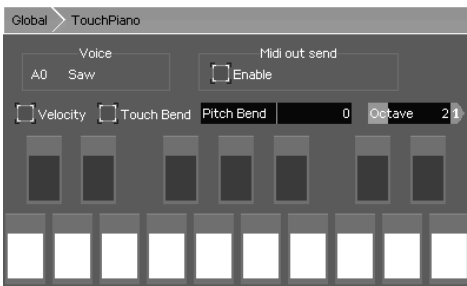


System

Reset

Resets the system to its original state. You can do a full reset or partial one. Reseted items can't be restored, use this feature with care!

Demo



TouchPiano

Provides a small touchscreen-based keyboard, for fun or as a last resort if your controller/input fails.

The current select sound from the current mode is used. To change it, you need to go into the mode you were in, select a Voice/Patch/Performance Part, then go back to the TouchPiano.


Automation

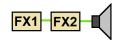
When you make a track using the EssenceFM you want to be able to save its patch/routing/effects settings and recall them automatically when needed. To do so, save your performance into one of the 256 slots, then use the MIDI CC 39 and CC 40 to load the desired performance.

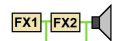
CC 39	Selects the performance bank : 0 (performances 0 to 127) or 1 (performances 128 to 255)
CC 40	Selects and loads the performance from the selected bank. (Performance number = CC39*128+CC40)

To change effects on the fly, CCs 47 to 60 are used :

CC 47 - 48	FX1 & FX2 type
CC 49 - 50	FX1 & FX2 subtype
CC 51 - 55	FX1 parameters 1 to 5
CC 56 - 60	FX2 parameters 1 to 5
CC 61 – 62	FX1 & FX2 output level
CC 90	MIDI channel DRY level
CC 91	MIDI channel FX1 send level
CC 92	Effect routing mode 0 = parallel 1 = chained 2 = chained + FX1 listen

Parallel 

Chained 

Chained hybrid 

Effect List

Each effect DSP can be setup to do the effects below. Effects subtypes/parameters are listed in the right order for use with the CCs detailed above.

N°	Effect name	Effect subtypes	Effect parameters
0	Reverb	Room 1, Room 2, Studio Small, Studio Medium, Studio Large, Hall, Space Echo	Time (0 ~ 124), Damping (0 ~ 127)
1	Delay	-	Delay L (0 ~ 127), Delay R (0 ~ 127),

			Feedback (0 ~ 120), Cutoff (0 ~ 127)
2	Chorus	-	Speed L (0 ~ 127), Speed R (0 ~ 127), Depth (0 ~ 127)
3	Distorsion	Saturate, Fold-Back, Halved Negative, Positive, Abs	Threshold (0 ~ 127), Gain (0 ~ 127), Cutoff (0 ~ 127)
4	Bitcrush	-	Frequency (0 ~ 127), Bit Reduction (0 ~ 127), Cutoff (0 ~ 127)
5	Ring Modulation	-	Speed (coarse) (0 ~ 127), Speed (fine) (0 ~ 127)
6	Phaser	-	Speed (0 ~ 127), Depth (0 ~ 127), Frequency (0 ~ 127)
7	Rotary	-	Rotor speed (0 ~ 127), Stereo Depth (0 ~ 127), Distorsion (0 ~ 127)
8	Equalizer	-	Low Freq (0 ~ 127), High Freq (0 ~ 127), Low Gain (0 ~ 127), Mid Gain (0 ~ 127), High Gain (0 ~ 127)
9	AutoWah	-	Speed (0 ~ 127), Cutoff (0 ~ 127), Resonance (0 ~ 100), Depth (0 ~ 127)
10	Phase Shift	-	Left (samples x10) (0 ~ 127), Right (samples x10) (0 ~ 127)

Troubleshooting

Problem	Solution
Some notes are stuck active and I can't stop them	Press the "Panic" button
I have some voices and patches marked as "Corrupted" instead of their original name	Your probably had a power loss while pressing "Save". If accessing those elements crashes the synth, clear and save them ("Clear" button on the Voice List and Patch List pages) . Unfortunately, corrupted elements can't be restored. If your electrical network isn't very reliable, we suggest regularly saving your work on a USB drive.
I can't hear any sound as I play	In Patch and Voice modes, check that the Main Audio Output parameter (found in Global => Audio) is set to the output jacks you are plugged into. Also, check that you are sending MIDI

	<p>events on the Global Channel, which can be configured in Global => MIDI.</p> <p>In Performance mode, check that there is at least one Part assigned to the MIDI channel you are using, check that this part is routed to the right jack output ("FX & Routing" button), check that it isn't muted or has its volume set to zero.</p> <p>For all modes, check that your controller isn't sending MIDI expression CC with a null values. Press the Panic button to reset it to its maximum value.</p> <p>By going to the Global => Audio page you can see if there is audio signal generated, so you know if the issue is on the software or hardware side.</p>
My USB drive isn't detected	Check it is FAT32 or exFAT formatted. NTFS isn't supported.
I plugged a MIDI-USB device on the front port, but nothing happens.	MIDI class-compliant devices are supported but hot swap isn't. You need to plug it in and power up the EssenceFM after.
I found a software issue and want it to be fixed	<p>Alright! Please describe the problem and how to reproduce it by writing at contact@kodamo.org.</p> <p>A fix may be released for the next firmware version, so you can upgrade it when available.</p>
I sent tons of MIDI events triggering complex patches and now the sound is glitchy	There is a lot of CPU power to handle everything, but you may find cases where it can be overwhelmed. Such a case may happen by sending hundreds of notes within a second, each one triggering dozens of notes at the same time via the Voice Sequencer. If this happens, no worries, it doesn't do anything harmful - but you need to restart your EssenceFM to fix the glitchy sound. We suggest trying a different approach in your sound design, to achieve the effect you like in a more efficient way.
After updating the firmware, the synth doesn't boot anymore.	This may happen if you suffered from a power loss while upgrading the firmware. Please contact us, we'll explain you the procedure to restore it.

Memo

Warranty

The EssenceFM is sold with an included 2-year manufacturer's warranty, allowing two workshop returns, in case of a defective product.

Normal wear and damage caused by the user are not covered: water damage, impacts, electrical surges, use of the wrong wall adapter, use in high-temperature environments (>40°C).

If you need to return the product under warranty, please send us an email (contact@kodamo.org) describing what happened and we'll send you the procedure.

License

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You are not allowed to sell/redistribute content that is the property of KODAMO: sound banks available for sale, firmwares...

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Publication date : --/--/2020

Printed in France