WoodSynth



Woodman’s Immaculate Maple Syrup Studio

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1.What

WoodSynth is a synthesizer with 4 independent layers. Each layer is in fact a synthesizer on its own.
Each layer has 3 VCO's plus a samples or wavetable based source, coming from a file or from recording the audio track.
Up to 16 voices can be set per layer.
Layers can be used in parallel, assigned to a region of the keyboard or used in a sequential mode where the first note(s) on are played by layer 1 and the next note(s) by layer 2 and so on.
This last mode allows to have a different sound per note played (and independent from a keyboard region).
WoodSynth has a polyphonic pitch-bending touch bar which also displays notes received from a keyboard.
Each layer has its own filter and envelope with ADSR per voice, a pitch shifting envelope per VCO, a delay, a basic reverb, a modulator LFO per VCO, 2 general LFO's and a 16 steps sequencer.
Key tracking can be applied on the ADSR attack and release, on the filter cutoff and on the VCO modulation.

The app can be used stand-alone (device audio input and output) or as a plugin in a DAW.

- IOS plugin type : AUv3 and stand-alone app.
- MacOS plugin type : AU, AAX, VST, VST3 and stand-alone app.
- Has 4 independent synthesizers, each with up to 16 voices.
- Supports MPE.
- Has a polyphonic touch bar with polyphonic pitch bending.
- Velocity, channel pressure, (polyphonic) aftertouch, CC74 can be used to modulate several synth parameters.
- VCO's have the usual waveforms (sine, saw, square, triangle, pulse and noise) and can be modulated in various ways (FM, AM, Pulse Width, Slew rate)
- Samples can be recorded from the audio input/track or loaded from file (sample files should be in the WoodSynth iCloud folder)
- Wavetables can be loaded from file or converted from loaded or recorded samples.
- Each voice has a 4-pole Moog Lowpass filter with resonance and ADSR envelope.
- An offset can be set in the Filter cutoff for the R channel to create a stereo effect.
- Each voice has a pitch shifting ADSR envelope which can be independently enabled for each VCO.
- Has Key tracking for VCO pan, Filter cutoff, ADSR Envelope Attack and Release.
- Each layer has a delay unit (which can be separately panned) and a basic reverb.

- Each layer has a 16 steps sequencer which can run on multiple voices (poly mode).
- Each layer can set the midi channel and range of receiving midi notes (which allows for up to 4 split keyboard regions).
- Layers can be set in sequential mode : first note(s) played on layer1, next note(s) on layer2, etc.
- Layers have an additional high-pass filter saturation and crush control.
- Synth audio and delay can be panned independently.
- The 2 general LFO's can have their source from the samples or wavetables (or track input).
- Supports Ableton Link to sync tempo and start-stop.
- Has 4 User Control rotaries which can be freely assigned.
- The User Controls can be controlled by a midi CC which can be set or learned.
- Presets can be stored in iCloud Drive (makes them available on all your devices).
- Has surround and 3D panning (Mac version only).
- The 3D panning can be modulated by several sources like pressure or key tracking, which allows for expressive live panning by the musician using his keyboard.
- The Mac VST plugin supports NI (Native Instruments) NKS keyboards.

1.1 New

v1.1
- Added “Hold Note” button : when ALT is on, “All Notes Off” button becomes “Hold Note” button (acts as the sustain pedal)
- Added layer preset : when ALT is on, only the current selected layer is loaded from layer1 in the preset.
- Samples source now has own detune parameter.
- Samples source now has own frequency mod rotary (LFO is still the OSC1 LFO).
- Pitch Env panel now has extra button for the sample source (was using OSC1 button).
- Samples source not transposed by OSC1 octaves up/down any longer.
- Fixed sending files from other apps to WoodSynth on iOS.
- Fixed scanning preset files and samples when iCloud is off.
- Fixed sustain pedal bug.

v1.2
- Added touch bar expand (down) button (automatically “locks” the panel buttons).
- Added key tracking to Sample Slices Start : different notes start at other sample.
- Added Slice Width mode in samples : Sample End is replaced by Slice Width slider.
- Added LFO modulation of Sample Slice Start : LFO used is the OSC2 LFO ! (OSC1 LFO used for frequency modulation).
- Real subfolders now supported for presets (when copied into the iCloud WoodSynth folder).
- Added Note-On metronome start mode.
- Fixed "no sound" problem in Garageband (iOS).
- Fixed gain clipping in sequencer with samples source.
- Fixed bug in Random Slice.
- Fixed bug in Sample Reverse modes.
- Fixed OSC1 frequency bug (was double frequency).
- Fixed font scaling in Text Buttons when sizing down (which occured default on iPhone)
- Fixed state of Hold-Notes button when clicking Alt off-on.

v1.3
- Added File browser for presets and samples.
- Hold-note / sustain-pedal now also works for the Sequencer and Arpeggiator.
- Added sustain pedal (hold-note) enable per layer.
- Factory presets are now in a real subfolder /factory (cleaner WoodSynth folder)
- OSC2 & 3 LFO’s now have own waveform button (was previously OSC1 waveform).
- Added Amp Env Attack, Release and Decay time to LFO1&2 destinations.
- Added Auto Gain for Sample Slices. (max gain added = 20dB).
- Added Chan Pressure ,CC74, mod wheel and expression pedal modulation of Sample Slice Start.
- All-notes-off button now also stops the running sequencers.
- Added 11 more presets.
- Fixed crash in Samples for large slice widths and LFO or Key tracking on.
- Fixed Arpeggiator ADSR sustain level.
- Fixed bug in LFO mod of Sample Slice Start.
- Fixed default parameters for Pro Tools (MacOS)
- LFO2 mod of LFO1 frequency is now 10 times larger.
- Key tracking for ADSR has larger range and can now be changed when key(s) are held down.
- Key tracking for Filter cutoff can now be changed when key(s) are held down.
- Playhead in Samples now always shown also when metronome is not running.

v1.4

- Added multi out busses in AUv3 (bus 1 -> mix , bus 2 -> layer 1 , …, bus 5 -> layer 4).
- Added layer Lock buttons : allows to keep sequencer, arpeggiator or chord running without changing when playing notes in another layer.
  Also the Glide and Legato function are locked, the keyboard mods (pressure, etc) are not locked.
- Added midi send to DAW (was only to external) + on/off controls for sending to external and/or DAW in Advanced Settings.
- Added Sequencer note-on/off midi send (set midi chan in Advanced Settings).
- Browsing to a preset or sample file outside the WoodSynth folder will now copy the file into the WoodSynth folder.
- “add preset” of a (modified) factory preset will drop the “factory/“ so that the preset is not saved in the factory folder.
- When iCloud is NOT used, the standalone app will copy the presets and sample files into a shared (App Group) folder to make them available for the AUv3 plugins (copy is done only when starting up the standalone app)

v 2.0
- Added multi-point ADSR display/editor for the Amplitude Envelope.
- Added FM synthesis (Phase modulation between the main oscillators).
- Added source selection for the main LFO's :
  LFO signal can now come from the samples of any of the 4 layers.
  LFO signal can come from the track or side chain audio (low-passed or RMS)
- Added unison mode per layer (4 layers * 16 voices -> 64 voices !).
- Added Aux Envelope ADSR routing to :
  Phase modulation (FM synthesis),
  Ring Modulation of OSC1&2,
  LFO frequency modulation,
  Crossfade OSC1&2
- Added oscilloscope window.
- Added Midi Learn for almost all controls.
- Layer Velocity and Pressure popups are now multiple selection panels.
- Added volume control for each step in the sequencers.
- Added Parameter2 control for each step which can be routed to :
  Filter Up/Down
  Filter Q
  LFO frequency modulation
- Added oscillator and samples frequency modulation to the main LFO's.
- Added 15 presets.
- When not using iCloud the AUv3 presets will be copied into a "from_auv3" folder in the stand-alone app.
- Fixed font scaling in Cubasis and Garageband on iOS.
- Fixed crash in samples when auto gain is on and slice width set to zero.

v 2.0.2
- Fixed UI samples Clear when External file (browse …) was present
- Fixed a crash bug when loading a sample file and Random Slice mode was on
  and the slice width was 100%.
- Fixed Touch bar pitch bending.
- Fixed a crash bug for sample files with small (8kHz ...) sample rate.
- MacOS only : added sample file drag and drop into sample window(s).
  Hold ALT-key to also copy the file to the samples folder.

v 2.1
- Added 31 more factory presets. (thanks Shiloh !).
- Factory presets are now stored in 5 subfolders : bass, keys, lead, pad, soundscape.
- MacOS VST now has a stereo output bus (fix for Studio One 5 and Nuendo).

v 2.2

- Midi Control message 120 (All Sounds Off) is now recognised/handled.
- Improved timing accuracy of received Midi Notes from DAW (especially for larger block sizes)
- Added Midi Learn to controls in samples panel

v 2.3

- Added Sub73 mode : bass note generates more harmonics (generated by OSC2&3).
- MidiLearn values are now scaled (non-linearly) according to the rotary control, e.g. filter frequency gets much more steps in the lower frequencies.
- Added LFO1&2 Depth and LFO1 frequency to the Modwheel and ExpressionPedal destinations.
- Fixed sustain pedal bug : when releasing the pedal, also notes still held were released.

- Fixed lost midi messages (notes on/off) when “Midi from DAW” was on.

v 2.3.4

- Fixed bug in Preset Menu (all selections failed)
- Fixed bug in pressure : when Master Pressure was off and pressure destination was set to Note volume , pressure was still used.

v 2.4

- NI (National Instruments) NKS integration (MacOS only) :
  WoodSynth appears in the NKS browser.
  All factory presets can be set from the NKS browser.
  All factory presets have a “preview” sound fragment, heard when scrolling with the NKS browser.
  NKS keyboard rotaries are mapped to common WoodSynth controls.
  NKS keyboard leds are used to indicate the current layer and split keyboard usage.

- Added Notch Filter type.
- Added Slice Start modulation to LFO1 and LFO2 (see preset “Dancing on Slice”).
- Added Slice Start to Sequencer PAR2 (see preset “Slicequencer”).
- OSC3 phase modulation now done by the samples (was by OSC1)
- Added velocity to Slice Start.
- Added velocity to Filter Attack time (velocity 100% -> Attack Time = 0)
- Bpm DAW button now default on.

- Now supports the 7.1.4 3D track format (12 channels) in LogicPro (MacOS, AU)
- Added channel presets for the 5.1.4 and 7.1.4 3D track formats in Logic Pro (MaxOS, AU)

- Fix : touch bar now also working when midi channel set > 0 in layer.
- Fixed velocity and pressure in Filter Up/Down when Filter/Voice is switched off.

Added presets :

- After The Tornado (bass, used live by The Radar Station)
- Dancing on Slice (bass, demo of LFO1 slice start modulation)
- I Moan (bass, used live by The Radar Station)
- POY (Pictures Of You, bass, used live by The Radar Station)
- Slicequencer (bass, demo of Sequencer PAR2 modulating slice start)
- Warm Brass (lead, uses keyboard velocity)
- 4 Seasons, 1 Note (pad, the 4 layer sounds are played by the same note)
- Cinematic Pad (pad, very slow attack, PM modulation)

v 2.5

- Added new expanded UI view, showing all controls in one window. (MacOS and large iPads)
- Added “gated” filter ADSR (useful for percussive, plucky sounds, preset Mysterious plucking).
- Added ring modulation between layers (new sounds with different sample files per layer)
- Added Filter Up/Down to LFO1 destination (preset Nervous chase)
- Added Amp Env Sustain level to LFO1 and LFO2 destination (preset Nervous chase)
- Added LFO1 Amplitude Modulation and Filt Up/D to Aux Env destinations
- Fixed : LFO1 Amplitude Mod is now also working for Osc2, Osc3 and the Samples.

Added presets :

- Mysterious plucking (using the gated filter, random sequence, slice start mod)
- Nervous chase (gated filter, filter up/down mod, amp env sustain mod)
- Intergalactic bells (ring mod between layer1 and layer 2)
- Intergalactic rings (ring mod between layer1 and layer 2)
- Simple drum (simple , drum)
- Distorted Clarinet
- 8AM Sequence
- A Cloud Between The Waves
- You Shall Not Pass

v 2.5.2

- Fixed Oscilloscope display in the classic UI view.
- New UI is now also enabled for 11” iPads.

v 2.6

- Added Wavetable (playback) support :
  Wavetable files can be loaded or any sample file or sample recording can be converted to a Wavetable.
  Wavetable start position (wave number) can be set and changed/modulated by LFO1, LFO2, note velocity or pressure, note position (key tracking), Expression pedal or Mod Wheel, Aux Envelope, Sequencer, or set to a random number for each new note.
  A new Wavetable display shows an overview (4 waves) and the current wave within the overview.
  The Wavetable can also be used as source for the 2 general LFO’s.

- Improved Preset Selection with (system) File selection panel :
  Although this “Browse” panel was already present as item in the Preset dropdown, it now has its own button which makes it always and easily accessible (which was sometimes hard when a preset was selected at the bottom of a long list).
  The (system) File selection panel also allows to rename, delete, copy, move, duplicate and tag a preset file.
- The “Add” and “Save” preset also have their own button now (same reason).
- The spacing in the classic Preset dropdown is reduced to display more presets (less scrolling).

- Added (Wavetable) presets : “Riding the Waves” , “Up and Down”, “Caribbean Waves”.

v 2.7

Added CV (Control Voltage) Out support for modular or hardware synths :

Up to 8 channels of the audio interface can output a CV for :

- the current note (or sequencer note) being played.
- the current note with pitch (pitch wheel, pitch mod, glide, FM mod).
- the current ADSR.
- LFO 1 & 2 (LFO sources can be set to a wavetable yielding non-trivial waveforms !).
- the BPM clock.

The minimum and maximum CV value notes can be set manually or measured to calibrate the note CV values.

AC coupled audio interfaces are supported by outputting a square wave in stead of a DC value.

v 3.0

New Sequencer UI :

- New large panel with all 16 steps in 1 row.
- Added per step Mute/Skip button.
- New large Volume fader per step.
- Added on/off/skip Led and playing Led for each step.
- Volume curve can be drawn.
- Added “All Steps” button. (modifying a step parameter is set in all steps).

New Sequencer functionality :

- Step “On” or “Skip” probability.
- Random note can now be set per step (was previously on/off for all steps).
- Random note probability per step.
- Random note random range can be set per step.
- Ratcheting (repetition of same note in the step) per step.
- 9 ratcheting patterns provided (triplet, 4-sixteenths, 2-eights, etc).
- Different duration per step. (regular step time multiplied or divided by 2,3 or 4).
- Ratcheting probability per step.
- 4 sequence Variations (which can have different values for all step params).
- Variations can be selected manually, randomly or from a Playlist.
- Playlist allows to create 64 steps sequence or can be used for verse, chorus, etc.
- Variation glide for note values and volume : gradual transition between 2 Variations.
- Sub semitone allows for “strange” note values in a Variation glide or for random notes.
- Variation glide between notes can be limited to the selected scale.
- Variation glide and Sub Semitone can be set on/off per step.
- Added Envelope ADSR parameters per step.
- Added more scales to the random note Limit Scales. (Ionian, Minor Harmonic, Acoustic, Lydian, Dorian, Phrygian)

Smaller improvements and fixes :

- Touch bar lowest center note is now C1 (was C2)
- Floating panels (Sequencer, CV, 3D, Advanced) can be moved around
- Midi Out channel for Sequencer and Touch bar are now global and not part of a preset any longer.
- Delay now has its own Mod LFO (freeing up the general LFO’s).
- Stereo Out delay now only applied on delay and reverb (to avoid destroying center bass notes).
- Resizing the window does not toggle between the classic-expanded view any longer.
- Smaller iPads can now also toggle to the expanded view (overview …).
- Fixed a problem in the Copy Factory Presets (was sometimes duplicating presets).
- Fixed delay and reverb in 3D output.

New Presets (all in the new factory subfolder “sequences”) :

- Creeping
- Electroad
- Lymbo's Echoes
- Mozartificial
- Mystic Candles
- Ratch 22
- The First Day In The Universe

v 3.0.3

- Fixed some false preset changed indications.
- Disabled Ableton Link for AU instr and VST3.
- Fixed metronome running in AU and AUv3 instr.

v 3.0.5

- Fixed first step sometimes not played after note-on in sequencer.

v 3.0.7

- Fixed Unison note take over.
- Fixed bug in Sequencer for Unison when random notes or random skip was used.
- Increased spread of Unison both in pitch and panning.
- Added more LFO bar fractions (8, 12, 16 , 32 bars).

v 3.0.11

- VST3 controls in Bitwig are now shown.
- Fixed preset restore of Glide Time param (was rounded to integer).
- Fixed preset restore of selected Variation in the sequencer when mode is set to Select.
- Pressure and CC74 frequency modulation, filter U/D , filter Q, Mod Depth (for PulseWidth and Slewrate) are now all MPE compliant (-> only the note with the same midi chan as the pressure or CC74 midi command is affected).
- Disabled the combination of pressure and CC74 to both control the frequency mod (used to be multiplication -> when one of them was zero, result was zero).
- Aftertouch Sensitivity (Adv Settings) now also applied to CC74.
- Fixed midi handling bug when NOT receiving from DAW (stand-alone , …) for the Osmose keyboard.
- Fixed note gliding in sequencer when mode is set to Global.

v 3.0.12

- Fixed User Controls All button state (was not showing the correct state after loading a preset).
- Fixed Legato when Nr Voices is set to 1.
- Fixed note priority “layer” when using the Touch bar.

v 3.1

- Added 115 presets + 39 samples (made by Rosario Gennaro).
- Touch bar pitch shift now follows the notes (used to be the relative horizontal position).
- Wavetable number now displayed in sequencer panel when parameter is set to “Slice Start”.
- Fixed playing of first muted sequencer note after note-on.
- Glide now also works when layer nr voices is set to 1.
- Fixed DAW setting of BPM when loading presets.
- Fixed some parameters not being reset when doing “Reset to Default”
- Loading a preset now stops a running sequencer.

v3.1.2

- Fixed CC74 not working bug when WoodSynth in MPE mode and PC/CC chan (Adv) was not set to “all”.
- Added some more default CC’s (useful for WoodTroller).
- Added Wavetable Interpolation factors 64 and 128.

v 3.1.3

fixed potential crash when starting up.

v 3.1.4

Fixed no audio when Phase mod on and osc waveform set to noise/pulse

v 3.1.5

- Fixed multi-bus out (AUM , …)
- Added slower step times (1/2 bar, 1 bar , … 4 bars) to Sequencer.
- CV out now allows to set the output channel (useful when nr out channels > 8).

v 3.1.6
- Fixed overload (sometimes no sound) for very low frequency (C1 …) phase modulation.
- CV out on iOS can now be sent via extra busses (AUM, …)

v 3.2

- Added more CV out sources :
  Aux Env, Chan Pressure, Velocity, Mod Wheel, Expression Pedal, CC 74,
  Sequencer Par2, Par3, Step Up, Step Down
- Added Sequencer modulation modes in 3D panning (MacOS).
- Added Fade control to Sample loop used at start and end of each loop.
- Added Smoothing control to Wavetable source used when moving/modulating the wave number
- Added Anti-Aliasing filter to Samples and Wavetable sources.
- Added multi-out stereo busses to MacOS AU instrument (layers or CV output).
- Small UI update in expanded view : removed source panel buttons as all sources have their own panel (which is always visible).
- Added “Load from Presets” to CV panel.

- Fixed bug in multi-point ADSR Release : releasing the last note did re-trigger the release of the other voices.
- Fixed bug in Samples auto gain : was not used on all voices.
- Fixed bug in Wavetables : “Inter Slice” was not working.
- Fixed bug in Random Slice Start in Wavetables.
- Fixed crash bug when resizing window and Wavetable was shown.
- Fixed sizing bug of Source Panel in Classic view on iOS.

v 3.3

- Added Sequencer Absolute (ground note) Mode, allows to play melodies without modifying the sequence.
- Added new Sequencer Start/Stop modes : Metronome Start/Stop and DAW Transport Start/Stop.
- VST3 (MacOS) updated to support NI NKS keyboards, presets, previews, controls and the light guide (different key colours for the layers, …)
- Added support for the new Pro Tools bus widths (7.1.4 … 9.1.6).

- Added Samples / WT Fade and Smooth to ML (midi learn).
- Fixed selection in Playlist on iOS.
- Fixed restore of MPE mode after loading.

v 3.3.5

- Fixed potential crash when loading sample files.
- Fixed potential crash or hanging when loading presets in AUv3.

v 3.3.6

- Fixed loading (via Browse) of sample and preset files outside WoodSynth folder on iOS.

v 3.5

Added Midi V2 support :

- Uses the 16 bits velocity in received v2 note-on/off messages.
- Uses the 32 bits values in received v2 CC, Aftertouch, Pressure and Pitch messages.
- Uses the received new v2 “Per note pitch” messages (v1 MPE equivalent).
- Uses the received new v2 RPN (Registered Per Note) 74 messages (MPE equivalent).
- Uses the new v2 note-on attribute type 3 (Pitch 7.9).
- Sends v2 messages (16 bits velocity, 32 bits control values) when Sequencer midi out or Touch bar midi out is on.
- Responds to Midi V2 CI Discovery and Profile Inquiry messages.
- Added Midi v2 button in Advanced to enable v2 or revert to midi v1.
- Added Midi v2 group dropdown (All, 1..16).

Note : currently Midi V2 only works when “Midi from DAW” is off.

Other new features :

- Added (back) “Remove Preset” in presets menu.
- Selected preset now shows checkmarks on all sub folders.
- Added Undo & Redo (press Alt for Redo button in Classic view).
- Added Compare A/B button (toggles between original preset and modified preset).
- Added Octave Up/Down buttons to touch bar.
- Midi out does not send any longer to its own (WoodSynth) destination.
- Sequencer midi out now also sends :
  velocity in note-on messages with value set to the step volume.
  CC74 message with value of sequencer step param2.
  Mod wheel message with value of sequencer step param3.
  Pitch wheel message (Osc1 detune, Sequencer sub semitones, …).
  correct note values when using Variations, also with Var Glide on.

v 3.6

- Added Midi V2 CI (Capability Inquiry) PE (Property Exchange) support : allows midi v2 CI capable Initiators (keyboards, controllers, …) to automatically map WoodSynth midi CC parameter names and values to their controls. Also WoodSynth preset names (programs) with their PC and bank and category can be transferred.
- Supports the new Korg Keyscape keyboards with midi v2 CI Property Exchange.
- Added a preset category dropdown which allows to only see a subset of the presets.

- Added new Poly Aftertouch panel which allows multiple destinations.
- Poly Aftertouch / Pressure destinations now have an amount slider.
- Added Aftertouch/Pressure destinations for detuning Oscillators 1,2&3.
- Added Aftertouch/Pressure destination for panning (LR) of Oscillators.
- Added Aftertouch/Pressure destination for ring mod of Oscillators 1&2.
- Added Aftertouch/Pressure destination for crossfade of Oscillators 1&2

Note : currently Midi V2 only works when “Midi from DAW” is off.

v 3.7

- VST3 for NI NKS2 :
  uses the new parameter groups in NKS2 on the mk3 keyboards.
  uses the new controls in the mk3 keyboards (waveform, off/on, menu, …).

- AU and AU_instrument now support midi v2 UMP 32 bits with “Midi from DAW” in LogicPro. (but still no midi CI property exchange).

- Fixed display of some params in Korg Keyscape keyboards
- Fixed problem when DAW reloads state which uses a sample file.
- Added a subtle hint to the bottom buttons (in the classic iPad view) that there is a left and right difference.

v 3.8

- Added licensing via license code (MacOS plugins only).
- Factory presets and samples not copied to user space any longer but read from the package.
- Fixed memory leak on iOS.
- Fixed some wrong preset parameters in VST3.

v 3.8.2 Fixed remembering the license after restarting the plugin.
v 3.8.3 Minimum MacOS system set to 10.15 (was 11.5).
v 3.8.4 Fixed AU (instrument) midi input from DAW when MacOS < 12.x
v 3.8.5 Minimum MacOS system set to 10.13.
v 3.8.6 Fixed inconsistency in midi V2 PE lists which could lead to wrong indexes in subscriptions.

v 4.0

- Added Tube Oscillator type (based on the tube modelling in WoodValvet) :
  Drive, bias and tube type parameters allow to smoothly change harmonics and waveform from sine wave to square wave.
  An optional integrator circuit after the oscillator can generate sawtooth waveforms.
  The drive control can be modulated by the oscillator’s LFO, by the Aux ADSR or by midi input (pressure, aftertouch, modwheel and CC74).

- Added new convolution reverb unit based on WoodVerberator.
  It has a new reverb type dropdown, a new reverb time (0 .. 10s) and a new damping control.
  Reverb Send can be modulated by the general LFO’s and by keyboard pressure/aftertouch.
  Reverb parameters now have their own UI panel.
  Reverb now has its own HPF, LPF and Saturation (not shared with delay any longer).

- Added Samples per note : allows sampled instruments like drums, piano, etc.
  Notes without a sample have several modes to generate sound from an existing sample.

- Added new Preset Browser.
- Added SetList : a small list of presets with midi PC values starting from 0 and up.
- Added manual triggering of the sequencer (live playing, see section 6.1.9 …).
- Sequencer can now show the note values in stead of only semitone values.
- ML (midi learn) now indicates when a midi CC is already used.

2. Main window



WoodSynth main window with panels closed.

Individual controls are explained below in section 4.

Most rotaries can be double clicked which will set a minimum value or toggle to the maximum value.

You have pressed the Question-mark button already as you are reading this manual.

Each synth parameter panel button at the bottom (Layer, Source, …) has a **left** and **right** side which will show the panel either in the **middle** or on the **right**.

The touch bar allows polyphonic input and pitch bending on iOS but will also show received midi notes.

When all parameter panels are closed, the middle section shows the User rotaries and the Metronome. The right section shows the oscilloscope, the ADSR editor, touch bar controls and preset comments.

Clicking in the oscilloscope window will toggle the time scale trough the series : 0.05s , 0.03s, 0.01s, 0.005s, 5s, 1s, 0.5s, 0.1s.
Clicking on the small “+” or “-“ will set the vertical scale.
When preset comments are available, clicking on the “i” will toggle to the info window.

ML is the Midi Learn button : see section 18 (Midi CC Controls).

From v3.5 on, an Undo and Redo button was added.
In the classic view above, press the ALT button to turn the Undo button into Redo.

From v3.5 on, the “A/B” button toggles between the original preset and all parameters changed.



Main window with open Source and Filter panels



The expanded UI view (MacOS and 12.9” and 11” iPads)

Clicking on the expand button (right of the WoodSynth logo) will toggle between the expanded view and the “classic” panel view and resize the view to its default size on MacOS.

The expand button is since v3.x also present in iOS and will toggle between the 2 views, however on smaller iPads it is more meant to get an overview of the Synth.

When using WoodSynth as AUv3 plugin on 12.9’ iPad, the view will always first appear in the classic mode as usually the plugin window is instantiated in a smaller size.

Resizing the view will not toggle any longer between the 2 views as of v3.x

3. User Presets

User presets can normally be set via the DAW specific controls. Those presets will be saved in a specific format and location dependant on the DAW.

User presets can also be selected via WoodSynth's own dropdown in the header bar.
Factory presets can also be selected with this dropdown menu.

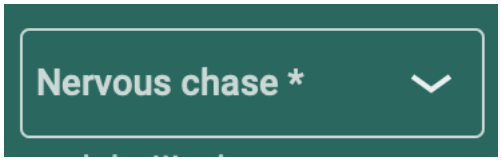
Another way to select a preset is by clicking the "Browse" button in the header which will show the system's file browser directed to the default WoodSynth preset folder.
The file browser window also has some convenient additional functionality like moving, copying, renaming, deleting or tagging a User preset file.
Choosing a preset file outside the WoodSynth main folder will copy the preset file to the WoodSynth folder. Choosing a sample file outside the WoodSynth folder will copy the sample file to the WoodSynth folder only on iOS.

The WoodSynth User and Factory presets are made available to the DAW which can/will present them as factory presets.

The WoodSynth User preset.json files are saved in your iCloud Drive (when enabled) or else in the app's local documents folder.
When saved to iCloud Drive the presets are automatically available (and synced) to all devices and all DAW's running WoodSynth and are obviously backed-up as well.

Subfolders with preset files are supported and can be copied (Files app, Finder, …) into the WoodSynth preset folder.
WoodSynth will create a subfolder when saving a new preset with a name starting with the subfolder's name and separated with a "/", e.g. saving a new preset with name "strings/violin" will create a subfolder "strings" (if it does not exist yet) and save a preset "violin" into this subfolder.

When a preset is selected and any parameter is changed afterwards, the name of the preset will be marked with a * at the end to indicate the settings are now different than those from the saved preset. When this preset is re-saved the * 's will disappear again.



The User presets can also be selected by a Midi Program Change. In the Advanced panel the Midi channel and Program Change mode can be set :

- mode "Index" : program change number is the index in the preset list
- mode "Name" : add ".midiXY" to the preset name to select it with program change XY. (e.g. the preset with name "snaredrum.midi3" will be selected by program change 3.





Selecting a preset with the system file browser

3.1 Factory Presets

From version 3.8 on, factory presets are stored and read from the app/plugin package.
This means they don't have to be copied any more to the User preset folder (with the "Copy Factory Presets") and that they can't be changed any more.

When changing parameters and choosing "Save Preset", a new User preset will be created with the same name in the User space.

Factory presets are shown on top of the User presets in the dropdown.

3.2 Preset Categories

Below the preset dropdown there is a category dropdown which will limit the preset list to only the ones in the category.
Categories are created from the subfolders in the main preset folder.

3.3 SetList (new in v4.0)

Is a list of a smaller number of presets as for example used in a live gig.

The list can be created or modified in the new preset browser which can show the list in the last (rightmost) column.

Special for the setlist is that midi PC (program change) values will start from 0 and go up to the number of presets in the list (minus 1 :-)
This allows a midi controller to set an absolute PC value or to easily scroll through the presets in the setlist.
To enable the setlist PC values, the category dropdown has to be set to the special entry "SetList".

The same preset can occur more than once in the list (and have its own PC value).

4. Main Controls

4.1 Synth Layer On-Off buttons

Enables/disables the audio out of this layer.

These buttons can be controlled with a midi in CC (pedalboard …)

4.2 Master control buttons

These buttons enable or disable the functionality in ALL the layers. In each layer the function can individually be enabled/disabled.

The buttons control :
- Arpeggiator
- Sequencer
- Glide
- Legato
- Velocity
- (Channel) pressure
- (Polyphonic) aftertouch
- Pitch bending
- CC74
- CV output

4.3 User rotary controls

The parameters controlled by the 4 user rotaries can be set in the Advanced panel.

Each rotary also has an “All” button which will apply the same setting of the parameter to all the layers.

The rotaries can also be assigned to a midi CC number which can either be set in the Advanced panel or be “learned” by clicking on the ML button (see section 18, Midi CC Controls).

The rotaries follow the colour of the current selected layer except when “All” is on or when the control is a global one. In that case they get the WoodSynth theme colour.

Two special “meta” destinations are “Crossfade 1&2” and “Crossfade 3&4” : those adjust the layer 1&2 (or 3&4) gain controls : one gain goes up, the other down.

4.4 Metronome

Besides the metronome visual aspect (leds running), the timing is also used to quantise the sequencer steps. This is especially useful in sequencer poly mode when more than 1 sequencer is running at the same time.

When Ableton Link (start/stop) is enabled, the start/stop button state will also be propagated to the Ableton Link session and starting other enabled devices/apps/plugins.

4.5 BPM controls

0 .. 800 bpm.
Will switch off the DAW button (when on).

4.5.1 DAW button

Toggle button. When on, WoodSynth will (continuously) follow the DAW bpm.

When Ableton Link is enabled, this button will be replaced with a “Link” button.

4.5.2 TAP button

Allows to set the bpm by … surprise … tapping.
Will switch off the DAW button (when on).

4.6 Output Gain rotary

-100 .. +20 dB

When the output signal becomes > 0dB, the output clip led will go on.

This can easily happen when more than 1 layer is producing audio as all the synths outputs are summed.

Double clicking will set the value to 0dB.

4.7 Synth Parameter panel buttons

The 9 buttons on the bottom will each show a specific side panel with the appropriate parameters.

Buttons/panels are :

- Layer
- Source
- Amplitude Envelope
- Pitch Envelope
- Filter
- Delay + Reverb
- Panning + Out
- Sequencer
- LFO's

All panels show the parameters of 1 layer : the current selected one.
The selected layer number is shown on top of the panel and all controls have the specific layer colour : blue, green, yellow, magenta.
The current layer can be selected by :

- clicking on 1 of the 4 the layer buttons (top left)
- enabling a layer
- clicking on the "next" button in the main window (top right corner of the User Controls area)

Changing a control in the side panel normally only affects the current selected layer.
However when the top button "Alt" is on (flashing red led) all layers will get the same value for this parameter.

4.8 Copy / Paste menu

Allows to copy all the current layer settings to one of the others. Can be useful for AB-ing 1 specific parameter and have all the other parameters be the same.

4.9 ALT Button

When on :

- Changing a sequencer/step parameter will update the same parameter in all layers.
- The "ALL NOTES OFF" button will change into a "HOLD NOTE" button which will act the same as a sustain pedal.
- The Preset menu will change into a "Layer Preset" : when a preset is chosen only layer 1 of the preset will be loaded into the current selected layer.

4.10 Touch bar

The touch bar has polyphonic pitch bending input on iOS, monophonic on MacOS (mouse).
It will also display notes received from an external midi keyboard or controller board.

4.10.1 Semitones rotary

Sets the number of notes displayed in the touch bar.

4.10.2 Center note rotary

Defines the … yes ! center note of the touch bar.

4.10.3 View mode popup.

Mode “Real Note” : displays the current real pitch (frequency)

Mode “Note on” : displays the midi note value as it was played on the keyboard.

Mode “Note on + pitch” : same as the first mode but without showing modulations (frequency, ring) on the note.

4.10.4 Limit Scale popup (Advanced Settings)

Allows to limit intervals to the selected scale.
When not set to “Free” :

When Random is on, values will be limited to the intervals in the scale selected.

The popup contains a “User scale” item which is defined in the Advanced panel.

4.11 All Notes Off Button

Panic button.

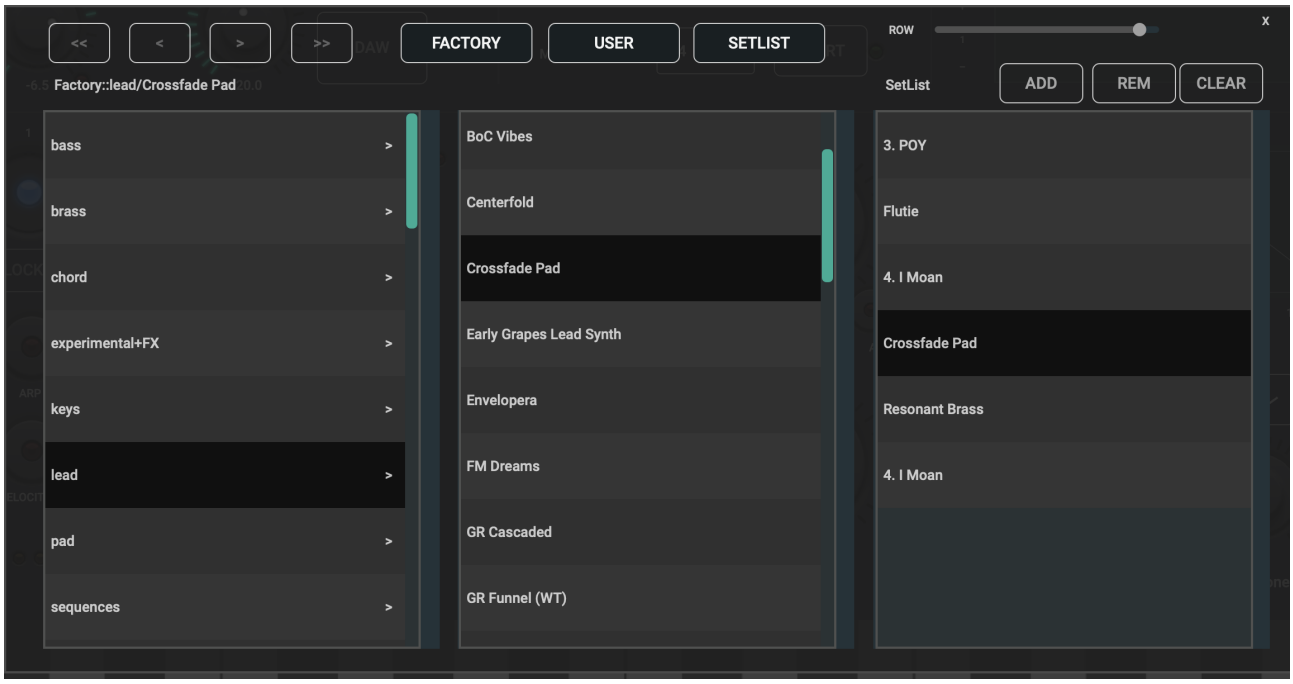
Will also stop a running sequencer (which has its Stop mode set to “running”).

4.12 Lock buttons

When switched on, the notes being played (sequencer, arpeggiator, chords, …) are held (just as the sustain pedal or hold-note button would do) but also can’t be changed (or notes added) when playing other notes (in another layer).
Changing the Sequencer, ARP, Glide and Legato master buttons also won’t affect the locked layer.
The keyboard modulation functions (like pressure) are not locked but they can be switched on-off in the Layer panel.

4.13 Preset Browse button

Will display the system file browser for versions < 4.0. From v4.0 on, it will display the new preset browser.



The Factory and User buttons allow to see only those presets.

The SetList button will show the SetList presets in the last column.
Note : to enable the SetList midi PC values, the Category dropdown has to be set to the special entry “SetList” !
When enabled the “Prev” and “Next” preset buttons will also follow the SetList.

Clicking once on a preset in the browser will load that preset.

In the SetList a preset entry has to be double-clicked to be loaded.

The vertical space between entries can be set with the “Row” slider which can be handy on a smaller device (iPad, …).

4.14 Add button

Allows to save a new preset. The “Save as” window will be displayed which also allows to save comments (and made by) for the new preset.

4.15 Save button

When an existing preset is modified, this button will become enabled and allows to save the changes under the same preset.

4.16 A/B button

toggles between the last selected preset and all parameter changes made.

4.17 Undo button

reverts the last parameter change. The change is added to the Redo queue.

5. Layer panel



5.1 Number of Voices

Can be set from 1 to 16.

The more voices used the more cpu load.

Voices can also be lowered to make use of the Note priority modes.

5.1.1 Unison mode button

When on, all voices (set in the number of voices) will play the same note but very slightly detuned to create a chorus effect. The amount of detuning can be set with the “Analog” control (Advanced Settings or User Control). Some different panning for each voice is also applied.

5.2 Note Priority

Determines what happens when all voices of a layer are used and another note is played.
(e.g. number of voices of layer 1 set to 2 and a third key (on top of 2 others) is pressed)

Mode “**Hold**” : the next note is discarded, the notes already played are held.

Mode “**Last**” : the last note played is replaced with the next note. In the example : note 3 will replace note 2. When the next note is released and the replaced note is still held, this replaced

note takes over again. In the example : when note 3 is released and note 2 was still held, note 2 is played again.

Mode “**Layer**” : when the next note is played and a next layer is also set to mode “Layer”, this next note will be played on that other layer. In the example (and suppose layer 1 and 2 are both set to mode “Layer”) : note 1 and 2 are played on layer 1, note 3 (and next notes) will be played on layer 2. If layer 2 is not set to mode “Layer”, it would play note 1 and 2 and also 3 if the number of voices for layer 2 was 3 or more.
This mode allows to have totally different sounds for subsequent notes played and this independently of where the notes are played.

5.3 Midi Channel

Active when WoodSynth is not set to MPE mode.

5.4 Note range

Beginning and ending note played by this layer.
Allows to assign a layer to only a part of the keyboard.

5.5 Pitch bend

When not set to “Global’, this value will override the global value (set in Advanced) for this layer (only) and will also be stored in the presets.

5.6 Arpeggiator

The layer button must be switched on together with the master ARP control to make the arpeggiator run on this layer.

5.7 Velocity destination multi selection panel

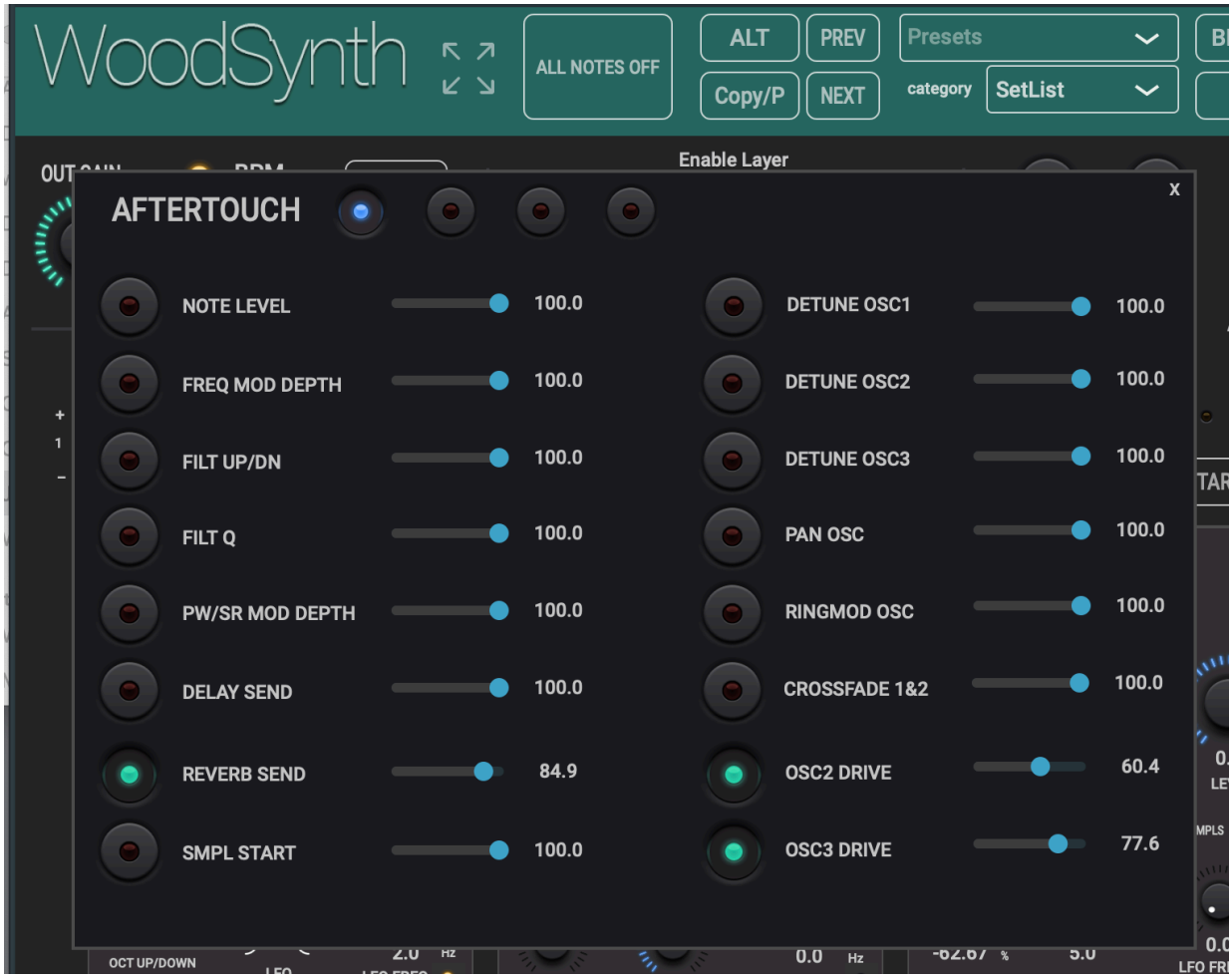
Destinations :
- Note Level
- Filter Up/Down
- Frequency modulation depth
- Filter Attack
- Sample Slice Start

5.8 Pressure destination panel

Pressure is set by the midi channel pressure command (hex D0). This command has no note value so when MPE is off, this is not a polyphonic control. Of course it is the keyboard or controller which decides to send either this command or the After Touch command.

Destinations :
- Note Level
- Filter Up/Down
- Filter Q
- Frequency modulation depth
- Modulation depth (Pulse Width, Slew Rate, Amplitude)
- Delay Send
- Reverb Send
- Sample Slice Start
- Detune Oscillator 1,2 & 3
- Panning Oscillators 2&3 (or 1&2 when Oscillator 3 is off)
- Ring Modulation Oscillator 1&2
- Crossfade Layer 1&2
- Oscillator 2 & 3 Tube Drive

Each destination has its own amount slider.



5.9 After touch destination panel

After Touch is set by the midi after touch command (hex A0). This command has a note value and hence is polyphonic even when MPE is off (actually it should not be generated by MPE controllers).

Destinations :
- Note Level
- Filter Up/Down
- Filter Q
- Frequency modulation depth
- Modulation depth (Pulse Width, Slew Rate, Amplitude)
- Delay Send
- Reverb Send
- Sample Slice Start
- Detune Oscillator 1,2 & 3
- Panning Oscillators 2&3 (or 1&2 when Oscillator 3 is off)
- Ring Modulation Oscillator 1&2
- Crossfade Layer 1&2
- Oscillator 2 & 3 Tube Drive

Each destination has its own amount slider.

5.10 CC74 destination popup

CC74 is normally sent by MPE controllers for a vertical movement on the board.

Destinations :
- Filter Up/Down
- Frequency modulation depth
- Modulation depth
- Filter Q
- Sample Slice Start
- Oscillator 2 & 3 Tube Drive
- Reverb Send

5.11 ADSR / Voice

When this is off, there is only 1 ADSR for this layer. Each note pressed will start the ADSR attack however the release is only started when all notes have been released (otherwise a 2nd note released would mute a first note still held). However this means that a 2nd note pressed will cause the first note also to go through the attack phase again.

When on each voice has its own ADSR and different notes played have no effect on the ADSR of the others.

5.12 Legato

When on in the layer and the master control is also on, all notes played after a first note will immediately go to the sustain level/phase of the ADSR's. This can be useful to play chords or string like sounds.

5.13 Filter / Voice

When this is off, there will only be 1 filter for the layer. Each note played will start the filter ADSR and when a key is released the ADSR release is started. This means that a second note pressed and released will have an influence on the sound of the first note played (and being held)

When on each voice has its own filter which will of course use more cpu. Im this case a second note played has no effect on the sound (filtering) pf the first note.

5.14 Sustain Pedal Enable button

When switched off, the sustain pedal AND the “Hold-Notes” button (ALT on) will have no effect for this layer.

Can be used to have 1 layer play a chord or keep the arpeggiator running while playing a melody on a second layer. In this use case set the layer 1 Note Priority to hold to prevent changing notes when playing in layer 2.

6. Source panel

Allows to select any of the 3 VCO's and samples buffer to create the sound for this layer.
Has 5 buttons (OSC1, OSC2, OSC3, SMPL, LOAD) which shows a sub panel when clicked.

Above the 4 first buttons a led is indicating if this source is on or off.
The led also has a button which toggles the source on/off.

Load is not a source itself but allows to load samples from file or from recording into the sample buffer. SMPL has controls for the sample buffer play back.

6.1 Oscillator 1 (VCO) controls





6.1.1 On-Off button

Can also be toggled by clicking the led above the "OSC1" button.

6.1.2 Oscillator waveform

The usual waveforms :

- Sine
- Square
- Triangle
- Saw down
- Saw up
- Noise
- Pulse

6.1.3 Oscillator Level

-100 .. 0 dB

Useful to set relative oscillator levels. The overall layer volume can be set in the Amp Envelope panel (Gain control).

6.1.4 LFO frequency rotary + popup

0 .. 100Hz

The popup allows to set the frequency to a bar fraction from the BPM and hence will be updated automatically when the BPM changes.

6.1.5 LFO waveform button

The usual waveforms :

- Sine
- Square
- Triangle
- Saw down
- Saw up
- Random
- Pulse

6.1.6 Frequency Modulation Depth

0 .. 100%

Can be set independently from the other (see next) modulation depth. Only the LFO frequency and shape are shared.

6.1.7 Modulation rotary

0 .. 100%

The modulation type depends on the waveform :

Sine, Triangle and Noise : Amplitude Modulation
Pulse : Pulse Width Modulation
Square and Sawtooth : Slew rate Modulation

The LFO frequency is shared with the Frequency modulation LFO.

6.1.8 Detune rotary

-700 … +700 cents
Allows to (de)tune all the note values generated by this VCO.

6.1.9 Octave Up/Down popup

Allows to transpose the Oscillator with up to 4 octaves up or down.

new in v4.0 : SEQ and SEQ1 mode : note value is taken from the sequencer each time any key is pressed. Can be used in a live gig where the player only needs to handle the timing and not the (maybe complex and fast changing) melody

6.1.10 Key tracking rotary

-100% .. +100%

For values > 0, modulation for lower notes will be smaller, for higher notes larger.

When the “pan” button is switched on :
for values > 0, lower notes will be panned more to the left, higher notes to the right.

For values below zero, this is reversed.

6.1.11 Pulse Width / Slew rate rotary

0 .. 100%
Controls the pulse width when the Oscillator waveform is set to Pulse.
Otherwise it controls the slew rate.

6.1.12 Phase modulation button

The phase of this oscillator is modulated by another (audio range) oscillator giving the typical FM synthesis sounds (DX7 …).

Oscillator 1 is modulated by oscillator 2.
Oscillator 2 is modulated by oscillator 3.
Oscillator 3 is modulated by the samples loaded.

The Modulating oscillator does not need to be on itself (but can).

The modulation depth is set by the rotary which normally sets the LFO frequency modulation.
The frequency modulation LFO for this oscillator is disabled when phase modulation is on (however the main LFO’s can still do frequency modulation).

6.2 Oscillator 2 & 3 (VCO) controls

VCO 2 and 3 follow the note (frequency) of VCO 1 but can be set a number of octaves up or down. The delta rotary still allows to detune from the followed note.
All other parameters are independent from VCO 1.





6.2.1 Frequency (note) octave popup

Allows to set the oscillator frequency 4 octaves up or down.

6.2.2 Oscillator waveform

The usual waveforms :

- Sine
- Square
- Triangle
- Saw down
- Saw up
- Noise
- Pulse

New in 4.0 : Tube button : will switch to the Tube Oscillator : see 6.6

6.2.3 Oscillator Level

-100 .. 0 dB

6.2.4 LFO Frequency rotary

0 .. 100Hz

6.2.5 Frequency Modulation Depth

0 .. 100%

6.2.6 Detune rotary

-700 … +700 cents

Allows to (de)tune all the note values generated by this VCO.

6.2.7 Panning rotary

This panning can be used to create a stereo sound, for example by panning VCO2 to the left and VCO 3 to the right.

6.2.8 Pulse Width / Slew rate rotary

0 .. 100%
Controls the pulse width when the Oscillator waveform is set to Pulse.
Otherwise controls the slew rate.

6.2.9 Modulation rotary

The modulation type depends on the waveform :

Sine, Triangle and Noise : Amplitude Modulation
Pulse : Pulse Width Modulation
Square and Sawtooth : Slew rate Modulation

The LFO frequency is shared with the Frequency modulation LFO.

6.2.10 LFO Waveform button

Clicking toggles between :

- Sine
- Square
- Triangle
- Saw down
- Saw up
- Random (2 values / cycle)
- Pulse

6.2.11 Sync OSC1 button

Every period of OSC1, OSC2 (or 3) will be forced to restart its cycle.
Detuning OSC2 or 3 will then still play the OSC1 note but with extra harmonics added.

6.2.11 Sub73 button

Observation of the Moog Sub37 suggest the bass note plays more harmonics than the higher note.
This button mimics this behaviour by only using OSC2 and 3 for the bass note (lowest note) and not for any higher note played at the same time.
OSC2 and 3 have to be set to a detuned value compared to OSC1, typical 1 octave down and 1 fifth down (but lot's of other values are possible as well).

6.3 Samples



6.3.1 Reference Note popup.

The difference between the incoming midi note and this reference note, determines the interval (ratio) the samples will be up/down sampled (pitched).

6.3.2 Play back popup

Play modes can be :

- Normal
- Reverse
- Random Reverse
- Random Start
- Random Slice

The random modes kick in each new midi note-on.

Random Start will use the same samples (determined by Start and End) but each time begin at another sample in that range (and then consequently loop around).

Random Slice only works when a part (slice) is selected by having a Start > 0% and/or End < 100%. In this case the slice duration is kept the same but a different part of the samples will be played.

6.3.3 Sample Slice Start and Slice Width rotaries

Allows to define a window on the samples which will be heard.
The samples are still all kept in memory so these settings can be changed without having to resample.
When the start is set larger than zero, the samples will be left shifted to align with the step boundary.

6.3.4 Sample Graphic Display

Displays the samples.
Clicking once in the display will zoom-in. Double clicking will jump back to the zoomed-out display.
The values of the Start and End rotaries can be seen as dimmed samples.

When running and the BPM is lower than 150, the playhead will be shown.

6.3.5 "1-SHOT" button

When on, the samples will not be repeated when the last sample is reached.

This occurs when the key is being pressed (and not released) and all samples have been played.

6.3.6 Detune

-200 .. +200 cents

Allows for smaller sub-semitone detuning. Detuning with multiple semitones can be done by changing the Ref Note.

6.3.7 Frequency Modulation Depth

0 .. 100%

The LFO is the same used by OSC1 (waveform, frequency) however the depth can be set independently with this control.

6.3.8 Key Tracking

-100 .. 100%

When set > 0, notes higher than the center note will use a further sample start position, notes lower than the center an earlier sample start position.
When the resulted sample start would hit a border (0 or 100%), it is wrapped around.

When the Key Tracking < 0, the behaviour is reversed.

6.3.9 Slice Start modulation (LFO or Expression)

0 .. 100%

The start position can be modulated by expression type :
- *Pressure*
- *CC74*
- *Mod wheel*
- *Expression pedal*

by setting their destination to "Sample Slice Start".

In this case the rotary controls the amount of the expression value used to modulate the slice start.

When no expression is selected the start position can be modulated by the OSC2 LFO. (OSC1 LFO is used for the frequency modulation). The rotary controls the LFO depth.

6.3.10 Slice Auto Gain

When on, will calculate a normalising gain for the current slice up to a maximum of 20dB. This can be very useful when the Samples have parts with very different loudness as for example a snare sample (very loud at the start but then very quickly decaying to small levels).

6.3.11 Samples Level

-100 .. 0 dB

6.3.12 Anti-Alias Filter button

As playing different notes is effectively resampling the wave, aliasing can generate the known fizzling high frequency noise.
When on, an anti-aliasing filter will get rid or greatly reduce this noise.

6.3.13 Fade Rotary.

Controls the fade-in and fade-out for the samples loop, except when the note is pressed or released which is controlled by the ADSR.

6.4 Load (Samples)





6.4.1 File selection popup

All sample files which reside in the folder “samples” (and its subfolders) in the WoodSynth iCloud folder will be shown in the popup and can be selected.

When the file’s sample rate does not match the app or plugin sample rate a conversion will be done.

The display will show the entire file.

6.4.2 Start and End rotaries

These work the same as in the Recording Samples mode.
They select a part of visible samples to be played.

6.4.3 Sampling Armed button

Needs to be on for the sampler to be active.
This button can also be controlled with midi CC 119.

When sampling is active the red led (left of this button) will light.

6.4.4 Clear button

Erases the current samples in this layer.

6.4.5 Recording popup

Defines when the sampling will start (after being Armed).

Recording modes can be divided in 2 groups :

Armed button will stay on after sampling :

- Gate : audio level > threshold
- Midi Note On : channel and range are set in the Oscillator section

1 Shot modes (Armed button will be disarmed after the sampling) :

- Gate
- Midi Note On
- Armed : immediately after the Armed button is switched on.

The sample time is defined by the bars popup.

6.4.6 Threshold (Gate recording mode)

-60 .. 0 dB

When the audio level gets above the Threshold, sampling will start

6.5 Wavetables

A wavetable is a sequence of waveforms where each wave has a fixed sample length (typical 2048) and where the waveforms slowly change when sweeping over the waves.





6.5.1 Wavetable button (Load panel).

When switched on, the loaded samples will be treated as a wavetable.

The sample display will change into a waves overview (4 waves) and also display the current selected wave.

6.5.2 Wavetable wave sample length popup (Load panel).

Although the wave length is usually 2048 samples, some other values can be chosen here.

6.5.3 Convert to Wavetable push-button (Load panel).

When a non-wavetable sample file is loaded (or recorded), it will very likely have non-zero values at the waveform width which will result in harsh transitions when playing the wave in a loop.

The “To Wavetable” button will multiply the samples with a periodic signal which is zero at the wave boundaries.
At the same time an interpolation factor can create intermediate waves to make smoother transitions from 1 wave to the next ones.

6.5.4 Wave Number (Slice Number) rotary.

This control selects the current wave being played.
It is similar to the Start position of the regular (non-Wavetable) Samples playback, however it will always set the sample start to a wave boundary (multiple of the wave length) except when the “Inter Slice” button is on.

The Wave number can be set/modulated in a more dynamic way by the following :
- Key Tracking : see 6.5.5 below.
- Aux Envelope : see 6.5.6 below.
- LFO1 & LFO2 Slice Start.
- Expression pedal.
- Mod Wheel.
- Note Velocity
- Note Pressure.
- Sequencer Par2 set to “Slice Start”.
- Random Wave number : see 6.5.7 below.

6.5.5 Key Tracking

-100 .. 100%

When set > 0, notes higher than the center note will use a further wave number, notes lower than the center an earlier wave number.
When the resulted sample start would hit a border (0 or 100%), it is folded back.

When the Key Tracking < 0, the behaviour is reversed.

6.5.6 Wave Start Envelope rotary.

Controls the amount of Aux Envelope on the Wave Number.

6.5.6 Stereo rotary.

Adds an offset to the Wave number on the R channel which creates a nice stereo effect.

6.5.7 Play mode popup.

- Normal
- Random Slice (Wave) Number : each time a new key is pressed a random wave number will be used.

6.5.8 Anti-Alias Filter button

As playing different notes is effectively resampling the wave, aliasing can generate the known fizzling high frequency noise.
When on, an anti-aliasing filter will get rid or greatly reduce this noise.

6.5.9 Smooth Rotary.

When changing the wave number (aka slice start) either manually or by modulation and the subsequent waves are different enough, some stepping can be heard. The smoothing will interpolate between the waves to generate a smooth transition. The more smoothing the slower will be the response time to arrive at the target waveform.

6.6 Oscillator 2 & 3 Tube Oscillator Type (new in v4.0)

The Tube oscillator works completely different compared to the digital types.
The tube amplifier circuit is followed by a frequency determining feedback loop and hence creates a very analog sound.

Check the new preset category “tube”.





6.6.1 Frequency (note) octave popup

Allows to set the oscillator frequency 4 octaves up or down.

6.6.2 Tube Type

Allows to set the tube type to :

- ECC82
- ECC83
- EL34
- ECC83_AB
- EL34_AB
- Woodman A
- Woodman B

Each tube will generate different harmonics and waveforms.

6.6.3 Tube Drive

This well known tube amp control increases the gain in the tube circuit and will produce more and more harmonics (distortion).
Going from 0 to 100% the waveform will smoothly change from almost sine wave to almost square wave.

The drive control can be modulated by several sources :

- *the oscillator's own LFO (see below)*
- *the Aux ADSR (set in Aux Envelope panel)*
- *keyboard pressure or aftertouch (set in Layer panel)*
- *midi CC74 (set in Layer panel)*
- *mod wheel (set in Advanced panel)*

6.6.4 Tube Bias

The bias controls the rest current flowing through the tube. This will mainly influence an asymmetric distortion between the lower and upper half of the waveform.

The bias can be modulated by the general LFO.

6.6.5 Sawtooth button

When on, the tube oscillator is followed by an integrator circuit (with fast discharge) and hence will create a (non-perfect) sawtooth waveform. This waveform will still be influenced by the drive , bias and tube type controls.

Oscillator 2 & 3 generate different waveforms : 2 has the familiar sawtooth but 3 discharges every half period and starts integrating from zero.

6.6.6 Oscillator Level

-100 .. 0 dB

6.6.7 LFO Frequency rotary

0 .. 100Hz

This LFO modulates the Tube Drive control.

6.6.8 Drive Modulation Depth

0 .. 100%

6.6.9 LFO Waveform button

Clicking toggles between :

- Sine
- Square
- Triangle
- Saw down
- Saw up
- Random (2 values / cycle)
- Pulse

6.6.10 Detune rotary

-700 … +700 cents

Allows to (de)tune all the note values generated by this oscillator.

6.6.11 Panning rotary

This panning can be used to create a stereo sound, for example by panning VCO2 to the left and VCO 3 to the right.

6.6.12 Tolerance rotary

0 .. 100%

Increases the tolerance on the electronic components which will lead to higher out of tune notes.
When zero the maximum out of tune amount is +- 2 cents.
When set to 100% it can become well over 20 .. 30 cents.
Note that this out of tune amount will/can be different for each note, which is very analog (and opposed to the Detune rotary which detunes all notes with the same amount).

6.7 Load Instrument (samples per note, new in v4.0)

Each note can now have its own sample.
Previously the same sample or wavetable was pitch shifted for the different notes.
This could for example be used to play a drumset on the keyboard.
Or play an instrument at higher quality than just pitch shifting 1 sample.

Check the preset /sequences/Drumming.



6.7.1 Instrument selection dropdown

Allows to select a previously saved instrument or add a new one.

6.7.3 Key dropdown

Selects the keyboard note for which a sample will be selected/stored.

Keys which have a sample allocated will be displayed in green.

6.7.4 Note dropdown

Allows to set the tuning of the loaded sample.

When set to “Key”, the sample will be played as is (no pitch shifting).

When the sample is loaded in keyboard note C4 and the tuning note is set to C3, the sample will be pitch shifted up with 1 octave.

6.7.5 File selection dropdown

All sample files which reside in the folder “samples” (and its subfolders) in the WoodSynth iCloud folder will be shown in the popup and can be selected.

When the file’s sample rate does not match the app or plugin sample rate a conversion will be done.

The wave display will show the entire file.

6.7.6 Start and End rotaries

These work the same as in the Recording Samples mode.
They select a part of visible samples to be played.

6.7.7 Mode dropdown

Selects the way how a key which has NO sample allocated will be played.

- Pitch
  The closest key which has a sample will be pitch shifted to this key.
- Octave + Pitch
  The closest key at 1 or more octaves from this one, will be pitch shifted.
- Octave
  The closest key at 1 or more octaves from this one, will be played as is.

7. Aux Envelope / Glide panel





7.1 Aux Envelope ADSR Envelope rotaries

Attack time : 0 .. 10s
Decay time : 0 .. 10s
Release time : 0 .. 10s
Sustain level : 0 .. 100%

7.2 Non-linear Attack/Decay/Release rotary

-100% .. 100% non-linear curves :

value > 0 :
attack will initially increase slower and finally increase faster.
decay and release will initially decrease faster and finally decrease slower.

value < 0 : reverse behaviour.

7.3 Aux Envelope Destinations

Clicking the button will display a multiple selection panel which allows the ADSR to control several destinations :

- Phase modulation of OSC 1 (by OSC2), 2 (by OSC 3) & 3 (by OSC 1).
- Ring modulation of OSC 1 with OSC 2.
- LFO's (Osc section) frequency modulation of OSC 1,2 & 3.
- Crossfade of OSC 1 & 2.
- Crossfade of OSC 3 & 4.
- LFO 1 destinations Amplitude Mod and Filter Up/Down.
- OSC 2&3 Tube Drive

The Pitch Up/Down destinations are set by separate buttons (see 7.5) to be compatible with v1.x.

7.4 Pitch Up/Down rotary

-24 .. 24 semitones

Defines the pitch shift when the sustain level is set to max.

The Aux ADSR envelope level moves the pitch from the note value (env = 0) to the up/down value (env = 100%).

7.5 Pitch OSC + SMPLS buttons

The pitch envelope can be independently enabled for the 3 oscillators and the samples source.

7.6 Glide button

When switched on for this layer and when the master Glide is on, each note played after a first note will glide from the previous note to the new one.

7.7 Glide time rotary

0 .. 10s

Defines the glide duration. Obviously large values only make sense when holding the notes longer.

7.8 Glide mode popup

Global : each new note will glide from the previous one.
Poly : will attempt to glide in group which is useful when playing chords.

8. Amplitude Envelope panel

Controls the classic ADSR amplitude envelope.



8.1 Attack rotary

0 .. 10s

Time to evolve from silence (key not pressed) to the max level (determined by the Gain Rotary)

8.2 Decay Time rotary

0 .. 10s

Time to evolve from the Attack Level (Gain Rotary) to the Sustain Level.

8.3 Sustain Level rotary

-60 .. 0 dB

Relative to the Gain level.

Level reached after Attack and Decay time have passed.

8.4 Release rotary

0 .. 40s

Time to evolve from the Sustain Level to silence when the key (midi note-off) is released.

8.5 (Layer) Gain

-60 .. 0 dB

Sets the overall gain for this layer.
So together with the global Out Gain this determines the absolute max level for this layer.
All other gains are relative to this level.

8.6 Key tracking rotaries

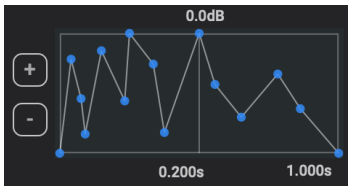
-100% .. 100%

values > 0 :
lower notes will have a faster attack time, higher notes will have a slower attack time than the center note.
lower notes will have a shorter release time, higher notes will have a longer release time than the center note.

values < 0 : reverse behaviour.

Currently the center note is set to C4 (midi note 60).

8.7 ADSR multi point Editor



The curve editor allows to create a much more complex curve for the AD part and/or for the Release part by setting any number of points on the curve.

The left part of the display represents the Attack + Decay curve, the right part represents the Release curve. Both parts/curves have their own timing displayed and which is set by either the Attack + Decay time or by the Release time in the ADSR panel.

To add a point : click the “+” button and then click in the editor window on the position the point has to be added.

To remove a point : click the “-“ button and click the point to be removed.

By default the editor displays the classic 4 points ADSR curve and moving the Attack or Sustain point will adjust the rotary controls in the ADSR panel.

9. Filter panel



9.1 Filter type popup

Type can be :

- Off
- Moog 4-pole low pass filter
- 2 pole band pass filter
- 2 pole high pass filter

9.2 Filter frequency rotary

Sets the cutoff frequency when the envelope is at zero (= ADSR released).

9.3 Filter up/down rotary

-100% … 100%

Sets the cutoff frequency when the envelope is in sustain state and the sustain level is set to the max (key keeping pressed …) or when the attack time has passed (and the decay starts).

+100% -> filter fully open when sustain level is 100%

-100% -> filter fully closed when sustain level is 100%

9.4 Resonance

0.. 10

Above 3 the filter can start to oscillate !

9.5 Filter ADSR envelope rotaries

Attack time : 0 .. 10s
Decay time : 0 .. 10s
Release time : 0 .. 40s
Sustain level : 0 .. 100%

The envelope level moves the cutoff frequency (env = 0) to the up/down frequency (env = 100%).

9.6 Non-linear Attack/Release rotary

0 .. 100% non-linear curves :

attack will initially increase slower and finally increase faster.
release will initially decrease slower and finally decrease faster.

9.7 Key tracking rotary

-100% .. 100%

values > 0 : lower notes will not open the filter as much as the center note, higher notes will open the filter more than the center note.
values < 0 : reverse behaviour.

Currently the center note is set to C4 (midi note 60).

9.8 delta LR rotary

0 .. 100% : sets a different cutoff frequency for the R channel, which creates some nice stereo.

10. Delay / Reverb panel

In v4.0 The Delay panel has a new button which switches to the new Reverb panel.
The new reverb is convolution based (WoodVerberator engine).
Delay and reverb now have their own HPF, LPF and Saturation controls (before v4.0 these were shared).
The reverb time, damping and stereo parameters are shared between the 4 layers as there is only 1 reverb unit for all layers (to save some CPU time).





10.1 Delay Send rotary

0 .. 100%

The amount of the signal sent to the delay line.

Can be modulated by general LFO1&2 and by keyboard pressure or aftertouch.

10.2 Delay Feedback rotary

0 .. 100%

The amount of the delay line out sent back to the delay line in.

Can be modulated by general LFO1&2.

10.3 Delay time popup

Defines the delay time (fraction of a bar).
Has all the common beat values (1/4 , 1/8, …) including dotted notes.
1/4 corresponds to the BPM time.

10.4 Delta Delay time rotary

-50% .. 50%

Allows to set a deviation from the discrete bar values set in the popup.

Can be modulated by general LFO1&2.

10.5 Delay high-pass and low-pass rotaries

Filters the delayed signal.

10.6 Delay saturation

0 .. 100%.

10.7 Delay Mod

Modulation of the delay time.

LFO frequency can be set between 0 and 10Hz.

10.8 Reverb Send

0 .. 100%.

The amount of the signal sent to the reverb unit.

Can be modulated by general LFO1&2 and by keyboard pressure or aftertouch.

10.9 Reverb Type

Allows to choose from a list of embedded IR's :

- Hall
- Plate
- Room
- Ambiance
- Spring
- Church

10.10 Reverb Time

Resamples the IR to extend or reduce the reverb time.

0 .. 10s

Can be modulated by general LFO1.

10.11 Reverb Damping

Modifies the IR to adjust the room damping.

-100% .. 100%

10.12 Reverb Stereo

Sets the stereo amount of the reverb.

0 .. 100%

11. Stereo Panning / Out panel



11.1 Audio LR panning

-100% is Left
+100% is Right

11.2 Delay LR panning

-100% is Left
+100% is Right

11.3 High pass filter frequency rotary

50Hz … 20kHz

11.4 Saturation rotary

0 .. 100%

Adds more gentle distortion.

11.5 Crush rotary

0 .. 100%

Adds crude distortion by simply clipping the signal.

11.6 Stereo Delay rotary

Was called LR delay in versions before 3.x.

0 .. 100 ms

Adds a delay to the left channel of the delay and reverb output signal.

This creates a wide stereo image due to the comb filtering.

In versions before 3.x also the dry signal was delayed but this often reduced the center bass notes too much.

11.7 Ring Modulation

Has an on-off button, an amount rotary (0 .. 100%) and a mode popup.

The mode defines which 2 signals are ring modulated.

Mode can be :
- Voices 1 : all voices played are multiplied
- Voices 2 : the 2nd voice is first 1 octave down shifted before being multiplied with voice 1
- Voices 3 : voice 1 and 2 are both 1 octave down shifted
- OSC 1&2 : not the voices but the OSC 1 and OSC 2 signals (of each voice) are multiplied.
- Layer 1&2 : (select in layer 1) final outputs of layers 1 & 2 are multiplied.
- Layer 3&4 : (select in layer 3) final outputs of layers 3 & 4 are multiplied.

For the voice modes, 2 notes must be played to hear the ring modulation.

OSC 1&2 mode can be heard when 1 note is played. When selecting this mode OSC2 is automatically switched on. However as OSC2 is normally set to the same frequency (+- some octaves) as OSC1, the ring modulation has much more effect by detuning one of the 2 oscillators.

A third and totally different mode of obtaining ring modulation is using one of the LFO’s with destination set to ring mod.

12. LFO panel

Has 2 general purpose LFO’s which can be routed to a set of destinations.





12.1 LFO frequency rotary

0 .. 400Hz

12.2 Modulation depth rotary

0 .. 100%

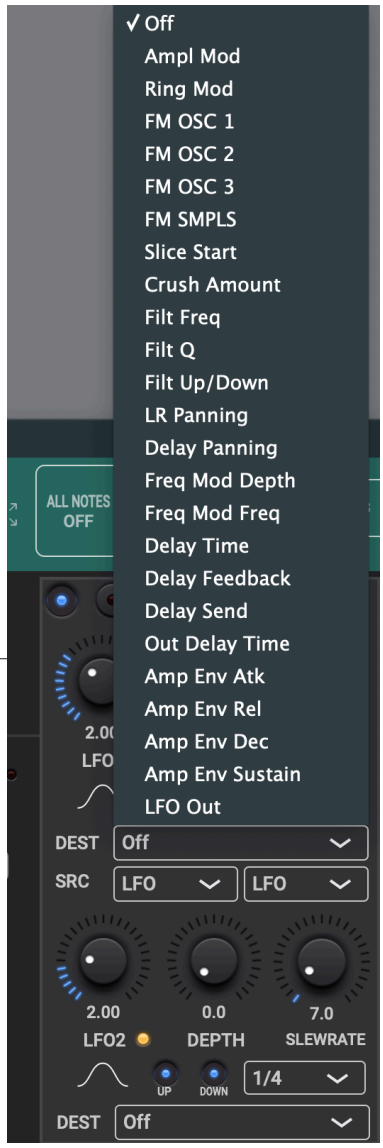
12.3 LFO waveform

- Sine
- Square
- Triangle
- Saw down
- Saw up
- Random (2 values / cycle)
- Pulse

12.4 Bar fraction popup

When not set to “Free”, the LFO frequency will be calculated from this bar fraction and the BPM. So when the BPM changes, the LFO frequency will also change automatically to keep the same relative value.

12.5 LFO Destination popup



All destinations can be set differently per layer :

- Amplitude Modulation
- Ring Modulation
- Frequency Modulation of OSC 1,2,3 and Samples
- Crush Amount
- Filter Cutoff frequency
- Filter Q
- Filter Up/Down
- LR panning
- Delay LR panning
- Delay Send
- Delay Feedback
- Amplitude Envelope Attack, Decay, Release and Sustain
- Samples slice start

12.6 Slew Rate rotary

0 .. 100%

Sets the slew rate of the oscillator square and sawtooth waveforms.

The slew rate is the steepness of the vertical transitions.

100% would make the square waveform into a triangle.

When the waveform is set to Pulse, this rotary changes to the Pulse Width.

12.7 Up and Down buttons

Defines if the modulation will only go up or down or both.

12.8 Modulation source selection popups

- LFO
- Samples of any layer (with loaded or recorded samples)
- Track audio
- Track RMS
- Side chain audio
- Side chain RMS

The track and side chain sources can only be selected when WoodSynth is inserted as an effect and not as an instrument (which does not get audio in).

In the stand-alone versions side chain is obviously not available.

When the source is set to Track or Side chain, the LFO frequency control has no function anymore and becomes a lowpass filter cutoff frequency.
The slew rate control becomes a Gain (-40dB … +40dB).

LFO1 destination can be set to LFO out which will send the source signal directly to the output (Out Gain is still applied). This allows to check which track or side chain audio is sent to WoodSynth.

13. Sequencer panel



The original (v2.x) Sequencer panel



The new (v3.x) Sequencer panel

The v3.x sequencer panel can be made visible by clicking the “Seq” button in the header of the expanded WoodSynth view (MacOS and larger iPads).

In the original condensed WoodSynth it can be made visible by clicking the LEFT half of the “Seq” button in the bottom button row. Clicking the right half will select the original smaller panel which still works but does not show/have all the new functionality.

13.1 On Button & ABS (Absolute) Button

On enables the sequencer for this layer. To run, the master control also needs to be on.

When ABS is on, the first note (ground note) is fixed to the value displayed and hence not determined any more by the key(s) pressed.
This mode is likely to be used with the Metronome or DAW Transport Start modes.
It allows to start the sequencer and then play melodies without modifying the sequence.

13.2 Step time dropdown

Set as a bar fraction and hence is relative to the BPM.

13.3 Number of notes (steps) dropdown

2 .. 16

13.4 Start mode dropdown

Mode “First Note” : the first note starts the sequencer and subsequent notes are just played.

Mode “Last Note” : each new note played, takes over the sequence

Mode “Poly” : each note played, starts a new sequence up to the number of voices set in this layer. Setting a quantise value makes sure the notes are played at the same moments.

Mode “Metronome Start/Stop” : the sequencer starts running when the metronome is started.
The metronome itself has a “Start” (Stop) button on the main control panel.
Indirectly this mode also allows to start the sequencer with the Ableton Link Start/Stop mode.

Mode “DAW Transport Start/Stop” : most DAW’s can easily start/stop the transport (Mac spacebar …) but most hardware controllers also have a button to control the transport.

The Metronome and DAW modes will likely be used with the Sequencer “Absolute (first note)” mode. This way the sequence can be started (without having to hold a key) and keys can be used to play a melody without modifying the sequence.

13.5 Stop mode dropdown

Mode “Note Off” : as soon as the key is released the sequencer stops.

Mode “End Loop” : when the key is released, the sequencer stops after having played all the steps.

Mode “Running” : the sequencer keeps running also when the key is released. **To stop it, switch off the sequencer master button or press the “All Notes Off” button.**

13.6 Quantise dropdown

Can be :
- Off
- Bar
- Beat
- 1/8

When not off, the sequencer notes will be played on a quantised moment in the bar.

This is especially useful when playing more than 1 note as each note starts a sequence.
With the quantise on, the sequences will be perfectly in sync.

13.7 Record button

When switched, notes played will replace the existing step values until the number of sequence steps is reached.
When record is on, the sequencer won’t run.

13.8 Step / Range (v3.x) values buttons

The values displayed are the semitone offsets from the first note recorded.

When ABS mode is on, the first note will display the fixed note value (C4 …)

Clicking on a value will display a popup which allows to change the value without recording.

MacOS : holding Shift will add 1 extra octave, holding Alt will add 2 extra octaves.

v3.x :
When the Range button (left margin) is selected, the semitone buttons display the semitone range. The range is used when this step is set to “Random Note” to determine how “far” the random semitone can go.

v4.0 : Show notes button : note values are displayed in stead of semitones.

13.9 Volume sliders (v3.x)

Sets the volume (dB) for the step.
Range is -60 dB to 0 dB.

The colour of the slider will fade more to grey when the “On” probability is set lower.

Clicking on the “pencil” button allows to draw the volume which is faster than changing each slider individually.

13.10 Mute / Skip Led buttons (v3.x)

The leds at the top of the step column can have 3 states :

- green : step is not muted or skipped
- off : step is muted
- red : step is skipped

A green led means the step is not switched off but will take the on probability into account (and hence can still be muted depending on the probability).
When the led is off, the step is muted.

The leds are also a buttons which allow to quickly mute/unmute the steps.

When the left margin “skip” button is on, the led button becomes a skip control.
Skipping a step makes the sequence duration shorter.

13.11 On/Skip probability rotaries (v3.x)

When the step is “on” (so not skipped) this control sets the “On” probability.

Probability :
- 100% : the step is always on,
- 0% : step is always muted (which has the same effect as switching off the green led mute button).
- 50% : on average 1 time out of 2 the step will be muted

The on/off probability (and green led mute button) has no effect on the duration of the sequence (opposed to the skip button).

When the step is skipped (red led), the probability changes meaning :

- 100% : step is always skipped
- 0% : step is never skipped
- 50% : on average the step is skipped every time out of 2.

13.12 Random note probability rotaries (v3.x)

Allows to set the probability a random note will be played per step :

- 100% : each time a random note will be played
- 0% : random note is off, the selected semitone will be played
- 50% : on average 1 time out of 2 a random note will be played

In v2.x there was only one global random on/off button which was the same for all steps.

As it can now be set per step, some important chord notes could be fixed while a few others may be set to random, creating an ever varying but still musical sequence.

As mentioned in 13.8 the random note range can now be limited and the exact random semitones played can further be limited by setting a scale in the “Limit Scale” dropdown.

13.13 PAR2 and PAR3 rotaries (v3.x)

Allows to set a relative effect amount of 0 .. 100% except for the ADSR where the amount is an absolute value overriding the Envelope Panel setting.

The effect controlled is set in the left margin PAR2 / PAR3 dropdown :

- Filter Up/Down
- Filter Q
- LFO frequency modulation depth
- Samples slice start
- Env Release : 100% -> 1s
- Env Decay : 100% -> 1s
- Env Attack : 100% -> 1s
- Env Sustain level :100% -> 0dB

13.14 Ratcheting / Step time buttons (v3.x)

Ratcheting is the repetition of the same note in the step according to a rhythmic pattern.
The pattern can be selected in the dropdown when clicking on the quarter note icon button.
Ratcheting usually needs a short attack, decay and release time.
Ratcheting does not change the sequence duration.

The same dropdown also allows to select a different step time : the normal step time either multiplied or divided by 2,3 or 4.
Obviously setting a different step time will change the total sequence duration.

13.15 Ratcheting / Step time probability rotaries (v3.x)

Allows to set the probability the ratcheting or a different step time will take place :

- 100% : each time.
- 0% : ratcheting is off and step time is the normal one.
- 50% : on average 1 time out of 2 ratcheting or the selected different step time will take place.

13.15 Var / Note Glide buttons (v3.x)

When the left margin button is set to “Note Glide”, these buttons control the glide from 1 note in the sequence to the next note.
For the glide to work the layer Glide button in the Aux Env panel has to be on and also the Master Glide control has to be on.

When the left margin button is set to Var Glide” the buttons control the gradual transition from 1 Variation to the next Variation (see below).

13.16 Variation buttons (v3.x)

A Variation is a kind of preset for the sequencer only which contains all the step parameters (as seen in each step column) plus the Limit Scale setting.
Up to 4 Variations can be set.

Selecting a Variation by clicking 1 of the 4 buttons, allows to edit the parameters for that Variation, even when the sequencer is playing another Variation.
When the “Var Mode” dropdown is set to “Select”, the buttons also control which Variation is played.
The Variation being played is indicated by the little leds below the buttons.

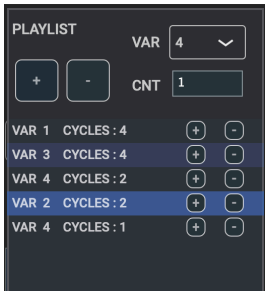
13.17 Variation Mode dropdown (v3.x)

Selects how a Variation is or will be played :

- Select : click on 1 of the 4 buttons to play the Variation.
- Random : any of the 4 Variations is played randomly.
- Playlist : plays any combination of Variations and number of times as set in the Playlist.
- Playlist Restart : will start from the first var in the list when the first new note is played.

13.18 Playlist button (v3.x)

Opens a little popup window to edit the Variations playlist :



Clicking “+” will add a Variation (set in de header popup) to the list.
Clicking “-“ will remove the selected line.

13.19 Variation Glide button (v3.x)

Variation Glide is the master control for all the steps in this sequencer to enable gliding.

Gliding will gradually transition for the semitone values and for the volumes when going from 1 Variation to the next.

For example : assume Var1 is played 4 times to reach Var2.

Var 1 (step x) semitone is set to 4, Var2 (step x) is set to 8

Without gliding semitone 4 will be played 4 times and then next time change to 8.

With gliding the difference 8 - 4 is divided by the number of cycles (4), giving 1 semitone.
This results in semitones played : 4, 5, 6 , 7 and then Var2 : 8

Now assume Var2 (step x) was set to 9.
This will now give a delta of (9 - 4) / 4 = 1.25 semitones !
Which would result in semitones played : 4 5.25 6.5 7.75 and then Var2 : 9

Clearly this results in sub (detuned) semitones.
When the button “Sub Semitones” is switched on, this is exactly what will be played by the oscillators yielding some “strange” (or detuned) notes.

When the button “Sub Semitones” is switched off, the semitones will be rounded to the next complete one, resulting in : 4 5 7 8 and then Var2 : 9

Of course this may still be not very musical (= out of scale) so the semitones can still be further limited by setting a scale in the “Limit Scale” dropdown.

13.20 Sub Semitones master button (v3.x)

When switched on, semitones with a fraction (1.25 …) are allowed and can create detuned (or strange) notes.

This can occur when Variation Glide is switched on OR when random notes are on.

Each step has an individual on/off control which can be set by selecting the “SUB SEMIT” radio button in the left margin.

13.21 Limit Scale dropdown (v3.x)

Allows to set a scale to limit the notes being played when Variation Gliding is on OR when random notes are played.
A different scale can be set for the 4 Variations.
When the “Sub semitone” is on for a step, the scale is not taken into account for that step.

13.22 (Variation) Copy/Paste button (v3.x)

Allows to copy all the step parameters from 1 Variation to another.

13.23 (Variation) Restart button (v3.x)

When the sequencer is running in “Playlist” mode, this will jump to the first var in the list.

When not running it will make that the Playlist starts at the beginning when a new note starts the sequencer.

13.24 All Steps button (v3.x)

When switched on, changing 1 step parameter will set the same value for all the steps.

13.25 Re-sync dropdown (v3.x)

When different step times are used and especially with a probability < 100% or steps are skipped also with a probability < 100%, it is hard or even impossible to predict when a number of cycles of the sequence coincides with a number of bars.

Therefore this dropdown allows to resync after a number of bars : it will restart with Var1, step1.

13.26 Random step probability rotary (v3.x)

- 100% : next step is completely random
- 0% : next step is always the normal one
- low % : only now and then the step “jumps” : useful for higher number of steps

13.27 Feel rotary

-50% .. 50%

Changes the relative timing between each 2 notes. Useful to create a shuffle feel.

13.28 v2.x (original) Sequencer panel

13.28.1 VOL button

Allows to set a relative step gain in dB.

13.28.2 PAR2 button

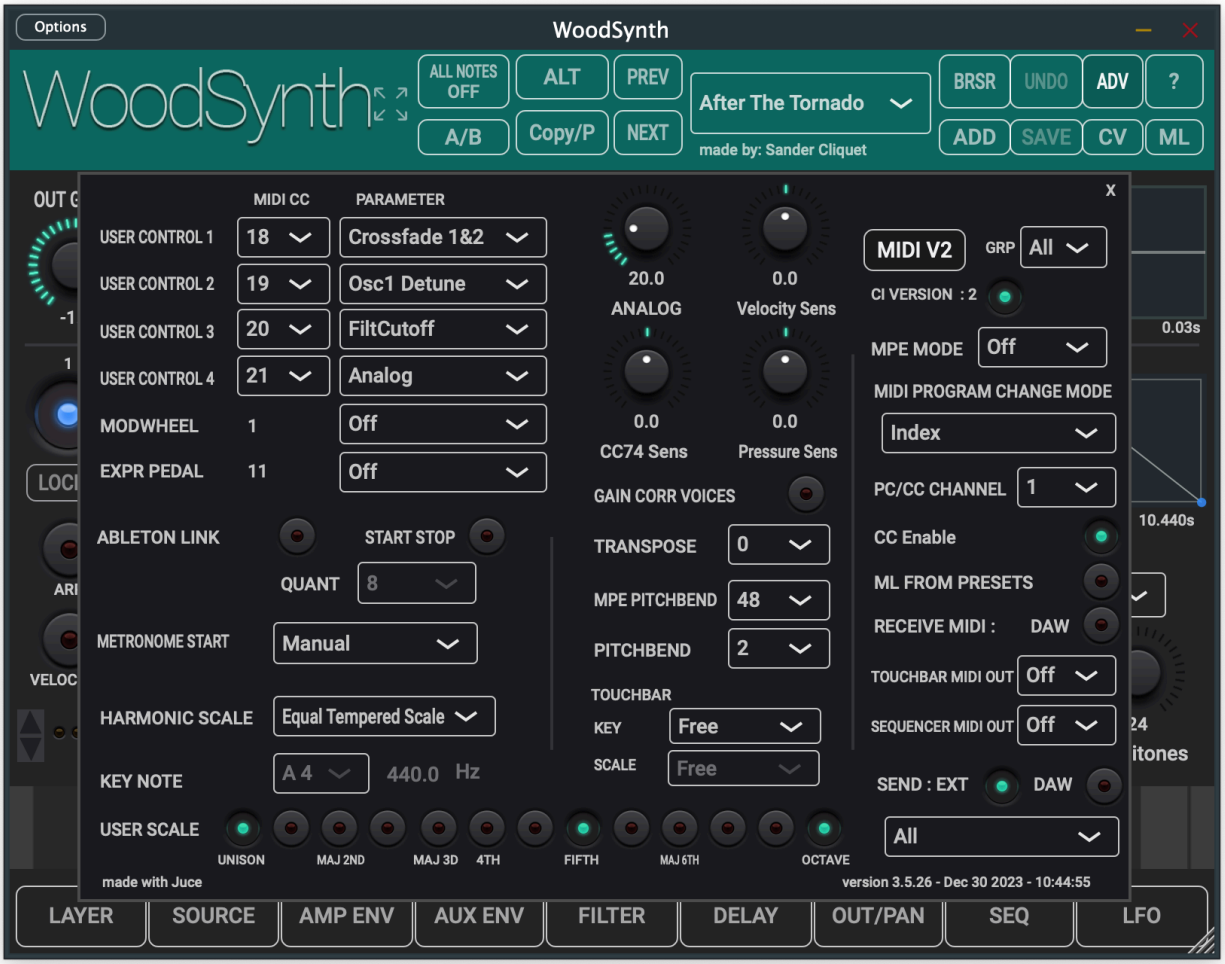
see 13.13

13.28.3 GLIDE button

When switched on, the value buttons change to glide on/off buttons (colour changes to yellow).

14. Advanced Panel

The Advanced panel can be made visible by pressing the “Advanced” button.



Most settings in the Advanced panel are NOT saved in a preset but in the DAW’s project settings.

The User scale and key note/frequency are stored in the preset.

14.1 MPE mode popup

Selects MPE for all layers. Setting NOT stored in the presets.

14.2 User Controls

Destinations can be set for the 4 User rotaries in the main window as well as the midi CC's to control those user rotaries. The midi CC's can also be set by midi learning.

Also the destination for the Mod wheel and Expression pedal can be set here. The midi CC's are set to the normal values (1 and 11).

14.3 Analog rotary

0 ..100%

Models some analog behaviour.

14.4 Sensitivity rotaries

-100% .. 100%

Applies a non-linear curve on the incoming values of Velocity, After Touch and Pressure.

14.5 Gain correction voices button.

When switched on, a gain reduction will be applied depending on the max number of voices to prevent clipping at the output stage. The disadvantage is that the volume will be lower when playing only 1 (or a few voices).

14.6 Transpose popup.

-12 .. +12 semitones

Transposes all layers.

14.7 Pitch bend popups.

Pitch bend values can be set for normal keyboards (non-MPE mode) and for MPE controllers.

These values are used by all layers and are NOT stored in the presets.
A layer can still override these values and that will be stored in the presets.

14.8 Midi Program Change and CC input controls

The midi channel popup is only for the PC and CC in messages, NOT for the note-on, note-off, pitch bend, after touch messages in the VCO. Those use the midi channel popup in the Source / Oscillator panel

14.9 DAW Midi button

If you want midi to be received from the DAW itself (DAW keyboard, midi track on which WoodSynth is inserted, …), switch on this button otherwise WoodSynth listens to external midi events.

Using this midi path currently does not support midi v2 and the midi CI Property Exchange.

AU and AU instrument now (v3.7) do support the UMP 16/32 bits in LogicPro on MacOS.
However new midi v2 messages below note off (0x80) like Pitch Per Note are not supported.
Also midi CI property exchange is not working as the midi sysex messages are not passed to the plugin by LogicPro.

14.10 Touch bar midi out channel

The internal WoodSynth touch bar can output midi messages on the channel set in this popup.

On iOS polyphonic touches are supported.

Messages sent are :
- Note on (finger touch) , the velocity value is determined by the vertical touched position in the touch bar.
- Note off (release finger)
- Pitch bend (moving horizontally), can be polyphonic when set to MPE out.
- CC74 when moving vertically outside the touch bar. (Slide movement)

14.11 Send midi Ext and DAW buttons

External : sends the touch bar or sequencer notes directly to the OS midi handler which allows to reach other devices or apps independent of the DAW settings or routing.
A dropdown allows to select a specific midi destination endpoint or all endpoints.

DAW : the midi is sent to the DAW which can decide how to route these further.

14.12 Sequencer midi out channel

When not set to Off, the running sequencer notes will be sent to this midi channel.

From v3.5 on, WoodSynth will now also send :
- a velocity value set to the step volume (only when midi v2 is on).
- CC74 messages with value set to Sequencer param2.
- Mod wheel (CC 1) messages with value set to Sequencer param3.
- Pitch wheel messages where a non zero value comes from Osc1 detune or from the sub-semitones (only when midi v2 is on)

When midi V2 is on the messages will use the 16/32 bits resolution.

14.13 Harmonic Scale popup

Allows to choose between the “Equal Tempered” scale or “Just” scale used in the pitch values when harmonic lock is on.

In the Equal Temper scale all note to next note ratios are the same : the 12th root of 2 = 1.05946.
In the Just scale the ratio depends on the interval and is based on rational numbers.

Interval ratios for the 2 scales :

	Unison	Minor Second	Major Second	Minor Third	Major Third	Fourth	Dim Fifth	Fifth	Minor Sixth	Major Sixth	Minor Seven	Major Seven	Octave
Equal Temper	1.0	1.05946	1.12246	1.18921	1.25992	1.33483	1.41421	1.49831	1.58740	1.68179	1.78180	1.88775	2.0
Just	1.0	25/24	9/8	6/5	5/4	4/3	45/32	3/2	8/5	5/3	9/5	15/8	2.0
Just	1.0	1.0417	1.1250	1.2000	1.2500	1.3333	1.4063	1.5000	1.6000	1.6667	1.8000	1.8750	2.0

The scale set is used to convert an incoming midi note number to the VCO frequency.
For the Just scale this requires to also set a reference (key) note and frequency.

14.13.1 Key Note and Key Note frequency

The frequency for a keynote is the reference frequency set and then multiplied or divided by a power of 2 to get to the wanted octave. For the other notes the Just scale intervals are applied on the closest key note.

14.14 User scale

Can be used in the sequencer Random mode with scale set to “User”.

Can also be used by the internal touch bar.

14.15 Metronome start

Can be manual (press the Start button) or started when the DAW transport is started.

14.16 Ableton Link controls

See chapter 19.

14.17 Midi V2

https://www.midi.org/specifications/midi-2-0-specifications

Midi V2 main features :

- Note on/off velocity values are now 16 bits (were 7 bits in midi v1).
- Controller (CC), pitch wheel, pressure, aftertouch values are all 32 bits (were 7 bits in midi v1 and 14 bits for pitch wheel).
- Has equivalent MPE functionality : new Per Note Pitch message and new Per Note Controller messages.
- Has 16 groups (each group has 16 midi channels).

WoodSynth is using the full resolution of midi v2 messages, 16 bits for velocity, 32 bits for all other values.

WoodSynth handles the new v2 “Per Note Pitch” messages which are the v1 MPE equivalent.

Also the v2 note-on attribute type 3 (Pitch 7.9) is supported.

The new v2 RPN (registered per note) controller 74 is also handled which is another v1 MPE equivalent.

Midi v2 Property Exchange allows to send program info (presets) and midi CC controlled parameter info and values to a midi v2 initiator (keyboard, controller, …) which can then map parameter names and values automatically to its controllers (rotaries, …) : see 14.17.6.

Note : currently Midi V2 is only implemented in the direct connection to the OS midi system so **switch off “Midi from DAW”** when running WoodSynth in a DAW.
The Midi from DAW is handled by the juce framework which is not updated for midi v2 yet.

Both MacOS and iOS convert v1 messages sent to v2 receivers or v2 messages sent to v1 receivers.
So even with Midi V2 on, WoodSynth should still work as before but of course may fall back on the lower bit resolutions of midi v1.

When sending midi v2 from iOS (WoodTroller on iPad) to the Mac (WoodSynth) via the Audio-Midi Setup network connection, the v2 messages are unfortunately converted to v1.
However the midi v2 CI Property Exchange will still work as this is using 7 bits sysex messages.

14.17.1 Midi V2 Button

When switched off, WoodSynth will use midi v1.

14.17.2 Midi V2 Group Dropdown

Allows to select the midi V2 group.

Set to “All” to discard the group and receive messages sent to any group.

14.17.3 Setup WoodTroller to send midi v2 to WoodSynth on iOS.

- run WoodTroller as stand-alone app
- set WoodTroller midi chan to 1 (not MPE)
- set WoodTroller Send midi mode in Advanced to “Dests + Source”

- run WoodSynth as stand-alone app, first try with “Reset to Default” in the preset menu.

Touching a note in WoodTroller should now produce sound in WoodSynth and pitch bending should work.

If pitch bend does not work check if :
- Pitch bend buttons in both WoodTroller and WoodSynth are on.
- Midi V2 buttons in both are on.
- MPE is off in both (or on in both but should not be needed with midi v2)

Running WoodSynth in AUM (either as Audio track source or as effect) :

- Switch off “Receive Midi DAW” in Advanced to let WoodSynth receive midi v2 directly from iOS.

Touch and pitch bend should now work as in the stand-alone case.

14.17.4 Check midi v2 has “native” MPE functionality :

With MPE switched off in both apps, press 2 notes in WoodTroller and bend them separately : you should hear 2 notes but only one shift in pitch when gliding with 1 finger. This works as midi v2 uses a new “Per Note Pitch” message.

When you now switch off Midi V2 in WoodTroller and do the same, the 2 notes will pitch shift together up or down even when moving only 1 finger. This is normal in midi v1 (MPE off) as pitch bending is using the pitch wheel message which is common for all notes.

14.17.5 Check midi v2 has extended resolution (32 bits) :

- connect WoodSynth oscillator 1 detune with ML (midi learn) to 1 of the rotaries on WoodTroller. (e.g. CC 64, rotary 8).
- set the range of the rotary in the WoodTroller “Rot” panel to a small range, e.g. 50 .. 60 (so sweeping the rotary form 0 to 100 will only result in using 10% of the total value range)
- when switching off midi v2 (in WoodTroller) you will hear discrete steps when sweeping the rotary form 0 to 100 (and of course holding a note). This is because 10% of the midi v1 range of 7 bits (= 128 values) is +- 13 different values .
- when using midi v2, no discrete steps will be heard as 10% of 32 bits is still +- 429 million values, which is much more than any hardware control can ever produce.

14.17.6 Midi v2 CI (Capability Inquiry).

WoodSynth midi v2 CI version : 1.2

WoodSynth implements (replies to) the following CI messages :

- Discovery message.
- Midi Message Report (sending current CC values).
- Property Exchange GET (see below)

Profiles are not supported.

14.17.7 Midi v2 CI Property Exchange.

WoodSynth replies to Property Exchange GET resources :

- ResourceList : list of the other resources below for which a reply is sent.
- DeviceInfo : company name (yes the long one …), model, family name, version number.
- ChannelList : current channel WoodSynth is listening to (set by Layer 1) + current preset. allows subscription : sends message to initiator when preset is changed.
- ProgramList : list of all preset names and the PC and bank values to set them.
- AllCtrlList : list of all midi CC controlled parameters (names, CC, defaults).

- X-ParameterList : Korg formatted parameter list.
- X-ProgramEdit : Korg formatted current parameter values (allows subscription).

All non-X resources follow the standard midi v2 CI schemas.

AllCtrlList has 5 extra WoodSynth unique keys :

- “x-value” : the current parameter value, 0-1 based (multiplied with 2^{32} - 1).
- “x-min” : the minimum (real) value.
- “x-max” : the maximum (real) value.
- “x-skew” : skew factor used in the UI (rotary) control.
- “x-unit” : Hz, dB, s, %

the real parameter value can be calculated as follows :

```
real_value = x-min + pow( x-value / (2^32 - 1)  , 1/skew) * (x-max - x-min)
```

Typical AllCtrlList entry :

```
 {
      "title": "FiltCutoff",
      "ctrlType": "cc",
      "channel": 1,
      "default": 2720363520,
      "typeHint": "continuous",
      "x-value": 2898142208,
      "priority": 1,
      "x-unit": "Hz",
      "x-min": 50,
      "x-max": 20000,
      "x-skew": 0.15,
      "ctrlIndex": [
         71
      ]
   }
```

Typical X-ParameterList entry :

```
{
   "name" : "FiltCutoff",
   "default" : 80,
   "controlcc" : 71
},
```

Typical X-ProgramEdit entry :

```
{
     "name" : "FiltCutoff",
     "value" : 80,
     "displayUnit" : "Hz",
     "displayValue" : "849.700"
},
```

Typical ProgramList entry :

```
{
     "title": "Unexpected Rise",
     "category": [
        "soundscape"
     ],
     "bankPC": [
        1,
        0,
        101
     ]
},
```

Typical ChannelList entry :

```
{
     "channel": 1,
     "programTitle": "GR Butterpulse",
     "bankPC": [
        0,
        0,
        31
     ],
     "title": "Ch0",
     "links": [
        {
           "resource": "ProgramList",
           "resId": "all",
           "title": "WoodSynth presets"
        },
        {
           "resource": "X-ParameterList"
        },
        {
           "resource": "X-ProgramEdit"
        }
     ]
}
```

14.17.8 Midi v2 CI Property Exchange Subscriptions.

The resources ChannelList, ProgramList and X-ProgramEdit allow subscription.

When a parameter is changed either on the Initiator (keyboard, WoodTroller, …) or on the WoodSynth UI itself, 2 subscription messages are sent to the Initiator as follows :

{“/currentValues/6/displayValue":"986.2"}
{"/currentValues/6/value":80}

This is the format Korg uses in their Keyscape keyboard.
The Initiator can use either the midi 7 bits value or the real display value or both.

When a preset (program) is changed on the Initiator or on WoodSynth, 2 (short) notify messages are sent as possibly all the parameters are changed and the previous way of sending all those changes would be too long.
After receiving the notify messages, the Initiator can request the parameter resource (X-ProgramEdit or AllCtrlList) and the ChannelList resource (containing the current program).

When the preset category on WoodSynth is changed, a ProgramList notify message is sent.

14.17.9 Testing Midi v2 CI Property Exchange.

Following apps can be used to test (and develop) midi v2 CI functionality :

- WoodTroller : implements CI initiator which will retrieve the Programs (presets) and CC parameters : https://www.woodmansimmaculatemaplesyrupstudio.be
- Midi v2 Workbench : https://github.com/midi2-dev/MIDI2.0Workbench
- Bome software tools : https://www.bome.com/products/midi-ci-tools
- Korg Keystage keyboard

14.17.10 Midi Endpoints (Source and Destination).

Midi devices and apps can receive midi from their destination endpoint and send midi from their source endpoint.
Other devices/apps can connect to either the source or destination to make a connection but the device can also make connections to other devices endpoints either automatically or via a UI.

A classic keyboard will have a source endpoint but usually not a UI to let the keyboard connect to destination endpoints of sound generating devices/apps. Therefore the sound apps usually either connect automatically to the keyboards source (e.g. WoodSynth) or have a UI to choose the keyboard source endpoint.

WoodSynth has both a source (sending midi) and destination endpoint (receive midi).
WoodSynth will also automatically connect to all midi sources to receive midi. This is convenient when switching to another keyboard as no new source endpoint has to be selected which is the case in some other apps.

The (Advanced) dropdown “Midi External destination” also allows WoodSynth to connect to all destination endpoints or to only a specific one.

14.17.11 Connect WoodSynth iPad to WoodTroller iPad on the same iPad

WoodTroller TO : from Source only
WoodTroller FROM ALL SOURCES : off

The WoodSynth destination dropdown can be set to “All” , “All + Source” or “WoodTrollerDest0”.

14.17.12 Connect WoodSynth Mac to WoodTroller Mac on the same Mac

WoodTroller TO : from Source only
WoodTroller FROM ALL SOURCES : off

The WoodSynth destination dropdown can be set to “All” , “All + Source” or “WoodTrollerDest0”.

14.17.13 Connect WoodSynth Mac or iPad to Korg Keystage keyboard (with midi v2 CI).

The WoodSynth destination dropdown has to be set to “**Keystage CTRL**”.

The Keystage has 2 sets of endpoints : Keystage CTRL and Keystage DAW.
When WoodSynth would send midi CI messages to both endpoints, the Keystage gets confused and fails to have the CI working.

15. Running on iOS (iPad, iPhone)

The WoodSynth standalone app can be used sending and receiving audio via the mic/headphone connector or via some audio docking station and receiving midi from external keyboards/ controllers.

The WoodSynth app also contains 2 AUv3 audio unit plugins : an AUv3 instrument and an AUv3 effect. The effect type should be used when audio input is needed, for example to record samples.
Host apps using the AUv3 plugin will present the WoodSynth UI in their own window which usually can be resized. The WoodSynth UI will scale to follow the resizing.

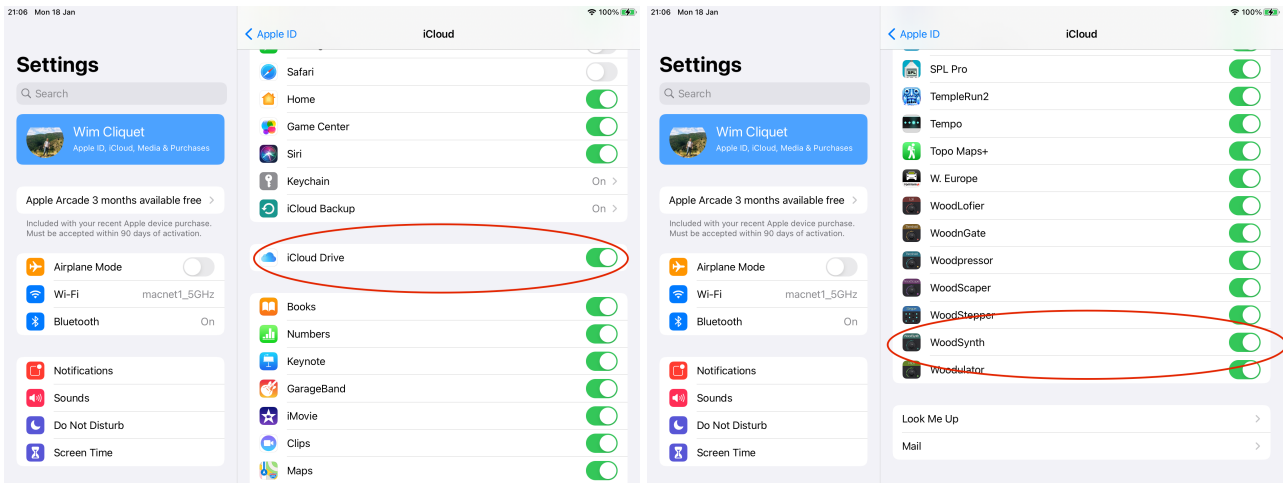
The number of channels will normally be limited to stereo.

WoodSynth AUv3 has 5 (stereo) output busses (which can for example be used in AUM) :
- bus 1 : mix of all the layers
- bus 2 : layer 1
- bus 3 : layer 2
- bus 4 : layer 3
- bus 5 : layer 4

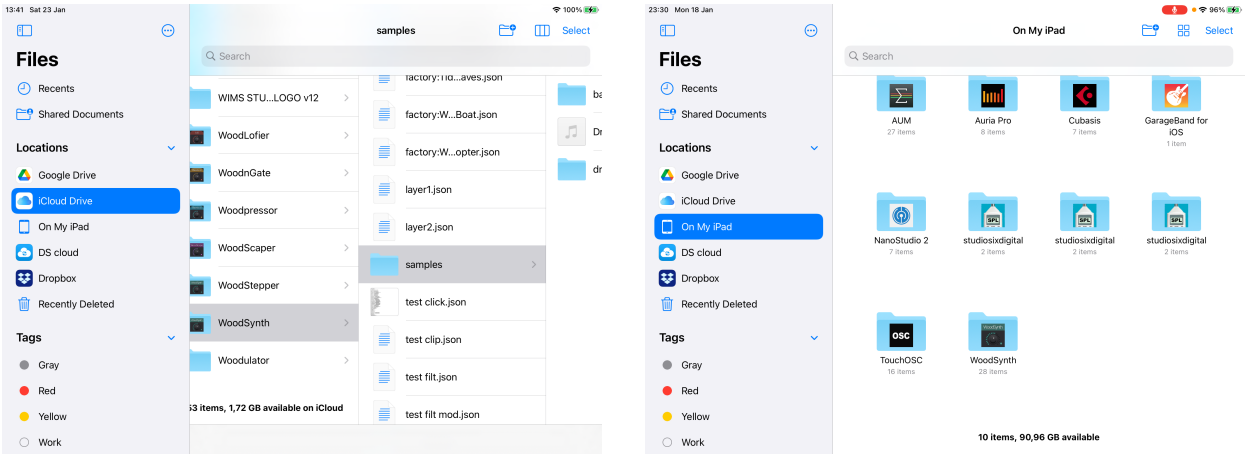
15.1 Presets

Presets can be loaded/saved via WoodSynth's preset popup.
The preset.json files are saved in iCloud Drive when enabled or else in the app's local Documents folder.
When saved to iCloud Drive the presets are automatically available (and synced) to all devices running WoodSynth and are obviously backed-up as well.

To Enable iCloud Drive you should be signed-in in iCloud (normally the case when you also want Contacts, Calendars, Mail, etc to be synced to iCloud) and the iCloud Drive switch should be on. Under iCloud Drive all apps using iCloud Drive are listed and obviously WoodSynth should be on as well (which it is by default).



Preset and sample files can be seen, copied, added and removed with Apple's File app :
- under "iCloud Drive" when iCloud for WoodSynth is enabled
- under "On My iPad" when using local storage for WoodSynth (only for the stand-alone app !)



Another way to get a sample file into the WoodSynth samples folder is simply to share the file from any app or other location to WoodSynth.

When switching from local to iCloud storage, you have to manually copy existing preset (and sample) files from the local space to iCloud with the Apple Files app.

When NOT using iCloud, an App Group shared folder will be used :
- the stand-alone app will copy its presets and sample files to this shared folder at boot time.
- the AUv3 plugins will add the presets from this shared folder to its local private folder. (which can't be seen/accessed with the Files app).
- the AUv3 plugins will use the shared folder as sample files folder. This means that when the stand-alone app removes sample files (from its local and when booted from the shared folder), the sample files will also be removed for the plugins !
- the AUv3 plugins will copy their local preset files to a folder "from_auv3" in the shared app folder. The stand-alone app will copy this folder to its local preset folder so that it becomes visible in the stand-alone app and the Files app.

Presets or Samples subfolders are possible by typing the subfolder name followed by a "/" (backslash character) followed by the preset name.

Presets for the AUv3 plugin can also be provided by the host app or can be saved/loaded via WoodSynth's popup as described above.

The User presets can also be selected by a Midi Program Change. In the Advanced panel the Midi channel and Program Change mode can be set :

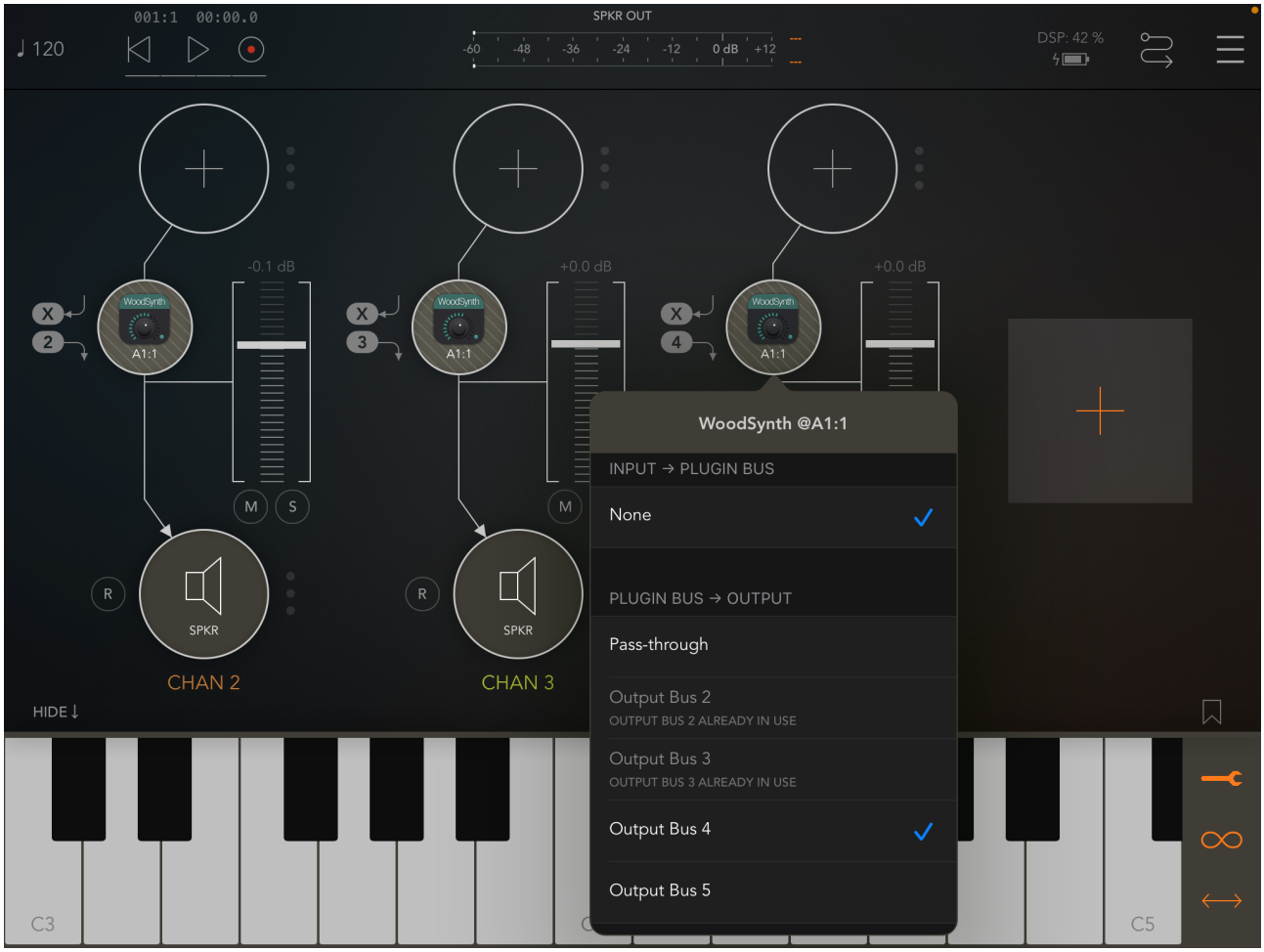
- mode "Index" : program change number is the index in the preset list
- mode "Name" : add ".midiXY" to the preset name to select it with program change XY. (e.g. the preset with name "snaredrum.midi3" will be selected by program change 3. This method is preferred as the selection will not change when presets are added or removed.

15.2 UI Zoom

Especially when used as AUv3 plugin in a host app, it can happen that the window in which the WoodSynth plugin is presented is too small (and sometimes can't be resized)

Pressing the "WoodSynth" logo (top left) will zoom in 3 steps to a maximum size.
Next press will cycle back to the un-zoomed state.

When zoomed the UI can be panned by dragging in any spot which is not a control.



multi output busses in AUM

16. Running on MacOS

The standalone WoodSynth app downloaded from the Mac App Store can be used as such but mainly acts as the license for all WoodSynth plugins (AAX , AU , VST3).

This means there is no limit to the number of Macs on which you can run WoodSynth (as long as the standalone app is in the Applications folder).

Due to Mac App sandbox security, you have to download the plugins installer from my website. The installer package contains the AU, VST3 and AAX plugins and will install them in the normal folders :

- for AAX : /Library/Application Support/Avid/Audio/Plug-Ins
- for AU : /Library/Audio/Plug-Ins/Components
- for VST3 : /Library/Audio/Plug-Ins/VST3

When the standalone app is not present, the plugins will run in trial mode : every 60s the audio will be silent for 3s.

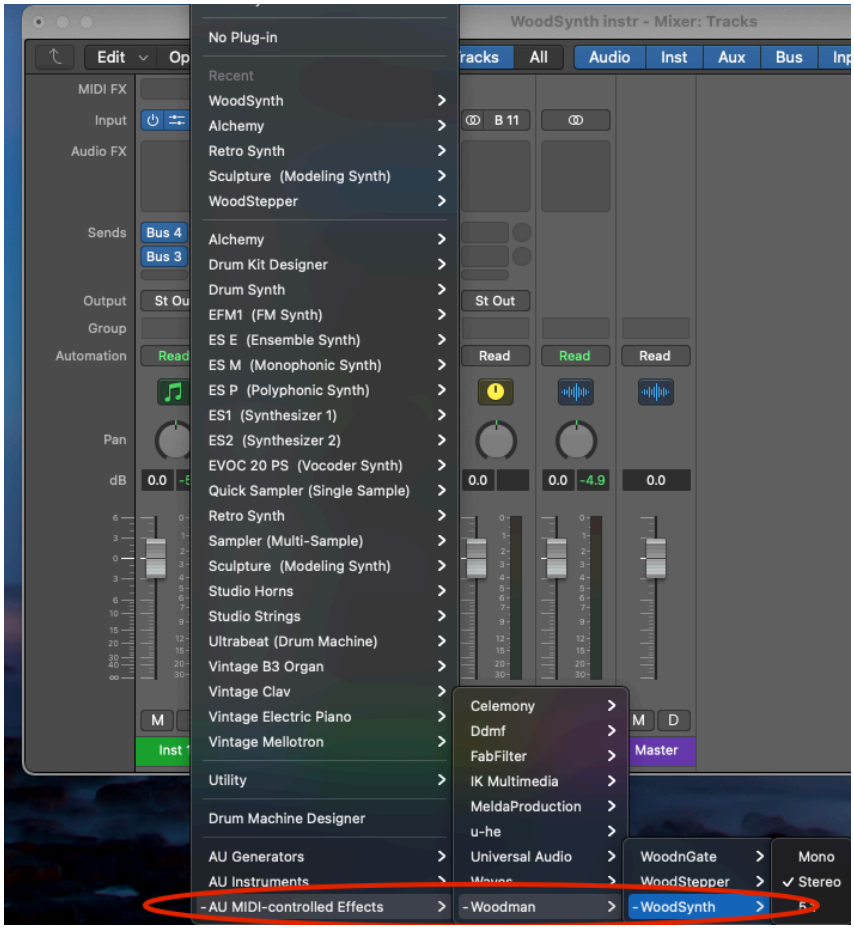
The Left-Right arrow keys will select the next/previous layer.
The Up-Down keys will select the next/previous preset.

From version 3.8 on, there is another licensing mechanism by using a license code obtained by registering a coupon on our website. Coupons can or will be sold for promotions, sales, etc on partner websites.
To enter the license code, click on the “No license found” label.



16.1 Running in Logic Pro

WoodSynth is registered as a midi-controlled effect (‘aumf’) which allows to insert it both on an instrument track as on an audio track (needed to record samples).



When inserted on an audio track WoodSynth may not produce sound because Logic Pro is optimising cpu processing and does not call the audio processing in a plugin which is an effect (and not a generator) when nothing is being played (or even when playing but no audio is on the track).

Options to get WoodSynth sound :

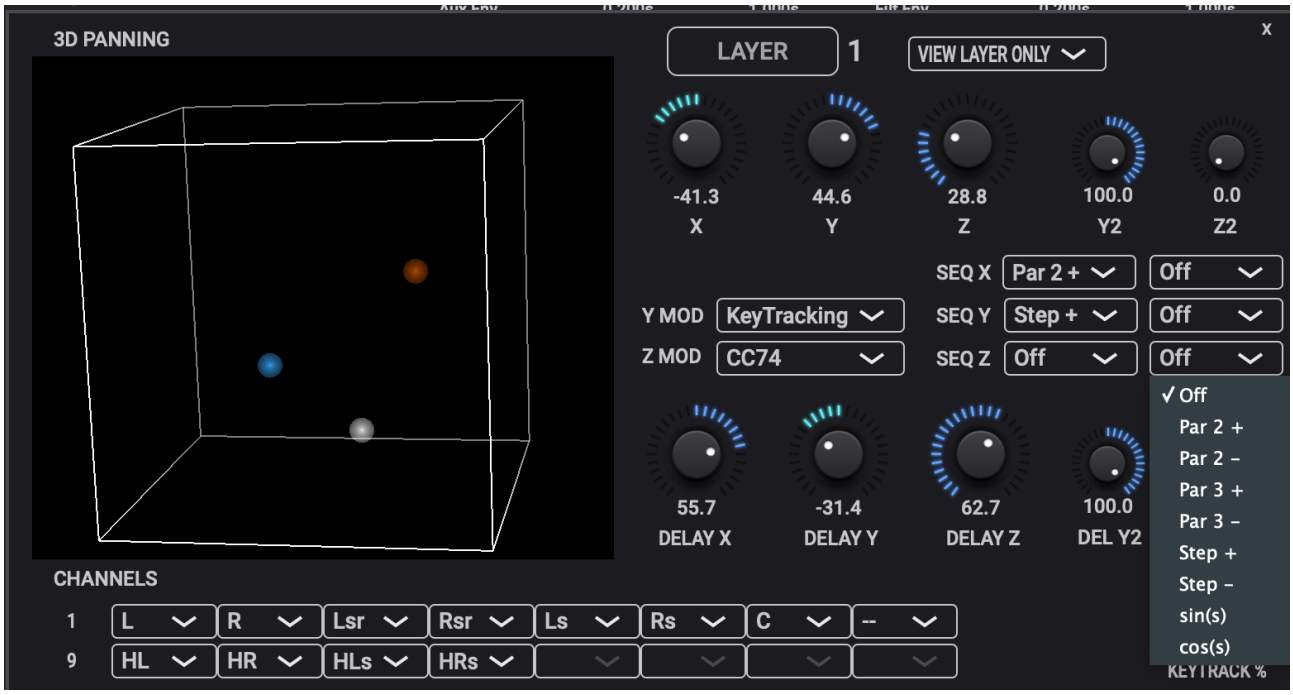
- enable Software monitoring AND the input monitoring on the WoodSynth track
- insert a “generator” plugin (e.g. Logic’s own TestOscillator) on the track and disable it (unless you want the TestOscillator’s output). Just the mere fact that a (even disabled) generator is on the track will cause Logic to call all plugins audio processing !
- insert audio on the track and start the transport (playing).

16.2 Running in Ableton

WoodSynth is also available as an AU instrument (‘aumu’) as required by some DAW’s like Ableton.
The only difference / disadvantage is that no samples can be recorded directly in WoodSynth as instruments don’t get audio input.

17. Surround and 3D Panning Panel

On MacOS when the plugin is inserted on a track with more than 2 output channels, the normal stereo panning panel will be replaced by the Surround and 3D panning.



The normal stereo pan control is now replaced by 3 controls :

X :	-100 .. +100	left to right
Y :	-100 .. +100	back to front
Z :	0 .. +100	bottom to top

The delay can be panned independently from the dry audio out.

Each layer is displayed in its own color in the 3D cube (which can be rotated).
The white spot indicates the position of the C speaker (the Center between L & R).

17.1 Speaker Configurations

For each output channel a popup is available which selects the speaker signal sent to that channel.

Depending on the number of output channels a default speaker configuration will be set.

For Logic Pro (AU) :

5 or 6 channels :	Surround 5.x
7 or 8 channels :	Surround 7.x

For Pro Tools (AAX) :

4 channels :	Quad
5 or 6 channels :	Surround 5.x
7 channels :	Surround 7.x
8 channels :	Auro 3D 8.0
10 channels :	Auro 3D 9.x

For Nuendo, Reaper, Cubase (VST) :

up to 8 channels :	Surround 7.x
12 channels :	Auro 3D 11_7_4

Auro 3D is a registered trademark of Auro Technologies.

17.2 Modulation

The Y and Z direction can be modulated by a number of sources set in the popups :

- Pressure
- CC74
- LFO1 & 2
- Key Tracking
- Mod Wheel
- Expression Pedal

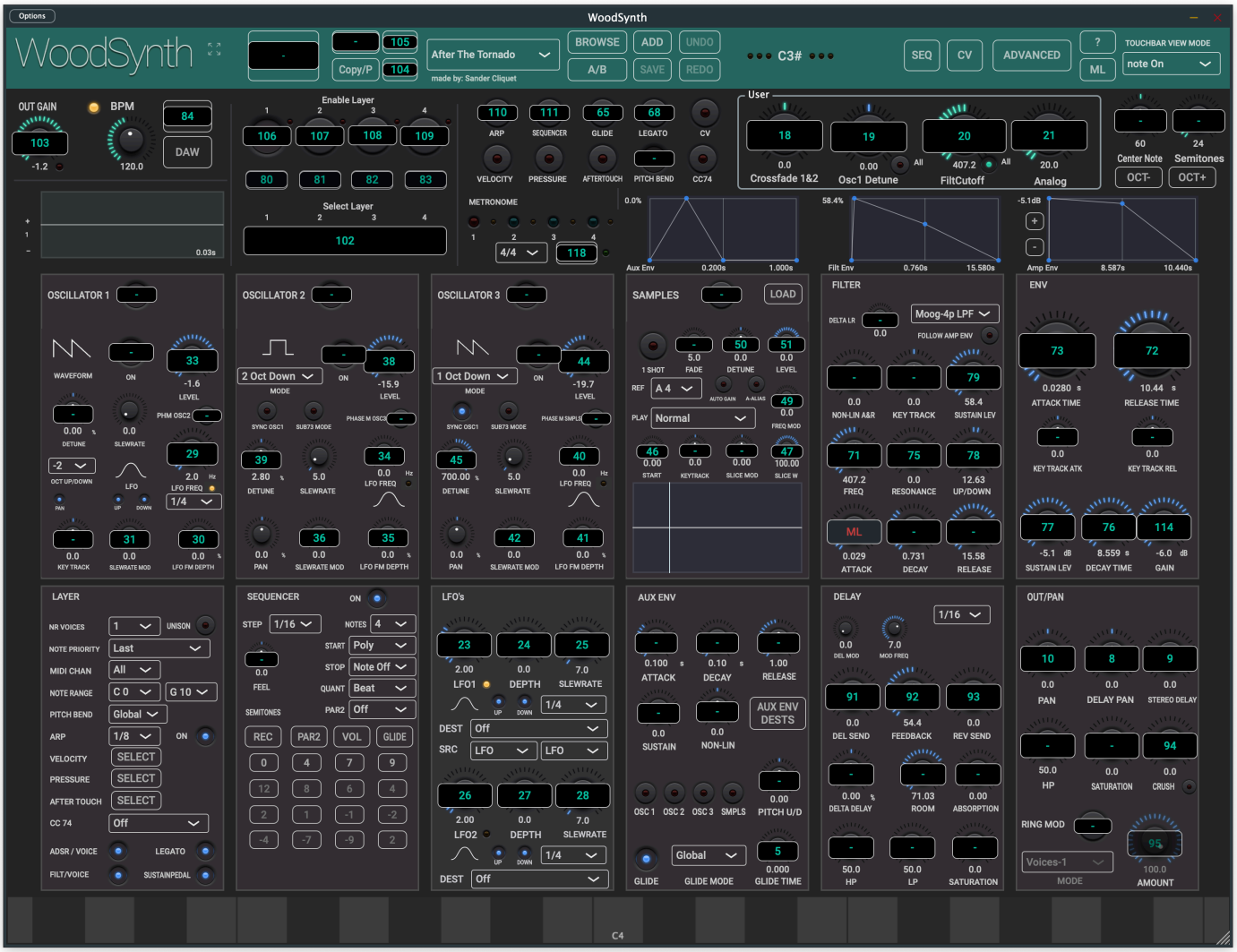
When a modulation source is set, a second Y and Z can be set and the modulation will move the location between Y1 -> Y2 and Z1 -> Z2.

18. Midi CC controls

18.1 ML (Midi Learn)

Clicking on the ML button engages the Midi Learn mode.
All controls which can be learned will display a black rectangle with either the currently assigned CC number or a green “-“.
Clicking on the black rectangle will change the number or “-“ into a red “ML” indicating that this control will get the next received midi CC.
To remove an existing CC from a control, click on its box (so it is showing the red “ML”) and leave the ML mode by clicking on the ML button.
The assigned CC’s will only be enabled when the “CC Enable” button is on in Advanced Settings.

New in v4.0 : when a selected midi CC is already used by another control, both controls will display the CC value in orange. When the ALT button is on, selecting an already used midi CC will reset the midi CC on the other control.



18.2 Default Midi CC's

Controller : Parameter

5 : Glide Time
8 : LR Delay Panning
9 : Stereo Delay Time
10 : LR Panning

23 : LFO1 Frequency
24 : LFO1Mod Depth
25 : LFO1Slew Rate

26 : LFO2 Frequency
27 : LFO2 Mod Depth
28 : LFO2 Slew Rate

29 : Osc 1 LFO Freq
30 : Osc 1 LFO Depth
31 : Osc 1 LFO Pulse Mod
32 : Osc 1 LFO Slew Rate
33 : Osc 1 Level

34 : Osc 2 LFO Freq
35 : Osc 2 LFO Depth
36 : Osc 2 LFO Pulse Mod
37 : Osc 2 LFO Slew Rate

38 : (use by LogicPro as RPN)

39 : Osc 2 Detune

40 : Osc 3 LFO Freq
41 : Osc 3 LFO Depth
42 : Osc 3 LFO Pulse Mod
43 : Osc 3 LFO Slew Rate
44 : Osc 3 Level
45 : Osc 3 Detune

46 : Samples Slice Start
47 : Samples Slice Width
48 : Samples Slice Start Mod Depth
49 : Samples Freq Mod Depth
50 : Samples Detune
51 : Samples Level

52 : Osc 2 Tube Drive
53 : Osc 2 Tube Bias
54 : Osc 3 Tube Drive
55 : Osc 3 Tube Bias

56 : Osc 2 Level

65 : Glide master toggles
68 : Legato master toggles

71 : Filter Frequency
75 : Filter Q

72 : Envelope Release
73 : Envelope Attack
76 : Envelope Decay
77 : Envelope Sustain Level
78 : Filter ADSR Amount
79 : Filter Sustain Level

80 : Layer 1 Lock
81 : Layer 2 Lock
82 : Layer 3 Lock
83 : Layer 4 Lock

84 : BPM TAP

86 : Sequencer VAR 1 select
88 : Sequencer VAR 2 select
89 : Sequencer VAR 3 select
90 : Sequencer VAR 4 select

91 : Delay Send
92 : Delay Feedback
93 : Reverb Send
94 : Crush Amount
95 : Ring Mod Amount

102 : Select current layer : 0 .. 3
103 : Output Gain

104 : Next Preset
105 : Previous Preset

106 : Layer 1 Enable toggles
107 : Layer 2 Enable
108 : Layer 3 Enable
109 : Layer 4 Enable

110 : ARP master toggles
111 : Sequencer master toggles

114 : Layer 1 Gain
115 : Layer 2 Gain
116 : Layer 3 Gain
117 : Layer 4 Gain

118 : Metronome On/Off

119 : Sampling Armed for current layer

18.3 Midi CC's always enabled

64 : Sustain Pedal

87 : MPE+ lsb

18.4 Midi CC's always enabled with selectable destination

1 : Mod Wheel
11 : Expression Pedal
74 : CC74 (aka MPE Slide)

The 4 midi CC's assigned to the User Control rotaries : can be set in Advanced or by midi learn.
Default set to : 18, 19, 20, 21

19. Ableton Link

19.1 What

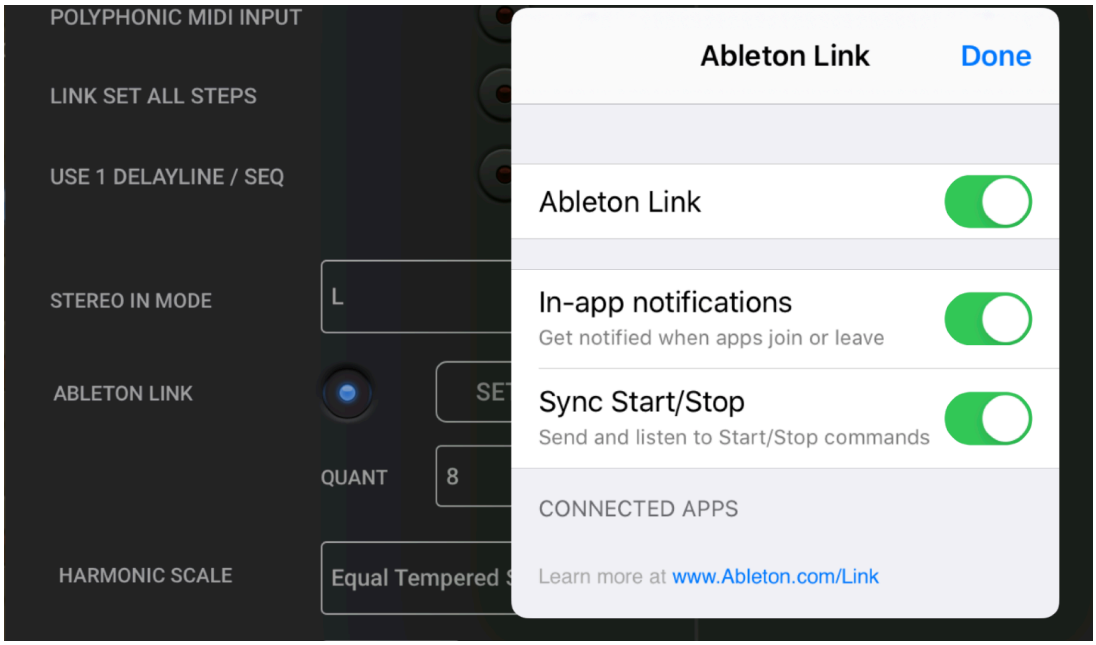
Ableton Link is a new technology that synchronises beat, phase and tempo of Ableton Live and Link-enabled applications over a wireless or wired network. It lets you play devices together with the freedom of a live band. Anyone can start and stop their part while others keep playing, and anyone can adjust the tempo and the rest will follow. You can use Ableton Link with an increasing number of Link enabled applications – even without Live in your setup.

More info on the Ableton website : https://www.ableton.com/en/link/

19.2 Enable Ableton Link button (Advanced Settings)

When enabled the “DAW” button on the main window changes into a “Link” activate button. Ableton Link will now scan the network for other peers but as the Link is not activated yet no syncing will take place yet.

Attention :
On iOS a little Ableton Link settings window will open in which a second Ableton Link enable button has to be switched on as well !
This has to be done only once as the settings are persistent.
In the same little window Start-Stop syncing can also be enabled.



19.3 Activate Ableton Link button

This button replaces the get BPM from “DAW” button in the main window.

The button has a little led which has following states :
- off : no other peers are found
- orange : other peers are found BUT activate is OFF
- green : other peers are found AND activate in ON.

When the activate button is on, each sequencer will display a little led just below the sequencer mute/enable button which has following states :
- green : sequencer steps are in phase with the Link session phase.
- orange : out of phase (tempo has just changed, step timing has just changed, …)
- red : phase syncing not possible (irregular beat timing in respect to the quantum)

When other peers are found and activate is on, following happens :

- changing the WoodSynth tempo (tap, rotary) will be propagated to the Link session.
- when another peer changes the tempo, WoodSynth will take over this tempo.
- when WoodSynth is started (in manual start mode), the real start (step 1) can be slightly delayed so that step 1 starts at the Link session phase 0.
- when the sequencer is running and the tempo changes or the step timing changes, the step duration will be adjusted to get in-phase again with the Link session.
- when the sequencer is running and the steps are in-phase, each step is kept being checked if it is still in-phase and if not the step duration will be slightly adjusted.
- when Start-Stop is enabled, the WoodSynth Start button will also start-stop other (start-stop enabled) peers and vice versa.



19.4 Ableton Link Quantum popup (Advanced Settings)

The quantum can be seen as the (maximum) number of phases WoodSynth can cycle through.

Default set to 8 (as the sequencer usually has 8 steps).

So at any moment in time the phase could be anything between 0.0 and 7.9999

In-phase means that step 1 occurs at phase 0.0 , step 2 at phase 1.0 … step 8 at phase 7.0
Out of phase could be step 1 occurring at phase 0.6 or 1.234 or even at 6.789, etc.

When you want the sequencer to play in bars of 3/4 or 6/8, you can disable 2 steps and set the Quantum to 3 or 6.

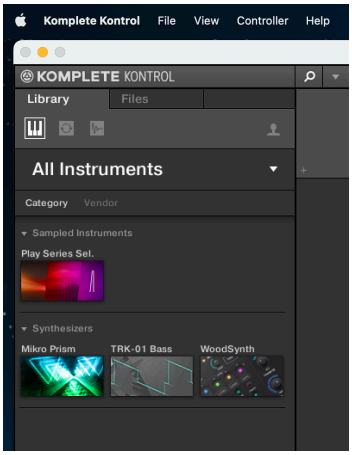
20.NI (National Instruments) NKS Integration

(NKS is a registered trademark of Native Instruments GmbH.)

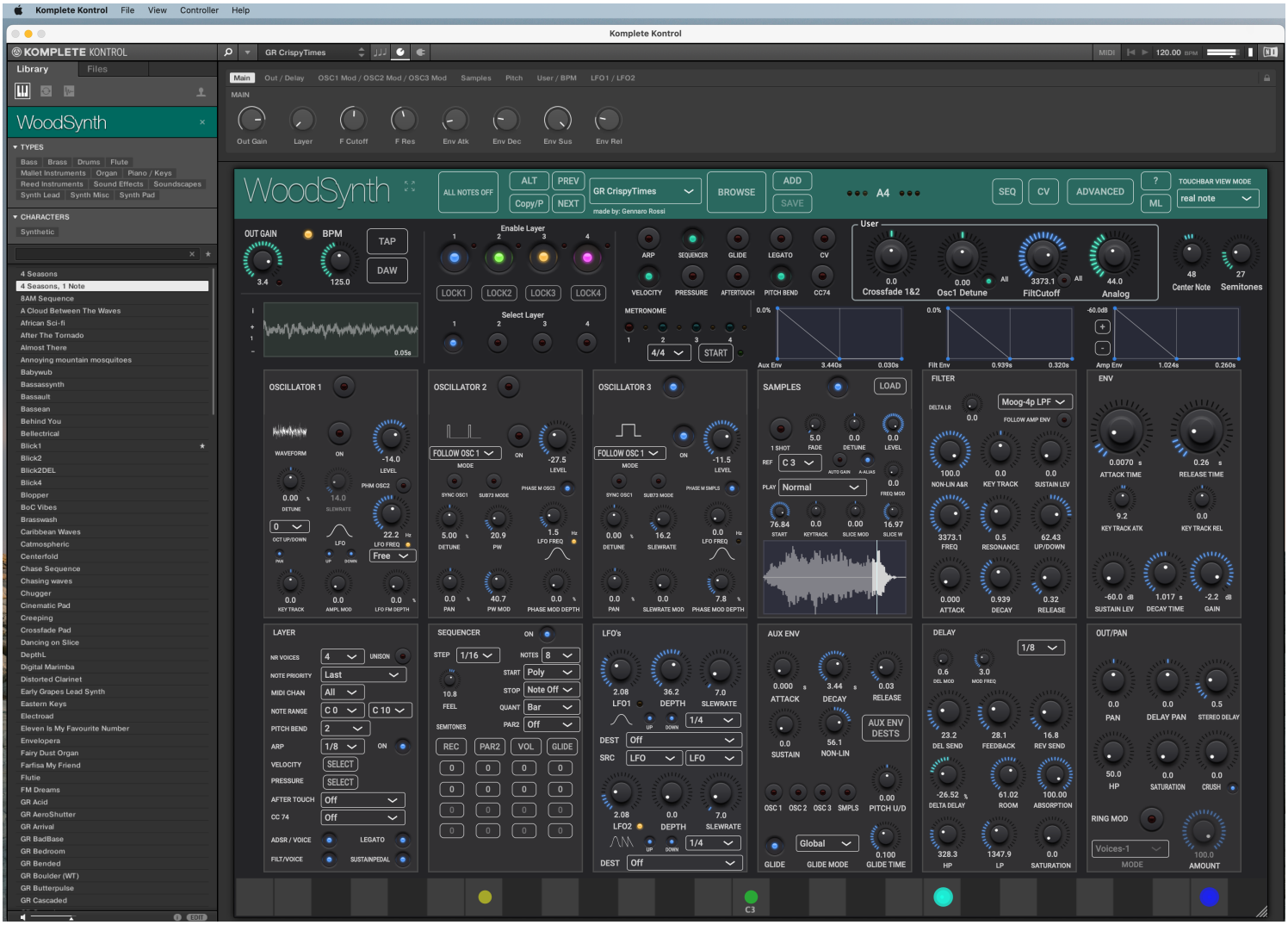
20.1 What

NI makes fancy keyboards which allow to browse for a plugin and for presets in the plugin.
The keyboard interfaces with the NI Komplete Kontrol or Machine app/plugin and these apps host the (synth) VST plugins.
See also the NI website : https://www.native-instruments.com/en/specials/komplete/this-is-nks/

WoodSynth now fully supports NKS :



- WoodSynth appears in the NKS browser (on the keyboard and in Komplete Kontrol or Machine)
- All factory presets can be set from the NKS browser.
- All factory presets have a “preview” sound fragment, heard when scrolling with the NKS browser.
- NKS keyboard rotaries are mapped to common WoodSynth controls.
- NKS keyboard leds are used to indicate the current layer and split keyboard usage.



20.2 WoodSynth NKS

The WoodSynth VST3 plugin was slightly modified to handle the NKS integration.

The separate installer for NKS does not only contain this VST3 plugin but also the preset files used by NKS, the preview sound fragments and some preference files needed to be recognised by NKS.

Although this VST3 will also work for other DAW's, it may be better to use the VST3 in the normal installer when not using the NKS system.

20.3 Presets

NKS uses its own files for the factory presets which you see in the NKS browser (and in the WoodSynth preset popup).
So when changing a parameter in the WoodSynth UI and saving it in the preset, the WoodSynth preset file will be updated but NOT the NKS file.
It also means that adding a new preset via the WoodSynth UI will NOT make it visible in the NKS browser.

New presets can be saved in NKS via the Komplete Kontrol save menu. They will appear under the "User" presets in NKS.
I would recommend to also save a new preset with the WoodSynth UI so that the new preset is backed-up in iCloud and is also available on your other WoodSynth plugins/devices.

The NKS factory preset files for WoodSynth are stored in the folder : "/Library/Application Support/Woodman/WoodSynth".

The NKS user saved presets are stored in the folder : "/Users/<your user name>/Documents/Native Instruments/User Content/WoodSynth".

A file can be moved/copied from the user folder to the factory folder to make it visible in the factory browser after doing a rescan of the presets in the Komplete Kontrol preferences.

20.4 Lightguide

Some NI keyboards have a colour led on each key.
The leds can have 16 different colours, be switched off and have 2 brightness values.
WoodSynth uses the colours and brightness as follows :

At startup the 4 layer colours are displayed on a split region of the keyboard during 5s.

Selecting a layer (2nd rotary on the keyboard or in the WoodSynth UI) will display the colour of the selected layer (blue , green, yellow , magenta).
As the other rotaries are changing a parameter for the selected layer only, this helps to remind which layer is being edited.

When using different input note (midi) ranges for some layers, the enabled note range will be shown as follows :
- led off when the key is disabled in all the layers
- led has the layer colour when the key is enabled in that layer only (most common use case).
- led has a fifth colour (cyan) when the key is used by more than 1 layer (overlap or stacked mode).

In the case of a split keyboard mode, switching the selected layer will briefly (0.6s) display the layer colour.

When the sequencer is enabled, the current note played by the sequencer will have full brightness.

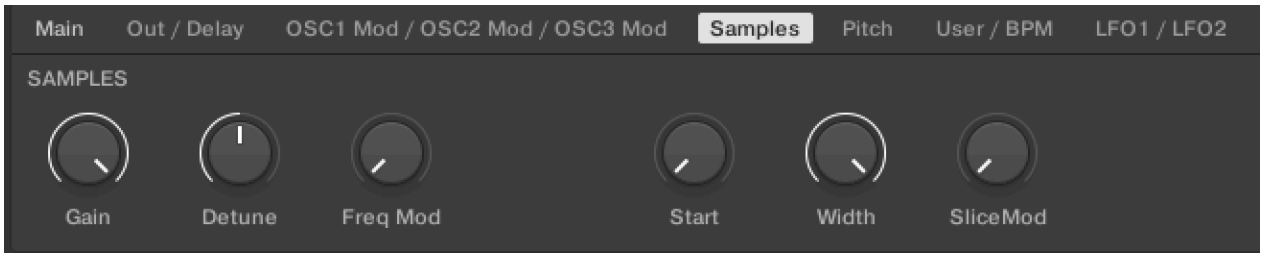
20.5 Keyboard rotary mappings NKS1

The rotaries are mapped to a predefined WoodSynth control (not by midi CC's but by using the DAW automation parameters). Although those mappings could be set per preset, WoodSynth uses the same mappings for consistency.















20.6 Keyboard parameter groups and controls NKS2 in MK3 keyboards.

NKS2 provides a very nice new feature where parameters are grouped and the group can be accessed by pushing on the group button.







21. CV Out support

CV (Control Voltages) are analog voltages (0 … 5V …) used in modular (and some hardware) synths to control/set several parameters and oscillator frequencies (note values, …).

WoodSynth can now output a CV for several signals on any of the channels of the audio interface.

A new CV panel has all the controls except for the “CV Master” button.



21.1 CV Out sources

Any of the first 8 audio interface channels can be set to :

- the current note (or sequencer note) being played
- the current note with pitch (pitch wheel, pitch mod, glide, FM mod)
- the current ADSR
- LFO 1 & 2 (LFO sources can be set to a wavetable yielding non-trivial waveforms !)
- the BPM clock
- Aux ADSR
- CC74
- Mod wheel
- Expression Pedal
- Note Velocity
- Sequencer Param2 & Param3 values (also when not assigned to a synth param)
- Sequencer Step up or down.

21.2 Calibration

The minimum and maximum CV value notes can be set manually or measured to calibrate the note CV out values. The CV value for a note is calculated linearly between the min and max note values.

Engaging the Min or Max “Play” button will output the min (0V) or the max voltage value.
The absolute max value is dependant on the audio interface and potentially the output volume knob/fader.

When the output of the external synth is connected to input channel 1 of the audio interface, the note (frequency) can be measured by switching on the “Measure” button.

When “Measure” and one of the “Play” buttons are on, the measured note will be set automatically in the min or max note.

When WoodSynth is used in a DAW, it should be inserted as an effect (not as an instrument) for the Measure function to work as instruments don’t get audio input. The DAW should then route the external synth input to the WoodSynth track.

21.3 DC and AC coupled audio interfaces

Normally CV outputs have to be DC and hence the audio interface has to be DC coupled.

However WoodSynth supports AC coupled audio interfaces by outputting a square wave in stead of a DC value when the “AC Out” button is on.

FIRST CHECK IF YOUR MODULAR SYNTH INPUT CAN HANDLE NEGATIVE VOLTAGES !

If it does, it will block the negative halves and the positive halves will be averaged out.

When you want to be sure that only positive voltages are fed to your modular synth CV inputs, a simple diode can be put between the audio interface output and synth input.