



Multi-oscillator for Minilogue XD and Prologue

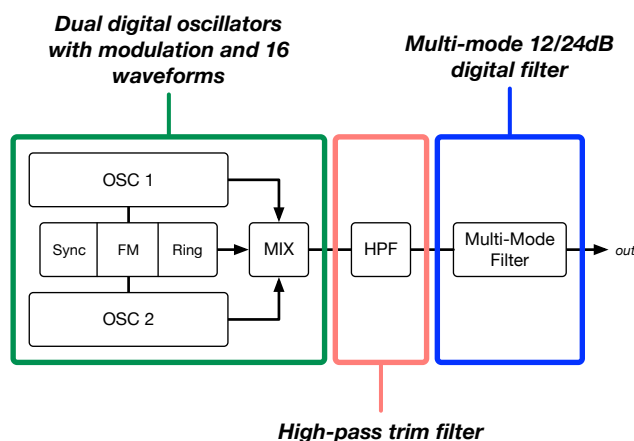
<https://tsoniq.com/software/korg/fusion>

fusion

fusion is a user oscillator for Korg Logue based synthesisers. It supports the Minilogue XD and Prologue.

fusion provides a complete virtual-analogue synthesiser, with extensive control from the Prologue or Minilogue XD front panel.

Layer *fusion* with the standard VCOs to thicken sounds and add sub-oscillators, or use it standalone to provide a complete emulation of the Logue VCOs but backed with a 24dB/octave filter - all controlled from the main synthesiser panel by mirroring the VCO and VCF controls along with their modulation sources.



fusion exists in *lite* and *pro* versions. Both share the following features:

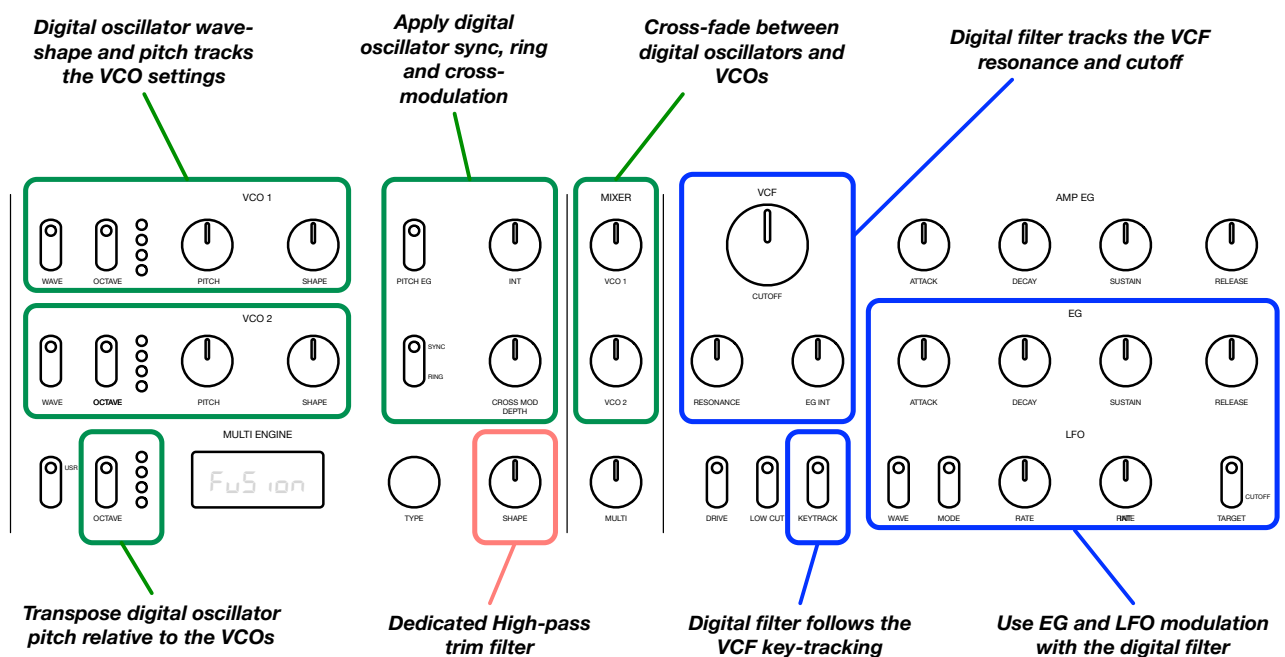
- resonant 12/24dB low-pass filter with optional control via the VCF cutoff and resonance controls
- filter cutoff modulation via the front panel EG and LFO controls
- accurate emulations of the Minilogue XD VCOs, including shape, sync, ring and cross-modulation
- dual oscillators that shadow the corresponding VCO panel controls
- dedicated high-pass trim filter controlled via the multi-engine 'shape' control
- adjustable analogue 'age' controlled via the multi-engine 'shift-shape' control
- options to use the VCO mixer levels to cross-fade or track the multi-engine gain
- high-quality audio engine using 2x oversampling and anti-aliased virtual analogue oscillators

fusion pro further adds:

- 16 additional virtual analogue waveform models, including:
 - emulation of the Alpha Juno PWM Saw ("hoover" sound)
 - emulation of the JP8000 super-saw and super-square oscillators
 - emulation of the JP-4 sawtooth and sawtooth + sub oscillator
 - pulse and pulse + sub waveforms
 - phase modulation waveforms
- additional filter modes for high-pass and band-pass cutoff

Front Panel Control

fusion makes extensive use of the Prologue or Minilogue front panel controls, shadowing many of the settings used by the analogue engine.



Use the multi-engine parameters to configure fixed values for the waveforms and filter settings, or bind the settings to the front panel controls.

Requirements

fusion requires a Korg Minilogue XD, Prologue 8 or Prologue 16, running firmware 2.10.

Please note that *fusion* is currently not compatible with the NTS1.

Installation requires the use of a PC or macOS computer and the Korg Librarian software appropriate for the synthesiser.

Downloading and Feedback

Information and updates can be found at <https://tsoniq.com/software/korg/fusion>.

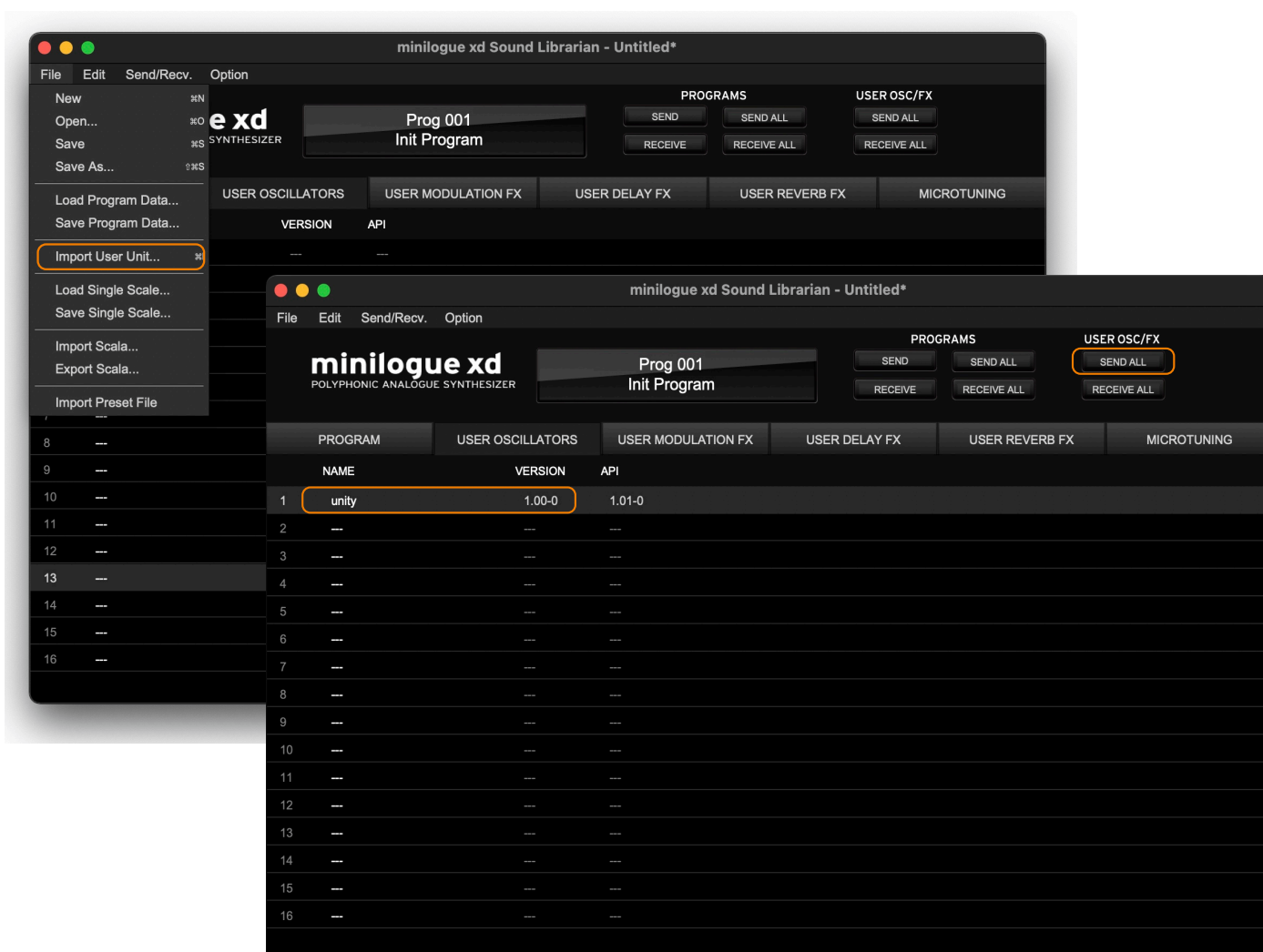
You can send feedback by email to logue@tsoniq.com, or leave a comment on the download page.

Installation

fusion is supplied as a zip archive containing separate files for each platform:

Minilogue XD:	fusion.mnlgxdunit	or	fusion-lite.mnlgxdunit
Prologue:	fusion.prlgunit	or	fusion-lite.prlgunit

Use the appropriate Librarian application (available from <https://korg.com>) to import the unit and then upload to the synthesiser.



Patch Parameters

Patch parameters can be accessed from the multi-oscillator edit menu. Note that many settings have an initial value that passes control to the front panel, while larger values set the control explicitly.

Parameter	Range	Function
OSC Wave 1	1 – 4 1 – 20 (<i>pro</i>)	<p>Sets the OSC 1 waveform.</p> <p>A value of 1 passes control of the waveform to the VCO 1 waveform selection switch. Values other than 1 specify the waveform directly, disabling the panel control.</p>
OSC Wave 2	1 – 4 1 – 20 (<i>pro</i>)	<p>Sets the OSC 2 waveform.</p> <p>A value of 1 passes control of the waveform to the VCO 2 waveform selection switch. Values other than 1 specify the waveform directly, disabling the panel control.</p>
OSC Mix	1-18	<p>Sets the oscillator output mix.</p> <p>A value of 1 sets the OSC 1 and OSC 2 output levels set in inverse-proportion to the VCO 1 and VCO 2 output levels. Turn the multi-engine level to maximum and then use the VCO mixer level controls to cross-fade between the VCOs and the multi-engine oscillators.</p> <p>Values from 2-16 set a fixed level for OSC 1 and OSC 2, adjusting the balance progressively. A value of 2 => OSC 1 only, 10 => equal levels, and 18 => OSC 2 only.</p>
FLT Mode	1 – 3 1 – 7 (<i>pro</i>)	<p>Selects the main digital filter:</p> <ul style="list-style-type: none"> 1: bypass 2: low-pass 12dB/octave 3: low-pass 24dB/octave 4: high-pass 12dB/octave (<i>pro</i>) 5: high-pass 24dB/octave (<i>pro</i>) 6: band-pass 6dB/octave (<i>pro</i>) 7: band-pass 12dB/octave (<i>pro</i>) <p>Note: set "Multi Routing" to "Pre VCF" or "Post VCF" to either enable/disable subsequent analogue VCF processing of the digital filter.</p>
FLT Cut	0 – 100	<p>Sets the filter cutoff.</p> <p>A value of zero passes control of the cutoff to the front panel, the envelope generator and the filter-cutoff LFO. The filter will respond to the Logue's key-tracking, modulation EG and LFO in the same way as the analogue VCF.</p> <p>Values from 1 to 100 configure the cutoff manually. The key-tracking, VCF controls and modulation are disconnected, and the cutoff set to the value specified.</p>
FLT Res	0 – 100	<p>Sets the filter resonance.</p> <p>A value of zero passes control of the resonance to the front panel VCF resonance control.</p> <p>Values from 1 to 100 configure the resonance manually. The VCF control is disconnected, and the resonance set to the value specified.</p> <p>Note that setting the maximum manual resonance setting of 100 is more intense than the maximum that can be set with the panel control, and will put the filter in to self-oscillation.</p>

Oscillator Waveforms and Shape Control

Nineteen waveforms are available, with an additional 'meta' setting that allows a fixed selection of three waveforms from the corresponding VCO waveform selector switch on the front panel:

Wave		Shape	Ring	Sync	XMod	Function
1		✓	✓	✓	✓	Passes control to the front panel waveform selectors for the corresponding VCO. Use the front panel switches to select between waveforms 2, 3 and 4.
2		✓	✓	✓	✓	Emulation of the Logue Sawtooth oscillator.
3		✓	✓	✓	✓	Emulation of the Logue Triangle oscillator.
4		✓	✓	✓	✓	Emulation of the Logue Square-wave oscillator.
5	<i>(pro)</i>	✓	✓	✓	✓	Emulation of the Roland Juno PWM Saw.
6	<i>(pro)</i>	✓	✓			Sawtooth generated using an emulation of Casio CZ Phase Modulation synthesis.
7	<i>(pro)</i>	✓	✓			Sawtooth generated using a circuit model approximating a Roland Jupiter 4.
8	<i>(pro)</i>	✓	✓			As 7 but with a square-wave sub-oscillator one octave below.
9	<i>(pro)</i>	✓	✓	✓		Symmetric pulse waveform.
10	<i>(pro)</i>	✓	✓	✓		As 9 but with a square-wave sub-oscillator one octave below.
11	<i>(pro)</i>	✓	✓			Sine wave with morph to sawtooth via VCO shape modulation.
12	<i>(pro)</i>	✓	✓			Triangle wave with blended transition to sawtooth via VCO shape modulation.
13	<i>(pro)</i>	✓	✓			Super-saw emulation with detune controlled via VCO shape modulation.
14	<i>(pro)</i>	✓	✓			Super-square emulation with detune controlled via VCO shape modulation.
15	<i>(pro)</i>	✓	✓			Digital multi-oscillator with phasing control via the VCO shape modulation.
16	<i>(pro)</i>					Fixed sine wave.
17	<i>(pro)</i>					Fixed sawtooth.
18	<i>(pro)</i>					Fixed square-wave.
19	<i>(pro)</i>					White noise.
20	<i>(pro)</i>					Decimated noise, with pitch tracking the keyboard.

Front Panel Controls

Many parameters are directly linked or can be linked to front panel controls on the synthesiser:

Control	Function
MULTI SHAPE	HPF cutoff frequency, adjustable from 3Hz to 3kHz.
MULTI SHIFT-SHAPE	The modelled analogue 'age', injecting detune, increased non-linearity and noise in to the main filter and oscillators.
VCF CUTOFF	If parameter <i>FLT Cut</i> is zero, controls the main filter cutoff.
VCF EG INT	If parameter <i>FLT Cut</i> is zero, sets the main filter cutoff modulation intensity.
VCF RESONANCE	If parameter <i>FLT Res</i> is zero, sets the main filter resonance.
VCO 1 WAVE VCO 2 WAVE	If parameter <i>OSC Wave 1</i> or <i>OSC Wave 2</i> are set to 1, the oscillator waveform is controlled by the corresponding panel switch.
VCO 1 SHAPE VCO 2 SHAPE	Controls the shape modulation for the digital oscillators.
VCO 1 OCTAVE VCO 1 PITCH VCO 2 OCTAVE VCO 2 PITCH	Controls the relative pitch of OSC 1 and 2. The VCO pitch setting is added to the multi-oscillator octave, allowing the multi-oscillator to function as a tracking sub-oscillator to the two VCOs.
VCO 2 RING	Enables/disables ring modulation of OSC 2 by OSC 1.
VCO 2 SYNC	Enables/disables sync modulation of OSC 2 by OSC 1.
VCO 2 CROSS-MODULATION	Enables/disables frequency modulation of OSC 2 by OSC 1.
VCO 1 LEVEL	If parameter <i>OSC Mix</i> is 1, then this cross-fades the OSC 1 level.
VCO 2 LEVEL	If parameter <i>OSC Mix</i> is 1, then this cross-fades the OSC 2 level.
VCF DRIVE	Controls the output drive.
VCF KEY-TRACK	Controls the main digital filter's keyboard tracking.

Use *fusion* to emulate a 24dB/octave Low Pass Filter with front panel control

- Set *OSC Wave 1* and *OSC Wave 2* to 1. The digital oscillators will provide emulations of the VCOs, honouring the front-panel settings.
- Set *OSC Levels* to 1, setting both oscillators to the maximum output level.
- Set *FLT Mode* to 3, enabling the 24dB/octave low-pass filter.
- Set the multi-engine VCF routing to pre-or-post VCF for different characteristics.
- Turn the VCO 1 and VCO 2 mixer levels to zero, and the multi-engine mixer level to maximum.
- *fusion* will now emulate the VCOs, responding to all front panel controls and modulation sources - but using the alternative digital filter.

Use *fusion* to thicken VCO based sounds

- Set *OSC Wave 1* and *OSC Wave 2* to 1. The digital oscillators will provide emulations of the VCOs, honouring the front-panel settings.
- Set *OSC Levels* to 4 (track) or 5 (cross-fade). This will cause the digital oscillator output levels to track the corresponding VCO mixer level panel settings.
- Set *FLT Mode* to 1, disabling the digital filter, and configure the multi-engine output to be processed by the VCO.
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Use *fusion* to add sub-oscillators to the VCOs

- Set *OSC Level* to 4 (track). This will cause the digital oscillator output levels to track the corresponding VCO mixer level panel settings.
- Choose a filter mode and routing for the VCF.
- Choose waveforms for OSC 1 and OSC 2.
- Lower the octave setting for the multi-engine: *fusion*'s oscillators will track the corresponding VCO pitches, but transposed an octave lower.
- Use waveforms 16 (sine), 17 (saw) and 18 (square) to avoid shape or cross-modulation affecting the sub-oscillators.

Hints, Tips and Problem Solving / 1

No output is heard

- Check that the multi-oscillator mixer level is not zero.
- If *OSC Mix* is set to 1, reduce the VCO output levels to increase the digital oscillator volume.
- Adjust the VCO shape controls - some large shape settings can result in extremely quiet output (for example, with a minimal width pulse-waveform).
- Adjust the VCF cutoff either from the front panel or parameter settings.
- Adjust the HPF cutoff from the multi-engine shape control.
- Adjust the *OSC Mix* parameter.

The VCF front panel controls do not work

- A newly initialised patch sets the *FLT Mode* parameter to 1, which disables *fusion*'s main filter. To enable it, set the parameter to a different value.
- The *FLT Cut* and/or *FLT Res* parameters are set to a non-zero value, bypassing the panel controls.

Change the multi-engine "Multi-Routing" setting!

- The Logue's analogue VCF can be chained with the digital filter, or it can be bypassed. The setting controlling this in in the "Other settings" menu - not in the parameters for the multi-oscillator.
- Chaining can create interesting sounds in itself, including a steeper low-pass filter response than is possible with either the VCF or digital filter alone. But when using the high-pass or band-pass filter modes, *fusion* should usually be used with the VCF bypassed.

Decouple the VCF and Waveform selections from the front panel

- *fusion*'s main filter cutoff and resonance can be controlled from either the front panel or the parameters.
- Set the cutoff or resonance to a non-zero value in the parameter settings to disable the front-panel, specifying the value directly. This is particularly useful with the resonance setting, where often a different setting will often be needed for *fusion* and the analogue VCF. Decoupling the filter cutoff from the front panel also decouples filter modulation and key-tracking.
- The *FLT Res* parameter allows higher resonance settings (resulting in self-oscillation) than are possible with the front panel resonance control option.

The output signal is distorted

- Reduce the filter resonance setting. Extreme resonance settings result in powerful self-oscillation, which is compressed by an overdrive limiter.
- Reduce the filter-drive switch on the front panel.

How is the oscillator pitch set?

- Use the VCO 1 and VCO 2 pitch knobs and octave switches to control the pitch of OSC 1 and OSC 2 respectively.
- Use the multi-oscillator octave control (front panel on Prologue (or menu option on the Minilogue XD) to shift the multi-engine pitch up or down relative to the VCO setting.
- Use the shift-shape control to increase the analogue 'age' to add imprecise tuning of the digital oscillators.

Hints, Tips and Problem Solving / 2

Why does the filter not reach self-oscillation at maximum resonance?

- The front-panel resonance and cutoff controls are set to give a useful blend with the VCF, and the maximum front panel resonance setting is reduced to avoid strong self-oscillation.
- Use the menu parameter for the resonance and set a value close to 100% to obtain maximum resonance. Very high resonance values will result in oscillations and potentially distortion that may be useful for special effects.

What does shift-shape ("Age") do?

- This sets a virtual component age for some of the VA engine modules.
- Increasing the age will reduce precision in frequencies, add noise and increase non-linearities.
- The effect of the age is random, but uniquely keyed to each voice card. For a given setting on a given synth, the effect will be the same - but no two synthesisers will sound identical.

Does fusion modify or interfere with the firmware running on my synth?

- No: *fusion*'s integration with the Logue firmware is entirely passive, and will not affect the normal operation of the synthesiser nor modify the firmware itself.

What happens if fusion is used with an incompatible firmware version?

- *fusion* checks the firmware for compatibility when it is loaded. If the firmware is not known to be compatible, the coupling to the Logue's front panel controls is disabled and *fusion* will operate as a conventional multi-engine plugin.
- At time of writing, *fusion* requires firmware version 2.10 to enable front-panel control.

Copyright, Warranty and Liabilities

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No warranty is implied. Any liability resulting from the use of this software is limited to the purchase price.

Release History

Version	Release Date	Changes
1.0	10-Feb-2022	Initial release.